Baseline Community Health Analysis Report

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This report was produced in whole with National Petroleum Reserve-Alaska grant funds made available through the Department of Commerce, Community and Economic Development.
I am very pleased to introduce to you the North Slope’s first ever Baseline Community Health Analysis Report. This report will serve as a valuable tool for understanding and improving the health of our residents and communities, both today and in the future. This report outlines community health trends and discusses topics such as cancer, injury, chronic disease, respiratory disease, maternal and child health, mental and behavioral health, and infectious disease. This report also includes a profile for each North Slope village, which covers general health status, prevalence of major chronic diseases, obesity, smoking rates, helmet use, availability of adequate subsistence and market foods, and the health impacts from drugs and alcohol.

The completion of this report is an important milestone for our region, as our history includes past health impacts from epidemic diseases such as tuberculosis, influenza and measles. The timing of this report is also significant as our region is experiencing the increased demand for industrial development of our resources on our lands and in our waters, which results in both positive and negative effects to our residents.

This report should be used as a foundation for understanding and improving the health of our communities into the future. It can guide our local agencies in prioritizing health issues; it can be used for community health promotion and strategic planning efforts by local, state, and federal agencies; and it can be used to help secure the funding required to allow these efforts to turn into action. This report will be vital in connecting and furthering two goals important to the Borough and to my administration: Healthy Communities and increased Economic Opportunity.

It is with heartfelt optimism that I envision this report will be utilized by our communities to not only educate ourselves on our health issues, but also bring forth action plans that address the issues affecting our communities that will build upon the resources we have to create a healthier North Slope.

Quyanaqpat!  

Charlotte E. Brower  
NSB Mayor
Welcome everyone, to the first Baseline Community Health Analysis Report for the North Slope. The Health Department has worked over two years on this report, and it is with great excitement that we share it with you. This report contains pertinent health information for all North Slope residents, including individual community health profiles for Anaktuvuk Pass, Atqasuk, Barrow, Kaktovik, Nuiqsut, Point Hope, Point Lay, and Wainwright. The report describes health trends for North Slope residents, and includes comparisons within our North Slope populations, with state statistics, the US as a whole, and at times, with other circumpolar regions to give you a clear outlook on North Slope health trends. It also discusses some of the important factors that may be influencing health in our region. We, as communities, can work together in addressing the health issues using a focused, resourceful approach guided by the information in this report, to have a positive impact on our communities’ health.

An important part of gathering health data is using the data to develop strategies to improve community health; in this report you’ll find a Summary and Recommendations section that covers North Slope community health in a historical context, leading community health issues, leading causes of death, disease, disability, and the use of healthcare services in the NSB, and health trends within the North Slope. Recommendations are made in this section on how communities can work together to set priorities and work towards improving community health within our region.

It is our goal that this report serves as a foundation and resource for future monitoring of health trends, for public health planning and policy decisions, for developing strategies to improve health, and to secure funding for needed programs and services. We hope that you, as an individual or as a community leader, can use this report to better understand the health of your community and to think about ways you might contribute to making the North Slope a healthier place to live for our people.

Sincerely,

Doreen Leavitt, RN, Director
Biography of Report Author
Dr. Jana McAninch is a family physician who has lived and worked in Alaska for eight years. Trained at University of California, San Francisco, she also has a Masters of Public Health in Epidemiology from University of California, Berkeley. Dr. McAninch has more than five years of experience caring for Alaska Native patients in the Yukon-Kuskokwim Delta and Interior regions of the state, and she has travelled to and spent time in a number of villages in rural Alaska. Dr. McAninch has also worked as a program consultant to the Tanana Chiefs Conference Diabetes Program in Fairbanks. She has visited the North Slope multiple times and worked closely with members of the health department during the preparation of this report.

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A healthy population is essential for a vibrant culture, a strong economy, and a bright future for the next generation.
Project Background

• **Purpose:** In 2008, the NSB Health Department began this project to better understand the health issues facing North Slope communities in order to work effectively with communities on addressing community health issues most important to them and to help inform planning and policy decisions that impact community health.

• **Funding:** The project was funded by a National Petroleum Reserve-Alaska (NPR-A) Impact Grant, as part of the NSB Health Impact Assessment (HIA) Program. HIA is a policy tool that ensures that the planning, evaluation, and permitting of large projects and policy decisions consider health and include mitigation measures to protect health.

• **Sources of information for this report:** Much of the data included in the report was obtained from existing sources, such as disease registries; local, state, and national databases; national surveys; published articles and reports, as well as interviews with local residents, healthcare providers, and community leaders. We also were able to collect some valuable information by adding a new “health” module to the 2010 NSB Census, which is coordinated by the NSB Planning Department.

• **About the report author:** The Health Department has contracted an Alaskan physician with public health training to research and write this report. The author has extensive experience working in rural Alaska and with Alaska Natives.

What Does This Report Cover?

1. **NSB-specific data** and discussion of the following health topics:
   - Overall health
   - Cancer
   - Injury
   - Chronic disease
   - Respiratory disease
   - Maternal and child health
   - Mental and behavioral health
   - Infectious disease

2. **Important factors influencing NSB community health**, both positive and negative:
   - Economics, education, and other social and cultural factors
   - Environment
   - Behaviors such as smoking, diet (including the health benefits of NSB subsistence foods), alcohol and drug use, and physical activity
   - Health services

3. **Results of the 2010 NSB Census health module** for each individual village and for the North Slope overall, along with state-level comparisons, on topics including:
   - General health status
   - Prevalence of major chronic diseases
   - Obesity and overweight estimates, and behaviors such as smoking, sugared beverage consumption, physical activity, and helmet use among household heads
   - Availability of adequate subsistence and market foods
   - Health impact of drugs and alcohol

4. A “**Summary and Recommendations**” section that covers:
   - NSB community health in historical context
   - Leading community health problems in the NSB, including
     - Leading causes of death, disease, and disability, and use of healthcare services in the NSB
     - Major “health disparities,” where the NSB or groups within the NSB suffer higher rates of certain health problems than other regions or the state as a whole
   - Trends and health problems that are on the rise in NSB communities
   - Recommendations on how residents and organizations across the North Slope can work together to set priorities and develop strategies to improve community health
   - Suggested health indicators that can be tracked over time to monitor changes in health in the NSB

5. **Complete references, descriptions of data sources, and a selected list of resources available to communities working to improve health.** Website links are provided whenever available.
How Can This Report Be Used?

This report can be of use to a variety of NSB departments, organizations, agencies, and community leaders.

1. **Baseline data source for HIA**: Health should be a consideration in all planning and policy decisions affecting the local community, and accurate baseline health data is an important first step in anticipating and addressing potential health effects of these decisions.

2. **Developing strategies to improve community health**: This analysis can serve as a foundation for the NSB Health Department and other community partners in prioritizing health issues, envisioning change, and working together to achieve community goals through programs and policies, talking circles, education and media campaigns, and other strategies.

3. **Grant-writing and securing funding**: Data from this report are available to the NSB Health Department and other Borough departments for use in grant applications and other projects. A bibliography and description of data sources provide additional information for grant-writing activities.

4. **Monitoring health trends**: Many of the health measures included in this report can be updated and used to monitor trends in community health and for evaluating the effectiveness of health promotion efforts.

5. **Training and orientation resource**: This report may be useful in orienting new health providers, counselors, public health nurses, and others new to working with North Slope communities.

6. **Guiding future research and data collection**: This report identifies a number of areas where health-related data are lacking or further study could benefit the health of NSB communities.

Brief Summary of Findings

**Community Health Assets and Achievements in the NSB**

- A large majority of residents report or are reported to have at least “good” general health status (page 66).
- Infant mortality rates have declined since the late 1970s (page 190).
- Unintentional injury death rates have declined since the late 1970s (page 72).
- Cases of vaccine-preventable illness and reportable infectious diarrheal illness have decreased since the 1980s (page 234).
- Self-reported prenatal alcohol use has declined since the early 1990s (page 200).
- Among Barrow household heads who smoked in 2010, fewer reported smoking one or more packs of cigarettes per day than in 2003 (page 105).
- Among Alaska Natives, the Barrow service unit has one of the lowest rates of type II diabetes in the state and a rate far lower than most Lower 48 American Indians (page 168).
- A combination of health indicators—for example, infant mortality and premature death rates—suggest that the North Slope may enjoy a better overall health status than other northern, southwestern, and interior rural Alaskan regions that have many geographic and demographic similarities (page 73).
- Despite the persistently high suicide rates in the region, self-reported general mental health in the NSB (among adults) is among the best in the state (page 218).

**Factors Likely Influencing Health in the NSB in a Positive Way**

- The subsistence way of life: participation in subsistence activities (page 90) and subsistence food use (page 112) are both high in the NSB, forming the foundation of community life. Not only are subsistence foods rich in nutrients and protective against chronic diseases, such as diabetes and heart disease, but participation in subsistence provides physical exercise, social interaction, and a source of cultural pride and continuity.
- Commitment of local leadership to supporting strong cultural values and subsistence participation in school, home, work, and community environments (page 89, page 83) through policies such as subsistence leave, community festivals and feasts, and many other programs may be imparting resilience and contributing to mental and physical health in the community.
• An increase in overall education levels, a growing Inupiaq education program, early childhood education programs, and expanding local culturally-affirming college opportunities all are likely to affect community health in a positive way (page 83).

• Improvements in water and sanitation infrastructure: The NSB’s water/sanitation infrastructure has improved in recent decades and is more advanced than in many other parts of rural Alaska (page 95).

• Access to basic emergency health services, primary care, and preventive health services, as well as many social and behavioral health services, despite the remote location of North Slope communities (page 122).

• Higher than average rate of health insurance coverage: Almost all (97%) of NSB household heads report having some form of health insurance coverage (page 122).

• Restrictive alcohol laws: North Slope communities have chosen to restrict access to alcohol through local option laws. These measures have been found, in multiple studies, to be associated with lower rates of alcohol-related injuries and other morbidities (page 157).

• Local tobacco control policies: Barrow has enacted both a municipal tobacco tax and an indoor air quality ordinance, both effective means of decreasing tobacco use and exposure. These policies may have contributed to the decrease in the amount smoked among Barrow adults (page 40).

• A strong local voice in decisions and legislation affecting North Slope communities (page 92) may be benefiting overall community mental and physical health.

• A local economy with below-average unemployment and poverty rates and above-average median household income, compared with statewide and nationwide estimates (page 77) has the potential to support overall community health. Chronic unemployment and underemployment, particularly in outlying villages and among Inupiat residents, are not well reflected in official unemployment statistics, however, and remain ongoing community concerns and threats to community health and well-being.

• A majority of youth are connected and engaged with their schools and communities, according to multiple surveys (page 88), many showing great promise as future leaders.

Community Health Challenges in the NSB

Health Disparities

The population of the NSB has a greater burden of some health problems than does the general population of Alaska. These types of differences between populations are sometimes called “health disparities.” Eliminating health disparities is a major state and national public health goal, and recognizing health disparities can be an important step toward improving the health of communities.

• General Health Status: Adult residents are less likely than adults statewide to report “very good” or “excellent” general health (page 66).

• Most measures of maternal and child health—for example, infant mortality rates, child mortality rates, reported general health status among children, child obesity, prenatal risk factors, preterm birth rates, birth defects, child maltreatment rates, prenatal and teen smoking rates, and teen pregnancy rates—suggest that this remains an area where the NSB lags behind the state as a whole (page 188).

• Lung and colon cancer incidence rates among NSB men are significantly higher than overall statewide rates (page 133).

• Death rates from chronic lower respiratory disease (such as emphysema or chronic obstructive pulmonary disease [COPD]) are roughly twice statewide rates (page 180). Reported asthma rates do not appear to be higher than in Alaska overall, however.

• Injury rates—including unintentional injury (particularly offroad vehicles), suicide, domestic violence, and sexual assault—remain higher than statewide and national estimates (page 144).

• Rates of chlamydia and gonorrhea, both sexually-transmitted infections, are considerably higher than statewide and national rates (page 235).

• Rates of permanent tooth loss from decay are higher than in Alaska or the U.S. (page 172).
Health Disparities Within the NSB

Data from the new 2010 NSB Census health module and other sources also suggest a number of differences in health-related measures within the NSB (also see Appendix A). These disparities are apparent primarily among different racial/ethnic groups and between residents of Barrow and those of the outlying North Slope villages.

The villages of the NSB differ from each other in many ways. Barrow, in particular, is the commercial and governmental hub and differs from outlying villages in employment opportunities, the goods and services available, the size and diversity of the population, and other factors.

Compared with Barrow residents, residents of the other North Slope villages (looking both at Iñupiat only and at all ethnic groups combined) were, as a whole, more likely to report

- Smoking tobacco, both among adults and children (page 105).
- Food insecurity (not having enough food at all times to sustain a healthy lifestyle for all household members) in the last year (page 116).
- Moderate physical activity for at least 30 minutes a day, 5 days a week (page 119), and
- Drinking three or more sodas or sugared beverages per day (page 114).

Residents of outlying villages were, as a whole, less likely than their counterparts in Barrow to report

- Very good or excellent general health status, among both adults and children (page 66 and page 188).
- Using a helmet when riding snowmachines or four-wheelers (page 158).
- Household members who had been hurt by alcohol or drugs in the past year.
- A diagnosis of diabetes, among adults (page 167).
- Frequent/chronic ear infections, among children (page 182).

Many measures of health and the factors influencing health differ among racial and ethnic groups in the NSB as well. For example, both at the state level and in the NSB, Alaska Native residents are more likely than non-Native residents to be hospitalized for an injury (page 145), to have a premature baby (page 192), or to be diagnosed with a sexually-transmitted infection (page 235).

- In the 2010 NSB Census, Iñupiat residents were also more likely than non-Iñupiat residents to report

  - Less than “very good” general health status, (page 66 and page 188).
  - Food insecurity (page 116).
  - Tobacco smoking, among both adults and teens (page 105).
  - Household members who had been hurt by alcohol or drugs in the last year (page 222).
  - Not wearing helmets when riding snowmachines or four-wheelers (page 158).
  - Drinking three or more of sodas or other sugared drinks per day, on average (page 114).
  - Being unemployed (page 79)
  - Having less than a high school education (page 84)

- Adults belonging to ethnic groups other than Iñupiat or Caucasian were roughly twice as likely as Iñupiat or Caucasians to report having been told they had diabetes (page 167), however. Caucasian adults in certain age groups were also more likely to have been diagnosed with high cholesterol and thyroid disease than were Iñupiat adults (page 166).

Leading Causes of Death, Disability, and Use of the Healthcare System in the NSB

- Since the early 1990s, the five leading causes of death in the NSB have been fairly constant, with minor changes in rank (page 72), and have included
  1. Cancer,
  2. Heart disease,
  3. Unintentional injury (accidents),
  4. Chronic lower respiratory disease, and
  5. Suicide

- The leading causes of premature death in the NSB are unintentional injury (accidents) and suicide (page 72).
• The leading self-reported chronic health problems among NSB adults in the 2010 NSB Census were (page 37)
  1. Arthritis and/or chronic pain,
  2. High blood pressure,
  3. High cholesterol, and
  4. Chronic respiratory problems.

• The leading admitting diagnoses to Samuel Simmonds Memorial Hospital (SSMH) in 2008–2009 were (page 38)
  1. Pneumonia,
  2. Exacerbation of chronic obstructive pulmonary disease, and
  3. Congestive heart failure.

• The leading reasons for visiting the outpatient clinic at SSMH in 2008–2009 were (page 38)
  1. Hypertension (high blood pressure),
  2. Upper respiratory infections (colds), and
  3. Otitis media (ear infections).

• The leading categories of clinical assessments made by community health aides in NSB villages in 2005–2006 were (page 38)
  1. Respiratory/ear/nose/throat problems,
  2. Digestive/abdominal problems, and
  3. Injuries.

Emerging Health Problems—Health Problems on the Rise in the NSB

• Obesity rates are increasing in the NSB, as they are across Alaska and the U.S. In the NSB, more than two of three household heads are now categorized as overweight or obese, based on self-reported height and weight (page 169).

• Even though the diabetes rate among Alaska Natives in the Barrow service unit is one of the lowest among IHS service units statewide, it more than doubled between 1985 and 2008 (page 168).

• Rates of the sexually-transmitted infections chlamydia and gonorrhea, as well as hepatitis C, have been increasing in the NSB in recent years (page 235 and page 234).

• Overall cancer incidence in the NSB appears to be following an upward trend, similar to that observed in Alaska Natives statewide and among Inuit across the circumpolar region (page 132). Lung cancer is the most commonly diagnosed cancer and the number one cause of cancer-related death in the NSB (page 133).

Factors Likely Influencing Health in the NSB in a Negative Way

• High smoking rates: Tobacco smoking rates in the NSB are among the highest in the state and show no indication of declining. Smoking rates among NSB teens and pregnant women are double statewide rates. Smoking rates are considerably higher among Iñupiat than in other ethnic groups in the NSB. Tobacco is a major risk factor for at least three of the leading causes of death in the NSB (page 105).

• Food insecurity: More than one in three NSB household heads report difficulty getting the food needed to eat healthy meals, and more than one in four Iñupiat household heads report that, at times last year, household members did not have enough to eat. Food insecurity is associated with numerous health problems, particularly among children (page 116).

• Difficulty accessing health services: The NSB is categorized as a medically underserved area and a health professional shortage area. Like many other remote rural Alaskan regions, the NSB suffers from chronic healthcare workforce shortages and high turnover of personnel, both of which affect the ability to deliver necessary health services. Residents must often travel long distances at considerable expense, inconvenience, and risk to access necessary health services. With the responsibility for healthcare shared by multiple agencies, fragmentation of health services is a frequently-cited barrier and frustration for patients (page 122).
• **Alcohol and drug abuse:** In the 2010 NSB Census, 30% of Inupiat and 10% of Caucasian household heads in the NSB report that a household member has been hurt by alcohol or drugs in the past year, and a large majority of NSB household heads overall believe that the health of their community has been hurt by alcohol or drugs in the past year. Alcohol is involved in a high percentage of injury hospitalizations, including suicide, motor vehicle and other unintentional injuries, and assaults (page 221).

• **Rising school drop-out rates:** Despite substantial investments in education and overall gains in education levels over the past 30 years, the overall high school graduation rates in the NSB School District remain below state and national averages (although not for all villages), and average grade 7–12 drop-out rates have increased since the early 1990s. Educational attainment is strongly associated with health outcomes throughout the lifespan (page 85).

• **High child maltreatment rates:** Child maltreatment rates in the NSB are roughly twice the statewide rates. Child maltreatment can have lifelong physical, emotional, and cognitive effects and contribute to the risk of suicide and experiencing interpersonal violence later in life (page 192).

• **Not enough physical activity and high consumption of sugary beverages:** As in most communities across the country, many residents of the NSB are not getting enough exercise for optimal health. Fewer than half of NSB household heads report getting the recommended amount of moderate physical activity per week (page 118). Also, consumption of sodas and other sugared drinks is high in the NSB, especially among Inupiat residents, compared with statewide estimates (page 114). Both of these factors may be contributing to the rising rates of obesity and other chronic diseases in the NSB.

• **Low levels of helmet and seatbelt use:** Only 18% of NSB household heads report using helmets when riding snowmachines or four-wheelers, a much smaller proportion than the estimated percentage of rural residents statewide who use snowmachine helmets (47%) (page 158). Helmets can reduce the likelihood of traumatic brain injury and death from offroad vehicle accidents, both major health concerns in the NSB.

• **Multigenerational and historical trauma:** As in all rural Alaska Native regions, the people of the North Slope have experienced devastating epidemics, forced removal of children to boarding schools (page 83), and other traumatic events. Experiences with environmental contamination (page 99) and unethical medical experimentation (page 138) compounded the multigenerational grief and victimization already impacting the region, and the high incidence of suicide, domestic and sexual violence, and unintentional injury death continue to traumatize many communities.

• **Poverty and unemployment:** Although rates in recent years have been lower than both state and national averages, both the poverty and unemployment rates in the NSB have fluctuated dramatically over the past 1–2 decades (page 77). Especially considering the high cost of living, NSB residents are far from immune to these economic stresses. Moreover, the negative health effects of poverty and unemployment often affect the most vulnerable community members, particularly children and those with chronic medical or mental health conditions.

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**Working Together to Improve Health: A Focus on Prevention**

Communities today have many challenges in keeping populations healthy. Skyrocketing medical costs, a fragmented healthcare system, and, in rural areas such as the NSB, chronic provider shortages and geographic remoteness add to the difficulty of healthcare delivery in an era of rising chronic disease rates and increasing complexity of medical care. Modern telecommunications and health information technology, expanded efforts to recruit and retain healthcare personnel, and efforts to build local capacity through mentorships, internships, scholarship programs, local training, and distance learning opportunities can help to meet some of the challenges in healthcare delivery in the NSB.

**Collaboration and Leadership**

Across the state and the country, however, communities are starting to look at health broadly and focus on prevention at the community level. Preventing disease and injury at a population level generally costs a fraction of what a society spends to treat these problems, and ultimately, investments in community-based health promotion can pay off economically for communities. Often with local health departments playing a leadership role, communities are examining their health challenges and resources, taking ownership
of problems, and attempting to address them through the development of partnerships and through collaborative planning and action. National grant funding programs are increasingly looking for this type of collaborative approach to community health improvement. In rural Alaska, innovative programs have also combined traditional knowledge and healing practices with modern evidence-based models to work toward community health goals (page 46).

Some potentially important community partners for health promotion in the NSB (page 47) include:

- Health Department;
- Elders, youth, and other community members;
- Mayor’s Office/Healthy Communities Initiative;
- NSB School District;
- Ilisagvik College;
- Arctic Slope Native Association;
- Health boards;
- Other Borough departments such as Planning, Law, and Wildlife Management, Police, Fire, and Public Works;
- Tribes and village governments;
- Iñupiat Community of the Arctic Slope (ICAS);
- Faith communities;
- Local businesses and Native corporations;
- Iñupiat history, language, and culture (IHLC) division;
- NSB Move-It campaign; and
- Maniilaq and Tanana Chiefs Conference.

Sustained leadership is one key to successful community health promotion. One of the challenges to initiating and sustaining community health promotion efforts in the NSB is that most community leaders, program directors, health providers, and others with an interest in community health have little time to take on and lead new projects. Recruiting for positions is often difficult, and turnover is high. One possible option would be a NSB community health promotion leadership position based, at least partially, in Anchorage or Fairbanks, where it may be easier to recruit and retain personnel as well as to collaborate with outside resources such as universities and tribal and state health organizations.

**"High Impact" Health Promotion Areas**

Each community must choose its own health priorities and strategies. However, based on the findings of this community health analysis, there appear to be several specific areas in which health promotion efforts have great potential to address major health disparities as well as leading and emerging health problems in the NSB.

The recommendations in this section present some health promotion activities in these areas that have been shown to work in other settings but that can be adapted to fit the specific needs of North Slope communities. Please see “Summary and Recommendations” section SR 3.2, and Appendix C for further discussion and resource information.

1. **Focus on Children and Young Families** (page 48)

Supporting the health of infants, children, and adolescents is one of the best investments a community can make in its future, and the findings of this report suggest that this is a major area of health disparity for the NSB.

A healthy childhood environment is a crucial step in preventing problems such as suicide, domestic violence, and drug and alcohol abuse, unsafe sexual behaviors, as well as many chronic health conditions, later in life.

A healthy childhood environment is one that is safe, loving, and free of tobacco, drug and alcohol problems, and violence; has enough healthy subsistence and store foods; has ample opportunities for social and cognitive development; and encourages physically active play and community engagement.

The “**NSB Healthy Kids Initiative**”: In 2010, the NSB Health Department began early efforts in this area, initiating community partnerships and developing a framework to address child and family health
challenges in the NSB. The mission of this initiative was "to develop community-wide partnerships that encourage and facilitate healthy choices and create an environment that supports optimal health and development for all infants, children, and adolescents living on the North Slope." Some of the themes that emerged from the initial working group included:

- A focus on early intervention: Iñupiaq values-based parenting education, engaging elders and other community members in helping young families to reduce family stress and create an environment where children can thrive.
- Improved coordination and prioritization of public health and medical services that support infant, child, and adolescent health.
- Efforts to reduce child obesity through breastfeeding support, encouraging traditional foods at home and in school, reducing soda and sugared beverage consumption, and educating about the importance of good sleep habits.
- The need for this work to be community-driven and to involve whole families, schools, and the larger community in planning and activities aimed at improving children's health.

The Health Department is hoping to continue work on this initiative with active participation and commitment from other organizations and community members.

2. Tobacco Prevention and Control Program (page 50)

A community-wide tobacco prevention and control program has the potential to significantly reduce the burden of suffering and death from the leading cause of death in the NSB—cancer, and lung cancer in particular. Reducing smoking rates may also reduce the significant health disparities in chronic lower respiratory disease, infant mortality, and other prevalent health problems in the NSB.

A large majority of adult smokers in the NSB are interested in quitting tobacco, and students surveyed in two different North Slope villages identified tobacco smoking as a top health concern. Some important components of a coordinated community-based tobacco-control program include

- Preventing tobacco initiation among children and adolescents through
  - policies and enforcement that limit access to tobacco,
  - culturally-tailored counter-advertising and other hard-hitting media campaigns,
  - early intervention programs,
  - helping youth become involved in and form peer connections around interests and activities that reduce their likelihood of smoking, and
  - engaging youth directly in tobacco prevention effort planning and implementation.

- Ensuring access to effective tobacco cessation services, with programs catering particularly to those groups who may be most highly motivated to quit; for example, pregnant women and those in younger age groups in general.

- Gathering support for expansion of local tobacco taxes and indoor air quality ordinances.

3. Coordinated Injury Prevention Program (page 50)

Injury is a leading cause of death and the number one cause of premature death in the NSB. Across Alaska, community leaders, health departments, public safety officials, and tribal health organizations are working collaboratively to address the related problems of unintentional injury, suicide, and interpersonal violence. Many tribal health organizations have worked with the ANTHC Injury Prevention Program to develop local injury prevention programs with dedicated local staffing. In addition to ongoing support and evaluation of current injury prevention efforts in the NSB, some possible areas of focus include:

- Talking circles, community spirit gatherings, and other supportive community forums that can help to address the historical and personal trauma, unresolved anger, and grief that can drive self-destructive, risk-taking, and violent behaviors.
- Maintaining support for local option laws that restrict access to alcohol.
- Motor vehicle and firearm safety programs and policies, including programs to increase helmet use and exploring gun and medicine locker programs.
- Early intervention programs such as nurse-family partnerships.
- Exploration of ways to prevent potential subsistence-related injury caused by climate change and industrial development.
4. Preventing Chronic Disease through Healthy Diet and Physical Activity (page 51)

Community-based nutrition and physical activity interventions incorporating healthy subsistence foods and activities have the potential to reverse the concerning trends in obesity and diabetes in the NSB. Moreover, cancer, arthritis and/or chronic pain, high blood pressure, oral health, and mental health are all linked to diet and lifestyle.

Education about diet and exercise can give people the information they need to make changes for themselves and their children. Programs such as WIC, diabetes and nutrition programs at SSMH, the Move-It campaign, and others are already working hard to give individuals information and support in these efforts. Communities can also help make personal lifestyle change easier through systems and policies that make it easier for people to live well. Many states (including Alaska) and an increasing number of local communities are developing food policy councils or committees to address the central role that food systems play in the health of populations. A food policy committee in the NSB could be a valuable forum for addressing the unique issues around food distribution and cost, food security, and subsistence that affect health in the region. Mandatory school wellness policies are another framework that can be utilized to address diet and physical activity through planning and policy change.

Five evidence-based components of a population-based approach to improving diet and physical activity include:

- **Media:** for example, promoting healthy food and/or drink choices, non-motorized transit, and physical activity through schools, community events, youth-produced videos, and local media.
- **Access:** for example, providing incentives to store owners to stock and promote healthier food options, assisting communities with subsistence food sharing and storage, offering healthy foods and beverages and limiting access to sugary drinks and junk foods at schools and Borough-sponsored events, and expanding local physical recreational opportunities.
- **Point of decision information:** for example, signage for healthy vs. less healthy foods, calorie and nutrition information in restaurants and stores, product placement and attractiveness.
- **Price:** bulk purchase and/or procurement programs to make healthy foods less expensive, building community support for a local tax on sodas and other sugared drinks that could fund subsistence support programs, double-value WIC or other food support coupons for healthy foods, or other community priorities.
- **Social support services:** for example, breastfeeding peer counseling and workplace policies that support breastfeeding, physical activity groups and events such as Eskimo dancing nights, walks and/or races, and family sports nights.

Enhancing Overall Community Health (page 52)

Overall community health can benefit from many activities occurring outside the traditional realm of public health, for example:

- Continued support for culturally-affirming education and employment opportunities, particularly ones with subsistence leave and other wellness policies.
- Stewardship of the natural environment and protection of subsistence resources.
- Social support networks and expanded opportunities for community engagement for all residents.
- Cultivating relationships with organizations such as the Alaska Native Tribal Health Consortium and the University of Alaska that can offer support and expertise in efforts to improve community health.
- Continued participation in HIA, a tool that can be used to consider health in large variety of planning and policy decisions in the NSB, large and small, both within and outside of the Environmental Impact Assessment process (page 52).
Introduction

IN 1.1. Project Background and Funding

IN 1.2. How Can This Report Best Be Used by NSB Communities?

Methods and Technical Notes

MTN 1. Conceptual Framework

MTN 2. Definition of the North Slope Borough Population

MTN 3. Data Sources and Health Indicators (also see Appendix B)

MTN 4. Data Limitations and Interpretation of Data

MTN 5. Health Disparities, Comparison Populations, and Benchmarks

MTN 6. Terminology
Introduction

IN 1.1. Project Background and Funding

The communities of the North Slope Borough (NSB) have experienced profound social, economic, and environmental changes over the last century and particularly since the discovery of large oil reserves on the north slope of Alaska in the late 1960’s. An evolution in health status has accompanied these changes. Recognizing that a healthy population is vital to a robust economy, a vibrant culture, and a promising future for the next generation, the NSB Health Department has commissioned this baseline community health analysis to better understand and work with North Slope communities to address the health issues they face.

This project was funded by a grant through the National Petroleum Reserve-Alaska (NPR-A) impact program, which provides funding for public facilities and services in communities most directly impacted by oil and gas development in the NPR-A region. This grant provided funds to the NSB Health Department for pioneering the use of Health Impact Assessment (HIA), a policy tool that ensures that the planning, evaluation, and permitting of large projects consider health and include mitigation measures to protect health. A solid understanding of the health problems and trends currently affecting a community is an important early step in the HIA process. This report is intended to provide the baseline community health information needed to fully evaluate potential impacts to human health from natural resource development and other major planning decisions in the NSB.

IN 1.2. How Can This Report Best Be Used by NSB Communities?

In addition to providing baseline health information for Health Impact Assessment in the NSB, this report is intended to serve as an ongoing resource for public health planners, community leaders, governmental departments, and others working to improve community well-being in the NSB. Below are some examples of how information from this report can be utilized. We hope that this project will prompt the discussion, collaboration, and commitment necessary to make the NSB the healthiest community possible.

Community Health Promotion and Strategic Planning: The findings of this baseline community health analysis can be used to guide the NSB Health Department and other community partners in setting goals, prioritizing health issues, envisioning change, and working together to develop programs and policies to achieve community goals. The process of strategic community health planning is dynamic. Community input and participation is necessary at every step and involves exchanging ideas and stories, listening to concerns and different perspectives, and mobilizing for change. This collaborative process can, in itself, be constructive and an important step toward improving community health. The NSB Health Department has already begun developing a framework for addressing disparities in child and family health and is actively seeking partnerships and community involvement.

Grant-writing and securing funding: Baseline data from this report are available to NSB Health Department and other Borough departments for use in grant applications and other projects. A complete bibliography and comprehensive description of data sources provide additional sources of information on health and health-related topics in the NSB.

Monitoring health trends: Many of the health measures included in this report have the potential to be updated regularly and used to monitor trends in aspects of community health and for evaluating the effectiveness of specific health promotion efforts.

Guiding future research and data collection: This report identifies a number of areas where reliable data are lacking and/or further study could benefit the health of NSB communities.

Training and orientation: This report may be useful in orienting new health providers, counselors, public health nurses, students, interns, and others to some of the major community health issues as well as factors influencing community health in North Slope communities.
Methods and Technical Notes

MTN 1. **Conceptual Framework**

Every culture, community, and individual has a slightly different definition of health. For many cultures, particularly indigenous cultures, health of the individual is closely linked with that of the community and is based on an individual’s ability to fulfill his or her role in society and relate to others. This report utilizes a broad definition of health, put forth in the constitution of the World Health Organization in 1948: “Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.”

Our understanding of what it takes to be healthy is constantly evolving. Research has shown us that health is shaped by many factors—genetics and personal behavior, as well as external factors such as economic conditions, culture and social connections, the physical environment, and access to health care. Our analysis also examines these factors, sometimes called “health determinants,” and how they may be impacting health in the NSB.

In planning, researching, and writing this report, the Inupiat Values that developed over countless generations and still form the foundation of health and well-being in North Slope communities were always kept in mind:

- Love and Respect for Elders, One Another, and Nature
- Family Kinship Roles
- Sharing
- Knowledge of Inupiat Language
- Humor
- Hunting Traditions
- Compassion
- Humility
- Avoidance of Conflict
- Spirituality —“Inupiat Values” Native Village of Barrow

MTN 2. **Definition of the North Slope Borough Population**

For this report, the North Slope Borough (NSB) refers to the region including the villages of Anaktuvuk Pass, Atqasuk, Barrow, Kaktovik, Nuiqsut, Point Hope, Point Lay, and Wainwright. Unless otherwise specified, the NSB does not refer to the Borough governmental body but rather to the region and its people. The referenced NSB population includes both Alaska Native—primarily Inupiat—and non-Native residents, but it does not include non-resident workers stationed at sites on the North Slope. Wherever possible, this report includes data for all residents of the NSB; however, some valuable data sources include only Alaska Native residents, and some sources do not include the NSB villages (Point Hope and Anaktuvuk Pass) that obtain most of their health care in other service areas. When data include only a subset of the NSB population, this will be noted in the text. In general, race and/or ethnic group and geographic region definitions and terminology are kept as they are in the source material; therefore, some terminology (for example Caucasian vs. white, or North Slope vs. Arctic Slope) may vary within this report.

MTN 3. **Data Sources and Health Indicators** (also see Appendix B)

In developing this project, interviews were conducted with local community and tribal leaders, health aides, and medical and public health personnel to establish a context for discussion of community health issues in the NSB and to ensure that every attempt is made to address topics of community concern in the report. High school students were also surveyed about their perceptions of health problems in their communities.

A variety of data sources are used in this analysis in an attempt to develop a comprehensive picture of evolving health in North Slope communities. Health indicators, data sources, and health topics were identified and selected by reviewing models and examples of community health assessments and community health profiles prepared by a variety of organizations. Data sources were also identified through online data searches, review of peer-reviewed published literature, reports and bulletins, personal
communication with public health experts, and review of draft statewide guidelines for Health Impact Assessment baseline health data sources provided by the Alaska Native Tribal Health Consortium.

A large portion of the data included in this report is drawn from existing sources such as state and national surveys, disease registries, governmental and health system databases, and published reports. A great deal of the data is publicly available, often accessible online. Additional data were obtained through specific requests to the agency or department holding the data. Peer-reviewed journal articles were also a source of some NSB-specific data, but those sources primarily provided background information on the topics examined in the report.

This report also includes a new body of information for the NSB: for the first time, a series of health questions were included in the locally-conducted North Slope Borough, 2010 Economic Profile and Census Report, conducted by the North Slope Borough Department of Planning and Community Services, referred to in this report as the NSB Census. In an effort to create an accurate and complete picture of North Slope communities, the NSB has done its own household census every 5–7 years over the last 20 years. This census has included questions about housing, employment, education, income, subsistence, Inupiat language ability, and general attitudes. The new health questions were developed in an attempt to fill gaps in the available health data as well as to understand the health of each individual NSB community in more detail. A major strength of the health data collected in the 2010 NSB Census is the high proportion of households that participated in each community and the relatively large number of survey participants overall. While some data were collected by proxy—meaning that one household member answered questions about other household members to the best of his or her ability—the high level of participation slope-wide was felt to provide a very representative picture of the NSB population. Health data from the 2010 NSB Census were analyzed using SPSS Stats 18 software and are incorporated into this report in relevant sections and included in entirety in Appendix A. The full 2010 NSB Census report will be available separately. Additional information on the 2010 NSB Census methodology is provided in Appendix B.

Commonly-used data source acronyms:
ABVS: Alaska Bureau of Vital Statistics
(Alaska) BRFSS: (Alaska) Behavioral Risk Factor Surveillance System
(Alaska) PRAMS: (Alaska) Pregnancy Risk Assessment Monitoring System
(Alaska) YRBS: (Alaska) Youth Risk Behavior Survey
CDC: Centers for Disease Control and Prevention

Reference endnotes are included for each report chapter, and a full bibliography and detailed descriptions of majors data sources appear in Appendix B.

**MTN 4. Data Limitations and Interpretation of Data**

All data have limitations, and where identified, caveats are noted in the text or in the accompanying figures and tables later in this report. Detailed descriptions of data sources, limitations, and caveats in interpreting data are included in Appendix B as well. Often, multiple sources of data are used to examine a single topic, especially when one source of data has significant limitations. Generally, all available years of reliable data are included, up to the most recent year available at the time of writing.

Evaluating health data in NSB communities poses some specific challenges, primarily related to the relatively small population of the region. When calculating the prevalence of a disease or the rate of an event in small communities, small numbers of cases can result in unreliable estimates that fluctuate greatly from year to year or from community to community. Surveys that attempt to achieve a representative statewide sample—for example, the Behavioral Risk Factor Surveillance System (BRFSS) and the Pregnancy Risk Assessment Monitoring System (PRAMS)—typically include a fairly small number of participants from the NSB in a given year and, therefore, are not very reliable annual estimates for the NSB population.

Often in this report, multiple years of data are combined to achieve more stable rates or larger sample sizes. For example, for BRFSS survey data, 3 years of data were combined to calculate rolling 3-year averages. Data are presented only for questions for which at least 50 survey responses per time period are available for the NSB census area. Additional information about BRFSS data is located in Appendix B. Alaska Bureau of Vital Statistics (ABVS) data were also combined into 3- to 5-year periods and presented as rolling average rates. It is noted when rates are based on fewer than 20 events or cases per time period, as these are less reliable and must be interpreted with particular caution. When confidentiality of
personal health information is at risk due to small numbers of events (generally fewer than six in a given location and time period), the data are not reported.

The terms “statistically significant,” or “significant” are used in this report to describe associations or differences between two variables or population groups that are statistically unlikely to have occurred by chance alone. The threshold used throughout this report is a p-value of <0.05, indicating that there is less than a 5% chance that an observed difference or association occurred by chance alone. Other statistical terms used in this report are discussed below under Terminology.

Finally, great caution should be used whenever making health comparisons between two groups. There are many factors, often unmeasured, that can affect the prevalence of disease in a population.

MTN 5. Health Disparities, Comparison Populations, and Benchmarks

For decades, the public health field has recognized that some groups within our society suffer higher rates of many diseases than others. Often, members of ethnic or other minority groups, those with lower education or income levels, and those living in rural communities have shorter life expectancies and suffer a greater burden of health problems than the general population. These differences are referred to as “health disparities.” Identifying health disparities can be an important step in a community’s efforts to improve community health. Where available, this report includes comparisons of health measures in the NSB to those of Alaska and the U.S. overall to identify areas where the NSB is affected disproportionately by certain health problems compared to the larger population. Depending on availability, data for other circumpolar regions, other Alaskan communities or regions, or specifically for the Alaska Native population, may be provided for reference as well. Based on data collected in the 2010 NSB Census, the author also attempts to identify significant health disparities within the NSB. Benchmarks of many of the targets presented in the Alaska Department of Health and Social Services publication, Healthy Alaskans 2010: Targets and Strategies for Improved Health have also been included. Created by a statewide council, the Healthy Alaskans Partnership Council, this document put forth a set of health objectives for the year 2010 that, if achieved, would reflect significant improvements in health status for the state of Alaska.

MTN 6. Terminology

This report is intended for readers both with and without a background in public health. Definitions of technical terms that are used throughout the report are provided below:

95% Confidence Interval: A statistical term used in a number of different settings, the 95% confidence interval around an estimated rate is the range in which one can be 95% confident that the true population rate or proportion lies. Estimated rates in small populations or based on small sample sizes tend to have wider confidence intervals. If two groups have estimates with 95% confidence intervals that do not overlap, then one can be fairly sure that the death or event rate, or prevalence of disease or health characteristic, is truly different in these two populations.

Adequate Prenatal Care: In this report, we utilized a measurement call the Adequate Prenatal Care Utilization (APNCU) index. This index assesses the adequacy of prenatal care based on the following information obtained from birth certificates: trimester of entry into prenatal care, number of prenatal visits, and gestational age of infant at birth. For this report, the term “adequate prenatal care” combines the categories of “adequate” and “adequate plus,” according to the index categories used by the Alaska Bureau of Vital Statistics.

Age-Adjusted Rate: An age-adjusted rate is a mathematically-weighted average of the age-specific actual (crude) rates of a disease or condition. The “weight” of each age group is determined by the proportion of persons in that age group in a standard population (commonly the 2000 U.S. standard population). Disease rates are typically age-adjusted to allow comparisons between populations with different age distributions. For example, if one population has a higher proportion of older people, that population is likely to have a higher death rate from heart disease, while a younger population may have relatively higher death rate from motor vehicle accidents. To compare death rates in these two populations, the rates can be adjusted to control for the effect of age.

Body Mass Index (BMI): BMI refers to a person’s weight in kilograms, divided by their height in meters squared. The categories of healthy weight, overweight, and obese are based on BMI. For most people,
BMI correlates with their amount of body fat and is an inexpensive and simple method for estimating obesity rates in a population. For children, these categories also take into account age and gender due to normal differences in body fat between boys and girls and at various ages. Therefore, for children, BMI age- and sex-specific percentiles are used. The categories below are based on Centers for Disease Control and Prevention guidelines.

<table>
<thead>
<tr>
<th>Weight Category</th>
<th>Adults</th>
<th>Children and Teens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>BMI less than 18.5 kg/m²</td>
<td>Less than 5th BMI percentile</td>
</tr>
<tr>
<td>Healthy weight</td>
<td>BMI 18.5–24.9 kg/m²</td>
<td>5th percentile to less than the 85th BMI percentile</td>
</tr>
<tr>
<td>Overweight</td>
<td>BMI 25.0–29.9 kg/m²</td>
<td>85th to less than the 95th BMI percentile</td>
</tr>
<tr>
<td>Obese</td>
<td>BMI 30 or greater kg/m²</td>
<td>Equal to or greater than the 95th BMI percentile</td>
</tr>
</tbody>
</table>

**Crude Rate:** A crude rate is calculated by dividing the actual number of observed events or cases in a population by the total population, generally multiplied by a factor of 100–100,000 (depending on how common or rare the disease is).

**Health Disparity:** An important concept in population health, health disparities are substantial differences in measures of health, life expectancy, and quality of life that occur among populations differing by race or ethnicity, gender, education or income, disability, living in rural localities, or sexual orientation.

**Incidence:** Incidence refers to the total number of new cases of a specific disease during a year, divided by the total population, generally multiplied by a factor of 100–100,000 (depending on how common or rare the disease is). This is sometimes called annual cumulative incidence.

**Infant Mortality Rate (IMR):** IMR refers to the number of deaths in infants less than 1 year of age during a year, divided by the total number of live births during that year, generally multiplied by a factor of 1000.

**Low Birth Weight (LBW):** LBW refers to infants born weighing less than 2500 grams (5.5 pounds).

**Mortality Rate:** The mortality rate, sometimes also called a death rate, is the total number of deaths in a population (from a specific cause or all causes combined) during a year, divided by the total population, generally multiplied by a factor of 100,000.

**Neonatal Mortality Rate:** The neonatal mortality rate is a subclassification of infant mortality rate, referring to the number of deaths in infants less than 28 days of age during a year, divided by the total number of live births during the year, generally multiplied by a factor of 1000.

**Post-Neonatal Mortality Rate:** The post-neonatal mortality rate refers to the number of deaths in infants between 28 days and 1 year of age during a year, divided by the total number of live births during that year, generally multiplied by a factor of 1000.

**Prevalence:** A common descriptive statistic, prevalence refers to the total number of cases, new or old, of a disease, condition, or characteristic existing at a point in time divided by the total population at the point in time, generally multiplied by a factor of 100–100,000 (depending on how common or rare the disease is). The prevalence of a disease in a population depends on the number of people who get the disease as well as how long they live with the disease.

**Preterm Birth:** Preterm refers to infants born before 37 weeks’ gestation.

**Rate:** A rate is defined as the number of events or cases occurring in a specified time period, divided by the number of people in the population during that period.

**Statistical Significance:** An observed difference between two populations or relationship between two variables (for example, age and general health status) is termed statistically significant when it is unlikely to have occurred by chance. Generally, the level of statistical significance is set at 5%, where there is only a 5% chance that the observed difference or relationship occurred by chance alone. Statistically significant differences are difficult to detect when one or more groups being compared are very small, unless the differences between the two groups are very large or the relationships between two variables are very strong.

**Sudden Infant Death Syndrome (SIDS):** SIDS refers to the sudden, unexplained death of an infant from an unknown cause.
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Part I is intended for public health professionals and other local leaders involved in strategic planning and program development that is aimed at supporting and improving community health. This section synthesizes data and observations from the full report that follows to provide a picture of health on the North Slope in context. Leading health problems, health disparities, and major trends are discussed, as are local factors that are likely driving health status in the North Slope Borough.

This section also highlights resources and assets in NSB communities that build health, such as strong family and social ties, access to healthy subsistence foods, traditional knowledge and cultural values, engaged youth and respected elders, a history of successful self-determination, expanding educational opportunities, and leadership that is committed to improving community health. These and many other strengths can be harnessed as NSB communities work together to improve the health of their people.

Specific recommendations are included about how the health department and other sectors of the community can utilize the information contained in this report to address major community health issues. Specific “high impact” areas for health promotion are proposed, as well as broader community-based efforts with the potential to enhance overall community health and well-being.

Finally, a number of data gaps and areas where further research may benefit the health of North Slope communities are identified. Suggestions for ongoing monitoring and follow-up of community health indicators in the NSB are also discussed.

SR 1. Evolving Health in the NSB

SR 1.1. NSB Community Health in Historical Context

SR 1.1.1. A Brief History of Health in Rural Alaska

Few reliable health data exist for the NSB before the mid 1970s, but to interpret the more recent NSB-specific health indicators reviewed in this report, some historical context is useful. The early history of health and disease in rural Alaska is based primarily on observations made by European explorers and traders at the time of contact and on limited archeological evidence. These sources paint a picture of Alaska Native populations whose health and survival were closely linked to the harsh physical environment in which they lived. Contact with non-Native traders and settlers radically changed life for the people of rural Alaska, bringing epidemic infectious diseases such as measles, influenza, and tuberculosis. Alaska Natives, who were without immunity to such diseases, were devastated by these infections in the 19th and 20th centuries. Contact with non-Natives also introduced these communities to alcohol and tobacco, both of which have had undeniable health impacts in rural Alaska. Much of the last century also saw institutionalized discrimination, damaging social policies, and contamination of the natural environment upon which many rural communities rely for food, spiritual health, and cultural survival. Unethical medical experimentation on Alaska Natives also left residents angry and confused and eroded the trust in health care and research institutions. The epidemics and policies imposed on Alaska Native people disrupted cultural traditions and social relationships, leaving many communities traumatized and exacerbating problems with alcohol, drugs, and interpersonal violence. In 1950, the life expectancy of Alaska Natives was nearly 20 years shorter than that of their white counterparts, and infant mortality was more than one in ten, five times that in whites.

During the latter half of the 20th century, rural Alaska also saw a number of important public health successes as well as a resurgence of cultural heritage as a source of pride and a foundation for improving community well-being. In the 1950s, efforts to address the tuberculosis epidemic in rural Alaskan communities formed the foundation of today’s community health aide program and rural health care systems. Since then, improved water, sanitation, housing, and public safety, as well as immunization programs and the provision of essential health and emergency services in rural areas, have contributed to a 20-year gain in life expectancy and a 10-fold decrease in infant mortality among Alaska Natives. While infectious disease in Alaska is still a significant public health concern and an area of health disparity, it is now responsible for only a small fraction of deaths in rural Alaska. Many regions, including the North Slope,
have also founded cultural heritage centers, educational programs in traditional language and culture, talking circles, and other initiatives that support subsistence and traditional cultural values as avenues to improved community health and well-being. The more recent models of community-based participatory research have helped to rebuild partnerships and trust between communities and researchers and have started to answer questions that communities have about their own health and the health of the subsistence resources on which they rely.

Despite these successes, significant inequalities persist between the health of rural and urban populations in Alaska, and between that of different racial and socioeconomic groups. Moreover, new inequalities have emerged. During the decade 1999–2008, the life expectancy for Alaska Natives (70.1 years) still lagged behind that of Alaskans overall (75.5 years) and that of the general U.S. population (77.8 years). While substantial improvements in the area of maternal and child health have been achieved, this also remains an area of significant health inequality in northern and southwest rural Alaska, compared with the state and nation as a whole. Chronic diseases such as cancer, heart disease and chronic lung disease have emerged as leading causes of illness and death among Alaska Natives. Lung and colon cancer, in particular, have increased among Alaska Natives, resulting in cancer mortality rates that are significantly higher than rates among U.S. whites. Injuries remain a major area of health disparity and a leading cause of death and disability in rural Alaska, especially among youth, and the related problems of alcoholism, family violence, and sexual assault continue to plague many communities. During the latter decades of the twentieth century, a pattern emerged in Alaska, characterized by epidemic levels of suicide among young Alaska Native men, particularly in northern regions of the state. This pattern has also been observed in other circumpolar arctic indigenous populations such as those in northern Canada and Greenland. Though the reasons are complex and not completely understood, many researchers and Alaska Native people believe that this pattern is linked to the historic trauma and cultural changes that have taken place during this time period.

**SR 1.1.2. Overview of Community Health Status and Achievements in the NSB**

Since the formation of the NSB in the early 1970s, many aspects of health have improved for the population of the North Slope. Today, a large majority of adults in the NSB rate their health as good to excellent. The good health enjoyed by most residents speaks to the resilience of the people and an ability to adapt not only to a harsh and changing physical environment but to the social, cultural, and economic transformation they have experienced.

Reported general health status among NSB Iñupiat people appears to be quite similar to that of Alaska Natives statewide. The national County Health Ranking program placed the NSB 15th out of 23 Alaskan census areas in overall health outcomes, based on a combination of health indicators such as infant mortality and premature death. While this ranking places the NSB in the 3rd quartile in the state, it also suggests that the population of the North Slope may experience better overall health status than that of neighboring northern, southwestern, and interior rural Alaskan regions that share many geographic and demographic characteristics.

The NSB has seen a number of significant public health achievements in the past several decades. The number of vaccine-preventable infections and diarrheal illness have both declined in the last 20 years. The last thirty years in the NSB have also seen a decline in unintentional injury and a decrease in reported prenatal alcohol use. Today, chronic respiratory illness among children does not appear to be as prevalent as in some other rural areas of the state. Despite persistently high suicide rates in the region, the number of days with poor mental health reported by adult NSB residents is below average for the state.

Looking at all the Alaskan boroughs and census tracts in 2002–2008, adults in the NSB reported, on average, the second lowest number of mentally unhealthy days in the state.

The overall good health that NSB residents experience today and the improvements seen in the last 30 years likely reflect, in part, the substantial investments that have been made in health and social services, education and employment opportunities, community infrastructure, such as housing, water, and sanitation, and public safety, as well as local legislation restricting access to alcohol.

Subsistence, however, remains at the core of community health in North Slope communities, providing not only an important source of nutritious food but social interaction, cultural pride, and physical activity.
As is discussed in detail later in this report, the subsistence foods used by majority of NSB households confer many health benefits and may be protective against chronic diseases such as diabetes, which is on the rise in the NSB but remains far less prevalent than among most Lower 48 Native American populations and even most other Alaska Native regions. Local leadership has also prioritized supporting and strengthening traditional cultural values, culturally affirming educational programs, and maintaining a strong voice in decisions that impact North Slope communities, all of which can benefit community health.

The following sections will review the available data on the major health disparities in the NSB, notable trends and emerging health problems, and the leading burdens of disease and disability on the North Slope. For further discussion on each of these health topics, as well as the various individual and community factors influencing them, the reader is referred to the corresponding chapters in Part II: Full Report.

**SR 1.2. Health Disparities in the NSB**

Despite the many community health improvements seen in the NSB in recent years, some health problems are more common or more severe in the NSB than in most other parts of Alaska or the rest of the U.S. Within the NSB, some groups also suffer disproportionately from poor health. These observed differences are often called “health disparities,” referring to substantial differences in measures of health, life expectancy, and quality of life that occur among populations differing by race or ethnicity, gender, education or income, disability, living in rural localities, or sexual orientation. The reduction of health disparities has been identified as a top state and national public health priority, and recognizing health disparities can be an important step toward improving health at the community level.

**SR 1.2.1. General Health Status**

An analysis of self-reported health status data reveals a number of important health disparities between the NSB and the state as a whole as well as within the NSB. General health status is discussed in detail in Part II, Chapter 1: Overall Health.

The 2010 NSB Census asked residents about their general health and that of household members. While self-reported general health status varied widely across the North Slope communities, adults of all age groups in the NSB were less likely to report “very good” or “excellent” general health than were adults statewide. Moreover, reported health status among Inupiat residents, both adults and children, was significantly worse than that of Caucasians or other ethnic groups in the North Slope. This inequality between Inupiat and non-Inupiat residents of the NSB is similar to that seen statewide between Alaska Natives and non-Natives.

**Figure SR.1: General Health Status Among Adults:**

Percent with reported very good to excellent general health

Barrow is different from the other North Slope villages in a number of ways. It is the largest community by far, and has a more ethnically diverse population. Barrow serves as a regional hub for most commercial,
health, education, and social services, and also has employment opportunities not available in other villages. According to the 2010 NSB Census, reported general health was better in Barrow than in the other villages as a whole, both among Iñupiat residents and among residents of all ethnic groups combined.

Figure SR.2: Reported General Health Status of Adults: Barrow vs. other North Slope villages

### SR 1.2.2. Maternal and Child Health

Maternal and child health is a major area of health disparity in the NSB, as compared to the state as a whole. The prenatal period, infancy, childhood, and adolescence are times of profound developmental changes, and conditions during these critical periods can have lifelong impacts on individuals and multigenerational impacts on families and communities. Negative experiences in childhood, such as neglect and physical, emotional, and sexual abuse, have long-lasting effects on both mental and physical health. The topic of maternal and child health is discussed in detail in Part II, Chapter 6.

Although some important measures of maternal and child health have improved in the NSB, many indicators in this area suggest persistent disparities compared with the state as a whole. Many of these health disparities are seen in other parts of rural Alaska as well.

#### SR 1.2.2.1. General Health Status of Children

Children in the NSB were considerably less likely than Alaskan children overall to be reported having very good or excellent general health (63% vs. 89%, respectively). Caucasian children in the NSB were most likely to be reported to have very good or excellent health, and Iñupiat children were the least likely. This disparity of more than 20 percentage points was statistically significant.

Figure SR.3: General Health Status of Children, by Ethnic Group: Percent of children (<18 years) reported to have very good to excellent general health

**NSB data source: 2010 NSB Census, Economic, and Health Profile.**

**Alaska data source: National Survey of Children’s Health 2007.**
As was observed among adults, reported general health status among North Slope children (among both Iñupiat only and in all ethnic groups combined) was also significantly better in Barrow than in the other North Slope villages as a whole.

**SR 1.2.2.2. Infant Mortality**

An important indicator of the health status of women and children in a community, infant mortality has declined considerably in the NSB since the 1970s but has essentially leveled off since the middle 1990s and remains higher than statewide rates.

**Figure SR.4: Infant Mortality Rate: Average annual number of infant deaths (under one year) per 1000 live births, 1977–2009**

Rates for NSB include rates based on fewer than 20 events and must be interpreted with caution.
Missing data points represent time periods with fewer than 6 infant deaths.

**SR 1.2.2.3. Child Mortality**

Child and adolescent mortality rates in the NSB remain considerably higher than statewide rates. The high child mortality rate in Alaska is a significant public health concern statewide, where it also represents an area of significant racial health disparity.

**Figure SR.5: Child Mortality Rate (Ages 0–19 Years): Average annual number of deaths per 100,000 population, 1997–2008**

*NSB rates are based on fewer than 20 occurrences per time period and must be interpreted with caution.
U.S. Statistics were available for 2002, 2003, 2005 for ages 0–19 years. Data source: National Center for Health Statistics, accessed through the National MCH Center for Child Death Review. Child mortality statistics for the U.S. are typically calculated for age groups excluding infants less than 1 year and are, therefore, not directly comparable to Alaska census area data, where population estimates for children less than 1 year of age are not readily available.

**SR 1.2.2.4. Child Maltreatment**

Child maltreatment is a complex phenomenon, encompassing varying degrees of neglect and mental injury, as well as physical and sexual abuse. Childhood trauma and maltreatment contribute to an adverse early child environment that can have devastating consequences throughout the lifespan and for future generations.
Rates of substantiated reports of child maltreatment are roughly twice statewide averages but similar to some neighboring rural comparison regions. In the northern rural region of the state, which includes the NSB, neglect is the most common form of child maltreatment reported.

**Figure SR.6: Substantiated Allegations of Child Maltreatment**: Average annual number of substantiated reports per 1000 children ages 0–17, 2006–2009

<table>
<thead>
<tr>
<th>Location</th>
<th>Rate per 1000儿童</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barrow Office</td>
<td>54.8</td>
<td></td>
</tr>
<tr>
<td>Bethel, Nome, Kotzebue</td>
<td>52.8</td>
<td></td>
</tr>
<tr>
<td>Offices combined</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alaska</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Healthy Alaskans 2010 Target</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

*Combined neglect, physical abuse, sexual abuse, and mental injury.
Data source: Office of Children’s Services, Alaska DHSS.
Rates calculated by author, based on U.S. Census 2000 population estimates for communities covered by respective area offices.

**SR 1.2.2.5. Child Obesity**

Obesity in childhood has been identified as a national epidemic with potentially devastating health impacts for the current generation of children. NSB children are far from immune to this problem. In fact, estimated rates of obesity among young children enrolled in WIC in the NSB are more than twice national estimates. Obesity rate estimates among school-aged children are roughly 50% higher than statewide estimates (although comparable data are not available for exactly the same years).

**Figure SR.7: Early Childhood Obesity Among Children Enrolled in WIC: Percent of children ages 2–5 who meet BMI criteria for obesity**

<table>
<thead>
<tr>
<th>Location</th>
<th>Percent</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. (2008)</td>
<td>15%</td>
<td>U.S. data source: Pediatric Nutrition Surveillance Report 2008 (Alaska did not participate in this program. Thus, state-level data were not available for Alaska).</td>
</tr>
<tr>
<td>Healthy Alaskans 2010 Target</td>
<td>10%</td>
<td></td>
</tr>
</tbody>
</table>

**SR 1.2.2.6. Prenatal Risk Factors**

As in true in much of rural Alaska, the prevalence of prenatal risk factors is considerably higher in the NSB than in the state as a whole. These include such factors as:
- Prenatal smoking and alcohol use
- Late or inadequate prenatal care
- Unmarried status
- Pre-pregnancy obesity, and
- Abuse by an intimate partner during pregnancy.
SR 1.2.2.7. Teen Birth

While acceptance of and support available to teenage mothers varies widely in different cultures, birth to a teenage mother is associated with a number of poor health outcomes. Teen birth rates in the NSB are roughly twice the statewide average.\(^4\)

**Figure SR.8: Teen Birth Rate (Ages 15–19 Years): Average annual number of births per 1000 females, 1993–2009**


SR 1.2.2.8. Birth Defects

Rates of major congenital anomalies (birth defects) are considerably higher in the NSB than in Alaska as a whole.\(^{20–22}\) Risk factors for birth defects include many of the same risk factors as for other adverse pregnancy outcomes.

SR 1.2.3. Injury—Suicide, Unintentional Injury, and Interpersonal Violence

Like many other circumpolar and rural Alaskan regions, the communities of the NSB bear a disproportionately high burden of suicide, unintentional injury (accidents), and domestic and sexual violence. While suicide and interpersonal violence are not always categorized as injuries, all of these problems are grouped together in this report in part because they share many of the same risk factors, including alcohol and drug abuse, multi-generational trauma, and a host of other complex socioeconomic and cultural factors that create conditions in which these events are more likely to occur. All of these areas are discussed in further detail in Part II, Chapter 3: Injury.

SR 1.2.3.1. Suicide

Suicide has devastating impacts on families and communities, and the high suicide rate in the NSB has been a major focus of community concern and prevention efforts. After a period of increasing rates through the 1980s, suicide rates in the NSB remain roughly twice the statewide average and four times the national average.\(^4,^{23,24}\) Between 1999 and 2008, the suicide hospitalization rate for NSB residents overall was also higher than the Alaska rate (17 vs. 10 per 10,000, respectively), but among AI/AN residents, the NSB rate was lower than of AI/AN residents statewide (22 vs. 27 per 10,000, respectively).\(^{26}\)
In 2005, 15% of NSB high school students (not including alternative high schools) reported attempting suicide one or more times in the past 12 months, almost twice the 8% estimated among U.S. high school students. The percentages of students who reported symptoms of depression or who seriously considered suicide were similar among the two groups, however.25

SR 1.2.3.2. Unintentional Injury

Although they have declined considerably since the 1970s, unintentional injury (previously called "accidents") mortality rates in the NSB remain considerably higher than statewide and national rates.4,23,24

The largest single cause of unintentional injury death in the NSB is motor vehicle accidents (both on- and off-road), and the mortality rate from motor vehicle accidents is more than twice the statewide rate. The NSB death rate for off-road vehicle accidents is more than eight times the statewide rate.4
Injury hospitalization rates for snowmachines and ATV accidents among NSB Alaska Native residents were also more than twice the average rates for Alaska Native residents of all Alaska Native Health Service units.26

SR 1.2.3.3. Interpersonal Violence: Sexual Assault and Domestic Violence

Comparisons of crime statistics—particularly in the areas of domestic and sexual violence—must be made with caution due to the many factors that affect crime rates and crime reporting in communities. Moreover, Alaska does not currently collect standardized data on domestic violence incidents reported to local law enforcement agencies. Nonetheless, the limited data available strongly suggest that sexual assault and domestic violence are areas of significant health disparity in the NSB compared to Alaska and the U.S. overall.

Sexual Assault

For the years 2000–2009, the average annual rate of forcible rape in the NSB was more than twice the statewide rate and more than seven times the national rate.27,28 The definition of forcible rape used for these statistics is narrow and does not reflect the full impact of sexual violence. Data from the NSB Police Department suggest that in some reporting years, the number of sexual assaults reported in the NSB may be higher than the number of forcible rapes included in FBI Uniform Crime Reporting statistics by a factor of three or more.29

Figure SR.12: Forcible Rape: 10-year average rate per 100,000 inhabitants, 2000–2009

<table>
<thead>
<tr>
<th></th>
<th>NSB</th>
<th>Alaska</th>
<th>U.S.</th>
<th>Healthy Alaskans 2010 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Rate</td>
<td>233.2</td>
<td>78.8</td>
<td>31.4</td>
<td>30</td>
</tr>
</tbody>
</table>

Forcible rape includes rape by force and attempted rape by force.
Rates are not age-adjusted.
The 2000–2009 average rate for the NSB was calculated using the Alaska Department of Labor and Workforce Development total population estimates for the NSB.
**Domestic Violence**

In an in-depth 2003 report of domestic violence in the NSB, rates of reports of domestic violence to Barrow police were more than six times the rate of reports made to Alaska State Troopers statewide. In 2005, 13% of NSB high school students reported being hit, slapped, or physically hurt on purpose by their boyfriend or girlfriend in the past 12 months, compared with 9% nationwide. Domestic violence is also an area of health disparity, with Alaska Natives experiencing higher rates of lifetime intimate partner violence than white Alaskans.

**SR 1.2.4. Cancer: Lung and Colon Cancer Among Males**

Not only is cancer the leading cause of death in the NSB, but it also encompasses several significant health disparities in the NSB. Cancer is also one of the most frequently cited health concerns among community members in the NSB. Local concerns about air pollution from nearby oil development activities, contamination of subsistence foods, and the unfortunate history of unethical medical experimentation using radioactive substances on some residents have fueled fears and anger about the possible causes of these health disparities. Research has not, to date, completely answered all of these questions about cancer in the NSB. The available data regarding these issues, as well as other major risk factors such as the high rate of tobacco smoking, are examined in Part II, Chapter 2: Cancer.

Over the most recent 10 year period in the NSB, lung cancer accounted for four times more cancer deaths than either of the next most common types of cancer (stomach and colon). The incidence of lung cancer among NSB males is the highest in the state and is significantly higher than the statewide incidence rate. Males in the NSB are more than five times as likely to develop lung cancer as females. Looking at Alaska Natives specifically, Alaska Native males in the Barrow service unit had a significantly higher incidence of lung cancer than the average incidence among Alaska Native males from all other service units combined during 1989–2003.

<table>
<thead>
<tr>
<th>Borough</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSB</td>
<td>192.3</td>
<td>36.4</td>
</tr>
<tr>
<td>Nome</td>
<td>145.8</td>
<td>61.5</td>
</tr>
<tr>
<td>Bethel</td>
<td>113.6</td>
<td>29</td>
</tr>
<tr>
<td>Alaska</td>
<td>89.3</td>
<td>63.8</td>
</tr>
<tr>
<td>Anchorage</td>
<td>86.9</td>
<td>64.4</td>
</tr>
<tr>
<td>Fairbanks</td>
<td>82.5</td>
<td>64.9</td>
</tr>
<tr>
<td>Dillingham</td>
<td>72.4</td>
<td>59.2</td>
</tr>
<tr>
<td>NWAB</td>
<td>71.7</td>
<td>55.1</td>
</tr>
<tr>
<td>Juneau</td>
<td>66.3</td>
<td>56.1</td>
</tr>
<tr>
<td>Sitka</td>
<td>61.8</td>
<td>60</td>
</tr>
</tbody>
</table>

Rates are per 100,000 population, age-adjusted to 2000 U.S. standard population.


The second most common cancer in the NSB, colorectal cancer also shows a male predominance, but this gender difference is not statistically significant. The colon cancer incidence rate among NSB males is over twice the overall statewide rate among males and is significantly higher than the overall statewide incidence for males or females. Colon cancer incidence is higher in the rural, predominantly Alaska Native regions, than in the urban centers of Anchorage, Fairbanks, and Juneau.
SR 1.2.5. Chronic Lower Respiratory Disease

Chronic lower respiratory disease (CLRD) is consistently among the leading causes of death in the NSB in recent years. The mortality rate in the NSB from chronic lower respiratory diseases, such as emphysema and other forms of chronic obstructive pulmonary disease (COPD), is more than twice the statewide rate. CLRD also is an area of racial health disparity at the state level, with significantly higher mortality rates among Alaska Natives than among whites. Chronic respiratory disease is discussed in detail in Part II, Chapter 5: Respiratory Disease.

Figure SR.15: Chronic Lower Respiratory Disease Mortality Rates:
Average annual number of deaths per 100,000 population, 1990–2009

NSB rates are based on fewer than 20 events and must be interpreted with caution.
Age-adjusted to 2000 U.S. standard population.
Impacts of Alcohol and Drugs

The impact of drugs and alcohol on families and communities has been identified by North Slope communities as a major community health concern and is discussed in detail in Part II, Chapter 7: Mental and Behavioral Health. The rate of reported binge drinking behavior among both adults and teens in the NSB is quite similar to state and national estimates; however, many of the negative impacts of alcohol and drug abuse—for example suicide, motor vehicle accidents, domestic and sexual violence, and school failure—affect the NSB at higher rates compared with the state overall, as described previously and in the full report.

In the 2010 NSB Census, Iñupiat household heads in the NSB were three times as likely as Caucasian household heads to believe that a household member had been hurt by the effects of alcohol or drugs in the last 12 months. The impact of drugs and alcohol on families and communities is discussed in detail in Part II, Chapter 7: Mental and Behavioral Health.

Figure SR.16: Household Impact of Drugs and Alcohol in the NSB, by Ethnic Group: Percent of NSB household heads reporting that, in the past 12 months, a member of the household has been hurt by drugs or alcohol

<table>
<thead>
<tr>
<th>Ethnic Group</th>
<th>Often</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>All NSB</td>
<td>5%</td>
<td>19%</td>
<td>76%</td>
</tr>
<tr>
<td>Other Ethnicities</td>
<td>3%</td>
<td>12%</td>
<td>86%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>3%</td>
<td>7%</td>
<td>90%</td>
</tr>
<tr>
<td>Iñupiat</td>
<td>7%</td>
<td>24%</td>
<td>70%</td>
</tr>
</tbody>
</table>

Data source: 2010 NSB Census.

As a whole, compared with their counterparts living in Barrow, where it is legal to import limited amounts of alcohol, Iñupiat household heads in other villages were, as a whole, significantly less likely to believe that a household member had been hurt by alcohol or drugs in the past year (35% vs. 25%, respectively).

Unlike in the case of self-reported alcohol use, NSB high school students were significantly more likely to report marijuana and cocaine use than were students statewide or nationally. Marijuana use among NSB Iñupiat adults surveyed in the 2004 SLiCA survey was also higher than in other circumpolar regions. Use of other drugs among NSB high school students was similar to state and national estimates in this study, with the exception of inhalant abuse (“huffing” gas or other solvents), which NSB students were less likely to report in the 2005 survey than their counterparts statewide and nationally.

Sexually-Transmitted Infections: Chlamydia and Gonorrhea

Chlamydia and gonorrhea are both reportable sexually transmitted infections (STIs) with potentially serious complications, including pelvic inflammatory disease, infertility, ectopic pregnancy, preterm labor, and neonatal infections. These STIs represent an area of health disparity for the NSB and are discussed in detail in Part II, Chapter 8: Infectious Disease.

NSB chlamydia rates are considerably higher than statewide and national rates for comparable age groups. The Arctic Slope service region had the 4th highest age-adjusted chlamydia rate of twelve Alaska Native Tribal Health Corporation service regions in 2010. STIs are an area of racial and geographic health disparity in the NSB and at the state and national level. Within the NSB and in Alaska as a whole, chlamydia and gonorrhea rates are considerably higher among Alaska Natives than among non-Natives. In Alaska, the southwest and northern rural regions experience the highest rates of these two infections.
SR 1.2.8. **Tooth Decay and Periodontal Disease**

Almost two-thirds of adults in the NSB (64%) have had at least one permanent tooth removed (excluding tooth loss due to trauma), a significantly higher percentage than in Alaska (43%) or the U.S. overall (44%). Approximately one fourth of NSB adults report having had six or more permanent teeth removed.9

Tooth decay and periodontal disease can lead to loss of permanent teeth and result in difficulty chewing and eating a healthy diet. Periodontal disease can also worsen diabetes and may be a causal factor in a number of other health problems, including preterm delivery and cardiovascular disease. Poor diet, high consumption of sugary beverages, and inadequate dental hygiene are all risk factors for tooth decay and periodontal disease.

SR 1.3. **Notable Health Trends in the NSB**

For those topics on which sufficient years of data are available, a number of health trends are evident in the NSB. Some of the trends are encouraging and speak to the positive power of community change and public health interventions. Others trends raise concern about emerging health problems that threaten the well-being of current and future generations. Looking at the successes, however, can motivate and inform efforts to reverse negative health trends through community-wide action and advocacy.

SR 1.3.1. **Trends in the Leading Causes of Death in the NSB**

Looking at the leading causes of death in the NSB since the 1970s, some trends become apparent. By the early 1990s, cancer overtook unintentional injury (accidents) as the leading cause of death in the NSB. This is both because the rate of accidental deaths declined, and because the incidence of diagnosed cancer increased. Between 1970 and 2000, the rate of unintentional injury deaths declined rapidly, but since then, the rate has stopped declining and remains well above the statewide average. In the 1980s, suicide, motor vehicle accidents, and chronic lower respiratory infections emerged as leading causes of death.4
SR 1.3.2. Positive Community Health Trends and Achievements

SR 1.3.2.1. Infant Mortality
An important marker of the overall health and well-being of a community, the infant mortality rate (IMR) is a widely used indicator of the health status of women and children. The IMR reflects such factors as living conditions, education and income level of parents, as well as access to health care and efforts to prevent common causes of infant death such as Sudden Infant Death Syndrome (SIDS). Although rates fluctuate yearly because of the relatively small number of events, average infant mortality rates have declined considerably in the NSB since the late 1970s.4

SR 1.3.2.2. Prenatal Alcohol Use
In the past two decades, the proportion of mothers who report drinking alcohol during pregnancy has decreased from more than one in four mothers to less than one in twenty mothers giving birth.4 This trend coincides with a number of state- and community-wide efforts to address the negative impacts of alcohol, including local option laws, community education campaigns about fetal alcohol syndrome, and aggressive prenatal outreach programs run by the Public Health Nursing program.38

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**Figure SR18: Trends in Leading Causes of Death in the NSB:**
Average annual number of deaths per 100,000 population

**Figure SR.19: Infant Mortality Rate:** Average annual number of infant deaths (under one year) per 1000 live births, 1977–2009

**SR 1.3.2. Positive Community Health Trends and Achievements**

**SR 1.3.2.1. Infant Mortality**

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**Figure SR.19: Infant Mortality Rate:** Average annual number of infant deaths (under one year) per 1000 live births, 1977–2009

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SR 1.3.2.3. Vaccine-Related Illness and Gastrointestinal Illness

Rates of a number of reportable vaccine-preventable illness have declined substantially in the NSB since the early 1990s following the establishment of routine vaccination of children against such diseases as hepatitis A and B, *Haemophilus influenzae* type b (Hib), and *Streptococcus pneumoniae*. The NSB Health Department’s Public Health Nursing program is responsible for administering and tracking immunizations in the NSB.

SR 1.3.2.4. Unintentional Injury

As noted previously in section SR 1.3.1., the crude rate of unintentional injury deaths in the NSB has declined since the 1970s. The NSB’s rate remains higher than that of Alaska overall, however.

SR 1.3.3. Negative Health Trends and Emerging Community Health Challenges

SR 1.3.3.1. Self-Reported General Health Status

Over the past two decades, self-reported overall health among adults in the Borough has been declining and a significantly larger percentage of NSB residents report fair to poor health in recent years than in the early 1990s. This decline in self-reported health, similar to that seen at the state and national levels, corresponds to a time of rising prevalence of chronic health problems such as obesity and diabetes. This decline in self-reported health may also reflect an evolution in the way people perceive their own health and increasing awareness of certain conditions, socio-cultural changes that impact health, and changes in health care delivery that have been seen across the country.
SR 1.3.3.2. Type 2 Diabetes

Type 2 diabetes is increasing rapidly across the nation and has been referred to as a national epidemic. Diabetes rates are also increasing rapidly in the North Slope, more than doubling between 1985 and 2008 among Alaska Natives, according to the Alaska Native Diabetes Program’s registry data.40

The overall estimated diabetes prevalence for adults in the NSB is now similar to the estimated statewide rate for adults.49 Within the NSB, a significantly lower proportion of Inupiat and Caucasian adults reported or were reported to have diabetes than those in other ethnic groups.4

Despite the high prevalence of obesity, Alaska Natives in the Barrow service area still have one of the lowest rates of diagnosed diabetes of all the IHS service areas, and rates are considerably lower than in many Lower 48 Native American populations.40 These differences may, in part, be related to variations in diabetes screening practices and other factors, but they may be also be related to the relatively heavy reliance on healthful arctic subsistence foods and active participation in subsistence activities in North Slope communities.
Figure SR.24: 2006 Age-Adjusted Diabetes Prevalence Among Alaska Natives, by IHS Service Unit: Number of cases per 1000 user population*

<table>
<thead>
<tr>
<th>Service Unit</th>
<th>Number of cases per 1000 user population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barrow</td>
<td>23</td>
</tr>
<tr>
<td>GE</td>
<td>28</td>
</tr>
<tr>
<td>AG</td>
<td>32</td>
</tr>
<tr>
<td>FG</td>
<td>42</td>
</tr>
<tr>
<td>AE</td>
<td>39</td>
</tr>
<tr>
<td>KG</td>
<td>42</td>
</tr>
<tr>
<td>EJ</td>
<td>38</td>
</tr>
<tr>
<td>AI</td>
<td>52</td>
</tr>
<tr>
<td>FG</td>
<td>86</td>
</tr>
</tbody>
</table>

*Active cases per 1000 estimated user population, age-adjusted to 2000 U.S. standard population. Active cases are those who have had a visit within the service unit in the past three years.

The Barrow IHS service unit generally covers the following villages: Atqasuk, Barrow, Kaktovik, Nuiqsut, Point Lay, and Wainwright. Residents of Anaktuvuk Pass and Point Hope are generally seen in Manilaq and Tanana Chiefs service units, respectively.

Data source: Alaska Native Diabetes Program.

SR 1.3.3.3. Obesity

Obesity and being overweight are among the most common chronic health problems in the country, together affecting roughly two-thirds of Americans. Obesity rates in Alaska and the U.S. have increased dramatically in the past quarter century. The estimated proportion of NSB adults who are obese now is almost three times the proportion who were obese in the mid-1990s.

Figure SR.25: Adult Obesity Trend Data from the BRFSS Survey:

Percent of adults who are obese (BMI ≥ 30), 1994–2008

*BMI=body mass index.


NSB data source: Sub-regional analysis of Alaska BRFSS data for 1994–2007 provided by Alaska Department of Health and Social Services, Chronic Disease Prevention and Health Promotion, Division of Public Health. 2006–2008 estimates are from the County Health Rankings website.

NSB results are weighted according to the BRFSS rural region and not post-stratified to the NSB. Results are not age-adjusted.

Alaska and U.S. data are for the single, midpoint year of time period shown.

Being overweight or obese may impact health differently in different racial and ethnic groups. Across racial and ethnic groups, however, obesity and being overweight are associated with a number of chronic health problems, including high blood pressure, heart disease, diabetes, arthritis, certain cancers, and some types of respiratory problems. Although obesity rates are higher among some racial minorities (including Alaska Natives) than among whites in Alaska and the U.S., obesity rates in NSB household heads are similar among all ethnic groups.
SR 1.3.3.4. Cancer Incidence

Nationwide and in Alaska, overall incidence of invasive cancer has declined slightly,\textsuperscript{42,43} although in the NSB it appears to be continuing the upward trend\textsuperscript{42} documented among Alaska Natives statewide\textsuperscript{44} and among Inuit populations across the circumpolar regions.\textsuperscript{45} A study done for the NSB in 1998 also documented the increasing cancer incidence among Alaska Natives in the NSB in an earlier time period, from 1971 to 1994.\textsuperscript{46}

The increase in cancer rates in the NSB and among Alaska Natives and other circumpolar indigenous populations over the past four decades has been primarily caused by increasing rates of lung and other cancers, such as colon cancer, for which tobacco and other lifestyle factors contribute the greatest risk.\textsuperscript{42,44–46} Nonetheless, community concerns persist regarding possible environmental causes of cancer. Questions about environmental contributions to cancer risk in the NSB, the arctic, and elsewhere have not been completely answered by the research to date. This topic is discussed further in Part II, Chapter 2: Cancer.

SR 1.3.3.5. Stroke Mortality

Trends in stroke mortality in the NSB must be interpreted with caution because of the low number of events; however, the rapid increase in stroke mortality in the NSB raises concern about the possible increasing burden of disability and death caused by stroke in the NSB. The death rate from strokes is decreasing for Alaskan whites and in the U.S. overall but not among Alaska Natives.\textsuperscript{36} Stroke shares a number of risk factors with other types of cardiovascular disease, including smoking, age, high blood pressure, high cholesterol, and diabetes.
SR 1.3.3.6. Chlamydia and Gonorrhea

Paralleling trends observed across the state, the number of reported cases of the sexually-transmitted infection chlamydia has increased in the NSB since mandatory reporting of the infection began in 1996, almost doubling between 2001 and 2010. The region did see a modest decline in the chlamydia rate among Alaska Native residents in 2010. The rate among non-Natives in the NSB did not decline, however, and was the highest rate among non-Natives in the state in 2010.37

Figure SR.28: Trends in Chlamydia Rates in the NSB, by Race:
Number of cases reported per 100,000 population, 2001–2010

All rates are age-adjusted to the 2000 U.S. census standard population. AI/AN=American Indian/Alaska Native
Rates based on fewer than five cases appear as “0” in graph and table.
Data source: Alaska Department of Health and Social Services, Division of Public Health, Section of Epidemiology, STD Program: Chlamydia and Gonorrhea Rates, by Alaska Native Health Corporation Service Region—Alaska, 2001-2010 website

The NSB experienced a spike in gonorrhea cases in 2007. The rate has subsequently declined, but not to previous levels.37 In 2009, the state of Alaska experienced a large increase in the number of gonorrhea cases statewide, largely driven by increases in rural regions and among Alaska Natives.37

Figure SR.29: Gonorrhea Rates in the NSB: Number of cases reported per 100,000 population, 2001–2010

All rates are age-adjusted to the 2000 U.S. standard population.
Rates based on fewer than five cases appear as “0” in graph and table.
Data source: Alaska Department of Health and Social Services, Division of Public Health, Section of Epidemiology, STD Program: Chlamydia and Gonorrhea Rates, by Alaska Native Health Corporation Service Region—Alaska, 2001-2010 website
AI/AN=American Indian/Alaska Native.

Trends in chlamydia and gonorrhea rates may also reflect, in part, changes in screening practices, the availability of new diagnostic tests, the consistency with which cases are reported, and partner identification and testing efforts.
SR 1.4. Leading Health Burdens in the NSB

A number of measures can be used to examine the leading burdens of disease, disability, and death in a community. In this section, the leading causes of death, the leading self-reported health conditions, and the leading reasons for utilization of the health care system in the NSB are reviewed.

SR 1.4.1. Leading Causes of Death

Since the early 1990s, the leading causes of death in the NSB have been fairly constant, with only minor changes in rank. The leading causes of death in 2006–2008 are shown in Table SR.1.4

Table SR.1: 2006–2008 Leading Causes of Death

<table>
<thead>
<tr>
<th>Cause of Death</th>
<th>NSB Rank</th>
<th>Number of Deaths</th>
<th>NSB Rate (Number of deaths per 100,000 population)</th>
<th>Alaska Rank</th>
<th>Alaska Rate (Number of deaths per 100,000 population)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer</td>
<td>1</td>
<td>29</td>
<td>272.9</td>
<td>1</td>
<td>181.3</td>
</tr>
<tr>
<td>Heart Disease</td>
<td>2</td>
<td>26</td>
<td>274.8</td>
<td>2</td>
<td>154.8</td>
</tr>
<tr>
<td>Unintentional Injury</td>
<td>3</td>
<td>17</td>
<td>125.2</td>
<td>3</td>
<td>54.8</td>
</tr>
<tr>
<td>Chronic Lower Respiratory Diseases</td>
<td>4</td>
<td>10</td>
<td>144.3*</td>
<td>5</td>
<td>42.5</td>
</tr>
<tr>
<td>Suicide</td>
<td>4</td>
<td>10</td>
<td>53.3*</td>
<td>6</td>
<td>22.7</td>
</tr>
<tr>
<td>Total Deaths</td>
<td></td>
<td>136</td>
<td>1267.0</td>
<td></td>
<td>772.5</td>
</tr>
</tbody>
</table>

*Rates are based on fewer than 20 occurrences and should be interpreted with caution.

All rates are age-adjusted to U.S. 2000 standard population.

Although most deaths in a community occur in older people, some of the most tragic and often most preventable deaths occur to younger members of the community. Looking at the total potential years of life lost from the community, unintentional injury and suicide are the leading causes of premature death in the NSB.4

SR 1.4.2. Leading Self-Reported Chronic Health Conditions

Of the common health conditions included in the 2010 NSB Census questionnaire, the most commonly reported chronic health problem was pain, due to arthritis or other causes, that limits activity or requires prescription pain medicine. Other than ear infections, all of the problems noted in Table SR.2 disproportionately affect older age groups. Among children, ear infections and chronic respiratory problems were the most prevalent problems.5 Again, this list reflects only the common chronic health problems asked about in the 2010 NSB Census and does not include many other important health problems in the NSB; for example cancer, mental illness and substance abuse, tooth decay, infectious diseases, and injury.

Table SR.2: Reported Prevalence of Chronic Health Problems Among NSB Residents

<table>
<thead>
<tr>
<th></th>
<th>Adults (ages 18+ years)</th>
<th>Children (ages 0–17 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arthritis/Chronic Pain</td>
<td>21%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>High Blood Pressure</td>
<td>20%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>High Cholesterol</td>
<td>13%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Chronic Respiratory Problems</td>
<td>8%</td>
<td>5%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>6%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Heart Disease</td>
<td>5%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Chronic Ear Infections</td>
<td>4%</td>
<td>19%</td>
</tr>
<tr>
<td>Thyroid Problems</td>
<td>4%</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

Data source: 2010 NSB Census
SR 1.4.3. Leading Health Conditions Resulting in Utilization of the Healthcare System

SR 1.4.3.1. Leading Inpatient Diagnoses

In 2008–2009, the leading admitting diagnoses to Samuel Simmonds Memorial Hospital (excluding child-birth and newborn care) included lower respiratory infection and exacerbations of chronic lung and heart conditions (see Table SR.3).47

<table>
<thead>
<tr>
<th>Rank</th>
<th>Hospital Admitting Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pneumonia</td>
</tr>
<tr>
<td>2</td>
<td>Exacerbation of Chronic Obstructive Pulmonary Disease</td>
</tr>
<tr>
<td>3</td>
<td>Congestive Heart Failure</td>
</tr>
</tbody>
</table>

Admitting diagnoses for referral hospitals or other hospitals outside the NSB are not available.
Data source: NPRS.

SR 1.4.3.2. Leading Outpatient Visit Diagnoses

In 2008–2009, the leading outpatient visit diagnosis codes at Samuel Simmonds Memorial Hospital were primarily related to the management of chronic health conditions such as high blood pressure, diabetes, and arthritis, and to the treatment of acute respiratory infections (see Table SR.4).47

<table>
<thead>
<tr>
<th>Rank</th>
<th>Outpatient Visit Diagnosis*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hypertension (High Blood Pressure)</td>
</tr>
<tr>
<td>2</td>
<td>Acute Upper Respiratory Infection (Colds/Flu)</td>
</tr>
<tr>
<td>3</td>
<td>Otitis Media (Ear Infection)</td>
</tr>
<tr>
<td>4</td>
<td>Type 2 Diabetes</td>
</tr>
<tr>
<td>5</td>
<td>Hyperlipidemia (Elevated Cholesterol)</td>
</tr>
<tr>
<td>6</td>
<td>Tobacco Abuse</td>
</tr>
<tr>
<td>7</td>
<td>Acute Pharyngitis (Sore Throat/Strep Throat)</td>
</tr>
<tr>
<td>8</td>
<td>Rheumatoid Arthritis</td>
</tr>
</tbody>
</table>

*Does not include visits for preventive services such as immunizations or well-woman care. Reasons for visiting providers outside the NSB are not available.
Data source: NPRS

SR 1.4.3.3. Leading Community Health Aide Assessments

The leading clinical assessments made by community health aides in NSB villages in 2005–2006 are seen in Table SR.5. Acute and chronic respiratory and/or ear-nose-throat (ENT) problems accounted for roughly one in three visits, followed by digestive and/or abdominal problems, and injuries. Diagnoses that differ from the statewide pattern are indicated in bold—visits for digestive and/or abdominal problems occurred at slightly higher rates, and skin problems occurred at slightly lower rates than in village clinics in other parts of rural Alaska.48

<table>
<thead>
<tr>
<th>Major Assessment Categories</th>
<th>Rank NSB*</th>
<th>% of Total Visits NSB</th>
<th>% Total Visits Alaska</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory/ENT</td>
<td>1</td>
<td>33–37%</td>
<td>31–41%</td>
</tr>
<tr>
<td>Nose/Throat/Sinus</td>
<td></td>
<td>11–17%</td>
<td>16–18%</td>
</tr>
<tr>
<td>Lung Problems</td>
<td>11–12%</td>
<td>8–13%</td>
<td></td>
</tr>
<tr>
<td>Ear Problems</td>
<td>9%</td>
<td>7–10%</td>
<td></td>
</tr>
</tbody>
</table>
Table SR.5, continued

<table>
<thead>
<tr>
<th>Major Assessment Categories</th>
<th>Rank NSB*</th>
<th>% of Total Visits NSB</th>
<th>% Total Visits Alaska</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injuries</td>
<td>2</td>
<td>6–9%</td>
<td>5–9%</td>
</tr>
<tr>
<td>Preventive Care</td>
<td>3</td>
<td>5–8%</td>
<td>5–12%</td>
</tr>
<tr>
<td>Digestive/Abdominal</td>
<td>4</td>
<td>8–11%</td>
<td>5–6%</td>
</tr>
<tr>
<td>Circulatory Problems</td>
<td>5</td>
<td>5–8%</td>
<td>6–9%</td>
</tr>
<tr>
<td>Musculoskeletal Problems</td>
<td>6</td>
<td>5–8%</td>
<td>4–6%</td>
</tr>
<tr>
<td>Skin Problems</td>
<td>7</td>
<td>3–4%</td>
<td>6%</td>
</tr>
<tr>
<td>Mental Health Problems</td>
<td>8</td>
<td>2–4%</td>
<td>2%</td>
</tr>
<tr>
<td>Fever, Other Problems</td>
<td>9</td>
<td>3%</td>
<td>3–4%</td>
</tr>
<tr>
<td>Eye Problems</td>
<td>10</td>
<td>3–4%</td>
<td>2–3%</td>
</tr>
<tr>
<td>Urinary System</td>
<td>11</td>
<td>2–3%</td>
<td>2–3%</td>
</tr>
<tr>
<td>Genital Problems</td>
<td>12</td>
<td>3%</td>
<td>2–3%</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>13</td>
<td>3–4%</td>
<td>2–3%</td>
</tr>
<tr>
<td>Dental Problems</td>
<td>14</td>
<td>1–2%</td>
<td>2–3%</td>
</tr>
<tr>
<td>Nervous System</td>
<td>15</td>
<td>2–4%</td>
<td>2%</td>
</tr>
</tbody>
</table>

% total visits range includes estimates based on National Patient Information Reporting System (NPIRS) 2005–2006 data and sampled Daily Medical Log (DML) 2006 data
Rank based on Daily Medical Log (DML) data, as this may reflect a better, unbiased capture of diagnosis data
Data source: Golnick C, Alaska Community Health Aide/Practitioner Clinical Practice Description, Dec 1, 2009. NSB data from Appendix A, property of NSB-DHSS.

Villages include: Anaktuvuk Pass, Atqasuk, Kaktovik, Nuiqsut, Point Lay, and Wainwright.

**SR 2. Determinants of Health in the NSB**

**SR 2.1. The Health Determinants Framework**

Health is influenced by many socioeconomic, cultural and environmental factors, as well as personal characteristics and behaviors. Access to health care is also an important determinant of health, although direct health services are thought to be a relatively minor contributor to overall health status, compared to these other factors. Health care services are nonetheless potentially life-saving and necessary for the treatment of acute and chronic health problems, the alleviation of suffering, and the provision of individually tailored health education and preventive care. The factors influencing health have been a focus of much research in recent decades, as the public health field and policymakers search for effective approaches to community health promotion. Figure SR.30 depicts the factors research has shown to be linked to health.
SR 2.2. **Drivers of Health in the Alaskan Arctic**

Relatively little research has looked specifically at the factors influencing health in Alaskan arctic communities. The Institute for Circumpolar Health Studies in Anchorage examined the available literature on the determinants of circumpolar health as they relate to the leading causes of death in Alaska. Some factors with strong evidence of association with these health problems included:

- Addiction,
- Social isolation,
- Environmental exposures,
- Diet and/or nutrition,
- Global climate change,
- Access to clean water, and
- Access to quality healthcare

SR 2.3. **Drivers of Health in the NSB**

Drawing on what is known about the determinants of health in arctic and other populations factors that may be impacting health in the NSB can be outlined. The full report (Part II) also discusses the factors that drive overall health as well as health outcomes in particular areas of health including cancer, injury, chronic disease, respiratory disease, maternal and child health, mental health, and infectious disease.

SR 2.3.1. **Factors Likely Impacting NSB Health in a POSITIVE way**

Table SR.6 indicates factors that likely affect health in NSB communities in a positive way and contribute to the major community health achievements of recent decades.
### Table SR.6: Factors Likely Impacting NSB Health in a POSITIVE Way

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subsistence participation and subsistence diet</strong></td>
<td>Research in the NSB and in other arctic and sub-arctic regions has shown that eating a more traditional diet and actively engaging in subsistence activities have many health benefits. These health benefits may be imparted through the high nutrient value of the foods, the physical activity involved, and through the vital social and cultural aspects of subsistence. (see Part II, Chapter 1, section 1.2.3.2.1.3)</td>
</tr>
<tr>
<td><strong>Support and promotion of Iñupiaq culture and language and investment in culturally-affirming and integrated education programs</strong></td>
<td>One of the NSB’s stated goals has been to increase Iñupiaq language ability among residents and to promote Iñupiaq values. The Mayor’s Office, tribal organizations, NSB School District, Ilisagvik College, and many other community groups have devoted substantial resources toward this effort. The NSB has invested heavily in education, and educational attainment levels have increased considerably since 1980. The NSB School District has a growing Iñupiaq Education Department and program that uses the Iñupiaq values, culture, history, language, and philosophy as a foundation from which to provide instruction in all areas of the curriculum. Iñupiaq language immersion pre-kindergarten programs are available to children in Barrow, and the school district uses a variety of computer-based language-based learning programs throughout the school curriculum. Indigenous language ability in the NSB appears to be higher than in the neighboring regions of Bering Straits and the Northwest Arctic Borough; however, younger residents do not have the fluency that older residents do with the Iñupiaq language.</td>
</tr>
<tr>
<td><strong>Availability of health, social, emergency, and public safety services</strong></td>
<td>97% of North Slope household heads have some form of health insurance, including eligibility for IHS-funded services, compared to 82% statewide. Both ASNA and the NSB maintain vital community health services despite significant challenges. These services include such programs as the Community Health Aide Program that provides care in village clinics; inpatient and outpatient medical care and ancillary services; integrated behavioral health services; breast, cervical, and colon cancer screening; and child and adult immunizations; primary, and prenatal health care; health education in schools; nutritional counseling and support services, STD testing and treatment; specialized programs for elders and youth; first-responder and emergency services, and Barrow and village-based police officers.</td>
</tr>
<tr>
<td><strong>Improvements in water and sanitation infrastructure</strong></td>
<td>An estimated 92% of NSB households have modern water and sewer service, compared with an average of 76% for Tribal Health Regions statewide as of 2008. The cost and complexity of maintaining and repairing expensive water and sewer systems in the NSB and other parts of rural Alaska are ongoing challenges, however.</td>
</tr>
</tbody>
</table>

2 of 3 Iñupiat households still rely on subsistence foods for at least half of their household diet, and the vast majority of Iñupiat households share and/or receive subsistence food from other households, as is traditional in the region. A high percentage of Iñupiat residents actively participate in the traditional subsistence way of life, engaging in such activities as whaling, hunting, and preparing food from subsistence sources. The NSB has one of the highest levels of subsistence food harvests in Alaska, and there is no compelling evidence that use of subsistence foods in the NSB has declined in recent decades.

While local concerns about contamination of subsistence food sources persist, there is growing evidence that subsistence foods in the NSB are safe to eat and do not contain contaminants at levels likely to affect human health. There is general agreement in the scientific community that, the health benefits of eating subsistence foods in Alaska outweigh any potential health risks from contamination from pollutants or radioactivity. (see Part II, Chapter 1, section 1.2.2.3.3.)

Strong cultural values may help impart resiliency and enhanced health to communities experiencing dramatic social and economic changes. Education, particularly when it is culturally affirming, is also strongly predictive of health outcomes. Indigenous language ability in the NSB appears to be higher than in the neighboring regions of Bering Straits and the Northwest Arctic Borough; however, younger residents do not have the fluency that older residents do with the Iñupiaq language.

Access to adequate health care and community services are vital to protecting and maintaining the health of communities.
Table SR.6, continued

| Self-determination: civic participation and advocacy | Through the establishment of the North Slope Borough, the Iñupiat Communities of the Arctic Slope (ICAS), the Arctic Slope Native Association (ASNA), and the Arctic Slope Regional Corporation (ASRC), as well as through participation in numerous national and international advocacy organizations, advisory committees, and decision-making bodies, the residents of the NSB have worked to maintain an active and powerful voice in decisions that affect their communities as well as the health of the local, as well as global, communities and ecosystems. |

| Restrictive alcohol policies | NSB has faced difficult decisions around local option laws, but Barrow has remained “damp,” maintaining laws banning local sale of alcohol since 1997, and all the other NSB villages remain “dry,” banning sale, import, and possession of alcohol. |

| Tobacco taxes and indoor air quality laws | Barrow instituted an indoor air ordinance in 2003. In 2007, it passed a $1 local tobacco tax to be added to the $2 state tobacco tax. Although overall smoking rates have not changed, in 2010, adult smokers in Barrow were less likely than they were in 2003 to report smoking one pack per day or more. The persistently high and essentially unchanged smoking rates in the NSB demonstrate, however, that further steps are needed to curb smoking in the region. |

**SR 2.3.2. Factors Likely Impacting NSB Health in a NEGATIVE Way**

Table SR.7 lists factors that likely affect NSB community health in a negative way and contribute to the major health disparities, emerging health concerns, and leading health burdens.

Table SR.7: Factors Likely Impacting NSB Health in a NEGATIVE Way

| High rates of tobacco smoking | Smoking rates in the NSB are among the highest in the state and show no indication of declining. The high tobacco smoking rates in the NSB include not only adults but adolescents and pregnant women. Smoking rates among high school students and pregnant women in the NSB are more than twice statewide rates. |

| High levels of food insecurity and difficulty accessing foods for healthy meals | Of household heads in the NSB, 35% reported difficulty getting the food needed to eat healthy meals last year, and they reported an inability to get enough of both subsistence foods and store foods. Of Iñupiat household heads in the NSB, 26% reported that, at times last year, household members did not have enough to eat, an estimate considerably higher than statewide estimates. |
**Table SR.7: Factors Likely Impacting NSB Health in a NEGATIVE Way**

<table>
<thead>
<tr>
<th>Difficulty accessing health services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to quality health care is an important component of community health, both for the prevention and treatment of illness and injury. The remote location and severe climate present many challenges to the delivery of health care services in the NSB.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Historical and multi-generational trauma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discrimination, loss, and lack of control of one’s own destiny can have profound influences on both mental and physical health.</td>
</tr>
<tr>
<td>The people of the North Slope have experienced devastating epidemics of infectious disease and suicide, institutionalized discrimination and forced removal of children to boarding schools, and cycles of alcohol- and drug-related familial violence and abuse.</td>
</tr>
<tr>
<td>The contamination of hunting lands near Point Hope with nuclear waste in the early 1960s (known as the Project Chariot site), and unethical medical experimentation carried out on Alaska Native volunteers in the last century—most notably the now infamous 1957 radioactive iodine-131 thyroid experiment—left unresolved questions about physical health consequences and compounded the multi-generational victimization and grief already affecting the region.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Addiction: Alcohol and drug abuse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol is involved in an estimated 40% of snowmachine-related injury hospitalizations, 70% of assault injuries, 57% of suicide attempts, 45% of motor-vehicle-related injury hospitalization, and 59% of domestic violence incidents reported to troopers statewide (among Alaska Natives).</td>
</tr>
<tr>
<td>Of Iñupiat and Caucasian household heads in the NSB, 30% and 10%, respectively, report that a household member has been hurt by alcohol or drugs in the past year, and a large majority of NSB household heads believe that the health of their community has been hurt by alcohol or drugs in the past year.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Child neglect and abuse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions during early childhood have lifelong physical, emotional, and cognitive effects, and the early childhood environment is a predictor of both mental and physical health.</td>
</tr>
<tr>
<td>Child neglect and abuse have powerful negative impacts on health throughout the lifespan.</td>
</tr>
<tr>
<td>Similar to other remote rural regions, the NSB experiences high rates of child maltreatment compared with statewide rates.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rising school drop-out rates and below-average graduation rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>A higher educational level is associated with longer life and better health throughout the lifespan. Education can help mitigate the health effects of poverty and other adverse circumstances.</td>
</tr>
<tr>
<td>Despite substantial investments in education, the overall average graduation rate in the NSB school district remains below state and national averages. Graduation rates vary widely among North Slope village schools, however, with rates in some villages exceeding statewide rates.</td>
</tr>
<tr>
<td>Grade 7–12 drop-out rates have increased since the early 1990s and typically exceed statewide drop-out rates.</td>
</tr>
</tbody>
</table>
Table SR.7, continued

| Environmental problems such as climate change and contaminants | Changing weather and ice patterns in the North Slope region affect subsistence food availability and may increase risks associated with subsistence activities.68 |
| Environmental problems such as climate change and contaminants | Some concerns voiced by local North Slope residents and leaders include the impact of ocean temperatures and increased marine traffic on bowhead whale migration patterns, disappearing nesting grounds for migrating bird species and spoilage of subsistence meats that are stored in permafrost cellars.69 |
| Environmental problems such as climate change and contaminants | As permafrost temperatures rise and frozen ground thaws, there is potential for destabilization of infrastructure in many arctic communities. Barrow has been identified as “ground zero” for climate change.69 |
| Environmental problems such as climate change and contaminants | Arctic climate change and other environmental problems also affect water, sanitation, housing, and transportation infrastructure, cultural continuity and community stress levels.68 |
| Environmental problems such as climate change and contaminants | Although the available data regarding the health effects of environmental contaminants have generally been reassuring, anxiety and anger about the safety and availability of subsistence foods, local and global sources of pollution, and the possibility of local environmental catastrophes related to oil development, may have profound effects on community health and well-being that are difficult to measure. |
| High consumption of sodas and other sugar-sweetened beverages | High consumption of soda or other sugar-sweetened drinks and other high-calorie, low nutrient value processed foods has been linked to important health problems such as obesity, diabetes, tooth decay,70 and even certain cancers.71 |
| High consumption of sodas and other sugar-sweetened beverages | Household heads in the NSB are significantly more likely than adults statewide to report drinking at least two of these beverages per day.8,9 |
| Insufficient levels of physical activity among many residents | Fewer than half of NSB household heads (44%) report getting the recommended amount of moderate physical activity,8 similar to statewide estimates (47%).9 |
| Insufficient levels of physical activity among many residents | Almost one-third of NSB adults reported no leisure-time exercise, higher than statewide estimates.8,9 |
| Insufficient levels of physical activity among many residents | In 2005, the percentage of NSB high school students attending physical education classes daily was significantly lower than among high school students nationwide, but more NSB students did participate in after-school sports teams.23 |
| Low utilization of safety practices such as helmet and seatbelt use | Helmets and seatbelts reduce the likelihood of serious injury and death caused by motor vehicle accidents |
| Low utilization of safety practices such as helmet and seatbelt use | In the NSB, only 18% of household heads reported using helmets when riding a snowmachine or four-wheeler, and this estimate was even lower among Inupiat household heads and those living in North Slope villages other than Barrow.8 By comparison, in a statewide observational study, an estimated 57% of people used snowmachine helmets, 47% in rural areas.72 |
| Low utilization of safety practices such as helmet and seatbelt use | In 2005, 63% of NSB high school students reported never or seldom using a seatbelt.23 |
Table SR.8: Factors Likely Influencing NSB Health in Mixed, Complicated Ways

<table>
<thead>
<tr>
<th>Factor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil and gas development</td>
<td>The development of oil and gas resources has forever changed the North Slope. Following the formation of the North Slope Borough, oil and gas revenues have created employment opportunities, provided money for essential services and infrastructure, and raised the average household income. An influx of outside interests and money can also create conflict, alter social structure, and divide communities, affecting community well-being. Real and potential impacts to the environment and subsistence are also ongoing sources of tension and concern. Natural resource development and fossil fuel extraction worldwide has also contributed to the climate change that is disproportionately affecting arctic communities. The field of Health Impact Assessment (HIA) was developed to assess both the positive and negative potential human health effects of development projects. This policy tool can be used to make recommendations that will maximize the health benefits and minimize health damage to a community from development projects. Widely used internationally, the use of HIA is growing in the U.S. and in Alaska. The NSB has been a leader in integrating HIA into the Environmental Impact Assessment process for natural resource development in Alaska.</td>
</tr>
<tr>
<td>Employment opportunities</td>
<td>Oil development on the North Slope has created a variety of employment opportunities for local residents, and the unemployment rate in the NSB has generally been lower than in other rural Alaskan regions. The official unemployment rate in the NSB has fluctuated widely over the last 20 years, however, and inadequate local job opportunities have been cited as a leading community concern. In the 2010 NSB Census, 28% of NSB residents aged 16–64 report currently being unemployed. Of these, roughly one-third state that this is because they could not find a job. Iñupiat residents were significantly more likely to be unemployed that Caucasian residents. A large majority of jobs created by oil and gas development have gone to non-resident Alaskan and out-of-state workers. A mismatch between skills and workforce needs can contribute to chronic unemployment and underemployment among local residents. Drug and alcohol problems also present additional barriers to securing and maintaining employment for some NSB residents.</td>
</tr>
<tr>
<td>Income level and distribution</td>
<td>The NSB has above-average median household income, compared to Alaska overall and to other remote rural areas. According to one standard measure, the NSB has among the lowest estimated levels of household income inequality in the state. This means that, compared to other regions in Alaska, income in the NSB is more equally distributed among households. Income inequality levels in the NSB, Alaska, and the U.S. are, however, all still above the level beyond which negative health effects begin to occur. Estimated poverty rates in the NSB have fluctuated considerably over the past two decades. Poverty levels in the NSB rose through the 1990s and early 2000s to peak at almost 14% in 2007 before dropping back down slightly below statewide estimates. They have generally remained below nationwide estimates; however, poverty rates do not take into account differences in local cost of living, which is high in the NSB. The percent of children eligible for free and reduced lunch gives a reasonable estimate of the number of children living in families with household incomes less than 185% of the poverty level. In 2011, 44% of students enrolled in the NSB School District were eligible for the Free or Reduced Lunch program. Roughly one-third of Alaska school districts had lower percentages and two-thirds had higher percentages of students eligible for the program.</td>
</tr>
</tbody>
</table>

### Notes
- Poverty has a devastating impact on health. The chronic stress, poor nutrition, increased exposure to crime and victimization, fewer opportunities and problems with access to health care associated with poverty all play a role in influencing health behaviors and outcomes.
- Research in a wide variety of cultures has demonstrated that income level is positively associated with mental and physical health, both mental and physical. Income level and distribution
- Research also suggests a relationship between income distribution and health such that more equitable distribution of income within a community or country is associated with better health outcomes.
- Oil and gas development
- The health impacts of oil and gas development in the NSB are complex, as it has touched many aspects of community life in the region.
SR 3. Working Together To Improve Health in the NSB: Focus on Prevention

Traditionally, local health planning has focused on the provision of medical services and essential public health programs such as immunizations and infectious disease control. Like in other parts of rural Alaska, chronic staffing shortages and high turnover of personnel continue to make provision of necessary services challenging in the NSB. The sharing of responsibility for key health and social services in the region between multiple organizations and across many miles of frozen tundra adds to the complexity of this task. Some of these challenges may be met through improved communication and coordination of services, utilizing modern telecommunications technology, expanding efforts to recruit and retain health care personnel, and building local capacity through mentorships, internships, scholarship programs, local training, and distance learning opportunities.

Across the state and the country, communities are also starting to look at health more broadly and focus on prevention at the community level. Communities are examining their health challenges and achievements, taking ownership of problems, and attempting to address them through the development of community partnerships and through collaborative planning and action. In rural Alaska, innovative programs have combined traditional knowledge and healing practices with modern evidence-based models.79 Whereas local health departments are taking the lead in community health promotion efforts across the country, leadership and collaboration in multiple organizations within and outside the community are necessary for achieving community health goals.

SR 3.1. Community-Based Health Promotion and Disease Prevention

SR 3.1.1. The Process of Community Health Promotion

Multiple models and guidelines have been developed for community-level health improvement efforts.10,79–83 Most recognize, however, that this process is not linear, but rather a cycle, with phases that overlap and reflect back on themselves as the community moves forward together. Each step in the cycle requires leadership, collaboration, and commitment from multiple sectors of the community. Many national public health agencies and foundations are increasingly focusing their grant funding on this type of community-based collaborative model of health promotion. Initiating and sustaining the effort can be a significant challenge when local budgets are tight and participants have many competing duties and limited time. These challenges can be overcome, however. At least one staff member, and ideally a collaborative leadership team, should have a substantial portion of their paid time dedicated to leading the development and implementation of a community health promotion initiative. Realistic goals, both short- and long-term, should be set early in the process, and a plan for ongoing evaluation and modification of efforts must be established (see figure SR.31).

Successful planning requires a solid understanding of the nature and magnitude of the problems as well as the factors that drive community health. This report is intended to provide much of the information necessary to assess community health needs and resources, as well as to serve as a resource for community leaders in all phases of the health promotion process.
SR 3.1.2. **Community Health Partnerships in the NSB**

Developing community partnerships is one of the cornerstones of successful community health promotion efforts. Within the NSB, many agencies and groups have an interest and a role in community health. Below are just some of the potential local partners that have contributed and can continue to contribute to efforts to address the health issues facing North Slope communities.

SR 3.1.3. **Community Health Promotion Resources Outside the NSB**

SR 3.1.3.1. **Community Health Promotion in Rural Alaska Native Communities**

Looking to other Alaskan communities and learning from their various experiences with community health promotion can be valuable. A number of common themes have emerged from Alaskan communities’ efforts at health improvement and healing, compiled in the report *Healthy Alaskans 2010 Volume 2:*
\textit{Talking Circles}, which consists of 14 stories of community-based efforts for public health improvement in rural Alaska. Table SR.9 lists some of these themes.

<table>
<thead>
<tr>
<th>Community</th>
<th>Elders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional knowledge</td>
<td>New knowledge</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Leadership</td>
</tr>
</tbody>
</table>

Local ownership of both the problems and solutions

The Alaska Native Tribal Health Consortium’s Health Promotion and Disease Prevention Program has developed the “Creating Community Circles for Change” program to provide support and tools for communities trying to improve their people’s health at the local level. They also provide training and support for “digital storytelling,” which enables community members to develop their own health messages through powerful personal narratives through the use of digital storytelling technology.

SR 3.2. Focused Health Promotion Recommendations

Communities must develop their own health promotion priorities; however, based on the findings of this baseline community health analysis, there appear to be several specific areas in which health promotion efforts have the greatest potential to address major health disparities as well as leading and emerging health problems in the NSB.

SR 3.2.1. Focus on Children and Families: The NSB Healthy Kids Initiative

The findings of this report suggest that maternal and child health represents an area of significant health disparity in the NSB. Supporting the health of infants, children and adolescents is one of the best investments a community can make in its future, and this can only happen through supporting healthy families. The NSB Health Department is responsible for many aspects of maternal and child health through programs such as public health nursing and WIC, and adequate support for these programs is crucial to improving child and family health in the NSB. ASNA currently has primary responsibility for prenatal and obstetrical care in the region. Maintaining adequate staffing to provide these services has been an ongoing challenge. Improved intra-agency coordination of existing health and social services can maximize the benefits to pregnant women and families.

In the North Slope, supporting the health of children means focusing not just on mothers and their infants, but also working with fathers and extended families, schools, and the entire community to keep children healthy and safe. Communities, schools, families, and health care workers can promote child and family health by creating supportive, positive environments for children and helping them develop the skills that
will enable them to make healthy choices throughout their lives and navigate the many challenges they will face during adolescence and adulthood.

The NSB Health Department has already engaged in early efforts in this area, building relationships with community partners such as the NSB School District and ASNA to develop a framework for addressing child and family health challenges in the NSB. Some themes and ideas that have emerged so far from this working group include:

Draft Mission Statement

“To develop community-wide partnerships that encourage and facilitate healthy choices and create an environment that supports optimal health and development for all NSB infants, children, and adolescents.”

Overall Themes

- Children’s health is about *family health*, and entire families need to be included.
- Community involvement is essential at every stage of the process.
- Incorporating traditional Iñupiaq values and activities into all aspects of initiative.
- Giving community members information about their own health can inspire involvement and action.
- Community members want concrete, specific information about health risks.

Maternal-Infant and Young Family Health

- Focus on parenting: Provide Iñupiaq values-based parenting guide, education and support for new parents involving Iñupiat elders and experienced parents as mentors and role models.
- Reduce family stress and reduce the likelihood of child maltreatment with in-home nursing support, respite care services, and other circles of community support for families with young children.
- Build relationships with ASNA to improve coordination of prenatal/newborn/post-partum/well-child health services—addressing low rates of early and/or adequate prenatal care, fragmented newborn follow-up, low breastfeeding continuation rates, and high prenatal smoking rates.
- Bring together people from around the North Slope and outside to work toward improving MCH services in the region with local Maternal Child Health (MCH) mini-conferences.

Child Obesity and Chronic Disease Prevention

- Get traditional foods into schools—look at YKHC model for guidance, work with the NSB School District’s Iñupiaq Education Program.
- Work with the NSB School District on updating and implementing school wellness policies
- Plan family-oriented physical activities such as family Eskimo dancing nights, volleyball, and multicultural food and music nights
- Increase opportunities for participation in Native Youth Olympics-type activities
- Mobilize the community around reducing soda pop and other sugar-sweetened beverages, exploring effective promotion of tap water as the primary beverage for children and adults
- Educate community members about the importance of adequate sleep in preventing obesity and chronic disease
- Advocate for and participate in the development of a local food policy committee
- Address high obesity rates in toddler to preschool aged children: promote and support breastfeeding continuation and healthy nutrition, discouraging sugared beverage use in this age group

Youth Risk Behavior Reduction

- The problem of youth tobacco/alcohol/drug use belongs to the whole community and requires engagement from the whole community. Drug use is a big community concern and is frequently brought up as a priority at conferences and meetings. Tobacco and other addictive substances are linked and need to be addressed together
- Community members must start talking more openly about the pain that drives these behaviors.
- *Early* intervention is crucial: work with very young children and young families to prevent neglect, abuse, educate about the body and nutrition, and develop self-esteem and strong coping and decision-making skills
- NSB youth cite tobacco and alcohol use as the top health problems in their community (see Appendix D)
- Many groups are working on these issues—how can we all best work together to use the community resources we have and not replicate efforts?
Innovative approaches are needed to address all of these complex issues. Approaches that involve elders, young people, and other community members at all stages and those that incorporate traditional Iñupiaq values, activities and ways of healing are likely to be the most effective.

**SR 3.2.2. Tobacco Prevention and Control**

A large majority of adult smokers in the NSB are interested in quitting, and students surveyed in two different North Slope villages identified tobacco smoking as a top health concern. A community-wide tobacco prevention and control program has the potential to significantly reduce the burden of suffering and death from the leading cause of death in the NSB—cancer, and in particular, lung cancer. Reducing smoking rates also has the potential to reduce the significant health disparities in chronic lower respiratory disease, infant mortality, and other prevalent health problems in the NSB. Barrow has already taken several important policy steps to reduce smoking and second-hand smoke exposure—a local tobacco tax and indoor air ordinance—but very high smoking rates persist. No single local organization or agency can solve this problem alone, but leadership and commitment from multiple sectors of the community working together can undoubtedly have an impact on this major public health issue. In addition, many outside resources exist to aid communities in local tobacco prevention and control efforts. Some of these resources are identified in Appendix C.

Some areas on which to focus efforts include:

- Preventing tobacco initiation among children and adolescents through policies and enforcement that limits access to tobacco, counter-advertising and other hard-hitting media campaigns, early education programs, and helping youth engage and form peer connections around interests and activities that reduce their likelihood of smoking;
- Ensuring access to effective tobacco cessation services, with programs catering to those groups who may be most highly motivated to quit; for example, pregnant women and those in younger age groups in general
- Encouraging community members to make traditional subsistence gatherings such as whaling and hunting expeditions, feasts, and skin-sewing groups “tobacco-free” and emphasizing that tobacco is not part of the traditional Iñupiat culture or a traditional rite of passage for adolescents.

**SR 3.2.3. Coordinated Injury and Violence Prevention Program**

Injury is a leading cause of death and the number one cause of premature death in the North Slope communities. It is also a major area of health disparity for the NSB. Across Alaska, community leaders, health departments, public safety officials, and tribal health organizations are working collaboratively to address the related problems of unintentional injury, suicide, and interpersonal violence. The ANTHC Injury Prevention Program has worked with many communities in rural Alaska to develop local, coordinated injury prevention programs with dedicated local staffing. These programs are tailored to the particular needs of local communities. Appendix C contains information about a number of injury and violence prevention resources.

- A number of organizations in the NSB—Arctic Women in Crisis, the NSB police and fire departments, the NSB Integrated Behavioral Health Division, and others—are already doing important work toward reducing unintentional injury, suicide, and domestic and sexual violence. Ongoing support, expansion, coordination, and evaluation of these efforts are warranted.
- Talking circles, community spirit gatherings, and other supportive community forums can help address the historical and personal trauma, unresolved anger, and grief that can drive destructive behaviors. As a high proportion of injuries, both intentional and unintentional, are related to alcohol and drugs, both retaining local option laws that restrict access to alcohol and maximizing the availability of alcohol and drug prevention and treatment services are likely to reduce the burden of both intentional and unintentional injury in the NSB.
- Programs to encourage, facilitate, and enforce helmet use and motor vehicle safety practices, particularly on off-road vehicles, can help address this leading cause of premature death and disability. Other Alaskan communities have begun exploring gun and medication lockers as ways to reduce suicide attempts and accidental injuries, particularly among children and adolescents.
- National groups working on reducing injury and violence are increasingly turning their focus to younger children, finding ways to help parents, schools, and communities build the emotional skills in
young children that will enable them to cope effectively with challenges and hardships that can sometimes lead to impulsive behavior, substance abuse, violence, and injury. Nurse-family partnerships are one example of such an early intervention program.86

SR 3.2.4. Preventing Chronic Disease Through Healthy Diet and Physical Activity

Community-wide nutrition and physical activity interventions incorporating traditional foods and activities have the potential to slow or reverse the concerning trends in obesity and diabetes in the NSB. Such programs can have wide-reaching benefits on other common health problems as well, including cancer, arthritis and chronic pain, high blood pressure, oral health, and mental health. Initial work in this area has already begun in the NSB with the Move-It campaign, the Mayor’s Office Healthy Communities Initiative, youth sports camps, school wellness policies, and other programs. Resources on community health promotion around nutrition and physical activity are included in Appendix C.

While education about diet and exercise can give people the information they need to make changes for themselves and their children, often things like food cost and availability, lack of time and family support, and inadequate opportunities for recreation make these changes more difficult for individuals. Population-based approaches, such as policy, system, and environmental changes, are essential components of any community-based strategy. Five evidence-based components of this population-based approach include:88

- **Media:** for example, promoting healthy food/drink choices and non-motorized transit and physical activity through schools, community events, healthy fairs, youth-produced videos, local media such as radio, and social media sites
- **Access:** for example, providing incentives to store owners to stock and promote healthier food options, assisting communities with subsistence food sharing and storage, and expanding local physical recreational opportunities
- **Point of decision information:** for example, signs or labels indicating for healthy vs. less healthy foods on store shelves, product placement and attractiveness
- **Price:** for example, making healthy foods less expensive through bulk purchase/procurement and building community support for a local tax on sodas and other sugared drinks that could decrease consumption and fund subsistence support programs or other community priorities
- **Social support services:** for example, breastfeeding peer counselors and workplace policies that support breastfeeding; subsistence support programs; and physical activity groups and events such as Eskimo dancing nights, walking groups, and family sports nights

Many states (including Alaska) and an increasing number of local communities have developed food policy councils or committees to address the central role that food systems play in the health of populations. Some potential topics of focus for a local food policy council or local nutrition initiative in the NSB might include:

- A strategic plan to address the high reported levels of food insecurity (both market and subsistence) throughout the North Slope, particularly among Iñupiat households in outlying villages.
- Ways to facilitate the increased consumption of traditional subsistence foods and other healthy foods among children in school, community, and home environments.
- Policies and planning decisions that protect subsistence resources, support subsistence hunting and fishing, enhance food-sharing networks, and address the impacts of climate change and resource development on traditional subsistence activities and food storage.
- A strategic plan to reduce the high consumption of soda and other sugar-sweetened beverages in North Slope communities, particularly among young people. Efforts could include policy approaches that address the current bypass mail system and other issues of food distribution and cost in the NSB, community-wide and point-of-sale education, counter-advertising, promotion of alternatives, and assessing community support for a tax on sugar-sweetened beverages.
SR 3.3. Enhancing Overall Community Health

Health is influenced by virtually every aspect of a person’s life. Many of these factors exist outside of the traditional realm of public health or health care. Therefore, health needs to be considered in virtually every major policy and planning decision affecting North Slope communities. Health Impact Assessment (HIA) is one policy tool that can be used to ensure the consideration of human health in resource development and other planning decisions, and the NSB has already become a leader in the use of HIA within the Environmental Impact Assessment process. Understanding the current health issues facing a community as well as the factors underlying health can help delineate the pathways through which these decisions can affect community health.

Below are some examples of local, community-based activities outside the traditional scope of public health services that have the potential to enhance community health. Many of these efforts are already occurring in the NSB and warrant ongoing or increased support:

- Continuing or expanding programs that encourage the incorporation of traditional Iñupiaq values, skills, activities, and language into community life, education, and employment.
- Expanding job training and employment opportunities that create stable, equitable, and safe working environments.
- Providing consistent and ongoing opportunities for strengthening supportive social ties—for example Talking Circles, Healing Circles, or community Spirit Gatherings—for residents of all ages.
- Advocating for policies and decisions that protect the local and global environment.
- Facilitating civic engagement and meaningful participation among residents in decision-making processes affecting local communities.

SR 3.4. Setting Targets and Monitoring Community Health

Monitoring community health status over time can be a valuable tool in tailoring programs to meet the needs of the communities served. Communities must determine which health-related indicators are of greatest value and interest, taking into consideration availability and ease of use of the various data sources. The Health Department and other organizations might also be interested in monitoring health indicators related to a particular health promotion campaign or program. North Slope communities facing policy, planning, or resource development decisions might be interested in monitoring aspects of community health affected by those decisions; and this type of monitoring is part of the Health Impact Assessment process. References and data sources are provided at the end of each chapter in this report, and Appendix B provides descriptions of data sources and how data were obtained for this report. Data tables have been provided to the NSB Health Department for all figures and graphs based on numerical data that were too numerous to display within the report.

SR 3.4.1. Choosing Community Health Indicators

The Healthy Alaskans Partnership Council developed a set of leading health indicators and targets for the state of Alaska that reflect major public health concerns in the state (See Table SR.10). These indicators are meant to be good measures of progress toward Alaskans living longer, healthier lives in healthy communities. The list of leading indicators was modified from the national Healthy People 2010 leading indicators list to better reflect and allow tracking of public health issues of particular importance in Alaska.89 Local data for the NSB are available for many of these leading health indicators and are included in Table SR.10. Targets set by the Healthy Alaskans Partnership Council were based on baseline estimates for the state of Alaska. Local targets for the NSB could also be set, using the baseline estimates for the NSB and the statewide targets as guides.
**Table SR.10: Healthy Alaskans 2010 Leading Health Indicators**

<table>
<thead>
<tr>
<th>Category</th>
<th>Healthy Alaskans 2010 Target</th>
<th>Baseline NSB Estimate</th>
<th>NSB Data Source</th>
<th>NSB 2020 Target?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical Activity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase the proportion of adolescents who engage in vigorous physical activity (percent of high school students grades 9–12 who exercise or participate in sports activities for at least 20 minutes that cause sweating and heavy breathing on 3 or more of the past 7 days)</td>
<td>85%</td>
<td>58%</td>
<td>YRBS (2005)</td>
<td>?</td>
</tr>
<tr>
<td>Increase the proportion of adults who engage in regular, preferable daily, moderate physical activity (percent of people age 18 years and older who engage in physical activity five or more sessions per week for 30 or more minutes per session, regardless of intensity)</td>
<td>40%</td>
<td>44%</td>
<td>NSB Census (2010)</td>
<td>?</td>
</tr>
<tr>
<td><strong>Overweight and Obesity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduce the proportion of adolescents who are overweight (percent of high school students grades 9–12 with body mass index greater than or equal to the 95th percentile, based on age-sex specific NHANES)</td>
<td>?</td>
<td>?</td>
<td>YRBS (2005)</td>
<td>?</td>
</tr>
<tr>
<td>Reduce the proportion of adults who are obese (percent of persons aged 18 years and older with body mass index greater than or equal to 30kg/m²)</td>
<td>18%</td>
<td>37%/31%</td>
<td>NSB Census (2010)/BRFSS (2005–2007)</td>
<td>?</td>
</tr>
<tr>
<td><strong>Tobacco Use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduce cigarette smoking by adolescents (percent of high school students grade 9–12 who have smoked cigarettes on one or more of the past 30 days)</td>
<td>17%</td>
<td>40%</td>
<td>YRBS (2005)</td>
<td>?</td>
</tr>
<tr>
<td>Reduce cigarette smoking by adults (percent of adults aged 18 years and older who smoked more than 100 cigarettes in their lifetime and smoked on some or all days in the past month)</td>
<td>14%</td>
<td>49%/46%</td>
<td>NSB Census (2010)/BRFSS (2005–2007)</td>
<td>?</td>
</tr>
<tr>
<td><strong>Substance Abuse</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase the proportion of adolescents not using alcohol or illicit drugs during the past 30 days (percent of high school students grades 9–12 who have not used alcohol, marijuana, or cocaine in past 30 days)</td>
<td>60%</td>
<td>Comparable estimate not available</td>
<td>YRBS (2005)</td>
<td>?</td>
</tr>
<tr>
<td>Reduce binge drinking among adults (percent of persons aged 18 years or older who consumed five or more drinks on one occasion within the past 30 day period)</td>
<td>14%</td>
<td>17%</td>
<td>BRFSS (2005–2007)</td>
<td>?</td>
</tr>
<tr>
<td><strong>Mental Health</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduce the suicide rate (deaths per 100,000 population)</td>
<td>10.6</td>
<td>50.4</td>
<td>ABVS (2005–2009)</td>
<td>?</td>
</tr>
<tr>
<td><strong>Injury Prevention</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduce deaths caused by unintentional injury (deaths per 100,000 population)</td>
<td>31.4</td>
<td>102.1</td>
<td>ABVS (2005–2009)</td>
<td>?</td>
</tr>
<tr>
<td>Reduce deaths cause by motor vehicle crashes (deaths per 100,000 population)</td>
<td>7</td>
<td>45.6</td>
<td>ABVS (1999–2008)</td>
<td>?</td>
</tr>
<tr>
<td><strong>Violence Prevention</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduce deaths from homicides (deaths per 100,000)</td>
<td>4</td>
<td>*</td>
<td>ABVS</td>
<td>?</td>
</tr>
<tr>
<td>Reduce child maltreatment (rate of substantiated reports of child maltreatment per 1,000)</td>
<td>10</td>
<td>54.8</td>
<td>OCS</td>
<td>?</td>
</tr>
</tbody>
</table>
### Table SR.10, continued

<table>
<thead>
<tr>
<th>Category</th>
<th>Healthy Alaskans 2010 Target</th>
<th>Baseline NSB Estimate</th>
<th>NSB Data Source</th>
<th>NSB 2020 Target?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Immunization</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase the proportion of young children who have received all vaccines recommended for universal administration (percent of children aged 19–35 months who have received recommended doses of DTaP, polio, MMR, Hib, and Hep B vaccines, the 4:3:1:3:3 series)</td>
<td>90%</td>
<td>75% (AI/AN only)</td>
<td>ANTHC Immunization program (12/31/2010)</td>
<td>?</td>
</tr>
<tr>
<td>Increase the proportion of elderly adults immunized against influenza and pneumococcal disease (percent of adults aged 65 years and older who have received an influenza vaccine in the past year; percent of adults aged 65 and older who have ever received a pneumococcal vaccine)</td>
<td>90%; 90%</td>
<td>41%, 84% (AI/AN only)</td>
<td>ANTHC Immunization program (June, 2010)</td>
<td>?</td>
</tr>
<tr>
<td><strong>Environmental Quality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase number of households with access to safe water and proper sewage disposal</td>
<td>98%</td>
<td>92%</td>
<td>NSB Census (2010)</td>
<td>?</td>
</tr>
<tr>
<td>Reduce the proportion of adult non-smokers exposed to second hand smoke in either their home, a car, or at work in the previous 30-day period</td>
<td>Developmental</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Access to Health Care</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decrease the percent of Alaskans without health insurance coverage throughout the year</td>
<td>5%</td>
<td>3%</td>
<td>NSB Census (2010)</td>
<td>?</td>
</tr>
<tr>
<td>Increase the proportion of adults aged 18 or older with a usual place to go for care if sick or needing advice about health</td>
<td>100%</td>
<td>Not available</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Maternal and Child Health</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase the proportion of pregnant women receiving adequate prenatal care (percent of live births with APNCU Index greater than or equal to 80)</td>
<td>90%</td>
<td>22.0%</td>
<td>ABVS (2009)</td>
<td>?</td>
</tr>
<tr>
<td>Reduce post-neonatal death rate (deaths between 28 days and 1 year per 1,000 live births)</td>
<td>*</td>
<td></td>
<td>ABVS (2005–2009)</td>
<td>?</td>
</tr>
<tr>
<td><strong>Responsible Sexual Behavior</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase the proportion of adolescents who abstain from sexual intercourse (percent of high school students grades 9–12 who have never had sexual intercourse)</td>
<td>65%</td>
<td>50%</td>
<td>YRBS (2005)</td>
<td>?</td>
</tr>
<tr>
<td>Increase the proportion of sexually active adolescents who use condoms (percent of high school students grade 9–12 who had intercourse in past 30 days who used condom at last intercourse)</td>
<td>75%</td>
<td>64%</td>
<td>YRBS (2005)</td>
<td>?</td>
</tr>
<tr>
<td>Increase the proportion of sexually active persons who reported condom use at last intercourse (percent of sexually active unmarried women (divorced, widowed, separated, never married, or member of an unmarried couple) aged 18–44 years who reported condom use at last intercourse). The comparable proportion for Alaska males was 45 percent.</td>
<td>50%</td>
<td>Not available</td>
<td>BRFSS</td>
<td>?</td>
</tr>
</tbody>
</table>

*Fewer than 6 occurrences
Adapted from Healthy Alaskans 2010: Targets and Strategies for Improved Health

This list of leading health indicators could serve as a starting point for North Slope communities in creating a set of leading community health indicators and targets for the NSB. Some health indicators might be removed from the Healthy Alaskans 2010 list and others modified or added to create a set of local leading health indicators that can be tracked over time. A number of factors should be considered in choosing community health indicators.
• Community priorities and vision for a healthy future—incorporating issues of greatest interest and importance to the community;
• Leading health burdens, health disparities, and emerging health problems in the NSB, as outlined in Part I of this report;
• Availability and reliability of data at the borough level—is the data already being collected (for example, ABVS data) or will collection of new data be needed (for example, NSB Census, local YRBS data)? Is the number of events, cases, or survey participants large enough at the borough level to calculate reliable rates at the local level?
• Health measures that would be affected by existing or anticipated community health promotion activities, policies, or programs in the NSB;
• Health measures that might be particularly affected by new laws, funding decisions, environmental factors, or resource development activities.

Sometimes, an indicator that is used at the state level may not be appropriate for short-term monitoring at the local level in a region such as the NSB with a relatively small population. These indicators include rates based on small numbers of events from a statistical standpoint, such as motor vehicle death rates, suicide rates, or post-neonatal infant mortality rates. Other, more sensitive, indicators might be substituted or added, such as reported helmet use, reported suicide attempts among high school students, first-trimester prenatal care rates, and prenatal smoking rates. Disease and mortality rates can, however, be useful to examine in smaller communities when combining multiple years of data or when looking at trends over many years.

Some potential health indicators that might be included in an ongoing community health monitoring program in the NSB include (but are not limited to) those listed below in Table SR.11. These indicators add to the picture of overall community health and also reflect many of the areas of health disparity, major burdens of disease, and emerging health problems in the NSB outlined in this report. The indicators also represent data that are either already being collected on an ongoing basis, or could be collected through a repeat survey, for example, as part of the next NSB Census or through another YRBS survey in NSB high schools. Again, targets can be set through a community collaborative process and may also take into account baseline differences among age groups, ethnic groups or villages within the NSB. Statewide and national estimates are provided for general reference, and comparisons should be made with caution.

<p>| Table SR.11: Possible Additional Community Health Indicators for the NSB |
|--------------------|----------------|----------------|----------------|
| Indicator                                      | NSB Baseline | Alaska Baseline | NSB Data Sources | Alaska Data Sources |
| General health status among adults: Percent of adults reporting or reported to have “very good” or “excellent” general health. | 46% (All) 40% (Iñupiat) | 56% (All adults) 42% (Alaska Natives) | NSB Census (2010) | BRFSS (2008) |
| Food security: Percent of household heads who report that, at times last year, household members did not have enough to eat | 19% (All) 26% (Iñupiat) | (4–11%)* | NSB Census (2010) | Food Insecurity in Alaska DHSS report (2006 BRFSS data) |
| Consumption of soda and other sugar-sweetened beverages: Percent of household heads who report drinking 2 or more sugar-sweetened beverages per day, on average in the past week | 45% (All) 57% (Iñupiat) | 30% (Alaska adults) | NSB Census (2010) | Obesity Facts DHSS report (2009 BRFSS data) |
| Subsistence food use: Percent of Iñupiat households who report that half or more of their diet comes from subsistence food sources | 67% (Iñupiat) | N/A | NSB Census (2010) | N/A |
| General health status among children: Percent of children reported to have “very good” or “excellent” general health | 63% (All) 60% (Iñupiat) | 89% (Alaskan children) | NSB Census (2010) | National Survey of Children’s Health (2007) |</p>
<table>
<thead>
<tr>
<th>Indicator</th>
<th>NSB Baseline</th>
<th>Alaska Baseline</th>
<th>NSB Data Sources</th>
<th>Alaska Data Sources</th>
</tr>
</thead>
</table>
| Child obesity:  
  a. Percent of NSB children aged 3–18 years with measured BMI above the 95th percentile for age and gender.  
  b. Percent of children aged 2–5 enrolled in WIC with BMI above the 95th percentile for age and gender | a. 31%  
  b. 37% | a. 20% (Alaskan children ages 3–19)  
  b. 15% (U.S. 2008) | a. PHN database (2008–09)  
| First trimester prenatal care:  
  Percent of women delivering a live birth who accessed prenatal care during the first trimester of pregnancy | 64.7% | 80.4% | ABVS (2005–09) | ABVS (2005–09) |
| Breastfeeding initiation and duration:  
  Percent of mothers using WIC who report  
  a. Initiating breastfeeding  
  b. Continuing for at least 8 weeks  
  c. Continuing for at least 6 months | a. 71%  
  b. 33%  
  c. 26% | a. 62%  
  b. N/A  
| Prenatal smoking:  
  Percent of women delivering a live infant who report smoking tobacco during pregnancy | 47% | 16% | ABVS (2007–09) | ABVS (2007–09) |
| Teen birth rate:  
  Number of births per 1000 women aged 15–19 years | 92.9 | 42.2 | ABVS (2007–09) | ABVS (2007–09) |
| Domestic violence during pregnancy:  
  Percent of women who recently delivered an infant who report physical abuse by a husband or partner during the pregnancy | 10.7% | 3.9% | PRAMS (2001–2005) | PRAMS (2001–2005) |
| Forcible rape rate:  
  Number of reported cases of rape by force and attempted rape by force, per 100,000 population | 138.3 | 72.6 (Alaska)  
| Health impact of alcohol and drugs:  
  Percent of household heads who believe a household member has been hurt by drugs or alcohol in the last year (often or sometimes) | 24% (All NSB)  
  31% (Iñupiat only) | N/A | NSB Census (2010) | N/A |
| Helmet use:  
  The percent of household heads who report using a helmet when riding a snowmobile or four-wheeler | 18% (All NSB)  
  11% (Iñupiat only) | 57% (All)  
### Table SR.11, continued

<table>
<thead>
<tr>
<th>Indicator</th>
<th>NSB Baseline</th>
<th>Alaska Baseline</th>
<th>NSB Data Sources</th>
<th>Alaska Data Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social and emotional support:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Percent of adults who report &quot;always&quot; or &quot;usually&quot; getting the social and emotional support they need</td>
<td>a. 53%</td>
<td>a. 80%</td>
<td>a. County Health Rankings (BRFSS 2005–09 data)</td>
<td>a. County Health Rankings (BRFSS 2005–09 data)</td>
</tr>
<tr>
<td>b. Percent of household heads who feel that the social support they receive has increased in the past 5 years</td>
<td>b. 25%</td>
<td>b. N/A</td>
<td>b. NSB Census (2010)</td>
<td>b. N/A</td>
</tr>
<tr>
<td>c. Percent of high school students who responded that about every day one of their parents talked with them about what they were doing in school</td>
<td>c. 31%</td>
<td>c. 52%</td>
<td>c. YRBS (2005)</td>
<td>c. YRBS (2007)</td>
</tr>
<tr>
<td><strong>Youth suicide:</strong> Percent of high school students who actually attempted suicide one or more times during the past 12 months</td>
<td>14.5%</td>
<td>10.7%</td>
<td>YRBS (2005)</td>
<td>YRBS (2007)</td>
</tr>
<tr>
<td><strong>Chlamydia incidence rate:</strong> Number of cases reported per year per 100,000 population</td>
<td>1733**</td>
<td>862</td>
<td>Alaska DHSS, Department of STD/HIV (2010)</td>
<td>Centers for Disease Control and Prevention, 2010</td>
</tr>
</tbody>
</table>

Unless otherwise specified, estimates are for all races/ethnicities combined.

*Estimates are not directly comparable: for reference, 10.6% of Alaskans were found to be food insecure, meaning that at times members of the household were uncertain of having, or unable to acquire, enough food for all household members. Approximately 4% of households were found to have “very low food security,” with disrupted eating patterns or reduced food intake. Estimates are significantly higher in rural areas.*

** Age-adjusted to 2000 U.S. standard population.

### SR 3.4.2. Sources of Data for Ongoing Monitoring of Community Health Indicators

State of Alaska data sources: A great deal of health-related data for the NSB is already being collected on an ongoing basis by a variety of government agencies—for example Alaska Bureau of Vital Statistics data (including birth and mortality data as well as data on maternal risk factors), reportable infectious diseases, cancer incidence rates, trauma hospitalizations, child maltreatment reports, sexual assault statistics, and school drop-out and graduation rates. Much of this information is publically available on-line, and additional local data can be obtained upon request. In addition, ongoing surveys such as the Behavioral Risk Factor Surveillance System (BRFSS), the Pregnancy Risk Assessment Monitoring System (PRAMS), and its more recent follow-up survey, the Alaska Childhood Understanding Behaviors Survey (CUBS), include participants from the NSB. The small number of participants from individual census areas such as the NSB generally necessitates combining multiple years of data to achieve any statistical reliability, however.

Alaska Native Tribal Health Consortium data sources: The Alaska Native Tribal Health Consortium’s Epidemiology Center serves as a resource for tribal and other organizations interested in learning more about and improving the health and well-being of Alaska Natives. This agency regularly publishes reports that contain regional as well as state level health data for Alaska Natives. ANTHC’s immunization program also collects immunization data from all the Alaska Native service areas in order to track child and adult immunization rates. The Alaska Native Diabetes Program has also been very helpful in providing local statistics from their registry on diabetes among Alaska Natives in the Barrow service area. These are updated annually.

Local NSB data sources: Some data can be extracted and updated from locally-kept databases such as those used by WIC—for example, breastfeeding rates among WIC clients—and Public Health Nursing—for example, BMI’s for NSB children and current immunization rates. The RPMS electronic health records system used at Samuel Simmonds can be queried by trained personnel to track a variety of health indicators in the segment of the NSB population accessing the health care system.
Follow-up health-related data can be collected in future NSB Census surveys as a follow-up to the baseline data collected in the 2010 NSB Census. The NSB School District may also be able to collect valuable follow-up data on youth risk behaviors and mental health by partnering with the Alaska Department of Health and Social Services to re-survey NSB high school students using the Youth Risk Behavior Surveillance (YRBS) questionnaire. Including students in the alternative high school in Barrow would be of particular interest, as alternative schools were also included in the statewide YRBS survey for the first time in 2009.

Local observations and traditional ways of knowing: Finally, the importance of local observations the value of traditional knowledge are increasingly being recognized by the scientific community. Focus groups and semi-structured interviews with elders, community leaders, health and social services workers, and students can provide valuable additional insight about on-the-ground community health issues and underlying causes. The observations can alert public health leaders to emerging community health issues and aid in the interpretation of observed data trends.

**SR 3.5. Data Gaps and Research Needs**

In this report, the existing data on a variety of health topics relevant to community health in the NSB are reviewed. There are undoubtedly data sources and information, both local and from outside the NSB, that were not uncovered in the preparation of this report. Based on the resources identified and utilized in this report, however, there appear to be a number of areas where health-related data are particularly lacking for NSB communities. Some areas where additional research or surveillance may be beneficial to community health in the NSB, particularly if initiated and carried out with the support and active participation of community leaders and residents, are listed.

1. **Effective community-level interventions:** Although a growing body of evidence exists to guide population-based health promotion, very limited research is available to guide the development of specific community-level and culturally tailored interventions in rural Alaska. Collaboration with tribal, university, and state health department researchers in the evaluation of health promotion activities could benefit not only residents of the NSB but Alaska Native communities across the state. Some key areas include tobacco and substance abuse; improving maternal and child health indicators; obesity and chronic disease prevention; the prevention of teen pregnancy and sexually-transmitted infections; and injury, including suicide, unintentional injury, child maltreatment, and domestic and sexual violence prevention.

2. **Dietary composition and/or biomarkers:** Very few data exist regarding dietary composition in North Slope communities. Survey tools and biomarkers are available that would enable researchers to examine the contribution of various subsistence and market foods to diets in NSB communities in order to assess the risk of contaminants, guide health promotion efforts, and have a baseline when assessing impacts of resource development, climate change, and socio-economic shifts.

3. **Children’s health:** The available data suggest many challenges to the health of infants and children in the NSB, including reported general health status that is substantially lower than statewide estimates. Many children’s health indicators are not available at the borough or village level, however. Now that several years of data from the Alaska Childhood Understanding Behaviors Survey (CUBS) have been collected statewide, it may become possible to analyze some measures at the local NSB level. Future NSB Census surveys may also be a vehicle to focus further on children’s health issues in NSB communities.

4. **Health disparities within the NSB:** To best address community health challenges, NSB communities may benefit from further work to identify the factors contributing to differences in health across ethnic groups and villages within the NSB. The NSB Census datasets contain a large amount of information on various potential drivers of health and health disparities within the NSB. Further analysis of these datasets could help illuminate some of these health disparities, particularly if local elders and other community leaders participate in the generation of hypotheses and interpretation of findings.

5. **Cancer patterns:** The striking male predominance of lung cancer incidence in the NSB is likely due, at least in part, to higher lifetime levels of tobacco exposure. It is not entirely clear, however, that different levels of tobacco exposure explain the dramatic gender differences in lung cancer rates in the NSB. Other factors—environmental, genetic, etc.—may be contributing to this pattern of cancer incidence in the NSB, as well as to the increasing incidence of cancer overall. Community-based participatory research may help communities answer the questions they have about cancer in their people to improve the effectiveness of cancer prevention efforts.
6. **Mental and behavioral health**: Few data exist that describe patterns and trends in mental illness in North Slope communities. Given the concerning level of such problems as suicide, child maltreatment, and domestic violence, a deeper understanding of underlying mental health issues and their determinants could help guide efforts to improve community well-being. Having good baseline mental health prevalence data may also be useful in evaluating the effect of mental health promotion efforts as well as the influence of other major changes that may occur in the community.

7. **Community-generated research questions**: Ultimately, some of the most relevant research questions around community health are generated by communities themselves. The data in this report may stimulate discussion and collaboration to address questions and concerns that North Slope communities have about their own health and well-being.

### Part I Endnotes


15. North Slope Borough Women, Infants and Children (WIC) Program, a division of the Alaska WIC Program: Upon request, WIC personnel queried the WIC program database for breastfeeding initiation and duration rates, low hemoglobin rates (USDA Risk 201), and BMI or Weight-for-Stature >95th percentile for age and gender (USDA risk 113), for the years 2003–2009.


Part I: Summary and Recommendations


33. Alaska Birth Defects Registry: NSB-specific data from the registry were provided by Gessner, B.: Alaska Department of Health and Social Services, Maternal and Child Health Epidemiology Unit.


37. Alaska Youth Risk Behavior Survey (YRBS): http://www.hss.state.ak.us/dph/chronic/school/YRBSresults.htm. NSB-specific data from 2005 survey was provided courtesy of the NSB School District. Weighted state-level data are not available from the 2005 survey, so the 2007 survey was used for statewide estimates.


41. North Slope Borough Police Department, data courtesy of NSB Health Department.


73. Alaska Department of Labor and Workforce Development: http://almis.labor.state.ak.us/?PAGEID=67&SUBID=115.
75. Nageak, E.: NSB Health Department Health Educator. Personal communication, January 26, 2011. States sources as “what I have learned from the Elders and from knowledgeable presenters.”
82. CDC Healthy Communities Program: works with communities through state and national partnerships to improve community leader’s skills and commitments of establishing, advancing, and maintaining effective population-based strategies that reduce the burden of chronic disease and achieve health equity. Links to community action guides and toolkits http://www.cdc.gov/healthycommunitiesprogram/.
88. Communities Putting Prevention to Work grant application information.
## Part II: Full Report

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</table>
Chapter 1: Overall Health

“Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.”

—World Health Organization, 1948

Individuals and cultures define health in different ways, and there is no universally agreed-upon way of measuring overall health in a community. By examining a number of overall health indicators, however, this section attempts to provide a picture of the evolving health status of the people of the NSB. This section also explores many of the factors, or determinants, that may be influencing overall health in the NSB.
1.1. Measures of Overall Health

1.1.1. Self-Reported General Health Status

Self-reported general health status is a useful indicator of overall health and health-related quality of life in a community. It has been shown to be one of the strongest predictors of illness, premature death, health care utilization, and hospitalization. Although perceptions and definitions of health can vary among individuals and across cultures, self-reported health is a useful way to compare overall health status across different populations and time periods.

In this section, we examine several data sources. The 2010 NSB Census collected data on self-reported general health status from a large majority of NSB household heads as well as proxy-reported general health status of other household members, based on responses from household heads. We also present general health data from the Alaska Behavioral Risk Factor Surveillance System (BRFSS) annual telephone survey. Although BRFSS sample sizes in the NSB are quite small—between 50 and 250 respondents for each 3-year period—the BRFSS data do allow some examination of trends going back to the early 1990s as well as statewide and nationwide reference points. We also have included self-reported general health data from the 2007 Survey of Living Conditions in the Arctic (SLiCA) study. This study surveyed NSB Iñupiat residents over age 16 and was also limited by small sample sizes in the NSB—about 200 respondents—but provides an important context of health and living conditions in other circumpolar arctic indigenous communities. General health status of children is discussed separately in Chapter 6: Maternal and Child Health.

1.1.1.1. General Health Status in the NSB: Data from the 2010 NSB Census

In the 2010 NSB Census, household heads were asked to rate their own general health as well as that of other household members. Overall, a large majority of NSB adults (including household heads) reported being or were reported to be in good, very good, or excellent health. Reported general health status among household heads was similar to that of adult household members, except in the 44- to 54-year-old age group, where household heads were more likely to have “fair” to “poor” reported health than were other adult household members (25% vs. 16%, respectively). Household heads and other adult household members were roughly equally likely to have “very good” to “excellent” reported health in all age groups.

Reported general health among adults did not vary significantly by gender but was highly associated with age throughout the North Slope. In all age groups, NSB adults were less likely to have reported very good to excellent health than were Alaskan adults in the BRFSS survey as seen in Figure 1.2.
Reported general health among NSB adults varied significantly by ethnic group. NSB Iñupiat adults in all age groups were less likely than Caucasians and those in other ethnic groups to report very good or excellent health and more likely to report fair or poor general health.

Reported general health status among adults in the NSB was worse than for Alaskan adults overall, despite the fact the NSB adults are, as a group, younger than Alaskan adults. Reported general health status among NSB Iñupiat adults was similar to that of Alaska Native adults statewide, however, and health status among NSB Caucasian adults was similar to that of Caucasian adults statewide. The disparity between general health status among Alaska Natives and Caucasians statewide was similar to that seen among Iñupiat and Caucasians in the NSB.

In the NSB, the relationship between reported general health status and community of residence was also statistically significant. Reported very good to excellent health status among NSB adults ranged from 21% in Atqasuk to 53% in Barrow. Atqasuk adults were also significantly more likely than those living in other North Slope villages to have fair to poor reported health. The reasons for this wide range of reported health status among the North Slope villages, and in particular for the poor reported health status among Atqasuk residents, are not entirely clear and warrant further inquiry.
Reported general health status was significantly better among Barrow adults than among adults in the other North Slope villages as a whole, both in all ethnic groups combined and among Iñupiat only.

1.1.2. Trends in Self-Reported General Health Status: Data from the Alaska BRFSS Survey

In a state-wide telephone survey, the Behavioral Risk Factor Surveillance System, a large majority of U.S., Alaskan, and NSB adult residents rate their own health as good to excellent. Despite improvements in health indicators such as life expectancy and infant mortality, however, self-reported health status has been gradually declining in the NSB since the mid-1990s. This trend is also apparent in Alaska and the U.S. Between 1993 and 2007, the number of adult NSB residents reporting fair to poor health has quadrupled, and this increase was statistically significant.
In Alaska, a significantly higher proportion of non-Natives than Alaska Natives report very good or excellent health. Respondents living in rural areas were significantly less likely than those in non-rural areas to rate their health as very good or excellent. Self-reported excellent or very good health is also associated with higher educational and income level, as well as younger age.

1.1.3. Self-Perception of Personal Health Among Circumpolar Indigenous Regions: Data from the SLiCA Study

In this survey of arctic indigenous communities, self-reported health was similar in the three regions of northern Alaska that were surveyed but varied substantially throughout the circumpolar regions surveyed, with Greenland respondents reporting the best health and residents of Chukotka in eastern Russia reporting the worst. Perceived health of Alaskan Iñupiat—including the NSB—and Canadian Inuit fell in between.

1.1.2. Life Expectancy and Mortality

Life expectancy and mortality statistics give us useful information about the relative burden of different health problems and causes of death in a population, and examining trends over time can help us understand the evolving health status of a population. Because death certificates are legally required and filed with the state, mortality statistics are some of the more reliable sources of information about the health status of...
large populations. When looking at relatively small populations, however, death rates become quite variable from year to year, given the relative infrequency of events in small populations. In general, rates based on fewer than 20 occurrences during the time period examined are considered unreliable and must be interpreted with caution, and will be noted. Rates based on fewer than 6 occurrences are not reported.

1.1.2.1. Life Expectancy

During the decade 1999–2008, the life expectancy at birth for a resident of the NSB was roughly four years shorter than that of Alaskans overall, falling between that of Alaska Natives and Alaska whites, and six years shorter than in the U.S. in 2005.5,6

Figure 1.8: Life Expectancy at Birth, 1999–2008

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<tr>
<td>1999-2000</td>
<td>71.9</td>
<td>75.6</td>
<td>77.8</td>
<td>70.1</td>
<td>76.6</td>
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</table>


1.1.2.2. All-Cause Mortality

A high level of year-to-year variability makes it difficult to detect trends in mortality rates in small populations such as the NSB. The downward trend seen in Alaska since the mid-1990s is not apparent in the NSB during this time period, however. Since 1990, all-cause mortality rates in the NSB have generally remained higher than Alaska and U.S. rates.5–7 All-cause mortality is an area of racial health disparity. In 2003–2007, the all-cause mortality rate for Alaska Natives was 1.4 times that of U.S. whites and 1.5 times that of Alaska whites.8

Figure 1.9: All-Cause Mortality Rates, 1990–2009

<table>
<thead>
<tr>
<th>Year</th>
<th>NSB</th>
<th>Alaska</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990-2009</td>
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</table>

Rates are age-adjusted to the U.S. 2000 standard population.

1.1.2.3. Infant Mortality

The infant mortality rate (IMR), defined as the number of deaths in infants below one year of age per 1000 live births, is an important marker of overall health and well-being of a community. The IMR reflects such
factors as living conditions, education and income level of parents, as well as access to primary care and other medical interventions.

The IMR has decreased dramatically in the NSB and around the state in the past half-century. The IMR in the NSB remained approximately twice the state average, however, until around 1990, when the Borough experienced a dramatic decrease in the IMR. The NSB’s IMR has not continued this decline, however, and remains higher than the state average and has not reached the Healthy Alaskans 2010 target of 4.5 per 1000 live births.

**Figure 1.10: Infant Mortality Rates: Average annual number of infant deaths per 1000 live births, 1977–2009**

<table>
<thead>
<tr>
<th>Year</th>
<th>NSB</th>
<th>Alaska</th>
<th>Healthy Alaskans 2010 Target</th>
<th>U.S.</th>
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<td>35</td>
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<td>5</td>
<td>10</td>
</tr>
<tr>
<td>2005</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>2006</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>2007</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>2008</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>

Rates for NSB include rates based on fewer than 20 events and must be interpreted with caution.
Missing data points represent time periods with fewer than 6 infant deaths.

1.1.2.4. Child Mortality

Due to the small number of events from a statistical standpoint, NSB rates fluctuate from year to year, but over the past decade, the 0- to 19-year-old child mortality rate in the NSB has remained higher than the statewide average.

Child mortality is a major public health concern in Alaska, and reducing deaths among children is a public health goal statewide. Alaskan children have 1.5 times the risk of death as other American children, and Alaska Native children have death rates several times higher than that of whites.

**Figure 1.11: Child Mortality: Average annual number of deaths per 100,000 persons aged 0–19 years, 1997–2008**

<table>
<thead>
<tr>
<th>Year</th>
<th>NSB</th>
<th>Alaska</th>
<th>Healthy Alaskans 2010 Target</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>200</td>
<td>150</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>1998</td>
<td>180</td>
<td>120</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>1999</td>
<td>160</td>
<td>100</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>2000</td>
<td>140</td>
<td>80</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>2001</td>
<td>120</td>
<td>60</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>2002</td>
<td>100</td>
<td>40</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>2003</td>
<td>80</td>
<td>30</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>2004</td>
<td>60</td>
<td>20</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>2005</td>
<td>40</td>
<td>10</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>2006</td>
<td>20</td>
<td>5</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>2007</td>
<td>10</td>
<td>2</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>2008</td>
<td>5</td>
<td>1</td>
<td>50</td>
<td>20</td>
</tr>
</tbody>
</table>

*NSB rates are based on fewer than 20 occurrences per time period and must be interpreted with caution.
Mortality statistics for the U.S. are typically calculated for age groups excluding infants under one year old, and are therefore not directly comparable to Alaska census area data, where population estimates for children under age one are not readily available.
1.1.2.5. Leading Causes of Death

Cancer has been the leading cause of death in the NSB for almost two decades. Heart disease, unintentional injuries (accidents), and intentional self-harm (suicide), and chronic lower respiratory disease are other major causes of death in the Borough. Leading causes of death in the NSB have been fairly similar to statewide rankings.5

Table 1.2: Leading Causes of Death, 2006–2008

<table>
<thead>
<tr>
<th>Cause of Death</th>
<th>NSB Rank</th>
<th>Number of Deaths</th>
<th>NSB Rate (Number of deaths per 100,000 population)</th>
<th>Alaska Rank</th>
<th>Alaska Rate (Number of deaths per 100,000 population)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer</td>
<td>1</td>
<td>29</td>
<td>272.9</td>
<td>1</td>
<td>181.3</td>
</tr>
<tr>
<td>Heart Disease</td>
<td>2</td>
<td>26</td>
<td>274.8</td>
<td>2</td>
<td>154.8</td>
</tr>
<tr>
<td>Unintentional Injury</td>
<td>3</td>
<td>17</td>
<td>125.2*</td>
<td>3</td>
<td>54.8</td>
</tr>
<tr>
<td>Chronic Lower Respiratory Diseases</td>
<td>4</td>
<td>10</td>
<td>144.3*</td>
<td>5</td>
<td>42.5</td>
</tr>
<tr>
<td>Suicide</td>
<td>4</td>
<td>10</td>
<td>53.3*</td>
<td>6</td>
<td>22.7</td>
</tr>
<tr>
<td>Total Deaths</td>
<td></td>
<td>136</td>
<td>1267.0</td>
<td></td>
<td>772.5</td>
</tr>
</tbody>
</table>

*Rates are based on fewer than 20 occurrences and should be interpreted with caution.
All rates are age-adjusted to U.S. 2000 standard population.

1.1.2.6. Leading Causes of Death in the NSB—Historical Perspective

Looking back to the 1970s, some trends become apparent. In the early 1990s, cancer overtook unintentional injury as the leading cause of death in the NSB. The crude death rate from heart disease has also increased over the past decade, overtaking unintentional injury as the second leading cause of death in the NSB. In the 1980s, suicide, and chronic lower respiratory infections emerged as leading causes of death.5

Figure 1.12: Trends in Leading Causes of Death in the NSB: Average annual number of deaths per 100,000 population

![Graph showing trends in leading causes of death in the NSB from 1970-1974 to 2004-2009.]

Represent "crude" rates, not adjusted for the effect of age. Thus, changes in the age structure of the population over time may affect the death rates from different causes.
Rates based on fewer than six occurrences are not reported.
Data source: Alaska Bureau of Vital Statistics. Historical rates were provided by ABVS for 1970–2004 in 5-year intervals. The 2004–2009 rate was calculated from the 3-year moving average rates provided on the ABVS Data and Statistics website.

1.1.2.7. Leading Causes of Premature Death

Although cancer is the leading cause of death overall in the NSB, unintentional injury and suicide disproportionately affect a younger segment of the population and take the most years of potential life from the community, emerging as the leading causes of premature death in the NSB.5 Although most deaths in a community occur at advanced ages, some of the most tragic and often most preventable deaths occur to younger members of the community. Using a set endpoint (age 75 is used here), the potential years of life lost for each death in a community can be combined for a given time period to determine the leading causes of premature death in the NSB for each time period.
Figure 1.13: Leading Causes of Premature Death in the NSB:
*Average annual years of potential life lost*

| Years of potential life lost are calculated by subtracting age at death from 75. Rates based on fewer than six occurrences are not reported. Data source: Alaska Bureau of Vital Statistics. |

1.1.3. County Health Rankings—Alaska

Now in its second year, the County Health Rankings, a national public health project, has recently ranked almost every U.S. county on their overall health status and a variety of individual health measures to facilitate community-level health promotion efforts. The overall rankings are based on a weighted composite of health indicators for which comparable data are available. In 2011, the NSB ranked 15th in health outcomes of 23 Alaskan counties or census tracts, placing it above most of the other remote rural Alaskan regions. The NSB was ranked 17th in health factors, which include various health behaviors and socioeconomic and environmental variables that influence health. Some data were unavailable for the NSB and other small rural Alaskan communities.

Table 1.3: 2011 County Health Rankings—Alaska

<table>
<thead>
<tr>
<th>Rank</th>
<th>Health Outcomes</th>
<th>Rank</th>
<th>Health Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Southeast Fairbanks</td>
<td>1</td>
<td>Juneau</td>
</tr>
<tr>
<td>2</td>
<td>Juneau</td>
<td>2</td>
<td>Kodiak Island</td>
</tr>
<tr>
<td>3</td>
<td>Sitka</td>
<td>3</td>
<td>Anchorage</td>
</tr>
<tr>
<td>4</td>
<td>Fairbanks North Star</td>
<td>4</td>
<td>Sitka</td>
</tr>
<tr>
<td>5</td>
<td>Kodiak Island</td>
<td>5</td>
<td>Fairbanks North Star</td>
</tr>
<tr>
<td>6</td>
<td>Kenai Peninsula</td>
<td>6</td>
<td>Wrangell-Petersburg</td>
</tr>
<tr>
<td>7</td>
<td>Wrangell-Petersburg</td>
<td>7</td>
<td>Kenai Peninsula</td>
</tr>
<tr>
<td>8</td>
<td>Anchorage</td>
<td>8</td>
<td>Matanuska-Susitna</td>
</tr>
<tr>
<td>9</td>
<td>Aleutians West</td>
<td>9</td>
<td>Ketchikan Gateway</td>
</tr>
<tr>
<td>10</td>
<td>Ketchikan Gateway</td>
<td>10</td>
<td>Valdez-Cordova</td>
</tr>
<tr>
<td>11</td>
<td>Dillingham</td>
<td>11</td>
<td>Aleutians West</td>
</tr>
<tr>
<td>12</td>
<td>Prince of Wales-Outer Ketchikan</td>
<td>12</td>
<td>Aleutians East</td>
</tr>
<tr>
<td>13</td>
<td>Matanuska-Susitna</td>
<td>13</td>
<td>Skagway-Hoonah-Anagoon</td>
</tr>
<tr>
<td>14</td>
<td>Skagway-Hoonah-Anagoon</td>
<td>14</td>
<td>Southeast Fairbanks</td>
</tr>
<tr>
<td>15</td>
<td>North Slope</td>
<td>15</td>
<td>Dillingham</td>
</tr>
<tr>
<td>16</td>
<td>Valdez-Cordova</td>
<td>16</td>
<td>Prince of Wales-Outer Ketchikan</td>
</tr>
<tr>
<td>17</td>
<td>Bethel</td>
<td>17</td>
<td>North Slope</td>
</tr>
<tr>
<td>18</td>
<td>Aleutians East</td>
<td>18</td>
<td>Lake and Peninsula</td>
</tr>
<tr>
<td>19</td>
<td>Northwest Arctic</td>
<td>19</td>
<td>Bethel</td>
</tr>
<tr>
<td>20</td>
<td>Yukon-Koyukuk</td>
<td>20</td>
<td>Northwest Arctic</td>
</tr>
</tbody>
</table>
### 1.2. Determinants of Overall Health

In this section, we will examine many of the factors that may be influencing general health status in the NSB. An individual’s health is influenced by a complex interaction of social, economic, and environmental factors, genetics, and personal behaviors, such as diet, exercise, smoking and alcohol use. Access to good quality health prevention and treatment services also has important effects on health. The figure below identifies a number of factors that research has suggested or shown to be linked with health.12 These factors are sometimes called “health determinants.”

![Figure 1.14: Determinants of Overall Health](image)

Relatively little research has looked specifically at the factors influencing health in arctic communities like the NSB. The Institute for Circumpolar Health Studies in Anchorage examined the available literature on the determinants of circumpolar health as they relate to the leading causes of death in Alaska.13 Table 1.4 summarizes their findings.

#### Table 1.4: Determinants of Circumpolar Health

<table>
<thead>
<tr>
<th>Determinant</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addiction</td>
<td>Confluence of psychological, social, and biological forces that combine to promote and support compulsive substance use</td>
</tr>
<tr>
<td>Social isolation</td>
<td>Social situations characterized by anxiety, depression, shame, conflict, and a lack of gainful employment</td>
</tr>
<tr>
<td>Environmental exposures</td>
<td>Presence of environmental hazards that adversely affect health or the ecological balances essential to human health</td>
</tr>
<tr>
<td>Diet/nutrition</td>
<td>Procurement and consumption of nutrients necessary to maintain life and health</td>
</tr>
<tr>
<td>Global climate change</td>
<td>Adverse environmental factors induced by rapid changes in the earth’s climate</td>
</tr>
<tr>
<td>Access to clean water</td>
<td>Processes, quantity and quality of water obtained for hygiene and consumption</td>
</tr>
<tr>
<td>Access to quality health care</td>
<td>Effective health care service utilization</td>
</tr>
</tbody>
</table>

Driscoll DL. Social and Physical Determinants of Alaskan Health: a Meta-Analysis
1.2.1. Social and Economic Environment

1.2.1.1. Demographic Factors

The health of a population is determined, in part, by its demographic composition—the size of the community, age and sex of the residents, the racial and ethnic mixture, movement of populations, and other demographic factors.

Total Population Size

Like other rural Alaskan regions, the NSB is comprised of a larger "hub" village and a number of smaller communities distributed across a large geographic area. The size of a community determines, in part, the availability of jobs and services, the social structure of the community, and many other factors that influence health. The population estimates below are from the 2010 NSB Census.

Table 1.5: 2010 NSB Estimated Population

<table>
<thead>
<tr>
<th>Community</th>
<th>2010 NSB Census Population Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td>369</td>
</tr>
<tr>
<td>Atqasuk</td>
<td>258</td>
</tr>
<tr>
<td>Barrow</td>
<td>4789</td>
</tr>
<tr>
<td>Kaktovik</td>
<td>286</td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>455</td>
</tr>
<tr>
<td>Point Hope</td>
<td>803</td>
</tr>
<tr>
<td>Point Lay</td>
<td>269</td>
</tr>
<tr>
<td>Wainwright</td>
<td>574</td>
</tr>
<tr>
<td>NORTH SLOPE BOROUGH</td>
<td>7839</td>
</tr>
</tbody>
</table>

Data source: 2010 NSB Census

Population Trends

Like most regions in Alaska, the NSB experienced steady and dramatic growth between 1960 and 2000, almost tripling in population size during those four decades. Annual Alaska Department of Labor and Workforce Development population estimates from 2000 to 2009, however, suggest that the population of the borough is leveling off, even experiencing a small net decrease in population. Like many other rural regions in Alaska, net outmigration from the NSB exceeded natural increases, resulting in net population loss during this period, according to these population estimates.

Figure 1.15: Trends in NSB Estimated Population, 2000–2009

Data source: Alaska Department of Labor and Workforce Development
Age Distribution
The NSB is one of the youngest regions in the state, with children making up the largest portion of the population. The age distribution of a community, in part, determines the relative burdens of different health problems as well as how health resources must be utilized. For instance, a younger population will likely experience higher rates of childhood illnesses, pregnancy-related problems, some mental illnesses, and sexually-transmitted infections. An older population will likely experience more chronic disease such as heart disease, diabetes, arthritis, and cancer.

Figure 1.16: Age Distribution in the NSB:
Estimated number of persons, by age group, in 2008

![Age Distribution Chart]

Data source: Alaska Department of Labor and Workforce Development.

Based on ages of household members reported by the household head in the 2010 NSB Census, the median, or middle, age for the NSB in 2010 was 26 years. This means that half of the people living in the NSB are younger than 26 years old and half are older. The 2000 U.S. census estimated the median age for the NSB at 27 years, lower than Alaska and the U.S. overall. The 2010 NSB Census median age for Iñupiat residents of the NSB was 23 years, similar to the 2000 U.S. census estimate for Alaska Natives statewide.

Figure 1.17: Year 2000 U.S. Census Median Age Estimates

![Median Age Chart]

Data source: United States Census Bureau.

Dependency Ratio
Another useful measure of age composition of a community is the dependency ratio. The dependency ratio is a measure of the portion of a population that is composed of dependents (people who are too young or too old to work and needing support or care) to those of working age. This ratio, in part, determines the amount of services needed in a community and the economic workforce available to fund them. It is also a factor in
economic growth and stability. According to the 2010 NSB Census, the ratio of residents aged 0–15 years or 65+ years to those aged 16–64 is 0.56, although it is higher in some North Slope communities. This number indicates that there are slightly less than two persons of working age for every person in “dependent” age groups in the NSB.

Racial/Ethnic Composition
The homeland of the Inupiat people for millennia, the North Slope of today is a racially and ethnically diverse community. In the 2010 NSB Census, 76% of residents were identified by the household heads as Inupiat. Caucasians represented the largest minority, followed by Asian/Pacific Islander groups, of which Filipinos comprised the largest single ethnic group.4

Figure 1.18: Racial/Ethnic Composition of the NSB in 2010

Data source: 2010 NSB Census.

1.2.1.2. Economic Factors
The economic environment in which a person lives has been shown to be a major driver of health. In virtually every population studied, higher income level is associated with better health, and poverty and unemployment are associated with ill health.16 While “the disparity in health status between the Inuit and the larger national populations to which they belong (Canada, Denmark, Russia and the United States) has often been attributed to their poor socioeconomic status,”17 research is relatively limited regarding direct causal links between economic conditions and health in the Alaskan arctic. Peter Bjerregaard, in his 1998 book, The Circumpolar Inuit—Health of a Population in Transition, examines the determinants of health in circumpolar Inuit communities, primarily in Greenland and Canada and identifies evidence of associations between socioeconomic status and measures of overall health in these populations.

The economy of remote rural Alaska and other circumpolar indigenous regions is complex, incorporating income from wages, tax revenues from resource development, Native corporation dividends, and government sources. Many remote rural areas also engage in a difficult-to-measure informal economy of goods and services exchanged among residents. Subsistence activities and sharing networks also have both economic value as well as social and health benefits that go beyond their direct economic contribution. Moreover, among rural Alaskan and circumpolar regions, the economic situation in the NSB is unique.

The economy of the North Slope of Alaska was forever changed by the discovery of massive oil reserves in the 1960s. In 1971, the Alaska Native Claims Settlement Act (ANCSA) was ratified, allotting 11% of Alaska’s land and $962 million to regional and village for-profit and non-profit Native corporations, and enabling oil extraction at Prudhoe Bay and the construction of the Trans-Alaska Pipeline.

After the passage of ANCSA, state legislation made it possible to form regional governments, or boroughs. Following an extensive period of litigation, the North Slope Borough was formed and granted the authority to tax properties, including the oil-rich region of Prudhoe Bay.18 In the decades since oil development began, the NSB has collected substantial tax revenues from oil production, funding many community services and infrastructure projects and creating local employment opportunities, primarily in Barrow. In addition, residents receive dividends from the for-profit corporations created with ANCSA.
A comprehensive analysis of the effects of ANCSA and the current status of the NSB economy is beyond the scope of this report, but some major economic indicators are reviewed to provide a general picture of the economic environment as a potential determinant of health in NSB communities.

**Income**

Socioeconomic status is generally accepted to be an important driver of overall health. Income is only one of a number of measures of socioeconomic status. In Alaska, income level is strongly associated with self-reported health status. It is not entirely clear to what extent this association represents a direct causal relationship, however. Driscoll’s meta-analysis of determinants of health in Alaska and circumpolar regions did not find evidence of income level as a causal factor in any of the leading causes of death.

**Median Household Income**

The estimated median household income in the NSB has remained above the Alaska state average for several decades.

![Figure 1.19: Median Annual Household Income Estimates, 1989–2009 (U.S. Dollars)](image)

Data source: U.S. Census Bureau Small Area Income and Poverty Estimates (SAIPE).

**Income Distribution**

Income is never distributed equally to all residents, and medians and averages can sometimes be misleading. Research suggests a relationship between income inequality and health. More equitable distribution of income within a community or country is associated with better self-reported health and lower mortality. This relationship likely reflects a variety of mechanisms and pathways through which the distribution of social and economic goods within a society affects health. Researchers have calculated estimates of income distribution within Alaskan census areas, and identified the NSB as having among the highest levels of household income equality in the state. There seems to be a threshold of inequality beyond which negative health effects begin to occur, however, and the NSB, Alaska, and the U.S. fall above this level in measures of income inequality. Therefore, whereas income in the NSB may be more equitably distributed than in other parts of Alaska, overall levels of income inequality are quite high in Alaska and the rest of the U.S., as compared to other developed countries, and this income inequality may be affecting health in negative ways.

**Employment**

Across widely varying socioeconomic and geographic populations, unemployment has been found to be associated with ill health, both mental and physical. According to Mathers and Schofield, two prominent researchers in the field:

People who are unemployed have poorer physical and mental health than people who are employed. Health problems that are associated with unemployment include depression and other mental health problems, chronic illnesses such as cardiovascular disease, and high levels of risk behaviours such as smoking. These health differentials are the result of several mechanisms. Job loss can be a consequence of ill health. Unemployment also causes ill health, by reducing people’s ability to purchase goods and services—such as adequate nutrition and housing—and through its psychosocial effects, including lowered self-esteem and loss of social networks.
The relationship between employment and health has not been well studied in a mixed wage and subsistence economy such as exists in large parts of rural Alaska; however, NSB Inupiat residents have identified the lack of good jobs as a priority issue of community concern. A majority (65%) of North Slope Inupiat aged 16 years and older surveyed stated that they would prefer to participate in a combination of wage-based and traditional subsistence activities. In the 2010 NSB Census, 40% of Inupiat household heads thought that the number of good jobs for Inupiat people has decreased in the last 5 years, compared to 16% who believed it had increased.

**Unemployment**

According to the 2010 NSB Census:

- 28% of NSB household members aged 16–64 years identified themselves or were identified by the household head as "unemployed."
- Of those identified as unemployed, 32% stated reason for unemployment as "could not find a job," for an overall 9% of household members identified as unemployed because they could not find a job.
- Unemployed status was significantly related to ethnic group, with 36% of Inupiat residents aged 16–64 years identified as unemployed, compared with 6% of Caucasians, 13% of Filipinos, and 12% of other ethnic groups.

The Alaska Department of Labor and Workforce Development also reports monthly and annual average unemployment rates. The unemployed are defined as persons aged 16 years and older who had no employment during the reference week, were available for work, except for temporary illness, and had made specific efforts to find employment sometime during the four-week period ending with the reference week. Unemployment rates in the NSB have fluctuated over the last decade, often not following the state and national trends. The standard definition of unemployment typically underestimates the true number of unemployed, as those who have exhausted their unemployment benefits or have given up trying to find employment are not included in estimates. This phenomenon is common in areas, such as many parts of rural Alaska, where employment opportunities are limited. Prolonged, or chronic, unemployment may also be a result of drug or alcohol problems, particularly where the available local jobs require drug testing. Chronic unemployment can have even more profound negative effects on health than temporary unemployment. The chronically unemployed are not reflected in standard unemployment statistics. Although in recent years, the formal unemployment rate in the NSB has been among the lowest in the state, the number of non-working adults in the villages of the NSB likely represents a higher percentage of residents.
Underemployment
According to the 2010 NSB Census:

- Of those aged 16–64 years, 26% with temporary or seasonal employment, 34% working part-time, and 8% with full-time permanent work believe that they are underemployed (working at a job that does not utilize their experience and education).
- Perceived underemployment varied by ethnic group, with 24% of Iñupiat residents aged 16–64 years feeling underemployed, compared with 8% of Caucasians, 16% of Filipinos, and 12% of those in other ethnic groups.

Underemployment estimates help capture more subtle indicators associated with poorer health outcomes, including unstable employment and job insecurity, as well as suboptimal psychosocial environment at work, with regard to “enabling (a worker) to practice his or her skills and experience control in terms of successful agency (and)…feelings of mastery.”16

Resident and Non-resident Employment in the NSB
Whereas this report focuses on permanent residents of the NSB, it is notable that non-residents of the NSB working in the North Slope, primarily in privately-owned oil and gas drilling and related operations, outnumber NSB permanent resident workers by more than 4 to 1.23

Table 1.6: Resident and Nonresident Workers and Earnings in the North Slope (2008)

<table>
<thead>
<tr>
<th>Ownership</th>
<th>Alaska Resident Workers</th>
<th>Nonresident Workers</th>
<th>Wages (in Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Local resident</td>
<td>Other Alaska resident</td>
<td>Number</td>
</tr>
<tr>
<td>State Government</td>
<td>16</td>
<td>26</td>
<td>12</td>
</tr>
<tr>
<td>Local Government</td>
<td>1,971</td>
<td>238</td>
<td>244</td>
</tr>
<tr>
<td>Private Sector</td>
<td>1,445</td>
<td>10,424</td>
<td>5,379</td>
</tr>
</tbody>
</table>


Household Economics
Many factors contribute to a household’s economic situation, including such variables as household income, the local cost of living and specific household needs, family size, money-management skills, and the presence of drug or alcohol problems.

Cost of Living
Some of the relatively high median household income in the NSB is offset by the high cost of certain essentials such as food. In recent surveys of food costs, Barrow had the highest food costs of all of the Alaskan cities surveyed. The cost of a weekly “market basket” for a family of four in Barrow was more than twice the cost in Anchorage and slightly higher than other remote rural hubs, such as Bethel and Kotzebue.24 An increasing cost for many Americans, health-care is provided to Alaska Natives at no cost, although travel and expenses associated with health-care outside the village can be significant. Overall, Barrow ranked fourth highest in cost of living of 13 Alaska communities surveyed in 2008.25 One North Slope resident comments that, with the increasing cost of living, many rural Alaska Natives seem to be relying more heavily on subsistence.

Satisfaction with Standard of Living and Household Economics
Among Iñupiat adults surveyed in the SLiCA study, reported satisfaction with household income and standard of living in the NSB was quite similar to that in the Northwest Arctic and Bering Straits regions and to indigenous communities of Greenland. In all of these regions, indigenous residents expressed higher levels of satisfaction than did their counterparts in Chukotka, Russia.3
Poverty

The federal poverty threshold takes into account household income and household size and age composition. It is based on a set of economic measures and updated each year using the consumer price index, but it does not take into account regional variations in cost of living and many other variables affecting household economics and standard of living. Poverty has a devastating impact on health. The chronic stress, poor nutrition, increased exposure to crime and victimization, and problems with access to health care associated with poverty all play a role in influencing health outcomes. The high cost of living, a complex economic structure, and small population numbers compound the difficulty of defining and measuring poverty in remote rural Alaska. The poverty estimates for the NSB below are based on nationally-developed models utilizing tax return data combined with other U.S. survey and census data. Defining and measuring poverty has been controversial for many decades, and newly developed models for setting poverty levels are expected to change the way poverty is measured in the future.

Percentage of Population Living Below the Poverty Threshold

Estimated poverty rates in the NSB have fluctuated considerably over the past two decades. Estimated poverty levels in the NSB rose through the 1990s and early 2000s to peak in 2007 before dropping back down below national and then statewide estimates.19

Free or Reduced Lunch Program Eligibility

A number of programs use federal poverty guidelines to determine eligibility for services. The National School Lunch program is one such program for which annual data are readily available at the community level. The percent of children eligible for free and reduced lunch gives a reasonable estimate of the number of children living in families with household incomes less than 185% of the poverty level.

In 2011, 44% of students enrolled in the NSB School District were eligible for the Free or Reduced Lunch program. Roughly 1/3 of Alaska school districts had lower percentages and 2/3 had higher percentages of students eligible for the program than the NSB School District.26

Table 1.7: Percent of Enrolled Students Eligible For Free or Reduced Lunch: Alaska, by School District

<table>
<thead>
<tr>
<th>School District</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Mary’s School District</td>
<td>88%</td>
<td>92%</td>
</tr>
<tr>
<td>Bering Strait School District</td>
<td>87%</td>
<td>88%</td>
</tr>
<tr>
<td>Yupit School District</td>
<td>91%</td>
<td>88%</td>
</tr>
<tr>
<td>Hydaburg City School District</td>
<td>94%</td>
<td>85%</td>
</tr>
<tr>
<td>Southwest Region Schools</td>
<td>91%</td>
<td>85%</td>
</tr>
<tr>
<td>Yukon Koyukuk School District</td>
<td>82%</td>
<td>85%</td>
</tr>
<tr>
<td>Alaska Gateway Schools</td>
<td>90%</td>
<td>84%</td>
</tr>
<tr>
<td>Yakutat School District</td>
<td>76%</td>
<td>81%</td>
</tr>
<tr>
<td>Annette Island School District</td>
<td>73%</td>
<td>79%</td>
</tr>
<tr>
<td>Kashunamuit School District</td>
<td>75%</td>
<td>77%</td>
</tr>
<tr>
<td>Kuspuk School District</td>
<td>76%</td>
<td>77%</td>
</tr>
<tr>
<td>Lower Kuskokwim Schools</td>
<td>72%</td>
<td>77%</td>
</tr>
<tr>
<td>Lower Yukon School District</td>
<td>67%</td>
<td>76%</td>
</tr>
<tr>
<td>Craig City Schools</td>
<td>77%</td>
<td>75%</td>
</tr>
<tr>
<td>Iditarod Area Schools</td>
<td>64%</td>
<td>75%</td>
</tr>
<tr>
<td>Klawock City Schools</td>
<td>72%</td>
<td>74%</td>
</tr>
<tr>
<td>Northwest Arctic Borough School</td>
<td>72%</td>
<td>74%</td>
</tr>
<tr>
<td>Kake City Schools</td>
<td>68%</td>
<td>73%</td>
</tr>
<tr>
<td>Yukon Flats School District</td>
<td>74%</td>
<td>72%</td>
</tr>
<tr>
<td>Chatham School District</td>
<td>70%</td>
<td>71%</td>
</tr>
<tr>
<td>Lake Peninsula School District</td>
<td>66%</td>
<td>68%</td>
</tr>
<tr>
<td>Dillingham City Schools</td>
<td>71%</td>
<td>64%</td>
</tr>
<tr>
<td>Nome Public Schools</td>
<td>68%</td>
<td>64%</td>
</tr>
<tr>
<td>Southeast Island School District</td>
<td>72%</td>
<td>62%</td>
</tr>
<tr>
<td>Wrangell Public Schools</td>
<td>59%</td>
<td>61%</td>
</tr>
<tr>
<td>Haines Borough Schools</td>
<td>60%</td>
<td>59%</td>
</tr>
<tr>
<td>Aleutians East Borough Schools</td>
<td>56%</td>
<td>58%</td>
</tr>
<tr>
<td>Hoonah City Schools</td>
<td>68%</td>
<td>58%</td>
</tr>
<tr>
<td>Mt. Edgecumbe High School</td>
<td>40%</td>
<td>51%</td>
</tr>
<tr>
<td>Galena City Schools</td>
<td>46%</td>
<td>48%</td>
</tr>
<tr>
<td>Petersburg Public Schools</td>
<td>50%</td>
<td>47%</td>
</tr>
<tr>
<td>Kodiak Island Borough Schools</td>
<td>43%</td>
<td>45%</td>
</tr>
<tr>
<td>Cordova Public Schools</td>
<td>45%</td>
<td>44%</td>
</tr>
<tr>
<td>North Slope Borough School District</td>
<td>45%</td>
<td>44%</td>
</tr>
<tr>
<td>Bristol Bay Borough Schools</td>
<td>43%</td>
<td>43%</td>
</tr>
<tr>
<td>Copper River School District</td>
<td>43%</td>
<td>43%</td>
</tr>
<tr>
<td>Nenana City Public Schools</td>
<td>26%</td>
<td>43%</td>
</tr>
</tbody>
</table>
Table 1.7: Percent of Enrolled Students Eligible For Free or Reduced Lunch: Alaska, by School District

<table>
<thead>
<tr>
<th>School District</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenai Peninsula School District</td>
<td>37%</td>
<td>42%</td>
</tr>
<tr>
<td>Delta Greely School District</td>
<td>38%</td>
<td>40%</td>
</tr>
<tr>
<td>Anchorage School District</td>
<td>37%</td>
<td>39%</td>
</tr>
<tr>
<td>Matanuska-Susitna Borough School District</td>
<td>36%</td>
<td>37%</td>
</tr>
<tr>
<td>Ketchikan Gateway Schools</td>
<td>33%</td>
<td>36%</td>
</tr>
<tr>
<td>Sitka Borough School District</td>
<td>27%</td>
<td>33%</td>
</tr>
<tr>
<td>Fairbanks North Star Borough Schools</td>
<td>28%</td>
<td>30%</td>
</tr>
<tr>
<td>Juneau School District</td>
<td>22%</td>
<td>27%</td>
</tr>
<tr>
<td>Uralaska City School District</td>
<td>17%</td>
<td>25%</td>
</tr>
<tr>
<td>Valdez City Schools</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td>Skagway City Schools</td>
<td>14%</td>
<td>8%</td>
</tr>
</tbody>
</table>

Table 1.7, continued

<table>
<thead>
<tr>
<th>School District</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>state of alaska Department of Education and Early Development: Child Nutrition Services: National School Lunch Program</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Within the NSB School District, the percent of students eligible for the Free or Reduced Lunch program varied quite widely among the village schools.26

Table 1.8: Percent of Enrolled Students Eligible For Free or Reduced Lunch: NSB, by School

<table>
<thead>
<tr>
<th>School</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alak School (Wainwright)</td>
<td>77%</td>
<td>81%</td>
</tr>
<tr>
<td>Harold Kaveolook School (Kaktovik)</td>
<td>82%</td>
<td>79%</td>
</tr>
<tr>
<td>Nunamiut School (Anaktuvuk Pass)</td>
<td>63%</td>
<td>67%</td>
</tr>
<tr>
<td>Tikigaq School (Point Hope)</td>
<td>75%</td>
<td>63%</td>
</tr>
<tr>
<td>Meade River School (Atqasuk)</td>
<td>58%</td>
<td>49%</td>
</tr>
<tr>
<td>Kita Learning Center (Barrow)</td>
<td>35%</td>
<td>40%</td>
</tr>
<tr>
<td>Ipalook Elementary School (Barrow)</td>
<td>30%</td>
<td>35%</td>
</tr>
<tr>
<td>Kali School (Point Lay)</td>
<td>39%</td>
<td>33%</td>
</tr>
<tr>
<td>Barrow High School (Barrow)</td>
<td>29%</td>
<td>32%</td>
</tr>
<tr>
<td>Eben Hopson Sr. Memorial Middle School (Barrow)</td>
<td>32%</td>
<td>32%</td>
</tr>
<tr>
<td>Nuiqsut Trapper School (Nuiqsut)</td>
<td>34%</td>
<td>25%</td>
</tr>
</tbody>
</table>

1.2.1.3. Education

The North Slope Borough has invested heavily in educational opportunity in the region. The NSB School District spends more than twice the state average in average per-student expenditures.27 The NSB School District and other leaders within the NSB community have also recognized the importance of incorporating Iñupiaq values, culture, and language into the school curriculum, establishing the Iñupiaq Education Department. Ilisagvik College was also founded to offer North Slope residents further educational opportunities that incorporate and affirm the Iñupiaq cultural heritage.

Education is widely recognized as an important determinant of overall health. Research has demonstrated that educational attainment is a strong predictor of health outcomes over the lifespan.16 Education may mitigate some of the negative influences of other factors, such as poverty and discrimination. Moreover, “education is a strong predictor of many of the important intervening variables that are more directly associated with good health outcomes, including self-efficacy, knowledge, social participation, control over work, cognitive complexity, and coping.”28 Additionally, improved education of women, particularly in developing countries, has been associated with better birth outcomes and lower infant mortality,28, 29 and “educated girls and women...seek medical care sooner for themselves and their children and provide better care and nutrition for their children.”30
Research has shown, however, that “education which is characterized by cultural and linguistic alienation has long-term negative impacts on individuals and disempowering consequences for communities.” Unfortunately, the history of education in rural Alaskan communities has been far from positive or affirming of Native cultures. The forced placement of rural Alaska Native children into boarding schools during the 20th century, as well as the devaluing and persecution of traditional language and customs within the school system, traumatized many Native children, families, and communities and lead to multi-generational social ills. The incorporation of Alaska Native culture, history, and language into public school education has improved over the past several decades, but tensions and controversy remain about balancing the need to meet statewide education requirements and efforts to integrate Native language and culturally relevant curriculum. The NSB School District has been a leader in this area, developing a comprehensive Iñupiaq education curriculum that will attempt to incorporate Iñupiaq language, culture, traditional skills, and knowledge into virtually every aspect of the school curriculum.

Below are presented a number of educational indicators for the NSB. The educational measures below do not consider components of traditional education such as hunting skills, ecological knowledge, or storytelling. One NSB Iñupiat resident describes the importance of traditional Iñupiaq education:

Learning from our Elders is very crucial in our way of Iñupiaq life. Our Iñupiaq Elders were doctors, scientists, weather forecasters, astronomers (they knew directions using the stars and looking at the sky and horizon knew what kind of weather it was going to be), teachers of survival. They knew how to make the most energy efficient home (sod house) for this type of harsh climate, knew which plants were edible, medicinal and what was not edible. They taught young people how to cut up a whale, seals, and certain seasons of what kind of caribou skin would be good for attire (caribou skin is thicker for winter wear) walrus (how to prepare it, ferment it).

### Community Education Levels

According to 2010 NSB Census data, four of five NSB adults over age 25 years had attained at least a high school diploma or equivalent. The largest differences between ethnic groups were in the proportions with high school diplomas and with college degrees.

| Table 1.9: NSB Adults Over Age 25 Years: Highest Level of Education Attained |
|---------------------------------|----------------|----------------|----------------|----------------|
|                                 | Iñupiat | Caucasian | Other ethnic groups | All NSB adults over age 25 |
| None                            | 1%      | 0%        | 0%                | 1%              |
| Elementary school               | 3%      | 0%        | 1%                | 2%              |
| Middle school                   | 4%      | 0%        | 0%                | 3%              |
| High school                     | 3%      | 0%        | 1%                | 3%              |
| Did not finish high school      | 15%     | 2%        | 3%                | 11%             |
| High school diploma             | 40%     | 12%       | 27%               | 33%             |
| GED                             | 7%      | 2%        | 4%                | 6%              |
| Voc/tech graduate               | 3%      | 5%        | 3%                | 3%              |
| Some college                    | 20%     | 25%       | 31%               | 22%             |
| B.A. degree                     | 2%      | 35%       | 22%               | 9%              |
| M.A. degree                     | 1%      | 22%       | 7%                | 6%              |
| Professional degree             | 1%      | 4%        | 1%                | 2%              |
| Other                           | 0%      | 3%        | 0%                | 1%              |
U.S. census data show that, since 1980, educational levels among adults in the NSB have increased steadily but still remained below statewide levels in 2000. The 2010 U.S. 2010 Census questionnaire did not include questions on educational level of residents, but the 2010 NSB Census estimates that 80% of NSB adults over age 25 years have at least a high school diploma or equivalent, a slight increase from the 2000 U.S. Census estimate.15

**Figure 1.23: Education Levels Among Residents Over Age 25, 1980–2000**

Data source: U.S. Census Bureau.

**High School Graduation Rates**

Because of the small size of the NSB School District, graduation rates fluctuate substantially from year to year. Between 2005 and 2009, however, the average graduation rate in the NSB School District was lower than that for Alaska overall and the U.S. but slightly higher than that of Alaska Natives statewide.27 A student in Alaska does not count as a graduate if the students has not passed the HSGQE, regardless of earning the required credits for graduation. Also, the graduation rate does not always correctly reflect students who leave school and come back to graduate at a later time.

**Figure 1.24: Average Annual High School Graduation Rates, 2005–2009**


NSB and Alaska data source: State of Alaska Department of Education and Early Development

Within the NSB, Kaktovik had the highest average high school graduation rate (90%), and Nuiqsut had the lowest (30%) during the most recent seven-year period. Caution must be used when interpreting these numbers, due to the small numbers of graduates per year.27
Figure 1.25: 2003–2009 Average NSB High School Graduation Rates, by Village

<table>
<thead>
<tr>
<th>Village</th>
<th>Graduation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td>54%</td>
</tr>
<tr>
<td>Atqasuk</td>
<td>53%</td>
</tr>
<tr>
<td>Barrow HS</td>
<td>60%</td>
</tr>
<tr>
<td>Kaktovik</td>
<td>90%</td>
</tr>
<tr>
<td>Nuigut</td>
<td>30%</td>
</tr>
<tr>
<td>Point Hope</td>
<td>64%</td>
</tr>
<tr>
<td>Point Lay</td>
<td>58%</td>
</tr>
<tr>
<td>Wainwright</td>
<td>54%</td>
</tr>
</tbody>
</table>

Data source: State of Alaska Department of Education and Early Development.

Grade 7–12 School Drop-Out Rates
School drop-out rates are an imperfect measure of school engagement and achievement, especially in small districts, but they do allow some examination of trends over time. The five-year average school drop-out rates in the NSB increased from approximately 5% through most of the 1990s to almost 8% between 2000 and 2009. The most common reasons NSB household heads cited for students they knew leaving school before graduating were boredom with school, having a baby, being behind in credits, and “other reasons.”

Figure 1.26: Grade 7–12 School Drop-Out Rates

Data source: State of Alaska Department of Education and Early Development.
Rates for Alaska and Alaska Natives reflect single-year statewide rates, midpoint of the referenced period.

Post-Secondary Education
Local post-secondary educational opportunities have increased dramatically for NSB residents over the last generation with the founding and ongoing expansion of Ilisagvik College in Barrow as well as the growth of distance-learning programs and other online educational opportunities. Non-Iñupiat community members are more likely than Iñupiat to have finished high school and completed a college degree, however, often coming to the community for employment opportunities such as teaching or health care that require a higher level of education. Roughly two of three household heads in all ethnic groups believed that additional training would help them achieve career goals. Only a modest proportion of household heads see a college curriculum as the best route for them, however, while a majority of household heads cite on-the-job training, either short or long-term, as the preferred route to improving their skills.
Early Childhood Education
There is growing evidence that quality day care and preschool settings support healthy development and improve health outcomes later in life. The NSB School District recognizes the importance of early educational opportunity and offers a half-day early childhood education program available to all 3- and 4- year-old children. In Barrow, an Iñupiaq language immersion pre-school class for 3- and 4- year-olds was started several years ago and is available to interested families. Previously, there were also immersion programs for grades K–4 in Barrow, but they are not currently available due to lack of qualified teaching staff.

1.2.1.4. Sociocultural Environment
One of the most important drivers of overall health is the social environment in which one lives and works. Social environment includes such factors as cultural integrity, personal safety and exposure to violence, job satisfaction, and level of civic participation and control. It also includes the degree of trust, mutual support, and connectedness among community members. High levels of social trust, a sense of belonging, and community participation are associated with better health. The inverse is also true: social isolation or exclusion has been associated with measures of poor health as well as with some of the leading causes of death in Alaska.

Social Support and Connectedness
Research suggests that the connections among people in a community can affect the overall health of community members. Residents of NSB communities place a high value on community and family ties and engage with other community members through subsistence activities and food-sharing networks, as well as other community and cultural events. Yearly celebrations such as Nalukataq (the whaling festival) and the bi-annual Kivgiq celebration in Barrow bring people together from all over the region. Many aspects of social connectedness are included in the Traditional Iñupiaq Values—Sharing, Family and Kinship Roles, Compassion, Cooperation, Avoidance of Conflict, and Love and Respect for Elders and Others.

Social Support Among Adults
Despite the emphasis placed on social connectedness in the Iñupiaq value system, many North Slope residents today do not feel that they are getting the social and emotional support they need. In the 2005–2009 BRFSS surveys, almost half (47%) of NSB adults stated that they “never,” “rarely,” or only “sometimes” get the social and emotional support they need, compared with only 20% of adults statewide. Northern, southwest, and interior rural regions of Alaska reported similarly low levels of social and emotional support.

Survey data collected in 2003–2004 for the SLiCA study also assessed the degree of social support and connectedness that North Slope Iñupiat residents experience. When asked whether they had someone to get together with for relaxation, someone to confide in or talk with about themselves or their problems, or someone they can count on when they need advice, a minority (39%) of NSB Iñupiat residents aged 16 years and over reported experiencing high or medium-high levels of social support.
In the 2010 NSB Census, household heads were asked whether they perceived that the support they received from others had increased, decreased or stayed the same over the past five years. Two-thirds of respondents thought that the level of support had stayed the same, 26% thought it had increased, and only 8% thought it had decreased.

Social Support and Connectedness Among Youth
A sense of connectedness is important during the adolescent years, and social isolation may be particularly harmful at this developmental stage. The NSB community has recognized youth connectedness and community involvement as important determinants of community well-being, organizing such programs as the Developmental Youth Assets program, the Mayor’s Youth Advisory Council, Elders and Youth conferences, the 2010 Tumitchiat Leadership Summit, and activities sponsored by the Mayor’s Office Healthy Communities Initiative, ranging from sports camps to dumpster painting to subsistence classes.

In the 2010 NSB Census, a large majority of parents with school aged children thought that their children were either somewhat or very connected or involved in their school. This was true for all ethnic groups.

In 2005, a number of questions were asked of NSB high school students regarding their feelings of connectedness and support within their communities. The results are summarized in the Figure 1.30 and
demonstrate, overall, a fairly high level of connectedness and social support for most students. A minority of students clearly experience isolation, however, and may not be receiving the support they need from their school, family, and community.36

Figure 1.30: Community Support and Connectedness Among NSB High School Students (2005)

<table>
<thead>
<tr>
<th>Percentage of Students</th>
<th>NSBSD Higher than 2007</th>
<th>NSBSD Lower than 2007</th>
<th>NSBSD Similar to 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of students who feel they matter to people in their community</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>Percent of students who spend time helping others for free</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>Percent of students who think teachers care about them and give encouragement</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>Percent of students who feel alone in their life</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>Percent of students who take part in organized activities outside of school</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>Percent of students who do not have an adult other than a parent to seek help from</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>Percent of students who responded that about every day one of their parents talked with them about school</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
</tbody>
</table>

Data source: YRBS 2005.

Compared with statewide estimates from the 2007 Alaska YRBS survey, North Slope high school students were either more likely or as likely to report high levels of social support and connectedness. The single exception was that NSB students were less likely to report that their parents talked with them about school on a daily basis, compared with their statewide counterparts.36

Table 1.10: Community Support and Connectedness Among High School Students in the NSB and Alaska

<table>
<thead>
<tr>
<th>NSBSD Higher than 2007</th>
<th>NSBSD Lower than 2007</th>
<th>NSBSD Similar to 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of students who feel they matter to people in their community</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>Percent of students who spend time helping others for free</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>Percent of students who think teachers care about them and give encouragement</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>Percent of students who feel alone in their life</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>Percent of students who take part in organized activities outside of school</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>Percent of students who do not have an adult other than a parent to seek help from</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>Percent of students who responded that about every day one of their parents talked with them about school</td>
<td>■</td>
<td>■</td>
</tr>
</tbody>
</table>


Cultural Integrity

In recent years, the leadership and active community members of the NSB have supported cultural strengthening and affirmation as a path to community well-being through the Healthy Communities Initiative, celebrations such as the Kivgiq (Messenger Feast), the Iñupiaq Heritage Center, the development of the NSB School District Iñupiaq Education Department, the Borough’s subsistence leave policy, and many other programs. The health of a predominantly indigenous community today depends on that community’s ability to adapt successfully to the rapid changes brought on by development and modernization. This
success depends on many factors, one of which is maintaining cultural values and identity in a modern world. In predominantly indigenous communities around the world, cultural integrity and the strength of one’s cultural identity are associated with positive health outcomes.

**Language Ability and Use**

Indigenous language use is an integral part of most indigenous cultures and one marker of cultural continuity. Increasing the ability of North Slope residents to speak and read the Iñupiaq language has been a major goal of the North Slope Borough, and the NSB School District has devoted substantial resources toward that effort. The theme of the most recent Elders and Youth Conference was “Let’s Speak Iñupiaq!” More than 600 people participated in a variety of workshops focused on increasing the use of the Iñupiaq language. The NSB Planning Department is also leading a project involving the use of the Rosetta Stone language technology.

Measuring language ability at the population level can be challenging, and different available data sources provide different measures that are not readily comparable but can each contribute to the overall picture of Iñupiat language proficiency, utilization, and exposure in North Slope communities.

**2010 NSB Census Language Data**

Data collected in the 2010 NSB Census confirm that the Iñupiaq language is actively being used in a large proportion of Iñupiat households. Two-thirds of Iñupiat households have at least one member who speaks fluent Iñupiaq and two-thirds have at least one household member who reads Iñupiaq. More than half (55%) of Iñupiat household heads report that either “mostly Iñupiaq” or “both Iñupiaq and English” are spoken at home. Iñupiaq language proficiency remains concentrated in older age groups, however, with 79% of Iñupiat household members aged 61 years and over speaking Iñupiaq fluently and preferring this language. Younger adults and children were more likely to understand some Iñupiaq but speak only a little or hardly at all. Slightly more than half report that English is the language mostly spoken to children, although 43% of household heads report that both Iñupiaq and English are spoken to children in the home.

**Language Data from the SLICA Study**

In 2003–4, compared with other Iñupiat regions in Alaska, language proficiency among Iñupiat residents in the NSB appeared to be relatively high. Compared with the circumpolar regions of Canada and Greenland, however, indigenous language proficiency in the North Slope and neighboring Iñupiat regions of Alaska was somewhat lower.

![Figure 1.31: Indigenous Residents’ Ability to Understand and Speak Indigenous Language “Very Well” in Circumpolar Arctic Regions](image)

Alaskan Arctic includes North Slope, Northwest Arctic Borough, and Bering Straits regions.
According to study authors, differences of 10 percentage points or more between groups are likely to be significant.
Data source: Poppel, 2007, SLICA results (includes Iñupiat residents/arctic indigenous residents aged 16 years and older).

**The Subsistence Way of Life**

In addition to providing nutritious food, exercise, and social interaction, participation in traditional subsistence activities is a vital part of maintaining cultural integrity on the North Slope. The Native Village of Barrow and the NSB both organize subsistence classes and community events such as traditional whaling feasts that celebrate subsistence as a source of cultural pride. A major part of the NSB Department of Wildlife Management’s mission is to document the continued importance of subsistence hunting, fishing, and trapping through the collection of harvest data. This department also works with community representatives to develop and implement management programs for subsistence-use animals. Information on nutrient value of subsistence foods is presented in the diet and nutrition section, later in this chapter.
The 2010 NSB Census confirms that participation in subsistence activities is high in North Slope households, particularly hunting land and sea mammals (including whales), fishing, sharing/cooking/processing wild foods, and picking berries and wild plants. Participation was high across all age groups. Iñupiat household heads were more likely to believe that hunting and whaling opportunities had increased than decreased in the last five years.

| Table 1.11: NSB Iñupiat Household Heads’ Participation in Subsistence Activities |
|----------------------------------------|-------|-------|
| Participate in spring whaling          | 44%   | 27%   |
| Participate in fall whaling            | 31%   | 23%   |
| Hunt sea mammals                       | 55%   | 17%   |
| Hunt land mammals                      | 69%   | 30%   |
| Fish                                   | 70%   | 49%   |
| Hunt birds                             | 61%   | 22%   |
| Gather bird eggs                       | 14%   | 7%    |
| Pick berries and plants                | 44%   | 45%   |
| Share, cook, and process wild foods    | 79%   | 82%   |
| Sew skins and clothes                  | 10%   | 42%   |
| Make sleds and boats                   | 38%   | 6%    |
| Trap fur bearers                       | 9%    | 1%    |

Data source: 2010 NSB Census.

The SLiCA study data collected in 2003–4 also confirmed substantial levels of participation in subsistence-related food harvesting and preparation among Iñupiat and Inuit adults throughout the circumpolar arctic. Overall participation in the NSB was fairly similar to other arctic indigenous regions. Participation in whaling was considerably higher in the NSB, however.

Subsistence food sharing is an important cultural component of the subsistence way of life. The NSB Census also collected data on subsistence food sharing, and these are discussed in a later section under food security.
Authority of Elders
Respect for elders is a core Inupiaq value. In the 2010 NSB Census, 67% of Inupiat household heads thought that elders in the community were highly respected by students and community members, while 23% thought that they were somewhat respected. High levels of respect for elders were reported across the NSB and did not vary significantly among different North Slope communities.  

Control of Destiny and Civic Engagement
Research suggests that personal empowerment, or “the ability of people to deal with the forces that affect their lives,” is positively associated with health. This finding is of particular importance in historically oppressed or exploited groups and in racial and ethnic minorities.  
The NSB governmental and tribal organizations have made substantial efforts to maintain a strong voice in decisions affecting the local people and environment, and levels of satisfaction with the influence of local indigenous people on these decisions do appear to be somewhat higher overall in the NSB than in other arctic communities, at least with regard to management of natural resources. In the 2010 NSB Census, roughly two of three household heads reported voting in the last borough and state elections, and 70% of household heads reported voting in the last national election.  

Crime and Victimization
Living in high crime or unsafe areas affects the health of community members through violent injuries, acute and chronic stress, the inability to be outdoors safely, and other pathways.

Community Perception of Crime
In the 2010 NSB Census, household heads were asked whether they believed the amount of drinking, drugs, fighting, and stealing in their village had increased, stayed the same, or decreased. Overall, 12% of respondents thought it had decreased, 39% thought it had stayed the same, and 49% felt it had increased, either somewhat or a lot in over the past 5 years. The responses varied considerably across the region.
Figure 1.34: Percent of NSB Household Heads Who Think That the Amount of Drinking, Drugs, Fighting, and Stealing in the Village Has Increased in the Last Five Years

<table>
<thead>
<tr>
<th>Location</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td>64%</td>
</tr>
<tr>
<td>Atqasuk</td>
<td>49%</td>
</tr>
<tr>
<td>Barrow</td>
<td>42%</td>
</tr>
<tr>
<td>Kaktovik</td>
<td>47%</td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>57%</td>
</tr>
<tr>
<td>Point Hope</td>
<td>29%</td>
</tr>
<tr>
<td>Point Lay</td>
<td>59%</td>
</tr>
<tr>
<td>Wainwright</td>
<td>49%</td>
</tr>
<tr>
<td>NSB</td>
<td>49%</td>
</tr>
</tbody>
</table>

Data source: 2010 NSB Census.

Self-Reported Victimization
In the SLiCA survey, conducted in 2003–4 in the NSB, Ifupiat survey respondents were asked whether they had been a victim of a crime in the last 12 months. Of the Barrow residents participating in the survey, 31% acknowledged being the victim of a crime, whereas 10% of respondents in other villages reported being victimized in the past year. Small sample sizes in the NSB make it difficult to draw firm conclusions about these differences. Theft was by far the most common type of crime that the residents reported.4

Figure 1.35: Victimization in Circumpolar Arctic Regions: Percent of respondents who reported being the victim of a crime in the last 12 months

<table>
<thead>
<tr>
<th>Location</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barrow</td>
<td>31%</td>
</tr>
<tr>
<td>Other North Slope</td>
<td>10%</td>
</tr>
<tr>
<td>Alaskan Arctic</td>
<td>18%</td>
</tr>
<tr>
<td>Greenland</td>
<td>18%</td>
</tr>
<tr>
<td>Chukotka</td>
<td>34%</td>
</tr>
<tr>
<td>All</td>
<td>22%</td>
</tr>
</tbody>
</table>

Alaskan Arctic includes North Slope, Northwest Arctic Borough, and Bering Straits regions.
Data from the Canadian arctic were not available for this question.
According to study authors, differences of 10 percentage points or more between groups are likely to be significant.
Data source: Poppel, 2007, SLiCA results (includes Ifupiat/arctic indigenous residents aged 16 years and older).

Local Crime Statistics
According to Uniform Crime Reporting statistics, assault is the most common crime reported to local law enforcement in the NSB, and the number of assaults in the NSB did not change appreciably between 2000 and 2009. Rape and/or sexual assault and drug and/or alcohol related crimes are discussed separately in later sections of this report.
Sexual Assault and Domestic Violence

Being a victim of intimate partner violence or sexual abuse is associated with a number of health problems, including chronic disease, poor self-rated health, and mental health problems.40 A number of different data sources provide evidence that the NSB has disproportionately high rates of sexual assault and intimate partner violence, compared with state and national estimates. Sexual assault and domestic violence are discussed in detail in the “Injury” chapter of this report.

Child Maltreatment

Conditions during the early childhood period have lifelong physical, emotional, and cognitive effects, and the early childhood environment is a predictor of health outcomes later in life.16 Child maltreatment has been linked to an increased risk of many physical and mental health problems, including alcoholism, depression, drug abuse, eating disorder, obesity, sexual promiscuity, smoking, suicide, and certain chronic diseases.41 Often, alcohol or drug abuse and domestic violence are contributing factors to adverse home environments for children. Children were present in 43% of domestic violence incidents reported to Alaska State Troopers in 2004.42

The NSB experienced rates of child maltreatment in 2006–2008 that were high compared with the state average, but similar to other remote rural areas.43 Child maltreatment is discussed further in Chapter 6: Maternal and Child Health.

1.2.2. Physical Environment

The physical environment in which one lives affects health in many ways. The NSB experiences a harsh arctic coastal climate, although one to which Inupiat have successfully adapted over thousands of years. Connection to the natural world is a core value for many residents of the North Slope Borough, and residents depend on the natural environment for not only for food, but also for social and cultural identity. A healthy ecosystem, therefore, is important to both the physical and cultural survival of NSB communities, and both real and perceived environmental problems have the potential to affect the health and well-being of the population.

Safe water and adequate sanitation facilities have been public health priorities for decades in Alaska and have contributed significantly to the improvement of health in rural Alaska. Exposures to pollution and
other contaminants systems are a concern throughout the developed and developing world, but factors specific to arctic communities have warranted attention and investigation in this area. The effects of climate change are also of particular importance and urgency to northern communities. Recently, increased attention has also been paid to the health effects of housing, urban planning, and access to safe and healthy recreational opportunities. These "built environment" issues apply not only to urban centers but also to smaller rural regions such as the NSB.

1.2.2.1. Geography

The North Slope Borough encompasses the vast area of land across the north slope of Alaska. The eight villages are widely distributed, with the majority along the northern coast. Anaktuvuk Pass is unique in the NSB for its mountainous interior location. The remote locations of NSB communities affect many aspects of community life, including many of the determinants of health such as access to health and social services, job and educational opportunities, and market goods.

![Figure 1.37: North Slope Borough Map](image)

1.2.2.2. Community Infrastructure

Housing

Today, the majority of housing units in the North Slope are simple, modern houses with modern heating, water, and sewer systems. According to the 2010 NSB Census, 69% of North Slope households occupy single-family homes. The household size in the NSB is 3.44 persons, compared to an average of 2.59 persons per household nationwide. The average square footage of the housing unit, according to household heads, is 1139 square feet. About half of household live in units that they own or on which they carry a mortgage, and about half rent their homes.

Transportation

The vast majority of motorized transportation within NSB villages occurs through private vehicles, including cars and trucks as well as snowmachines and four-wheelers. Barrow has a limited public city bus service, and there are several taxicab companies in town. The North Slope villages are fairly compact, allowing most parts of town to be reached by foot. Transportation between villages occurs through scheduled and chartered aircraft operated by commercial carriers. Transportation between the NSB and other parts of Alaska occur primarily via commercial aircraft that connect Barrow and Deadhorse/Prudhoe to the cities of Fairbanks and Anchorage. Since the development of the nearby Alpine oil production facility, a seasonal ice road has allowed surface transportation between the village of Nuiqsut and the Ayleska Pipeline gravel highway that leads south to Fairbanks.

Water, Sewage and Solid Waste

Access to adequate quantities of clean, safe water and proper disposal of waste are cornerstones of population health efforts worldwide, and this is an area in which the NSB has invested heavily. According to the 2010 NSB Census, 92% of NSB households have running water, 91% have flush toilets, and 8% currently rely on honeybuckets (buckets used as toilets inside the house). Of those households with running water, 90% have it piped to the house and 10% have it hauled by water truck. Point Lay had the lowest percentage of households with running water (62%) and Kaktovik the highest (99%).
Water and sewer access has improved dramatically in rural Alaska over the past two decades, but a minority of rural households continue to rely on honeybuckets and individually hauled water. Lack of modern water service has been found to be associated with increased rates of lower respiratory tract infection in children in Alaska. Alaska Native Epidemiology Center included 2008 comparison data on water and sewer service in Alaska in their recent publication *Regional Health Profile Arctic Slope*. The ASNA, or Arctic Slope, service area had one of the highest levels of water and sewer service in the state (94%) and was only slightly below the Healthy Alaskans 2010 target of 98%.

Proper disposal of solid waste is important to human and animal health. Improper dumping and poorly designed landfills can contaminate water supplies, attract wildlife foraging, create unpleasant odors, and allow litter to be blown over surrounding land. Alaska DEC regulates and permits landfills in rural and urban areas. In 2000, only 33% of landfills in Alaska had a current permit or acceptable alternative. As of 2010, all NSB villages had currently permitted landfills. Barrow has a permitted Class II municipal landfill and other NSB villages have Class III (less than five tons of municipal waste per day).
1.2.2.3. Environmental Concerns

A healthy natural environment is central to the physical and cultural survival of the residents of the North Slope. While often seen as pristine and untouched by the environmental problems plaguing more developed areas, the arctic environment faces many of the same issues seen in other regions. In some cases, for example in the area of climate change, the impact is even more severe in the arctic than in temperate regions. The climactic, geographic, and biological characteristics of the Alaskan arctic environment are unique and require tailored research and solutions. The top areas of environmental concern that NSB Iñupiat residents expressed in the 2003–4 SLiCA survey included erosion and climate change, pollution, and contamination of waterways and food sources. The concerns noted in Figure 1.40 are not unrelated, however. For example, other countries and regions are the source of much of the pollution affecting local waterways and wildlife.

**Figure 1.40: Perceived Environmental Problems**

<table>
<thead>
<tr>
<th>Problem</th>
<th>Barrow</th>
<th>Other North Slope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erosion of coastal areas or riverbanks</td>
<td>73%</td>
<td>56%</td>
</tr>
<tr>
<td>Climate change</td>
<td>47%</td>
<td>35%</td>
</tr>
<tr>
<td>Pollution of local lakes and streams</td>
<td>49%</td>
<td>45%</td>
</tr>
<tr>
<td>Local contaminated sites</td>
<td>46%</td>
<td>34%</td>
</tr>
<tr>
<td>Pollution from industrial development</td>
<td>22%</td>
<td>22%</td>
</tr>
<tr>
<td>Fish or animals that may be unsafe to eat</td>
<td>32%</td>
<td>28%</td>
</tr>
<tr>
<td>Pollution from other countries</td>
<td>44%</td>
<td>25%</td>
</tr>
</tbody>
</table>

Data source: Poppel, 2007, SLiCA results (includes Iñupiat residents aged 16 years and older).

**Climate Change**

Climate change and the related problem of coastal erosion were top concerns among the NSB Iñupiat residents who were surveyed, particularly in Barrow. The arctic region is warming twice as fast as the rest of the planet, and the arctic is expected to experience the greatest rates of warming compared with other world regions, according to the International Panel on Climate Change. As permafrost temperatures rise and frozen ground thaws, there is potential for destabilization of infrastructure in many arctic communities. Barrow has been identified as “ground zero” for climate change. Some concerns voiced by local North Slope residents and leaders include the impact of ocean temperatures and increased marine traffic on bowhead whale migration patterns, disappearing nesting grounds for migrating bird species, and spoilage of subsistence meats that are stored in permafrost cellars. A recent report on the health impacts of climate change in Point Hope identified a number of health concerns related to climate change, including temperature-related problems with the community drinking water source, thawing traditional permafrost food storage cellars resulting in food insecurity and food safety issues, unstable shore ice increasing risk to hunters and interfering with subsistence activities, and a number of other subsistence-related concerns.

Research on arctic climate change is ongoing. Some observed and potential effects of climate change on human health include, but are not limited to:

- Unpredictable and changing weather patterns, limiting subsistence activities or increasing risks associated with those activities.
- Changes in ice distribution and stability and land stability, limiting access to subsistence resources.
- Effects on subsistence food species abundance and/or availability.
- Emergence of new infectious diseases or re-emergence of old ones due to ecosystem changes.
- Impacts on water and sanitation infrastructure and possible contamination of water sources.
- Increased use of previously inaccessible arctic waterways resulting in potential disruption of marine migration patterns and potentially profound socioeconomic changes.
- Unpredictable effects on transport of contaminants to and within the arctic.
Rural arctic residents are particularly vulnerable to the effects of climate change for a number of reasons. These are summarized in the Climate Change and Human Health chapter of the Arctic Climate Impact Assessment synthesis report:

- Many arctic residents live in very small, isolated communities, with a fragile system of economic support, dependence on subsistence hunting and fishing, and little or no economic infrastructure.
- Rural arctic public health and acute care systems are often marginal, sometimes poorly supported, and in some cases, non-existent.
- Culture is often critical to community and individual health, and may be affected by climate change via mechanisms such as the loss of a traditional subsistence food source, which can result in a grief response and severe stress. Climate changes can become a source of illness, injury, and mortality for arctic communities.

With a more developed local economic and government infrastructure, the NSB may be more able to respond to the impacts of climate change than some other small arctic communities.

**Air Quality**

Air pollution has been shown to increase the risk of or exacerbate a number of respiratory and cardiac conditions, including such major health burdens as asthma, coronary artery disease, and lung cancer. The elderly, children, and those with underlying health problems are particularly vulnerable to the effects of air pollution.

Major areas of air quality concern in rural Alaskan villages include diesel emissions, indoor air quality, road dust, solid waste burning, and wood smoke. In the NSB, residents are also concerned about air pollution generated by nearby oil and gas extraction activities. Arctic climate-related factors can contribute to decreased air quality and increased levels of exposure to air pollution through a variety of mechanisms. Low temperatures increase incomplete combustion products and create temperature inversions, trapping pollution near homes and people. Newer, energy efficient, or “tight,” construction often lacks adequate ventilation and traps pollutants inside homes and buildings, where people spend a great majority of time, especially during the long winter months. Few data are publically available regarding local air quality in the NSB.

**Outdoor Air Quality**

Outdoor air pollution includes components such as dust from roadways, both exhaust from both vehicular and stationary combustion of fuels, and fumes from landfills and sewage lagoons. Alaska’s air monitoring program focuses on three major pollutants: carbon monoxide, coarse particulate matter (PM10, primarily dust), and fine particulate matter (PM2.5, formed by combustion). More than 50 villages in Alaska have expressed concerns about dust. Limited dust monitoring in rural Alaskan villages has confirmed periodic high levels of PM10 (dust). Of the 12 Alaskan villages that have or are conducting monitoring, eight of them have recorded values in excess of the PM10 standard. Among the ADEC PM10 communities with dust complaints are Barrow, Point Hope, and Nuiqsut. To the best of the author’s knowledge, none of these NSB communities has PM10 monitoring through the air monitoring program at this time, however.

Diesel exhaust contains air pollutants such as carbon monoxide, air toxics, and fine particles and is associated with a number of negative health effects. Studies in urban areas, and on workers occupationally exposed to diesel, found a number of health impacts from exposure. Shorter term exposure leads to eye, throat, and lung irritation, exacerbation of an existing lung condition like asthma, cough and increased phlegm, headaches, lightheadedness, and nausea. Longer term exposures may increase [the] risk of lung cancer.

In rural Alaskan communities, diesel power generation creates the vast majority of diesel exhaust. Conversion to ultra-low sulfur diesel (ULSD) and related technologies can reduce harmful particulate matter and nitrogen oxides in exhaust substantially. In 2010, rural areas of Alaska were mandated to begin transitioning to ULSD. In 2007, the Alaska Department of Environment Conservation (ADEC) and the Western Regional Air Partnership released the “Alaska Rural Communities Emission Inventory,” which quantified air emissions for communities and non-aviation sources in rural Alaska. According to the report authors, however, recruitment efforts for community participation in the air quality analysis were unsuccessful in the North Slope region.

In the NSB, all but two villages—Barrow and Nuiqsut—use diesel oil as the primary fuel source for heating. Barrow and Nuiqsut use primarily natural gas, and a small number of NSB households use electricity, wood, kerosene or a combination of sources. Motor vehicles are an additional contributor to diesel and
other emissions, as well as dust. The use of poorly maintained or inefficient engines and idling vehicles near homes and schools can increase exposure to harmful diesel exhaust. The number of vehicles registered with the Department of Motor Vehicles increased by more than 1000 vehicles in the NSB between 2000 and 2008. It is not known how many additional vehicles are not registered.

A recent study was conducted by the Alaska Native Tribal Health Consortium and the University of Alaska Institute for Circumpolar Health Studies investigating air quality and respiratory complaints in Nuiqsut, the village closest to active oil and gas extraction activities. Investigators set up air-monitoring stations in the village to measure particulate matter, carbon monoxide, sulfur dioxide, and nitrogen oxides and interviewed residents regarding perceptions of air-quality risk. Results have not been published at the time of this writing, but according to one of the investigators, the study has found little evidence of significant air-quality problems associated with oil development near the village.

**Indoor Air Quality**

Indoor air pollution includes components such as tobacco smoke, off-gassing of volatile fumes from stored gasoline and solvents, combustion heaters, cooking smoke, and fumes from a variety of chemicals used in household products, carpets, and furniture. Again few data are available regarding the various types of indoor air pollution in NSB communities. The main types of heating systems used in the NSB are boiler/baseboard heat and forced-air furnaces.

Awareness of the dangers of second-hand tobacco smoke is high in the NSB, and a large majority of household heads do not permit smoking in the house. Nonetheless, of the 49% of household heads who smoke, one-third smoked and/or permitted others to smoke inside the house. Barrow is one of a handful of localities in Alaska that has enacted more stringent smoking regulations, with a smoking ban in restaurants but not all enclosed workplaces. Alaska is one of only 11 states that have not enacted a general statewide ban on smoking in non-government-owned public spaces.

**Contaminants**

**Overview**

All humans living in modern society are exposed to chemicals and other potentially harmful pollutants through food, water, air, household products, and other pathways. One analysis estimated the average individual living in the U.S. is exposed to six different contaminants from pesticides and industrial pollutants at levels that may increase the lifetime risk of cancer and other negative health effects. Certain contaminants are known to travel to and accumulate in the arctic from lower latitudes via atmospheric and oceanic pathways, entering the arctic food chain. The North Slope is fortunate, however, that major pollution and contaminant transport pathways tend to lead to other regions and not to the Alaskan arctic. Military sites, industrial development, and landfills are additional local sources of local contamination in the NSB and other arctic regions. Possible contamination of subsistence food sources is a major concern among NSB residents, with 44% of Iñupiat village residents stating a concern that fish and animals may be unsafe to eat.

Two major categories of contaminants in the arctic food chain are persistent organic pollutants (POPs), which include polychlorinated biphenyls (PCBs) and other related compounds, and the elemental heavy...
metals, of which mercury has been the primary concern. The health effects of these contaminants are not completely understood despite a great deal of research. In general, young children and developing fetuses are most vulnerable to the health effects of these contaminants, although some compounds are implicated in an increased risk of certain cancers and other chronic health problems.63–66

Studies of subsistence foods in the NSB have been quite reassuring with respect to the health risks of contaminants, and the NSB Department of Wildlife Management strongly supports the consumption of subsistence foods in the NSB.64 A number of efforts have been undertaken to evaluate the health risks of contaminants in subsistence foods in Alaska67–70 and in the NSB.71–76 The most useful ones detail the actual analyses performed and provide information to balance the health risks of contaminants against the nutritional, social, cultural, and economic benefits of subsistence foods. Based on the growing body of evidence, the State of Alaska Department of Health and Social Services also encourages the use of traditional subsistence foods. The study and report authors continue to emphasize, however, that ongoing research and monitoring is warranted.

Note: The nutritional value of North Slope subsistence foods is discussed later in the Diet and Nutrition section of this chapter.

**Persistent Organic Pollutants: PCBs, Organochlorines (OCs), and Related Compounds**

**BACKGROUND**

PCBs, OCs and other POPs are manmade chemicals that persist for long periods of time in the environment at low levels. They are transported to the arctic through the atmosphere, oceans, and marine food chain, where they become more concentrated in animals higher on the food chain. Many studies have examined the potential health effects of these chemicals, often with conflicting results. A 2004 report published by the State of Alaska Department of Health and Social Services summarizes the evidence regarding the overall health risks of PCB’s and related compounds: “Overall, we conclude that there is some small, unproven but theoretical risk of subtle health effects related to low-level exposure to PCB-like chemicals.” 67

**SUMMARY OF LOCAL POP CONTAMINANTS RESEARCH**

Overall, analyses of subsistence-harvested foods from the North Slope have shown very low levels of OCs, levels that are below levels of public health concern.62

**Whale:** University-based research conducted in cooperation with NSB Department of Wildlife Management examined persistent OCs in tissues of subsistence marine species (bowhead and beluga whales) from the NSB. The investigators concluded that the nutrient and other benefits of consuming these species outweighed the minimal risk of health effects due to contaminants.71 A separate study compared OCs in store-bought foods to subsistence foods in the NSB, concluded that “there was no clear indication that store-bought foods were significantly less contaminated than comparable traditional (wildlife) foods, except for blubber and blubber-containing products (there was no blubber analog in the store). We conclude that switching from non-blubber tissues to local store-bought alternatives will not eliminate OC exposure and may only provide a slight reduction, in any, that may be at the expense of much less nutrient-rich products and the elimination of important, healthy, socio-cultural practices.”72

**Fish:** Overall, analyses of OC levels in North Slope fish species found them much lower than in marine mammals, and in many cases the subsistence fish had lower concentrations than the store-bought foods that were examined.62 In response to concerns about PCB and DDT contamination found in fish in Umiat, a former military site about 90 miles upstream of Nuiqsut on the Coleville River, community members, scientists, and state and federal officials collaborated to provide information about the safety of fish in the Nuiqsut area. In 2000–2001, analyses of subsistence fish species were carried out in the North Slope, including the Nuiqsut area. Burbot and broad whitefish from Nuiqsut were found to be seven to eleven times lower for PCBs and 25–45 times lower for DDTs than the Umiat fish. A related large study sampling fish from a wide area of lakes between Atqasuk and Nuiqsut found that, again, contaminant levels were much lower than Umiat levels and were similar to commercial food levels. One investigator noted that whitefish, in particular, are low on the food chain and, thus, the exposure to POPs is also low.73

**Caribou:** Chemicals like PCBs are generally not part of the lichen-caribou-human food chain and, thus, are not thought to be a problem in caribou hunted as a subsistence food.77
Human blood sampling: Blood samples taken from a small number of pregnant women suggest that PCB levels in the NSB may be lower than in other regions of the state. For additional reference, a study of banked serum from the 1980s from Alaska Native women statewide found blood levels of PCBs to be similar to those reported in New York women from the same period.79

<table>
<thead>
<tr>
<th>Study Participants</th>
<th>Serum PCB Levels (ppb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barrow: pregnant women79</td>
<td>0.77</td>
</tr>
<tr>
<td>Bethel: pregnant women79</td>
<td>1.29</td>
</tr>
<tr>
<td>Aleutian/Pribilof: women of childbearing age67</td>
<td>2.90</td>
</tr>
<tr>
<td>Alaska Native women: mean age 57, banked serum (1980’s)78</td>
<td>7.56</td>
</tr>
</tbody>
</table>

Table 1.12: Serum PCB Levels

STATE OF ALASKA RECOMMENDATIONS REGARDING POPs
Based on the limited sampling of human blood levels and fairly extensive sampling of animals used in subsistence diets, as well as the known health and social and cultural benefits of subsistence foods, the 2004 State of Alaska Department of Health and Social Services report concluded that while additional research and monitoring is greatly needed, “POP levels documented in Alaska to date are not expected to cause adverse health effects. We continue to recommend the unrestricted consumption of traditional foods.”67

PDBEs
Polybrominated diphenyl ethers (PDBEs) are related chemicals widely used as flame retardants and in other industries. PDBEs are an emerging concern, as their levels are increasing worldwide and they have been found in animals in the Canadian and Greenlandic arctic.80,81 Data are extremely limited in Alaska, however.

Mercury and Other Toxic Elements

Mercury
Background
Mercury is one of several naturally occurring heavy metals that are released into the environment by industrial activities such as coal burning and mining. Mercury is converted into its organic, and most toxic, form by microorganisms in water and sediments and then ingested by fish. This methylmercury accumulates as it travels up the marine food chain and, therefore, is found in highest concentrations in large marine predators. Mercury can cause severe toxicity to the central nervous system of human at high levels and more subtle neurodevelopmental effects at lower levels. Based on a number of studies of children exposed to mercury prenatally, the World Health Organization has established blood and hair mercury concentrations below which no effects have been observed, called the “no observed effect level,” or NOEL, for women of childbearing age.

Summary of Local Information About Mercury
In a 2002 analysis by the Alaska Native Tribal Health Consortium, both hair and blood samples taken from Barrow area mothers had very low levels of mercury, although sample sizes were small. In general, samples taken from rural Alaskan women contain levels well below the World Health Organization NOEL.

<table>
<thead>
<tr>
<th>Maternal Blood Mercury Levels (ppb)</th>
<th>Range</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>World Health Organization NOEL</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td>Health Canada level of concern</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Barrow (2002)82</td>
<td>1.5</td>
<td>(0–4.5)</td>
</tr>
<tr>
<td>Bethel (2002)82</td>
<td>6.5</td>
<td>(0.6–21)</td>
</tr>
</tbody>
</table>

NOEL=No Observable Effects Level
Ppb=parts per billion
Marine fish and mammals that feed higher on the food chain can be a source of mercury exposure for arctic residents. Bowhead whales, however, feed low on the food chain and have mercury concentrations that are “relatively miniscule compared to other marine mammals, ... below levels used by regulatory agencies for marketed animal products.”75

**State of Alaska Mercury Studies and Recommendations**

In 2002, the Alaska Section of Epidemiology in the Division of Public Health began the Statewide Maternal Hair Mercury Biomonitoring Program. As of May, 2010, hair samples from 813 pregnant women and women of childbearing age had been analyzed. Mercury levels were found to be low in women from all over Alaska, including participants from the NSB, with no samples exceeding the NOELs established by any organization and the vast majority found to be far lower.

**Figure 1.42: Alaska Hair Mercury Biomonitoring Program (July 2002–May 2010): Median hair mercury concentration (ppm), by region**

Based on the available evidence regarding mercury levels in Alaskan women as well as the proven health benefits of fish and marine mammals, in 2004, the State of Alaska recommended unrestricted consumption of fish and marine mammals from Alaskan waters for all residents.68 In 2007, the state released updated guidelines recommending modest limitations on consumption of several species of large Alaskan fish for women who are pregnant or breastfeeding or who could become pregnant, and for children under 12 years of age. The guidelines did not make any specific recommendations in marine mammal consumption.84

**LEAD, CADMIUM, AND OTHER HEAVY METALS**

Other heavy metals can produce a wide range of serious health problems, both in humans and animals. Industrial activities in the arctic region have raised concerns about potential heavy metal contamination in subsistence species, such as caribou. In response to local concerns about the health of local caribou herds, researchers measured concentrations of a number of heavy metals, including lead, cadmium, and arsenic in caribou carcasses from a large mortality event occurring near Point Hope and Cape Thompson in 1995 and compared them with levels in hunter-killed caribou from Barrow, Teshekpuk Lake, Point Hope, Anaktuvuk Pass, and Red Dog Mine areas. None of the levels found indicated concern for heavy metal toxicity.74

Lead is a heavy metal that produces a range of harmful human health effects, from subtle neurodevelopmental problems at low levels to seizures and death at high levels of exposure. With the transition to lead-free gasoline and paints in the latter half of the last century, the risk of lead exposure has decreased considerably nationwide. In Alaska, the primary route of non-occupational exposure has been found to be in indoor firing ranges (81% of cases). Alaska does not require universal lead screening for children. In 1993–1994, however, 967 Medicaid eligible children in 33 communities in Alaska, including Barrow and Nuiqsut, were offered blood lead screening. Blood lead levels in these children were found to be very low.65 In a separate study, lead levels in salmonberries collected at Point Hope were found to be the lowest of all berries sampled in the region.66 Analyses of bowhead whale liver and kidney found these tissues not to be a significant source of lead.75 Although lead continues to be an important public health issue, it does not appear to represent a major health concern in the NSB at this time.
Cadmium is another element with a number of potential toxic effects. Sources of cadmium include natural sources, industrial pollution, certain paints and pigments, contaminated processed foods, and cigarettes. Cadmium can accumulate in the liver and kidney of adult animals, and it has been found to be present in bowhead whale liver and kidney at varying concentrations.\(^7\) It is also present in the kidneys of North Slope caribou.\(^7\) However, as North Slope residents usually do not consume kidney in large amounts, it is unlikely to pose a significant health risk.\(^6\)

### Environmental Radiation

**BACKGROUND**

Radioactive contamination in the arctic has been a recurring health concern among Alaska Natives and other arctic peoples. Prior to the Nuclear Test Ban Treaty in 1963, extensive surface nuclear weapons testing in the U.S. and Soviet Union resulted in worldwide radioactive fallout. Geographic and ecological factors in the arctic environment caused radionuclides from weapons testing to accumulate in the arctic food chain, particularly in arctic herbivores such as caribou that feed on lichen, which are known to collect radioactive fallout. Events such as the intentional release of radioactive materials near Point Hope in 1962, known as the Project Chariot dumping, contributed further to the fear and anger around radioactive contamination in the NSB. The known history of dumping and spillage of radioactive materials into the Arctic Ocean by the former Soviet Union has raised concerns about contamination of marine mammals.

Naturally-occurring radioactivity is an additional environmental source of radiation exposure for humans. Industrial activity can enhance exposure to naturally-occurring background radioactivity, and fossil fuel extraction is one potential source of these so-called TENORMs (technologically enhanced naturally-occurring radioactive materials).\(^8\) Potential also exists for the effects of climate change to release existing radionuclides from the land, glaciers, and nuclear waste sites, although it is difficult to accurately predict or quantify these effects.\(^8\) Radon is a naturally occurring radioactive gas found in nearly all soils. Radon can enter homes through cracks in foundations and walls and become trapped and inhaled by residents. Exposure to radon is one cause of lung cancer. The NSB is in a low potential zone for radon exposure, although homes with high levels of radon have been found even in low potential zones. Many houses in the arctic are built on pilings in the permafrost, thus decreasing the risk of radon exposure in homes.\(^8\)

**HEALTH EFFECTS OF ENVIRONMENTAL RADIATION**

All humans are exposed to small amounts of naturally-occurring radiation every day. At high dosages, radiation can cause serious acute health effects and even death. At lower dosages, radiation is known to increase the risk of certain cancers and birth defects.

Cancer risk calculations have determined that in a worst-case scenario (likely overestimating the true risk by a factor of 10–1000), a maximum of 3.6 cases of cancer would have developed in North Slope villages over a 20-year period because of radioactive fallout burdens.\(^9\) No increase in radiation-related cancers has been detected in Alaska Natives, nor have residents of Iñupiat villages exposed to increased levels of radiation been found to have higher rates of the types of cancers that result from radioactive fallout.\(^9\) Caution is warranted in drawing any conclusions from such epidemiologic data, however, due to very small numbers of cases in individual villages and to the relative rarity of cancers associated with radiation exposure. At the state level, there does not appear to be any excess in radiation-associated cancers in Alaska Native children, compared to U.S. White children.\(^9\) Other contributions to cancer risk are discussed in detail in Chapter 2: Cancer.

A NSB-commissioned investigation also concluded that the while the potential exists, the likelihood of effects to NSB residents from radioactive waste released by Russian nuclear power plants was low.\(^9\) University-based researchers have conducted extensive sampling of marine mammals in the Arctic Ocean and determined that "the current human health risk from anthropogenic (man-made) radionuclides in marine mammal food resources is very likely to be negligible."\(^9\) In 1999, in response to resident’s concerns about the health and safety of local caribou herds, O’Hara et al.\(^9\) conducted an analysis of radionuclides in caribou in the Point Hope region and reference sites, concluding that "no significant human health risk exists at present...these caribou are unaffected by radionuclides and safe for consumption."\(^9\) Health Canada has conducted research on caribou in northern Canada, which have been found to have higher levels than Alaskan caribou, and found that the amount of radiation produced in the body of someone eating a half pound of caribou every day is equivalent to about one chest x-ray per year. Based on the most current research, Health Canada concluded that caribou was a safe and nutritious food item.\(^7\)
Although the available research suggests that the direct physical health effects of radioactivity in the NSB are very likely to be minimal, the impacts to psychological health may be substantial. An intimate relationship with the natural environment is fundamental to Inupiat culture, and the perception that the land, water, and animals have been poisoned by radioactivity has possibly had a profound effect on overall well-being.

**Local Contaminated Sites and/or Spills**
The arctic has an unfortunate history of contamination from military activity, mining, oil development and other human activity. The Alaska Department of Environmental Conservation operates the Contaminated Sites Program, which provides regulatory oversight for the assessment, cleanup and management of contaminated sites to protect humans and the environment. The program maintains a publicly accessible database, the Contaminated Sites Database, which documents identified contaminated sites and tracks the cleanup process for each site. DEC gives 'Cleanup Complete' status when efforts to reduce hazardous substance contamination have achieved the most stringent levels established in state regulation, or the possibility of human exposure to any residual contamination is highly unlikely. The Department may allow hazardous substances to remain in the environment at a site if the contamination does not pose a risk to human health or the environment, but there may be conditions or restrictions associated with the site that require compliance by current or future owners/operators.

There are more than 3,300 known contaminated sites in Alaska including 166 in the NSB (if Deadhorse and Prudhoe Bay are excluded). The sites are not equally distributed among villages, however. As of December, 2009, Nuiqsut had the highest number of open (active) contaminated sites.

![Figure 1.43: Number of Contaminated Sites in the NSB, by Village](image)

### 1.2.3. Health-Related Behaviors

Personal behaviors and choices affect many aspects of mental and physical health. Examples include tobacco, drug, and alcohol use, diet and exercise, sexual behavior, use of seatbelts and helmets, and utilization of preventive health services. Whereas these are individual behaviors, they are to a large extent determined by the social, cultural, economic, and physical environment in which people live. For example, dietary choices are driven by many factors, including access to different foods, cultural norms and traditions, cost, personal preferences, marketing and advertising, education, and time and resources available for food preparation. Other health-related behaviors, such as smoking, alcohol, and drug use are also heavily influenced by a person’s social, cultural, and economic environment. Across many cultures and populations, poverty and disadvantage are strongly associated with many unhealthy behaviors, while prosperity and social advantage are associated with healthy behaviors.

The 2011 County Health Rankings places the NSB 23rd of 23 Alaskan boroughs and/or census areas in health behaviors and related health indicators, specifically adult smoking, adult obesity, excessive drinking, sexually-transmitted infections, and teen birth rate. This section focuses on smoking, diet, and physical activity as major health-related behaviors. Although clearly affecting overall health in the NSB and elsewhere, a number of other important health-related behaviors are discussed in separate chapters: alcohol and drug use are discussed separately in the Behavioral Health chapter. Data on sexual behavior
are presented along with sexually-transmitted diseases in the Infectious Disease chapter. Data on safety practices such as helmet and seatbelt use are presented in the Injury chapter. Utilization of preventive health services such as cancer screening and prenatal care are presented in the Cancer and Maternal and Child Health chapters, respectively.

1.2.3.1. Tobacco

Tobacco smoking is associated with a multitude of health problems, including many cancers, diabetes, emphysema, heart disease and stroke, and even impotence. Thus, it is one of the most important modifiable behaviors influencing overall health and widely recognized as a top public health concern. Smoking rates vary widely by income, education, and employment status as well as race. In Alaska, BRFSS surveys have demonstrated that men and women with less than a high school education are four times more likely to smoke as are those who have graduated from college. Low-income residents, both Native and non-Native, are more likely to smoke than higher income residents, and those who are unemployed are nearly twice as likely to smoke as those who are employed.

Tobacco was introduced to Alaska Natives in the 1700s, when it was used as an article of trade. Use of the highly addictive substance quickly became pervasive throughout rural Alaska. Today, rates of tobacco use among Alaska Natives are nearly twice as high as among non-Natives. Alaska Native youth also smoke at more than twice the rate of non-Native youth and have not experienced the decline in smoking rates seen in their non-Native counterparts.

Tobacco Smoking Among Adults

NSB Census Tobacco Smoking Data

The 2010 NSB Census provided data on tobacco use in NSB villages. NSB adults (49%) were more than twice as likely to report smoking tobacco as did adults statewide (22%). Iñupiat adults in the NSB were almost three times as likely to report smoking as Caucasian adults in the NSB and also 37% more likely to smoke than were Alaska Natives statewide.

Adult males were significantly more likely to smoke than were adult females throughout the NSB.
Among household heads, reported tobacco smoking varied by age, with reported smoking dropping to 34% in the 65+ age group from roughly 50% in the other age groups.  
Among household heads, smoking rate was significantly associated with the village of residence, with Barrow household heads being the least likely to report smoking tobacco. Among Iñupiat household heads, the prevalence of tobacco smoking was also significantly related to village of residence, with slightly more than half (54%) of Point Hope household heads reporting smoking tobacco, and more than 70% of Iñupiat household heads reporting smoking in Kaktovik, Atqasuk, Point Lay, Nuiqsut, and Anaktuvuk Pass. Smoking rates were significantly lower in Barrow than in the other villages overall, looking at all ethnici-
ties together and at Iñupiat residents only.  

Table 1.14: Tobacco Smoking Among NSB Household Heads

<table>
<thead>
<tr>
<th>Smoke tobacco in any form:</th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>All NSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>All household heads</td>
<td>65%</td>
<td>61%</td>
<td>44%</td>
<td>65%</td>
<td>62%</td>
<td>49%</td>
<td>58%</td>
<td>53%</td>
<td>50%</td>
</tr>
<tr>
<td>Iñupiat household heads</td>
<td>71%</td>
<td>73%</td>
<td>61%</td>
<td>75%</td>
<td>71%</td>
<td>54%</td>
<td>72%</td>
<td>59%</td>
<td>63%</td>
</tr>
</tbody>
</table>

Tobacco Smoking: Barrow vs. Other North Slope Villages

<table>
<thead>
<tr>
<th>Adults: Smoke tobacco in any form</th>
<th>All</th>
<th>Iñupiat Only</th>
<th>All</th>
<th>Iñupiat only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barrow</td>
<td>42%</td>
<td>56%</td>
<td>57%</td>
<td>62%</td>
</tr>
<tr>
<td>Other North Slope Villages</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Smoking rates among household heads did not decrease between 2003 and 2010.  

Figure 1.46: Tobacco Smoking Among NSB Household Heads in 2003 and 2010, by Village

Data sources: 2003 NSB Economic and Census Profile and 2010 NSB Census.
Among smokers, there was no statistically significant relationship between ethnicity and the amount smoked each day. Male household heads were significantly more likely to smoke at least one pack per day (20 cigarettes) than were female household heads.\(^4\)

![Figure 1.47: Among NSB Household Heads Who Smoke Tobacco, Amount Smoked, by Gender](image)

```plaintext
Among Iñupiat household heads who smoked, the amount smoked was significantly related to village of residence, with Kaktovik household heads most likely to smoke at least one pack per day of cigarettes. Both in all ethnic groups combined and among Iñupiat only, household heads in Barrow were significantly less likely to smoke at least one pack per day than were their counterparts in the other North Slope villages overall.\(^4\)

Table 1.15: Amount Smoked: Among Iñupiat Household Heads Who Smoke

<table>
<thead>
<tr>
<th></th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>NSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent who report smoking one or more packs per day</td>
<td>32%</td>
<td>27%</td>
<td>21%</td>
<td>43%</td>
<td>29%</td>
<td>24%</td>
<td>25%</td>
<td>22%</td>
<td>24%</td>
</tr>
</tbody>
</table>

Barrow vs. Other North Slope Villages

<table>
<thead>
<tr>
<th></th>
<th>Barrow</th>
<th>Other North Slope Villages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Among household heads who smoke, percent who smoke one or more packs per day</td>
<td>22%</td>
<td>21%</td>
</tr>
</tbody>
</table>
```

Data source: 2010 NSB Census.

In the 2010 NSB Census, 71% of household heads who smoked reported a desire to quit, and a majority (62%) had tried to quit at least once in the past year. The *Healthy Alaskans 2010* target was for 90% of daily smokers in Alaska to quit for at least one day in the past 12 months.\(^7\) Although smoking rates among household heads have not changed significantly between the 2003 and 2010 census, smokers in several communities appear to be smoking less in 2010 than in 2003.\(^4,5,9\)
Tobacco Smoking Data from BRFSS and Other Sources

According to estimates from the Alaska BRFSS survey, the NSB has one of the highest smoking rates in Alaska, almost twice the statewide rate. Comparisons between individual communities must be made with caution, as sample sizes are small, and differences in the composition of the populations have not been completely controlled for. One can see, however, that smoking rates tend to be highest in the remote rural, predominantly Alaska Native regions of the state.\textsuperscript{11}

<table>
<thead>
<tr>
<th>Place</th>
<th>Percent of Adults Who are Current Smokers (2003–2009)</th>
<th>Sample Size</th>
<th>Error Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northwest Arctic</td>
<td>49%</td>
<td>330</td>
<td>43–56</td>
</tr>
<tr>
<td>Nome</td>
<td>46%</td>
<td>468</td>
<td>41–52</td>
</tr>
<tr>
<td>North Slope</td>
<td>44%</td>
<td>284</td>
<td>37–51</td>
</tr>
<tr>
<td>Yukon-Koyukuk</td>
<td>43%</td>
<td>378</td>
<td>37–49</td>
</tr>
<tr>
<td>Dillingham</td>
<td>40%</td>
<td>265</td>
<td>33–47</td>
</tr>
<tr>
<td>Wade Hampton</td>
<td>38%</td>
<td>286</td>
<td>31–45</td>
</tr>
<tr>
<td>Bethel</td>
<td>34%</td>
<td>758</td>
<td>30–38</td>
</tr>
<tr>
<td>Prince of Wales-Outer Ketchikan</td>
<td>34%</td>
<td>244</td>
<td>28–41</td>
</tr>
<tr>
<td>Aleutians West</td>
<td>33%</td>
<td>176</td>
<td>25–41</td>
</tr>
<tr>
<td>Matanuska-Susitna</td>
<td>28%</td>
<td>891</td>
<td>24–31</td>
</tr>
<tr>
<td>Ketchikan Gateway</td>
<td>25%</td>
<td>713</td>
<td>22–29</td>
</tr>
<tr>
<td>Skagway-Hoonah-Angoon</td>
<td>25%</td>
<td>157</td>
<td>18–34</td>
</tr>
<tr>
<td>Southeast Fairbanks</td>
<td>25%</td>
<td>239</td>
<td>19–32</td>
</tr>
<tr>
<td>Valdez-Cordova</td>
<td>25%</td>
<td>484</td>
<td>21–30</td>
</tr>
<tr>
<td>Kenai Peninsula</td>
<td>23%</td>
<td>2,541</td>
<td>21–25</td>
</tr>
<tr>
<td>Wrangell-Petersburg</td>
<td>23%</td>
<td>315</td>
<td>19–29</td>
</tr>
<tr>
<td>Fairbanks North Star</td>
<td>22%</td>
<td>3,354</td>
<td>20–24</td>
</tr>
<tr>
<td>Denali</td>
<td>21%</td>
<td>160</td>
<td>15–29</td>
</tr>
<tr>
<td>Kodiak Island</td>
<td>21%</td>
<td>614</td>
<td>17–25</td>
</tr>
<tr>
<td>Sitka</td>
<td>20%</td>
<td>393</td>
<td>16–25</td>
</tr>
<tr>
<td>Anchorage</td>
<td>19%</td>
<td>2,846</td>
<td>18–21</td>
</tr>
<tr>
<td>Haines</td>
<td>19%</td>
<td>130</td>
<td>13–28</td>
</tr>
<tr>
<td>Juneau</td>
<td>19%</td>
<td>1,409</td>
<td>17–22</td>
</tr>
<tr>
<td>Yakutat</td>
<td>16%</td>
<td>84</td>
<td>10–25</td>
</tr>
</tbody>
</table>

Data source: County Health Rankings, citing data from CDC BRFSS.
Among Alaska Natives, adult smoking rates in the Arctic Slope (NSB), Norton Sound, Aleutians and Pribilof regions are significantly higher than for Alaska Natives statewide (p<0.05). Smokeless tobacco use is lower in the NSB than in some other parts of rural Alaska, with between 2% and 9% household heads in North Slope villages reporting using smokeless tobacco in 2003. BRFSS data also suggest that the high smoking rates among NSB adults are not trending downward.

**Tobacco Smoking Among NSB Youth**

**2010 NSB Census and 2005 YRBS Youth Smoking Data**

The 2010 NSB Census collected proxy data on child and/or teen tobacco smoking from household heads. A 2005 anonymous survey of high school students, the Youth Risk Behavior Surveillance (YRBS) survey, yielded a far higher smoking rate among NSB teens than the results of the NSB census estimate, however, suggesting that proxy information from household heads likely considerably underestimates the number of adolescent and teen smokers in the NSB. The Healthy Alaskans 2010 target was for no more than 17% of high school students to report smoking a cigarette during the last 30 days.

In the 2010 NSB Census, gender was not significantly associated with teen smoking rates. Ethnic group was, however. Inupiat teens were significantly more likely to be reported to smoke than were Caucasian teens (18% vs. 12%, respectively). Reported teen smoking rates also varied widely across North Slope communities, with Nuiqsut having the highest reported tobacco smoking rate among teens and Barrow the lowest. Both among all ethnic groups combined and among Inupiat teens only, reported smoking rates were significantly lower in Barrow than in the other North Slope villages overall.
Table 1.17: NSB Teen Tobacco Smoking, by Community of Residence

<table>
<thead>
<tr>
<th></th>
<th>AKP</th>
<th>Aqtasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>NSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of teens (aged 14–18 years) who smoke tobacco in any form*</td>
<td>32%</td>
<td>**</td>
<td>8%</td>
<td>26%</td>
<td>43%</td>
<td>12%</td>
<td>15%</td>
<td>31%</td>
<td>16%</td>
</tr>
</tbody>
</table>

Barrow vs. Other North Slope Villages

<table>
<thead>
<tr>
<th></th>
<th>Barrow</th>
<th>Other North Slope Villages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
<td>Inupiat Only</td>
</tr>
<tr>
<td>Percent of teens (aged 14–18 years) who smoke tobacco in any form*</td>
<td>8%</td>
<td>11%</td>
</tr>
</tbody>
</table>

*According to the household head
** Cell-count less than five.
AKP=Anaktuvuk Pass

Based on the 2005 YRBS survey data, estimated smoking rates among NSB high school students are roughly double statewide and national estimates. Again, rates were similar among male and females students.

Youth smoking in Alaska has decreased considerably since the mid-1990s. In 2009, however, Alaska Native youth still smoked at significantly higher rates than their non-Native counterparts. Whereas overall, the smoking rate among Alaska high school students in 2009 achieved the 2010 Healthy Alaskans goal, this target has not been reached in certain subgroups, including Alaska Natives.

In the 2005 YRBS survey, 26% of NSB high school students reported smoking cigarettes on at least 20 of the last 30 days; 8% of percent of NSB high school students reported using chewing tobacco, and 9% reported smoking cigars or cigarillos. Overall, an estimated 43.7% NSB high school students had used some form of tobacco in the past 30 days. Of students who had smoked in the past 12 months, four of five had tried to quit.
Other Youth Tobacco Use Data
Smoking starts early. According to a separate anonymous survey of NSB students, by 7th grade, about 25% of NSB children reported having smoked cigarettes. The 2004 survey data also suggest that smokeless tobacco use is fairly common among NSB students, with more than one in five high school students reporting using smokeless tobacco in the last 30 days.\footnote{128}

Of the NSB high school students who smoked, the most common way cigarettes were obtained was by giving an adult money to purchase them. Only a small minority (6\%) reported buying cigarettes at a store.\footnote{36}

Prenatal Tobacco Smoking
Reported rates of smoking during pregnancy are also high in the NSB, roughly three times statewide rates, and do not seem to be declining. Smoking during pregnancy is associated with a number of poor birth outcomes.\footnote{5}
1.2.3.2. Diet and Nutrition

Diet and exercise have long been known to play an important role in health. The nationwide obesity epidemic and associated increase in obesity-related health problems, such as diabetes, have brought nutrition and physical activity into the national spotlight. Diets in rural arctic regions consist of both traditional, or subsistence, foods and non-traditional, or market foods. Subsistence foods and activities have been associated with lower rates of impaired glucose tolerance (a risk factor for diabetes)97–100 and high blood pressure,101 and a favorable cholesterol profile.102 Moreover, traditional subsistence foods are believed by many Iñupiat and other Alaska Natives to be the very foundation of health and well-being. According to one NSB resident:32

All these animals that they ate are very rich in minerals and vitamins.... We were the healthiest people with good set of teeth before coffee, sugar, etc. We hunted by walking; cutting up seal was an exercise in itself; picking greens; berries and other edible plants; getting ice for water; maintaining dogs for hunting; checking the nets for fish. Iñupiat were very active and maintained their overall health.

Good nutrition in childhood is particularly important. Nutrient deficiencies can result in conditions such as anemia and bone disorders that affect physical development. Inadequate nutrition can also impair a child’s cognitive development and school performance. The overuse of high-calorie, low-nutrient foods and beverages has also contributed to the national epidemic of childhood obesity, which often begins well before a child even begins school.

With increasing modernization, many arctic communities have come to rely more on store-bought foods, replacing the relatively healthy and nutrient-rich traditional subsistence foods with market foods that are often high in sugar, calories, and unhealthy types of fat. The often highly-processed foods available in Alaskan village stores are typically low in nutrients as well. A number of important dietary surveys have been conducted in rural Alaska; however, data from North Slope communities are extremely limited. Findings from other regions of Alaska suggest a higher reliance on non-traditional, or “store” foods by younger residents103,104 and a general trend has also been observed of increasing store-bought food and sugared beverages compared with past nutritional surveys.105 Considerable dietary variation exists among different regions of Alaska, however, and findings from a sample of regions cannot reliably be generalized to all of rural Alaska or to North Slope communities.

Subsistence Food in the NSB

Subsistence food use in the NSB remains high. Some residents believe that, with the increasing cost of living in the NSB, many Iñupiat are relying more heavily on a subsistence way of living.32 Data from the 2003 and 2010 NSB Census, presented in Table 1.18, demonstrate persistently high levels of subsistence food use among Native NSB households. The proportion of households reporting that more than half of their diet came from subsistence foods was higher than in two smaller separate surveys from 1977 and 1988.106

Subsistence Food Use Data from the NSB Census

More than 95% of NSB Iñupiat household heads in every age group reported that their households used subsistence foods in 2009. A high percentage of NSB Iñupiat respondents reported that at least half of their household food came from local subsistence resources. Older Iñupiat household heads in the NSB were more likely to report high levels of subsistence food use than were younger household heads, however. Among Iñupiat households in most villages, households with heads who are employed full time and those with higher education levels still relied heavily on subsistence resources,4 supporting other research that has found that employment and wage income opportunities do not adversely affect subsistence participation.22

Table 1.18: Subsistence Food Use Among NSB Iñupiat Households: Percent of households for which at least half of household diet came from subsistence foods in the previous year

<table>
<thead>
<tr>
<th></th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>NSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010 NSB Census</td>
<td>77%</td>
<td>67%</td>
<td>60%</td>
<td>76%</td>
<td>79%</td>
<td>72%</td>
<td>67%</td>
<td>75%</td>
<td>67%</td>
</tr>
<tr>
<td>2003 NSB Census</td>
<td>79%</td>
<td>67%</td>
<td>66%</td>
<td>76%</td>
<td>67%</td>
<td>75%</td>
<td>79%</td>
<td>82%</td>
<td></td>
</tr>
</tbody>
</table>

Data source: 2003 NSB Economic Profile and Census, and 2010 NSB Census
AKP=Anaktuvuk Pass
Harvest Data

The NSB Department of Wildlife Management, in collaboration with other organizations and researchers, has collected extensive harvest survey data on the large variety of subsistence species for each of the North Slope villages. Harvest data also provide some measure of comparison of subsistence food harvest across the state. Although harvest data are imperfect measures of actual wild food consumption, they suggest that wild, or subsistence, foods continue to comprise a substantial portion of the diets of many rural Alaskans, particularly in western, interior, and northern (arctic) regions. Subsistence food use in the arctic region is more than twice the amount of store-bought meat, fish, and poultry bought by the average American per year.

Figure 1.56: Wild Food Harvests in Alaska in the 1990s, by Region (pounds per person per year)

<table>
<thead>
<tr>
<th>Region</th>
<th>Harvests (pounds per person per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western</td>
<td>664</td>
</tr>
<tr>
<td>Rural Interior</td>
<td>613</td>
</tr>
<tr>
<td>Arctic</td>
<td>516</td>
</tr>
<tr>
<td>Southwest Aleutian</td>
<td>373</td>
</tr>
<tr>
<td>Rural Southeast</td>
<td>178</td>
</tr>
<tr>
<td>Kodiak Island</td>
<td>155</td>
</tr>
<tr>
<td>Rural Southcentral</td>
<td>153</td>
</tr>
<tr>
<td>Kenai Peninsula</td>
<td>40</td>
</tr>
<tr>
<td>Juneau</td>
<td>35</td>
</tr>
<tr>
<td>Ketchikan</td>
<td>33</td>
</tr>
<tr>
<td>Mat-Su Area</td>
<td>27</td>
</tr>
<tr>
<td>Anchorage</td>
<td>19</td>
</tr>
<tr>
<td>Fairbanks-Delta</td>
<td>16</td>
</tr>
</tbody>
</table>


Nutrients in NSB Subsistence Foods

Whereas the nutritional content of arctic subsistence foods has not been fully analyzed, an increasing amount of information on this topic has become available in recent years. In general, arctic subsistence foods, including many that are harvested and used in North Slope communities, have been found to be nutrient-dense, providing important sources of protein and energy as well as many other important nutrients. Among these nutrients are iron, zinc, selenium, vitamins A, E and C, and particularly the essential long-chain omega-3 fatty acids. These have been suggested or shown to be important in the prevention of many chronic diseases, including elevated blood pressure and cholesterol, heart disease, stroke, diabetes, arthritis, depression, and some cancers. Omega-3 fatty acids are also important for healthy fetal development.

Information on the composition and nutritional content of the diet of NSB residents is limited, but the research that has been conducted locally has confirmed the high nutritional value of a number of major subsistence foods in the NSB. The variety of species used for subsistence in the North Slope is large—encompassing marine mammals such as whale, walrus, and seal; caribou and other land mammals; and a wide variety of birds, fish, plants and berries. Moreover, the variety and balance of subsistence foods harvested varies considerably across the eight North Slope villages. An essential subsistence food resource in the NSB, the bowhead whale has been the particular focus of recent subsistence nutrient research. Analyses of bowhead whale tissues that are used as food, including the skin and blubber (muktak), skeletal muscle, and some organ meats, have found them to be rich in protein, the healthy omega-3 fatty acids, and important elemental nutrients. The skin of bowhead whale was also found to contain a considerable amount of dietary fiber, which has generally been found to be low in other Alaskan subsistence diets as well as typical American diets. An analysis of seal and sheefish in prepared forms traditionally consumed in the Kotzebue area also found them to be rich in omega-3 fatty acids and other essential nutrients.
The muscle of bowhead whale has been found to be much richer in iron than most store-bought meats. This finding is of particular importance given the high prevalence of iron deficiency observed in rural Alaska and among Alaska Natives in particular. Using stored serum samples from the 1980s, researchers found 31% of female Alaska Natives and 20% of male Alaska Natives in the Barrow service unit to have evidence of iron deficiency (ferritin level <12). These estimates are similar to statewide estimates for Alaska Natives from the same time period. The cause of iron deficiency in these populations is not completely understood, but inadequate nutritional intake does not appear to explain the high documented levels. Chronic gastrointestinal infection with the Helicobacter pylori bacteria is thought to play a role in many cases.

The oils and blubber of arctic marine mammals and fish have also been found to contain vitamin A and D. Vitamin D is of particular importance, as people living at high latitudes with low exposure to sunlight, increased skin pigment, and low intake of vitamin-D-fortified dairy products are at particularly high risk of vitamin D deficiency. Roles for vitamin D have been suggested in immune function, cancer prevention, and rheumatoid arthritis in addition to its known role in prevention of skeletal disorders such as childhood rickets.

Fruit and Vegetable Consumption
Although not a large part of traditional arctic diets, research has shown that a diet rich in fruits and vegetables can have many positive health effects, from reducing the risk of certain types of cancer to alleviating symptoms such as constipation. National guidelines recommend at least five servings of fruits and vegetables per day. The high cost and relatively limited availability of fruits and vegetables in the NSB makes this recommendation particularly challenging. The availability of fruits and vegetables in some of the outlying North Slope villages is extremely limited. For example, Atqasuk does not have a commercial village store, and residents generally must fly out to buy groceries. Fruits and vegetables that are available in village stores are often of poor quality as well.

According to combined BRFSS data from 1991–2007, fewer than one in four NSB adults reported eating the recommended five servings of fruit or vegetables per day. This proportion is similar to state and national estimates, however. In the 2005 YRBS survey, fewer than one in five NSB high school students reported eating five servings of fruits and vegetables a day and 18% had not eaten any fruit in the past seven days.

Soda and Sugar-Sweetened Beverage Consumption
Sugar-sweetened beverages (SSBs) such as soda pop, fruit punch, sports and energy drinks, and sweetened milk, tea, and coffee drinks, are a major source of added sugar and calories in the U.S. and typically have minimal nutrient value. Consumption of these beverages has increased dramatically in the last 30 years. High consumption of these beverages is associated with a number of health problems such as obesity, diabetes, cardiovascular disease, gout, and fatty liver disease, and dental caries (cavities). Recent research also suggests an association between soda consumption and pancreatic cancer.

In the 2010 NSB Census, consumption of sodas and other SSBs among household heads was strongly associated with age. Younger age groups reported significantly higher levels of consumption than older groups. Household heads were asked only about their own consumption; thus, data on children and teens are not available.
Inupiat household heads in the NSB reported significantly higher levels of SSB consumption than did Caucasians and those of other ethnicities. Inupiat household heads were more than six times as likely as Caucasian household heads to report drinking more than three of these beverages per day (31% vs. 5%, respectively). The relationship between ethnic group and consumption of sodas and other SSBs was statistically significant in all age groups.4

NSB household heads were about half as likely to report drinking, on average, no sodas or other SSBs per day in the last week as adults statewide. NSB household heads were also more likely to report drinking two or more of these beverages per day than were adults statewide.2,4

North Slope Borough Baseline Community Health Analysis

Data source: 2010 NSB Census.

nsB data source: 2010 NSB Census.

Consumption of sodas and SSBs was significantly associated with community of residence among Iñupiat household heads. Of all the villages, household heads in Anaktuvuk Pass and Atqasuk were least likely to report drinking two or more of these beverages per day (49% and 48%, respectively) and most likely to report drinking none (25% and 21%, respectively). Iñupiat household heads in Nuiqsut were least likely to report drinking, on average, no sodas or SSBs per day (11%). More than 60% of Iñupiat household heads in Nuiqsut, Point Hope, Kaktovik, Point Lay reported drinking two or more of these beverages per day. Household heads living in villages other than Barrow, on the whole, were significantly more likely to report higher levels of consumption of these beverages than were their counterparts in Barrow. This was true when comparing only Iñupiat household heads as well.4

Table 1.19: Soda and Sugar-Sweetened Beverage Consumption Among Iñupiat Household Heads

<table>
<thead>
<tr>
<th>Reported average daily consumption</th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>NSB Iñupiat</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>25%</td>
<td>21%</td>
<td>16%</td>
<td>15%</td>
<td>11%</td>
<td>16%</td>
<td>14%</td>
<td>14%</td>
<td>16%</td>
</tr>
<tr>
<td>Two or More</td>
<td>49%</td>
<td>48%</td>
<td>53%</td>
<td>65%</td>
<td>68%</td>
<td>66%</td>
<td>63%</td>
<td>64%</td>
<td>58%</td>
</tr>
</tbody>
</table>

Barrow vs. Other North Slope Villages: All Household Heads and Iñupiat Household Heads

<table>
<thead>
<tr>
<th></th>
<th>Barrow</th>
<th>Other North Slope Communities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
<td>All Iñupiat only</td>
</tr>
<tr>
<td></td>
<td>All</td>
<td>All Iñupiat only</td>
</tr>
<tr>
<td>None</td>
<td>29%</td>
<td>16%</td>
</tr>
<tr>
<td>Two or More</td>
<td>39%</td>
<td>53%</td>
</tr>
</tbody>
</table>

Data source: 2010 NSB Census.
AKP=Anaktuvuk Pass

Rural Alaskans have been found to drink three times as much soda per day as their urban counterparts,117 and two-year-olds in northern and southwestern regions of the state are twice as likely to regularly consume SSBs (58%) as two-year-olds statewide (29%).117 In 2009, Alaska Native high school students were more likely than their white counterparts to drink at least one can/glass of SSB per day (62% vs. 43%, respectively).36 Reasons for the high consumption of soda and SSBs in rural Alaska are multiple and not completely understood. Some reasons may include the relative ease and low cost of transporting and storing these beverages, limited availability of potable and palatable drinking water in some regions, social and cultural norms, and their low cost per calorie in areas of relatively high food insecurity.

Food Security

Simply having reliable access to enough food is an important driver of nutritional behavior and overall health. The term “food security” refers to the ability to procure enough food, at all times, for an active healthy life for all household members. Although food security is not an individual health-related behavior but rather a social, political, and economic phenomenon, a discussion of food security is included in this section because of its close association with diet and nutrition.

Food insecurity—the inability to access enough food at all times to meet basic needs—is a major public health concern and, paradoxically, contributes to obesity and chronic diseases like diabetes because people who do not always have enough food tend to choose cheaper, high calorie food with low nutrient value.119 “Research indicates the following negative outcomes are associated with food insecurity among children: poor health status; more frequent colds, ear infections, and other health problems; greater incidence of hospitalization; higher levels of aggression, hyperactivity, and anxiety as well as passivity; difficulty getting along with other children, and increased need for mental health services; impaired cognitive functioning and diminished capacity to learn; lower test scores and poorer overall school achievement; and increased likelihood of repeating a grade, school absences, tardiness, and school suspension.”119 Increasing food security in Alaska was one of the Healthy Alaskans 2010 goals. The target set was for 94% of Alaskan households never to lack access to enough food to meet basic needs.

In the 2010 NSB Census, household heads were asked several questions about their household’s ability to procure enough food to sustain a healthy life for all household members.4
- Overall, 35% of NSB household heads reported that there were times last year when they found it difficult to get the food needed to make healthy meals.
• Of the household heads who reported difficulty getting the food needed to eat healthy meals, 43% overall and 51% of Inupiat household heads reported that this was because they could not get enough subsistence foods. The vast majority of household heads (90%) who reported difficulty getting food for healthy meals stated that it was because (at least in part) they couldn’t get enough store foods.

• Overall, 19% of all household heads and 26% of Inupiat household heads reported times last year when household members did not have enough to eat.

Figure 1.60: Food Insecurity in the NSB, by Ethnic Group of Household Head

| Percent of households with times last year when household members did not have enough to eat | 19% |
| Percent of households with times last year when weren’t able to get enough STORE foods for healthy meals | 26% |
| Percent of households with times last year when weren’t able to get enough SUBSISTENCE foods for healthy meals | 25% |
| Percent of households with times last year when it was difficult to get the foods needed for healthy meals | 23% |

Data source: 2010 NSB Census.

None of the measures of food insecurity was significantly associated with the gender of the household head. Inupiat household heads in the middle-aged groups were most likely to report that at times, household members did not have enough to eat. There was a similar relationship between age group and difficulty getting foods for healthy meals. The associations between age of household head and both measures of food insecurity were statistically significant. Age group was not significantly associated with whether Inupiat household heads reported difficulty getting enough subsistence or store foods.4

Figure 1.61: Food Insecurity Among Inupiat Households, by Age Group of Household Head

Levels of reported food insecurity varied widely across the North Slope. Inupiat household heads living in villages other than Barrow were significantly more likely than those living in Barrow to report food insecurity. They were more likely to report difficulty getting foods for healthy meals, more likely to report difficulty getting enough subsistence foods, and more likely to report household members who at times did not have enough to eat, compared with Inupiat household heads living in Barrow.4

Among Inupiat household heads, those living in Anaktuvuk Pass were the most likely to report difficulty getting food for healthy meals, and a very high proportion reported this difficulty to be caused by not being able to get enough subsistence foods. Almost half of Inupiat household heads in Anaktuvuk Pass reported household members who, at times last year, did not have enough to eat.4
Table 1.20: Food Insecurity in Households with Iñupiat Household Heads

<table>
<thead>
<tr>
<th>Villages other than Barrow</th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of households that, at times last year, found it difficult to get the foods they needed to eat healthy meals</td>
<td>62%</td>
<td>56%</td>
<td>33%</td>
<td>39%</td>
<td>38%</td>
<td>38%</td>
<td>50%</td>
<td>47%</td>
</tr>
<tr>
<td>If yes, because not able to get enough subsistence foods</td>
<td>83%</td>
<td>41%</td>
<td>43%</td>
<td>58%</td>
<td>63%</td>
<td>64%</td>
<td>47%</td>
<td>41%</td>
</tr>
<tr>
<td>If yes, because not able to get enough store foods</td>
<td>78%</td>
<td>100%</td>
<td>87%</td>
<td>84%</td>
<td>84%</td>
<td>85%</td>
<td>100%</td>
<td>94%</td>
</tr>
<tr>
<td>Percent of households that, at times last year, had members who did not have enough to eat</td>
<td>49%</td>
<td>25%</td>
<td>22%</td>
<td>23%</td>
<td>28%</td>
<td>26%</td>
<td>26%</td>
<td>33%</td>
</tr>
</tbody>
</table>

Data source: 2010 NSB Census
AKP=Anaktuvuk Pass

Subsistence food-sharing networks: The sharing of subsistence foods is extremely important in North Slope communities, both culturally and as protection against food insecurity. The 2010 NSB Census found that 94% of households reported that they shared subsistence foods within their own community and well over half (64%) reported that they shared subsistence foods with other NSB communities. Three of five household heads aged 65 years and older reported that at least half of their subsistence diet came from other households. Surveys conducted by the NSB Department of Wildlife Management have also documented substantial sharing of whale and other subsistence foods within communities, with other North Slope communities, and with family members living in urban areas of the state.

Food insecurity in Alaska: Food insecurity in Alaska is recognized as a significant and growing problem, and in 2006, the Alaska BRFSS added a food insecurity module to its annual survey. Statewide and national food insecurity data are not easily comparable to NSB census data because the state and national surveys did not ask about subsistence food security, the role of food-sharing, or the lack of availability of many foods in remote communities. For reference, 10.6% of Alaskans were found to be food insecure, meaning that at times members of the household were uncertain of having, or unable to acquire, enough food for all household members. This number is similar to the U.S. estimates. Approximately 4% of households were found to have “very low food security,” with disrupted eating patterns or reduced food intake. Estimates for rural Alaska, however, are dramatically higher, with 21.8% of adults and 26.4% of children being food insecure. Although the NSB census data are not directly comparable with statewide estimates, the 2010 NSB Census results suggest that food insecurity is a serious problem across the North Slope and, like in other rural areas, exists at levels higher than statewide estimates.

Figure 1.62: Food Insecurity in Alaska (2006): Percent of residents living in households that were food insecure

1.2.3.3. Physical Activity
Like a healthy diet, physical activity has innumerable health benefits, both mental and physical. Regular exercise lowers the risk of diabetes, heart disease, and cancer and can also improve mood and concentration and help problems like back pain. Many factors influence the amount of exercise a person gets,
including social norms, educational and income level, occupation, leisure time, health problems, and physical environment.

Increased reliance on snowmachines, four-wheelers, and other motorized vehicles, have changed physical activity patterns in rural Alaska and may be having significant effects on health. An inverse relationship has been shown between non-mechanized physical activity and the prevalence of glucose intolerance (a risk factor for diabetes)\textsuperscript{98} and hypertension in Alaska Natives.\textsuperscript{101}

**Physical Activity Among Adults**

The North Slope Borough, Native Village of Barrow, and other local organizations have made increasing physical activity in the community a goal. Publically available indoor exercise facilities are available to residents of Barrow. A local collaborative coalition organized the Move-It campaign in 2010, a program aimed at facilitating and encouraging regular exercise for local residents. For one week each year just after Christmas, Barrow holds games for residents of all ages, focusing on traditional sports and skills. The Native Village of Barrow also organizes various adult sport leagues.

**Physical Activity Data from the 2010 NSB Census**

The 2010 NSB Census included one question on physical activity, asking specifically about the frequency of moderate-intensity physical activity such as outdoor work, brisk walking, heavy housework, or other activities that cause an increase in breathing or heart rate. Based on 2010 NSB Census data, NSB household heads appear to be roughly equally as likely to report getting the recommended 150 minutes of moderate physical activity (at least 30 minutes five days per week) as adults statewide were in 2007.\textsuperscript{2,4} The *Healthy Alaskans 2010* target was for at least 40% of adults achieve this recommended amount of physical activity.\textsuperscript{9}

![Figure 1.63: Physical Activity Among NSB and Alaska Adults: Number of days per week with at least 30 minutes of moderate physical activity](image)

In the 2010 NSB Census, reported frequency of physical activity was significantly associated with community of residence among household heads. Residents of Atqasuk were most likely to report getting, on average, no moderate exercise of 30 minutes duration per week and least likely to report five days or more per week (31%). Household heads in Point Lay and Wainwright reported the highest levels of exercise, with 59% reporting getting at least 30 minutes of moderate exercise on five or more days per week. Compared with their counterparts in Barrow, Iñupiat household heads in the other villages overall reported a significantly higher number of days that included at least 30 minutes moderate physical activity.\textsuperscript{4}
Table 1.21: Physical Activity Among Household Heads: Number of days per week, on average, get at least 30 minutes of moderate physical activity

<table>
<thead>
<tr>
<th></th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>All NSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Never&quot;</td>
<td>18%</td>
<td>24%</td>
<td>16%</td>
<td>17%</td>
<td>19%</td>
<td>10%</td>
<td>8%</td>
<td>11%</td>
<td>16%</td>
</tr>
<tr>
<td>&quot;Five days per week or more&quot;</td>
<td>39%</td>
<td>29%</td>
<td>41%</td>
<td>50%</td>
<td>44%</td>
<td>49%</td>
<td>59%</td>
<td>59%</td>
<td>44%</td>
</tr>
</tbody>
</table>

Barrow vs. Other North Slope Villages

<table>
<thead>
<tr>
<th></th>
<th>Barrow</th>
<th>Other North Slope Communities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
<td>Ifupiat only</td>
</tr>
<tr>
<td>&quot;Never&quot;</td>
<td>16%</td>
<td>20%</td>
</tr>
<tr>
<td>&quot;Five days per week or more&quot;</td>
<td>41%</td>
<td>41%</td>
</tr>
</tbody>
</table>

Data source: 2010 NSB Census
AKP=Anaktuvuk Pass

Physical Activity Data from the Alaska BRFSS
According to three years of combined BRFSS data, NSB adults are more likely than adults statewide to report no leisure-time physical activity, with almost one in three NSB adults reporting no leisure-time physical activity. The Healthy Alaskans 2010 target was for less than 15% of Alaskan adults to report no leisure-time physical activity. It is possible that physical activity in the NSB is more likely to be incorporated into the work and daily routines of the subsistence way of life. Statewide, a greater percentage of Alaska Natives reported engaging in regular, moderate physical activity than do U.S. adults of all races.

Figure 1.64: Percent of Adults Reporting No Leisure-Time Exercise, 2005–2007

Data source: Centers for Disease Control and Prevention (CDC) Behavioral Risk Factor Surveillance System (BRFSS).
Alaska Department of Health and Social Services, Chronic Disease Prevention and Health Promotion, Division of Public Health.
Results are weighted according to the five Alaska BRFSS regions and not post-stratified to individual census areas. Results are not age-adjusted.
Physical Activity Among Youth

Lifestyle patterns, such as regular exercise, are often established during the childhood and teenage years. The NSB Healthy Communities Initiative has contracted with an outside group that has successfully organized numerous basketball teams and sports camps for youth across the North Slope in an effort to increase youth participation in healthy physical activity. The Native Village of Barrow also organizes little league teams and other organized sports opportunities for children and teens.

In the 2005 YRBS survey, 58% of NSB high school students (41% of females and 64% of males) reported exercising vigorously for at least 20 minutes at least 3 out of the past 7 days. The Healthy Alaskans 2010 target for this indicator was 85%. A slightly larger proportion (64%) of NSB high school students (57% females, 70% males) reported exercising either vigorously for at least 20 minutes at least three days per week or moderately for 30 minutes at least five days per week. Only 14% of students reported getting no exercise in the last seven days. About half of NSB high school students attended physical education (P.E.) classes at least once a week in 2005, similar to state and national estimates. Only one in five attended P.E. daily however, and this was significantly lower than the national average. The Healthy Alaskans 2010 target was for at least 45% of high school students to attend P.E. classes daily. A significantly higher percentage of NSB high school students did report playing on a sports team than did their nationwide counterparts, however.36

Figure 1.65: Physical Education and Sports Participation Among High School Students

<table>
<thead>
<tr>
<th>Attended PE one or more days during an average school week</th>
<th>Attended PE classes daily in an average school week</th>
<th>Played on one or more sports teams in past 12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>55%</td>
<td>47%</td>
<td>54%</td>
</tr>
<tr>
<td>54%</td>
<td>20%</td>
<td>33%</td>
</tr>
<tr>
<td>65%</td>
<td>18%</td>
<td>62%</td>
</tr>
<tr>
<td>62%</td>
<td></td>
<td>56%</td>
</tr>
</tbody>
</table>

Percentage of U.S. students who reported attending P.E. classes daily was significantly higher than NSB and Alaska percentages (p<0.05). Percentage of U.S. students who reported playing on a sports team was significantly lower than NSB and Alaska percentages (p<0.05).

Data source: YRBS 2005, 2007

Excessive time spent watching television or playing video games can interfere with getting enough physical activity. It may also have detrimental cognitive effects. In the 2005 YRBS survey, high school students in the NSB were significantly more likely to report watching three or more hours of TV than in the state-wide sample, but the percentage was not significantly different from the national sample.36

Figure 1.66: Screen Time Among High School Students: Percent of students who watched three or more hours of TV on an average school day

<table>
<thead>
<tr>
<th>NSB 2005 (±5%)</th>
<th>Alaska 2007 (±3%)</th>
<th>U.S. 2005 (±2%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>33%</td>
<td>23%</td>
<td>37%</td>
</tr>
</tbody>
</table>

NSB percentage was significantly higher than the Alaska percentage (p<0.05).

1.2.4. Access to Health Services

1.2.4.1. Overview of Health Services and Access to Care in the NSB

Overall, 97% of NSB household heads report having some form of health insurance— including the eligible use of Indian Health Service, Medicare, Medicaid, and private insurances—compared with 83% of adults statewide. The remote location of the NSB presents many challenges to the delivery of health care services, however. Travel by plane is necessary for many services, and extended stays away from family are common. The associated costs and inconveniences of travel can be a substantial barrier to patients. Similar to many other remote rural Alaskan regions, the NSB suffers from chronic health care workforce shortages. It is categorized as a medically underserved area and a health professional shortage area by the U.S. Health Resources and Services Administration. Hospital and clinic facilities in Barrow experience high turnover of providers, nurses, and ancillary health care personnel. At times, severe nurse staffing shortages at Samuel Simmonds Memorial Hospital (SSMH) have necessitated transferring all women to Anchorage or Fairbanks for deliveries, and as of March, 2010, only half of physician positions were filled by permanent staff doctors. The public health nursing program, too, has suffered extreme staffing shortages in recent years.

In an effort to increase the local health care labor workforce, the NSB has implemented the Allied Health Training Program at Ilisagvik College, a two-year tribal college located in Barrow. The college provides associate degree programs, certificates, and training in various health fields to college and high school students, as well as summer camps. The NSB Health Department also offers college students a chance to work in any of the eight Health Department facilities to gain on-the-job experience in their respective fields.

The NSB and Arctic Slope Native Association share responsibility for providing health care services to the residents of the North Slope Borough. Other than the municipality of Anchorage, the NSB is unique in Alaska in that it offers services similar to city and county governments in other states. The NSB also oversees programs—for example the Community Health Aide and Behavioral Health Programs—that are typically run by tribal health organizations in other rural parts of the state. This unique distribution of responsibilities creates challenges in communication and coordination of services. In multiple interviews with health care providers, health department managers, public health nurses, and tribal leaders, concerns were raised regarding fragmentation of services and a need for improved communication between tribal and Borough organizations, departments, programs, and services. Care providers who were interviewed for this report were concerned about how difficult it can be for patients, especially young mothers and frail elders, to navigate multiple different programs, often in separate geographical locations.

1.2.4.2. Health Services Provided or Coordinated by the Borough

Village-Based Primary and Urgent Care Services

With the exception of those living in Barrow, residents of the NSB primarily access the health care system through the village clinics, staffed by community health aides. The health aides are non-medical personnel, typically from the communities in which they work, who are trained in the provision of basic health services according to protocols and under the supervision of medical providers in Barrow. A small minority (5–8%) of health aide visits are for preventive services. The utilization of these village clinic services varies across NSB communities.
Emergency and/or First Responder Services
A high level of coordination is necessary for urgent medical transport from outlying villages to Barrow and from Barrow to referral centers in Fairbanks and Anchorage. The NSB Department of Health and Social Services provides first-responder services through its Community Health Aide Program (CHAP) to all NSB villages, with the exception of Point Hope. Health aides consult with physicians in Barrow, with the exception of Point Hope, where Maniilaq physicians in Kotzebue are generally consulted, and Anaktuvuk Pass, where physicians with Tanana Chiefs Conference in Fairbanks are consulted regarding incoming medevacs. Unlike in some regions of rural Alaska, all the North Slope villages have health aides, with only rare days without health aide availability.125

The NSB Fire Department and NSB Search and Rescue Department provide ambulance and medevac services for NSB communities. Emergency transport to the Alaska Native Medical Center in Anchorage is coordinated between ASNA physicians in Barrow, accepting ANMC physicians in Anchorage, and NSB Search and Rescue or a contractor, Guardian Flight service. Utilization of medevac services varies among North Slope villages.125

Preventive Health Care
The NSB Health Department provides direct health care services to North Slope communities through the Public Health Nursing program, which provides:
- Well-child screenings and immunization
- School-based screenings and immunization campaigns
- Screening, treatment, and contact investigation for tuberculosis and sexually transmitted infections
- Health education and referrals

Community Health Aides also provide some preventive care, with an estimated 5–8% of visits being for preventive care.
Integrated Behavioral Health Services

There are five core behavioral health programs provided by the NSB. The NSB Integrated Behavioral Health Services (IBHS) include

- **Behavioral Health Services**: IBHS provides emergency services, prevention, outreach, psychiatric services, treatment, and support for individuals, families, and communities affected by mental health and substance abuse issues.

- **Arctic Women in Crisis (AWIC)**: AWIC is an eight-bed emergency shelter for victims of domestic violence and sexual assault, and oversees the Domestic Violence Intervention Program for men and women. AWIC also has prevention and outreach programs, and AWIC staff travel to outlying villages regularly.

- **Gathering Place**: The Gathering Place is a day program open to the mentally disabled and provides counseling services, case management, and assistance with state and local resources, in addition to assisting clients with daily living skills and providing a safe, social environment.

- **Iñupiat Teens Taking Control (ITTC)**: ITTC is an alternative youth program designed for adolescents 14–18 years of age that offers substance abuse assessments, individual, and group counseling, off-slope referrals and enhanced life skills education.

- **Children & Youth Services (CYS)**: CYS is a 10-bed emergency shelter for children 17 years of age and younger, where family or foster placements are not available.

Nutrition Services

The NSB Women, Infants and Children (WIC) program is operated by the NSB Health Department. WIC is a national nutrition program for infants and children up to age 5 years, and pregnant, postpartum, and breastfeeding women who meet financial eligibility guidelines. WIC provides nutritional risk assessments, nutrition and breastfeeding education, free healthy food vouchers, and referrals to other health and social services agencies. Between 1996 and 2008, reported WIC enrollment in the NSB increased 53% in the NSB.126

![Figure 1.71: Prevalence of WIC Participation in the NSB: The percent of NSB women (delivering live births) who report participating in WIC, 1996–2008](image)

Data source: Alaska Pregnancy Risk Assessment Monitoring System (PRAMS). NSB-specific data for this report was provided by the Alaska Department of Health and Social Services, Maternal and Child Health Epidemiology Unit of the Alaska Division of Public Health.

Optometry Services

Optometry services are provided by the Wellness Center Eye Clinic, a NSB Health Department program.

Services for Infants with Special Needs

Although it does not formally coordinate the program, the NSB Health Department provides local housing and acts as a local contact for the Infant Learning Program. The North Slope Infant Learning Program (ILP) provides specialized services for children birth to 3 years of age who have developmental delays and/or disabilities. Parents with concerns about their child’s development may request a developmental screening or evaluation to determine if their child is eligible for services. If the child is eligible and families choose to enroll in the Infant Learning Program, the ILP provider will meet with them to develop an individual plan of services for their child. The primary provider will assist with service coordination and provide information and support to promote the child’s development. Consultations by physical, occupational and speech/language therapists may be available. No family will be denied services because of inability to pay. The North Slope Infant Learning Program has an office in Barrow and travels to the North
Chapter 1: Overall health

North Slope Borough Baseline Community Health Analysis

Slope communities of Anaktuvuk Pass, Atqasuk, Barrow, Kaktovik, Nuiqsut, Point Lay and Wainwright. It is a component of ACCA (Alaska Center for Children and Adults), a non-profit agency in Fairbanks that also provides Infant Learning Program services in the Fairbanks North Star Borough, Delta-Greely School District and the Copper River area.

It is estimated that at least 8% of children aged birth to 3 years may be eligible for specialized services in the NSB because of developmental delay or conditions that put them at risk for developmental problems, based on a model that incorporates community variables known to predict eligibility for Infant Learning Program services such as OCS reports of harm, prenatal care and preterm birth rates, poverty rates and education levels. The prevalence of children served in the NSB was 1.67% in December of 2003, however, suggesting that a high proportion of eligible children may not be receiving services. Regional or local differences in percent of children served may reflect not only the prevalence of children meeting eligibility requirements, but also "local system structure and visibility, availability of providers, community knowledge, etc." 127

Services for Elders and Disabled Adults
The NSB Health Department also runs the Senior Program, which provides services such as Meals on Wheels, Handicap/Elder van, temporary and long-term housing in Barrow, and safety programs.

1.2.4.3. Health Services Provided or Coordinated by ASNA

Outpatient Medical Care
ASNA primary care physicians and mid-level practitioners provide general outpatient and prenatal care at SSMH for residents of the NSB, except those living in Point Hope and Anaktuvuk Pass, who usually receive direct medical services from other tribal health organizations. Prenatal care was previously provided by the NSB Public Health Nursing Program but is now the responsibility of ASNA. ASNA providers also provide consultation and supervision for the Community Health Aides, although the CHAP program is operated by the NSB Health Department. Specialty physicians hold clinics on a periodic basis in Barrow, but NSB residents must travel to Anchorage for many specialty services, including high-risk obstetrics, intensive care, surgery and other major procedures, and in-depth consultations. These referrals are coordinated by ASNA providers and case managers.

Preventive and Screening Services
In 2005, ASNA assumed responsibility for the Screening for Life program, providing breast and cervical cancer screening to NSB women via mammograms, breast exams, and pap smears. Previously, the NSB Public Health Nursing Program was contracted to provide these services. In July 2009, the program received additional funding from CDC to provide colorectal cancer screening and will be expanding services to include colonoscopies to males and females age 50 and over.

Inpatient Hospital Care and Ancillary Services
Constructed in 1963 and operated by ASNA since 1966, Samuel Simmonds Memorial Hospital in Barrow has a small (14-bed) inpatient facility, providing general medical inpatient care, inpatient pediatric care, and telemetry to residents of the NSB. The hospital also provides a 24-hour emergency room, obstetric care and uncomplicated deliveries, optometry, pharmacy, laboratory, audiology, physical therapy, respiratory therapy, and radiology services. Diabetes education and nutritional services are also provided. A new, larger hospital building is currently under construction.

Dental Health Services
SSMH Dental Clinic provides dental services for Barrow and outlying villages. The dental clinic staff also runs oral health promotion programs through local schools and other community-based programs. Dental specialists travel to Barrow periodically to provide specialty dental care.
Chapter 1 Endnotes


2. Behavioral Risk Factor Surveillance System (BRFSS): Statewide data accessed online at [http://www.hss.state.ak.us/dph/chronic/hs/brfss/default.htm](http://www.hss.state.ak.us/dph/chronic/hs/brfss/default.htm). NSB-specific data for 1991–2007 was provided upon request for this report by the Alaska Department of Health and Social Services, Chronic Disease Prevention and Health Promotion, Division of Public Health.

3. Poppel, B., J. Kruse, G. Duhaime, L. Abruynina. 2007. SLiCA Results. Anchorage: Institute of Social and Economic Research, University of Alaska Anchorage. Data tables and other information about the study were accessed online at [http://www.iser.uaa.alaska.edu/Projects/living_conditions/results.htm](http://www.iser.uaa.alaska.edu/Projects/living_conditions/results.htm).


Nageak, E. NSB Health Department Health Educator. Personal communication 1.26.11. States sources as “what I have learned from the Elders and from knowledgeable presenters.”


Litara, J. Principal Ipalook Elementary School, Barrow, Alaska. Personal communication, January 6, 2011.


Edwardson, G. NSB resident and President Iñupiat Community of the Arctic Slope (ICAS). Personal communication, March, 2010.


Alaska Department of Motor Vehicles: http://www.state.ak.us/dmv/research/curreg07.htm


Shepro, D., Mass, and D. Calloway, North Slope Borough 2003 North Slope Borough Economic Profile and Census Report: This report represents the results of a periodic household census commissioned by the North Slope Borough that examines the current population, economic status, employment, education, subsistence participation, and attitudes of the entire NSB population.


Alaska Department of Environmental Conservation: Contaminated Sites Program Database [http://www.dec.state.ak.us/SPAR/CSP/db_search.htm](http://www.dec.state.ak.us/SPAR/CSP/db_search.htm).


Chapter 2: Cancer

Half of all men and one-third of all women in the United States will be diagnosed with cancer during their lifetime—most in their later years—and about one in five Americans will die from it. It is now the leading cause of death in Alaska overall, among Alaska Natives, and in the NSB, and it is understandably a major community health concern in the NSB. Overall cancer incidence rates and cancer death rates have declined in the United States, but cancer incidence is increasing not only among Alaska Natives but among Inuit in all circumpolar regions. Concerns about environmental pollution have fueled fears and anger about cancer in many arctic communities, while high smoking rates and dietary factors continue to increase cancer risk in the NSB and neighboring regions.
2.1. Cancer Statistics

2.1.1. Cancer Incidence

2.1.1.1. Overall Cancer Incidence

There were 288 cases of invasive cancer documented in the NSB between 1996 and 2009. The age-adjusted incidence for this period was higher than both the statewide and national age-adjusted rates, but these differences were not statistically significant. In other words, these numbers are estimates of the "true" incidence of cancer in the populations adjusted for differences in age composition, and the ranges of estimates in the three groups overlap.1,3

Figure 2.1: Incidence of Invasive Cancers, all Types, 1996–2009: Cases per 100,000 population

<table>
<thead>
<tr>
<th></th>
<th>NSB (461.8-604.6)</th>
<th>Alaska (481.2-493.1)</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidence rate</td>
<td>530.1</td>
<td>487.1</td>
<td>467.4</td>
</tr>
</tbody>
</table>


Nationwide and in Alaska, overall incidence of invasive cancer has declined slightly, while in the NSB this decline is not apparent.1,3 Because of the small absolute number of cases annually in the NSB (generally in the range of 15–25 cases), rates fluctuate widely from year to year and trends over a relatively short period of time are difficult to interpret. Epidemiologic work done by Dr. Bowerman4 for the NSB in 1998 documented the increasing cancer incidence among Alaska Natives in the NSB between 1971 and 1994, and the NSB incidence data in Figure 2.2 suggest a continuation of this upward trend.

Figure 2.2: Trends in Incidence of Invasive Cancer, all Types, 1996–2009


2.1.1.2. Cancer Incidence, by Type of Cancer

Lung cancer is the most common type of cancer diagnosed in NSB residents, followed by colorectal, prostate, and breast cancers.¹

![Figure 2.3: Incidence of Invasive Cancer, by Site of Malignancy, 1996–2009](image)

Cases per 100,000 population, age-adjusted to 2000 U.S. standard population.

*Rates for NSB are based on fewer than 20 cases and should be interpreted with caution.


NSB data source: SEER (U.S. rates are for 1996–2007).

Lung Cancer Incidence—Regional Comparisons

The incidence of lung cancer among NSB males is the highest in the state and is significantly higher than the statewide incidence rate.² Gender-specific lung cancer incidence show a striking male predominance in the NSB, with rates among males more than five times that among females. This male predominance in lung cancer incidence is also seen in other areas of the state, although it is most marked in the NSB, Nome, and Bethel regions. According to the Centers for Disease Control and Prevention, lung cancer incidence rates among U.S. males are less than twice rates among U.S. females (83 vs. 55 cases per 100,000 persons, respectively).³

![Figure 2.4: Lung Cancer Incidence, by Borough and/or Census Area and Gender, 1996–2009](image)

Cases per 100,000 population, age-adjusted to 2000 U.S. standard population.


NWA=NWAB=Northwest Arctic Borough
Looking at Alaska Natives specifically, Alaska Native males in the Barrow service unit had a significantly higher incidence of lung cancer than the average incidence among Alaska Native males from all other service units combined during 1989–2003.6

**Figure 2.5: Lung Cancer Incidence for Alaska Natives, by I.H.S. Service Unit and Gender, 1989–2003**

<table>
<thead>
<tr>
<th>Service Unit</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anchorage</td>
<td>132</td>
<td>108</td>
</tr>
<tr>
<td>Barrow*</td>
<td>289</td>
<td>56</td>
</tr>
<tr>
<td>Bristol Bay</td>
<td>124</td>
<td>88</td>
</tr>
<tr>
<td>Interior</td>
<td>115</td>
<td>115</td>
</tr>
<tr>
<td>Kotzebue</td>
<td>115</td>
<td>53</td>
</tr>
<tr>
<td>Mount Edgecumbe</td>
<td>81</td>
<td>50</td>
</tr>
<tr>
<td>Norton Sound</td>
<td>159</td>
<td>51</td>
</tr>
<tr>
<td>Yukon Kuskokwim</td>
<td>142</td>
<td>40</td>
</tr>
</tbody>
</table>

Cases per 100,000 population, age-adjusted to 2000 U.S. standard population.

IHS service units include Alaska Native residents residing in communities served by the respective tribal health organization. The Barrow service unit includes residents of communities served by the Arctic Slope Native Association and thus does not include Point Hope.

*Statistically significant difference from average for all service areas combined (p<0.05).


**Colon Cancer Incidence—Regional Comparisons**

The second most common cancer in the NSB, colorectal cancer also shows a male predominance, but this gender difference is not statistically significant. Colon cancer incidence among NSB males is more than twice the overall statewide rate among males and is significantly higher than the overall statewide incidence for males or females. Colon cancer incidence is higher in the rural, predominantly Alaska Native regions, than it is in the urban centers of Anchorage, Fairbanks, and Juneau.3

**Figure 2.6: Colorectal Cancer Incidence Rates, by Borough and/or Census Area and Gender, 1996–2009**

<table>
<thead>
<tr>
<th>Borough</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSB</td>
<td>131.3</td>
<td></td>
</tr>
<tr>
<td>Dillingham</td>
<td>101.8</td>
<td></td>
</tr>
<tr>
<td>Nome</td>
<td>102.4</td>
<td>97.2</td>
</tr>
<tr>
<td>NWAB</td>
<td>99</td>
<td>98.1</td>
</tr>
<tr>
<td>Slika</td>
<td>77.5</td>
<td></td>
</tr>
<tr>
<td>Bethel</td>
<td>78.7</td>
<td></td>
</tr>
<tr>
<td>ALASKA</td>
<td>62</td>
<td>49.5</td>
</tr>
<tr>
<td>Juneau</td>
<td>53.7</td>
<td>45.1</td>
</tr>
<tr>
<td>Anchorage</td>
<td>53.7</td>
<td>42.3</td>
</tr>
<tr>
<td>Fairbanks</td>
<td>46.5</td>
<td>51</td>
</tr>
</tbody>
</table>

Rates are per 100,000 population, age-adjusted to 2000 U.S. standard population.

Among Alaska Natives specifically, colon cancer incidence in the Barrow service unit was not significantly different from the average rate of the other service units combined during 1989–2003.\(^6\)

### Chapter 2: Cancer

#### 2.1.2. Cancer Mortality

Over the last 20 years, cancer mortality rates in the NSB have been higher than statewide and national rates, although the differences are not statistically significant. Cancer mortality rates have been declining in Alaska and in the U.S., although this trend is not apparent in the NSB.\(^7,8\)

![Figure 2.8: Cancer Mortality Trends, 1990–2009: Cancer deaths per 100,000 population](image)

**Figure 2.8:** Cancer Mortality Trends, 1990–2009: Cancer deaths per 100,000 population

Combining over a decade of cancer mortality rates for all malignancies combined, the age-adjusted average annual rate in the NSB is almost 25% higher than the statewide mortality rate. The difference in rates does not quite reach statistical significance, however.\(^3\) The Healthy Alaskans 2010 target is to reduce the overall cancer death rate to 162/100,000.\(^28\)
Lung cancer is a particularly deadly cancer and the leading cause of cancer death in the NSB, causing 35 of the 90 cancer deaths between 1996 and 2007. Of these deaths, 28 were in males and 7 in females. Lung cancer caused more than four times the number of deaths attributed to stomach or colorectal cancer deaths, the next most common causes of cancer death.\(^3\)

### Table 2.1: Cancer Deaths in the NSB, 1996–2007

<table>
<thead>
<tr>
<th>Site</th>
<th>Number of Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung and bronchus</td>
<td>35</td>
</tr>
<tr>
<td>Stomach</td>
<td>8</td>
</tr>
<tr>
<td>Colon and rectum</td>
<td>8</td>
</tr>
<tr>
<td>Pancreas</td>
<td>7</td>
</tr>
<tr>
<td>Oral cavity and pharynx</td>
<td>*</td>
</tr>
<tr>
<td>Esophagus</td>
<td>*</td>
</tr>
<tr>
<td>Gallbladder</td>
<td>*</td>
</tr>
<tr>
<td>Peritoneum, omentum, and mesentery</td>
<td>*</td>
</tr>
<tr>
<td>Soft tissue</td>
<td>*</td>
</tr>
<tr>
<td>Kidney</td>
<td>*</td>
</tr>
<tr>
<td>Brain and other nervous system</td>
<td>*</td>
</tr>
<tr>
<td>Non-Hodgkin lymphoma</td>
<td>*</td>
</tr>
<tr>
<td>Myeloma</td>
<td>*</td>
</tr>
<tr>
<td>Miscellaneous malignancies</td>
<td>15</td>
</tr>
</tbody>
</table>

*Fewer than six cases.

Data source: Alaska Cancer Registry.

### 2.1.3. Cancer Trends and Disparities in Alaska Natives Statewide and Among Circumpolar Inuit

Cancer is an area of health disparity for Alaska Natives. Alaska Natives have experienced marked increases in cancer rates over the past 30 years and have cancer mortality rates that are significantly higher than rates among U.S. and Alaska whites.\(^4,9\) Statewide, cancers are diagnosed at similar stages among Alaska Natives and U.S. whites, but relative five-year survival rates for all invasive cancers, as well as for many specific sites, are significantly lower among Alaska Natives than for U.S. whites.\(^6\)

Cancer in general has been increasing among Alaska Natives\(^6\) and among Inuit in all regions, among both men and women.\(^2\) The increasing cancer rates among Alaska Natives and among circumpolar Inuit have been due primarily to increases in lung and colon cancer. Lung cancer incidence among Alaska Native men doubled between 1969 and 2003, whereas among Alaska Native women, lung cancer incidence more than quadrupled.\(^6\) Colon cancer has also increased dramatically among both Alaska Native men and women. Cervical cancer rates have decreased due to the use of screening pap smears. For a number of cancer sites, incidence is higher among Alaska Natives than U.S. whites. These include oral cavity and pharynx, esophagus, stomach, colon-rectum, liver, gallbladder, pancreas, lung, and kidney.\(^6\)

Several cancers, while relatively rare, are many times higher in Inuit populations than among other populations. These so-called “traditional cancers” include nasopharyngeal and salivary cancers, both of which are associated with a viral infection called Epstein-Barr virus. Other cancers, including prostate cancer and brain cancer, affect Inuit in circumpolar regions at lower rates than in other populations,\(^2,11\) leading
researchers to search for genetic differences and environmental, diet, and lifestyle factors that may be protective against these types of cancer. The cancer incidence rate for all cancers combined is similar in Alaska Native children and U.S. white children.

2.2. Determinants of Cancer Risk

Cancer is a complex illness. Not really a single disease, cancer is a constellation of many related diseases that involve abnormal, uncontrolled growth and spread of certain cells. Although we do not fully understand how and why a cancer develops, researchers have identified a number of factors that can contribute to the risk of developing cancer. The relative contribution of risk factors varies depending on the type of cancer being considered, and in most cases it is impossible to know with certainty what caused the cancer to occur. Some researchers suggest that the combination of tobacco use, poor diet, and a sedentary lifestyle are responsible for about two-thirds of overall cancer risk. Other factors, such as environmental and occupational exposures, genetic variations, and viruses are thought to contribute approximately one-third. As with other aspects of health, socioeconomic factors influence a person’s risk of cancer, as well as their chances of surviving a cancer diagnosis, through a variety of pathways.

Figure 2.10: Causes of Cancer: Relative Contribution of Risk Factors

![Figure 2.10: Causes of Cancer: Relative Contribution of Risk Factors](image)

*Socioeconomic status is an important underlying factor operating through other specific causes.


2.2.1. Tobacco

Tobacco smoking is a major risk factor for the most common types of lung cancer as well as other common cancers, including colon, stomach, esophageal, mouth and neck, bladder, and cervical cancers. It is estimated that cigarette smoking accounts for between 68% and 78% of female lung cancer deaths and 88% to 91% of male lung cancer deaths. The association between tobacco and cancer is not simple, and tobacco may have additive or multiplicative effects with environmental exposures and genetic vulnerabilities. For example, lung cancer rates can vary dramatically in different populations with similar smoking rates, and it has been suggested by some researchers that the beginning of the increase in lung cancer among Canadian Inuit predated the increase in tobacco smoking.

As outlined in Chapter 1, smoking rates in the NSB are among the highest in the state and nation and show no signs of declining. Men in the NSB smoke at higher rates than women, and men are more likely to be heavy smokers, although it is not clear whether the marked gender difference in NSB lung cancer rates can be entirely explained by differences in tobacco smoking practices. Whereas it is important to acknowledge that a variety of factors undoubtedly contribute to cancer risk in the NSB, tobacco smoking is likely to be the single largest, and most preventable, contributor to lung cancer, the leading cause of cancer death in the NSB, as well as to the overall risk of cancer in the NSB.
2.2.2. Diet and Lifestyle

Diets high in fruits and vegetables have been linked with a decreased risk of colon cancer, while diets high in red and processed meats have been associated with an increased risk of colon cancer,\textsuperscript{17} the second most common cancer in the NSB and one with higher rates than are seen statewide. Physical inactivity and obesity, as well as heavy alcohol use, are also associated with an increase risk of colon cancer.\textsuperscript{17} Breast cancer is also associated with obesity and dietary factors, in addition to reproductive factors such as lower number of children, older age at first birth, and length of breastfeeding.\textsuperscript{17} Recent research suggests a possible association between pancreatic cancer, the fourth leading cause of cancer death in the NSB, and high consumption of soda pop.\textsuperscript{18}

Subsistence foods may reduce the risk of some cancers. For example, consumption of subsistence foods rich in omega-3 fatty acids and selenium have been associated with reduced rates of prostate cancer in Canadian Inuit.\textsuperscript{11} The documented decline of subsistence foods consumption and replacement with processed store foods and sugared beverages among Alaska Natives in some parts of the state may be contributing to the increase in cancer in this group. Similar to many other communities in Alaska and the U.S., the NSB has experienced rising rates of obesity and diabetes, as outlined in Chapter 4. Similar to other communities in Alaska and the U.S., a majority of NSB residents also report levels of fruit and vegetable consumption and physical activity that are below recommended levels, as outlined in Chapter 1. Moreover, levels of soda consumption in the NSB are well above statewide estimates. These patterns may be contributing to the risk of colon, breast, and other cancers in the NSB, although the continuing tradition of subsistence hunting and using local subsistence foods may be having an important protective effect.

2.2.3. Environmental Factors

Environmental causes of cancer have been a topic of particular concern in the NSB and throughout the circumpolar arctic, where global contaminants concentrate in the subsistence food chain and local industrial activity is a source of environmental pollution. Some NSB residents have expressed concerns about pollution from oil and gas development and its role in increasing rates of cancer in the NSB. Many North Slope residents are also concerned about possible health effects of exposure to radiation from sources such as radioactive fallout, the intentional dumping of radioactive materials, and the administration of the radioactive iodine-131 to inadequately informed residents of Wainwright, Point Lay, Point Hope, and Anaktuvuk Pass during the now infamous 1957 thyroid function experiment.\textsuperscript{19}

Generally, the contribution of known environmental cancer risk factors is thought to be far smaller than that of smoking and lifestyle factors.\textsuperscript{14} The environmental contribution to cancer risk cannot be dismissed, however, and may be larger than previously thought. A recent presidential report suggests that nationwide, the environmental contributions to cancer have been grossly underestimated. The report cites the tens of thousands of unregulated chemicals in daily use today, some of which are known to cause cancer while most have never been rigorously tested for safety. In addition, the report recognizes the U.S. military as a major source of toxic occupational and environmental exposures that can increase the risk of cancer.\textsuperscript{21} Moreover, the combined effect of multiple low-level exposures must be considered when analyzing health risks.

The growing body of research, reviewed in Chapter 1, is demonstrating that the current health risks of radiation and other contaminants are very likely to be minimal in the Alaskan arctic, particularly when viewed relative to the health risks of other factors, such as smoking and obesity. The North Slope receives lower levels of global pollution than arctic Canada and Greenland, and in the NSB and throughout Alaska, the health benefits of subsistence foods, potentially including a reduction of cancer risk, are generally felt to outweigh any potential health risks caused by environmental contaminants.

The contribution to cancer risk in the NSB from air pollution generated by industrial and natural resource development activities has not been studied to the knowledge of the author. About 1- to 2% of lung cancer deaths are attributable to air pollution in the U.S.\textsuperscript{28} Although many questions about air quality in the NSB remain unanswered, a recent examination of air pollution levels in Nuiqsut was somewhat reassuring on this point.\textsuperscript{20} Diesel exhaust and other sources of air pollution may, however, increase the risk of certain cancers, and the number of vehicles registered in the NSB has increased considerably in the past 10 years. In addition, all but two villages (Barrow and Nuiqsut) use diesel oil as the primary way of heating homes and generating electricity. Environmental tobacco smoke is another environmental risk
factor for lung and other cancers. The city of Barrow has taken steps to decrease environmental tobacco smoke through a clean-indoor-air ordinance that prohibits smoking in restaurants, in addition to public governmental buildings. Previous NSB Census reports have documented a high level of awareness of the dangers of second-hand tobacco smoke. In the 2010 NSB Census, 95% of non-smoking household heads prohibit smoking in their home, but one of three household heads who smoke still allow smoking in their home.

Concerning the contribution of radioactivity to cancer risk in the North Slope specifically, cancer risk calculations have determined that in a worst-case scenario (likely overestimating the true risk by a factor of 10 to 1000), a maximum of 3.6 cases of cancer would have developed in North Slope villages over a 20-year period because of radioactive fallout burdens. Analyses of radioactivity levels of caribou and marine species in the North Slope have also demonstrated the safety of these important subsistence resources. At the state level, no increase in radiation-related cancers has been detected in Alaska Natives, nor have residents of Iñupiat villages exposed to increased levels of radiation been found to have higher rates of the types of cancers that result from radioactive fallout. At the state level, there also does not appear to be any excess in radiation-associated cancers in Alaska Native children, compared with U.S. white children. Caution is warranted in drawing any conclusions from such epidemiologic data, however, due to very small numbers of cases in individual villages and to the relative rarity of cancers associated with radiation exposure. Commissioned by the NSB, one small study of cancer cases in Point Hope raised concerns about possible environmental exposures by suggesting an association between cancer cases and residence in the village in 1962, the year that radioactive waste was dumped in a subsistence hunting area outside the village, known as the Project Chariot incident. Also commissioned by the NSB, a follow-up investigation of the 1957 radioactive Iodine-131 experiment found one case of thyroid cancer among former participants but concluded that the contribution to cancer risk among participants was extremely difficult to quantify.

Of additional note, the relatively high rates of stomach cancer in rural Alaska and among Alaska Natives are thought to have a cause that is at least, in part, environmental. One risk factor for stomach cancer is chronic infection with the bacteria Helicobacter pylori. Infection with H. pylori is associated with inadequate water and sanitation facilities, common in rural Alaska. It is possible that the improvements to sanitation infrastructure in the NSB have decreased this particular risk factor for cancer in the NSB.

### 2.2.4. Cancer Screening and Early Detection

Some types of cancer can be detected at early, potentially curable, stages through screening tests. Cervical, breast, and colon cancer are the forms of cancer with screening tests that have been the most widely studied and supported by research.

#### 2.2.4.1. Cervical Cancer Screening

The introduction of the routine Pap test, or Pap smear, has dramatically reduced the incidence and mortality of cervical cancer nationwide, including among Alaska Natives. Based on data from ASNA’s electronic health record database, however, in 2007, 62.6% of Alaska Native women aged 21–64 years in the Barrow service unit (without history of hysterectomy) have had a documented Pap within the previous three years. This number was lower than the percentage of Alaska Natives statewide (74.9%) for the same year. These data do not include the village of Point Hope. Although these data have the benefit of documentation from electronic health records rather than self-report, the database may not fully capture records of Pap tests done outside the local health care system.

According to BRFSS survey data, based on a sample of 72 NSB women in 2005–2007, 93% (C.I. 79–97%) of surveyed NSB women aged 18 and over (without a history of hysterectomy) reported having had a Pap smear within the previous 3 years. This number is higher than the statewide estimate of 87% for 2006, but the NSB estimate is based on a small sample and the difference is not statistically significant. The Healthy Alaskans 2010 objective is to increase the percentage of women aged 18 years and older who have had a Pap test within three years to 96%. The percentage of Alaskan women who report having had a Pap test within the last three years has consistently been higher than the national average. In Alaska in 2006, there was not a significant difference in the percentage of Native vs. non-Native women who have had the test, and no differences were noted by age, education, or income level.
A vaccine to prevent cervical cancer was approved in 2006. The vaccine, which protects against infection with certain types of the human papilloma virus (HPV), is currently recommended for all girls and women aged nine to 26 years and the vaccine has recently been recommended for boys also as it has been found to protect against certain other types of cancer as well. The state of Alaska pays for the vaccine for girls age nine through 18 years who are eligible for the Vaccines for Children program. Data on vaccination rates in the NSB are not currently available, to the author’s knowledge.

2.2.4.2. Breast Cancer Screening

Data from ASNA’s electronic health records database suggest that breast cancer screening rates for Alaska Native women in the ASNA service area may be lower than in other service areas. In 2007, 48.3% of Alaska Native women in the Arctic Slope service area aged 52–64 years were documented to have received a mammogram within two years, compared with 61.8% of Alaska Native women statewide.26 These data do not include the village of Point Hope. Again, it is possible that these data may not fully capture screening received outside the local service area.

BRFSS survey data on mammographic screening for the NSB are not available because of insufficient sample size. In Alaska and nationwide, the prevalence of mammography screening has been increasing since the early 1990s. In 2006, 73% of Alaskan women over the age of 40 years reported obtaining a mammogram in the prior two years. The percentage was higher for Native (81%) than for non-Native (72%) women, but this difference was not statistically significant.27 The Healthy Alaskans 2010 target is for 76% of women aged 40 years and older to have received a mammogram within the preceding two years.28

2.2.4.3. Colon Cancer Screening

Data from ASNA’s electronic health records database suggest that colon cancer screening rates among Alaska Natives, as of 2007, were lower than statewide rates. In 2007, only 11.5% of Arctic Slope Alaska Native people aged 51–80 years were documented to have had lower colorectal cancer screening.26 Data do not include the village of Point Hope. This number is likely to increase significantly with the addition of colonoscopy services through ASNA’s Screening for Life program. Since, until recently, colonoscopies were only available outside the Barrow service area, it is also likely that some off-slope colon cancer screenings were not included in these estimates.

BRFSS survey data for the NSB on colon cancer screening are not available because of insufficient sample size. The number of U.S. and Alaskan adults over 50 undergoing colon cancer screening has increased over the past decade.27 In 2006, 55% of Alaskan survey respondents over age 50 years reported ever having had a sigmoidoscopy or colonoscopy. There were no significant differences by gender or race in the prevalence of ever having had a home blood stool test or colonoscopy or sigmoidoscopy, but screening rates increased with income and level of education.27 The Healthy Alaskans 2010 target is for 64% of adults aged 50 years and older to have received colorectal screening examination (sigmoidoscopy or colonoscopy).28

Chapter 2 Endnotes

Chapter 3: Injury

Unintentional injury (formerly called accidents) and intentional self-harm (suicide) have been among the leading causes of death in the NSB for many years. Moreover, they are consistently the top causes of premature death among North Slope residents, robbing families and communities of young lives that are the hope for the future. Injuries that do not result in death can lead to lost productivity, suffering, healthcare costs, and sometimes, long-term disability. Intentional injury of others (assaults), and particularly intimate partner violence and sexual assault, also have tremendous impacts on community health. Injury is a major area of health disparity for the NSB.
3.1. Injury Statistics

3.1.1. Non-Fatal Injury Hospitalization

3.1.1.1. Injury Hospitalization Rates, by Cause of Injury

From 1999 to 2008, there were 736 non-fatal injury hospitalizations among North Slope (referred to as Arctic Slope in the source material) residents. During this 10-year period, the leading causes of injury hospitalization were falls, followed by suicide attempts, assault, and snowmachine-related injury hospitalization. Non-fatal injury hospitalization rates were highest in the elderly, due to falls. With the exception of motor vehicle traffic-related injury hospitalizations, rates in the NSB were higher than statewide rates for the leading causes of injury hospitalization. In particular, the snowmachine-related injury hospitalization rate among NSB residents was five times the statewide rate, and among Alaska Native/American Indian (AN/AI) residents only, the NSB rate was more than twice the statewide rate. These rate disparities were similar for all-terrain vehicles (ATVs), or 4-wheelers.


Rates displayed above are for the individual causes of injury with at least 20 occurrences during the 10-year time period. Data are reported by residential region of the patient, not by region where the injury occurred. The Arctic Slope region includes all NSB villages, plus Deadhorse, Prudhoe Bay, and Alpine; however, only one patient listed their residence as in an oil industry village (Prudhoe Bay). Among Arctic Slope residents, 8% of injury hospitalizations occurred outside of the region.

All rates are per 10,000 residents, not adjusted for age.

Figure 3.1: Non-Fatal Injury Hospitalization Rates, by Cause of Injury: Hospitalizations per 10,000 persons, 1999–2008

3.1.1.2. Regional Injury Hospitalization Rate

Non-fatal injury hospitalization rates vary widely across the state. In 2004–2008, the Northwest Arctic and Norton Sound regions had the highest rates in the state—notably higher than the neighboring Arctic Slope, as seen in Figure 3.2.
Figure 3.2: Total Non-Fatal Injury Hospitalization Rates, by Region: 
Hospitalizations per 10,000 persons, 2004–2008

<table>
<thead>
<tr>
<th>Region</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Alaska</td>
<td>71.1</td>
</tr>
<tr>
<td>Arctic Slope</td>
<td>96.9</td>
</tr>
<tr>
<td>Aleutian and Pribilof Islands</td>
<td>30.5</td>
</tr>
<tr>
<td>Anchorage/Matanuska-Susitna</td>
<td>53.7</td>
</tr>
<tr>
<td>Bristol Bay Area</td>
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<tr>
<td>Copper R/PWS</td>
<td>81.4</td>
</tr>
<tr>
<td>Interior and Fairbanks</td>
<td>68.7</td>
</tr>
<tr>
<td>Kenai Peninsula</td>
<td>69.1</td>
</tr>
<tr>
<td>Kodiak Area</td>
<td>54.9</td>
</tr>
<tr>
<td>Norton Sound</td>
<td>203.1</td>
</tr>
<tr>
<td>Northwest Arctic</td>
<td>235.5</td>
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<tr>
<td>Southeast Region</td>
<td>69.5</td>
</tr>
<tr>
<td>Yukon Kuskokwim area</td>
<td>143.3</td>
</tr>
</tbody>
</table>

Data are reported by residential region of the patient, not by region where the injury occurred. The Arctic Slope region includes all NSB villages, plus Deadhorse, Prudhoe Bay, and Alpine; however, only one patient listed their residence as in an oil industry village (Prudhoe Bay). Among Arctic Slope residents, 8% of injury hospitalizations occurred outside of the region.
All rates are per 10,000 residents, not adjusted for age.

3.1.1.3. Injury Hospitalization Rates, by Race

Injury is an area of considerable racial disparity, both in Alaska and in the NSB. In 2004–2008, the non-fatal injury hospitalization rate for Alaska Native/American Indian residents of the North Slope was more than three times that of non-Native residents. This racial disparity is similar to that seen at the state level.1

Figure 3.3: Non-Fatal Injury Hospitalization Rates, By Race: 
Hospitalizations per 10,000 persons, 2004–2008

Data are reported by residential region of the patient, not by region where the injury occurred. The Arctic Slope region includes all NSB villages, plus Deadhorse, Prudhoe Bay, and Alpine; however, only one patient listed their residence as in an oil industry village (Prudhoe Bay). Among Arctic Slope residents, 8% of injury hospitalizations occurred outside of the region.
All rates are per 10,000 residents, not adjusted for age.
3.1.4. Injury Hospitalization Rate Trends

Annual non-fatal injury hospitalization rates have fluctuated quite widely in the NSB since 1992. Between 1992 and 2008, the number of injury hospitalizations per year among NSB residents varied from a low of 43 hospitalizations in 1995 to a high of 106 hospitalizations in 2001.

![Image of hospitalization rates graph]

Data are reported by residential region of the patient, not by region where the injury occurred. The Arctic Slope region includes all NSB villages, plus Deadhorse, Prudhoe Bay, and Alpine; however, only one patient listed their residence as in an oil industry village (Prudhoe Bay). Among Arctic Slope residents, 8% of injury hospitalizations occurred outside of the region.
All rates are per 10,000 residents, not adjusted for age.

3.1.5. Traumatic Brain Injury Hospitalizations

Traumatic brain injury (TBI) refers to damage to the brain resulting from an injury, usually caused by a blow or jolt to the head. Survivors of TBI can experience immediate symptoms such as headache and confusion as well as long-term cognitive, emotional, and behavioral effects. According to Alaska Trauma Registry data, between 2004 and 2008, 51 North Slope residents were hospitalized with TBI. Of these, 14 hospitalizations were the result of falls, 13 were caused by snowmachine or all-terrain vehicles, and 5 were the result of traffic accidents.

The incidence rate of TBI in Alaska is 28% higher than the national rate. Rural regions typically have the highest rates; Alaska Natives have significantly higher rates than other racial groups. Males of all ages have higher rates than females, and males ages 15–24 years are at the highest risk.

3.1.2. Unintentional Injury

Unintentional injuries include all injuries for which the harmful outcome was not intended. Some examples include motor vehicle injuries and falls. At times, it is difficult to determine whether an injury was truly unintentional, particularly when the injury results in death of the victim.
3.1.2.1. Unintentional Injury Mortality

Whereas rates have declined since the 1970s, death rates from unintentional injury remain higher in the NSB than statewide and national rates and Healthy Alaskans 2010 targets. Unintentional injury is the leading cause of premature death in the NSB and the leading cause of death among Alaska Native children statewide.

**Figure 3.5: Unintentional Injury Mortality Rates: Average annual number of deaths per 100,000 population, 1990—2009**

The largest single cause of unintentional injury death in the NSB is motor vehicle accidents, including both on- and off-road, and the mortality rate from motor vehicle accidents is more than twice the statewide rate.

**Figure 3.6: Unintentional Injury Death Rates, by Cause: Deaths per 100,000 population, 1994–2008**

ATV and snowmachine injuries may be categorized as “traffic” or “non-traffic,” depending on the location of the accident. From 1999 through 2008, there were 16 deaths in the NSB from off-road vehicles, with five ATV-related deaths, and 11 snowmachine-related deaths. During this period, non-traffic motor vehicle accidents occurred at almost 10 times the statewide rate.
Figure 3.7: Motor Vehicle Accidental Death Rates: Average annual number of deaths per 100,000 population, 1999–2008

*Motor Vehicle, Other, non-traffic* are accidents occurring away from the highway and include snowmachines and ATVs (4-wheelers). A minority of snowmachine- and ATV-related deaths are also categorized as “Motor Vehicle Traffic” if they occurred on the highway.

Rates are age-adjusted to 2000 U.S. standard population.
NSB rates are based on fewer than 20 occurrences and should be interpreted with caution.

3.1.2.2. Unintentional Injury Hospitalization

Between 1991 and 2003, the North Slope (referred to in the source report as Arctic Slope) had the second highest rates of unintentional injury hospitalization of all Alaska Native Health Service regions. Data include Alaska Native only, and include all NSB villages, including Anaktuvuk Pass and Point Hope.

Unintentional Injury Hospitalization Among Children: In 2001–2006, the North Slope had the third highest regional rate of unintentional injury hospitalization for children in the state. The rate in the North Slope was twice the statewide rate (82/10,000 vs. 41/10,000). Between 1991 and 2003, the leading causes of unintentional injury hospitalization among Alaska Native children in the North Slope were falls, ATV, snowmachine, other motor vehicle, and poisoning.
3.1.3. Intentional Self-Harm: Suicide

3.1.3.1. Suicide Mortality

Suicide Rate Trends
Suicide was the fourth leading cause of death in the NSB in 2006–2008. After a period of increasing rates through the 1980s, suicide rates appear to have roughly leveled off (although they fluctuate from year to year) in the NSB. They have remained a leading cause of death in the NSB for over two decades. Since 1990, age-adjusted suicide mortality rates in the NSB have averaged twice the statewide average and four times the national average. More than two-thirds of the completed suicides occurring on the North Slope since 2000 have been by use of firearms.6

![Figure 3.9: Suicide Mortality Rates: Average annual number of deaths per 100,000 population, 1990—2009](image)

*NSB rates are based on fewer than 20 occurrences per time period and must be interpreted with caution.
All rates are age-adjusted to the 2000 U.S. standard population.
U.S. rates are for the single, midpoint year of the five-year period noted.

Suicide Rates: Regional Comparison
Suicide rates vary considerably among different regions in Alaska. From 1990 through 2006, the northern and western regions of the state had the highest suicide rates, while the Aleutians and southeastern regions had the lowest.7 In 2007–2009, the average suicide rate in the NSB was the 6th highest among Alaskan boroughs and/or census areas.6 Specific rankings must be viewed with caution, however, because of the small number of events, from a statistical standpoint.

<table>
<thead>
<tr>
<th>Borough and/or Census Area</th>
<th>Age-Adjusted Suicide Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northwest Arctic</td>
<td>67.5</td>
</tr>
<tr>
<td>Wade Hampton</td>
<td>62.8*</td>
</tr>
<tr>
<td>Bethel</td>
<td>61.6</td>
</tr>
<tr>
<td>Yukon-Koyukuk</td>
<td>60.2*</td>
</tr>
<tr>
<td>Nome</td>
<td>53.8</td>
</tr>
<tr>
<td>North Slope</td>
<td>43.6</td>
</tr>
<tr>
<td>Dillingham</td>
<td>42.4*</td>
</tr>
<tr>
<td>Ketchikan Gateway</td>
<td>33.5*</td>
</tr>
<tr>
<td>Sitka</td>
<td>24.7*</td>
</tr>
<tr>
<td>Matanuska-Susitna</td>
<td>23.2</td>
</tr>
<tr>
<td>Kodiak Island</td>
<td>23.1</td>
</tr>
<tr>
<td>Kenai Peninsula</td>
<td>22.8</td>
</tr>
</tbody>
</table>
3.1.3.2. Suicide Attempts and Suicidal Thoughts

Suicide Attempt Hospitalization Rates
Between 1999 and 2008, 113 NSB residents were hospitalized for intentional self-harm and/or suicide attempts. Suicide attempt was the second leading cause of non-fatal injury hospitalization. As shown in Figure 3.1, the suicide hospitalization rate for NSB residents overall was higher than the Alaska rate (17 vs. 10 per 10,000, respectively), but among AI/AN, the NSB rate was lower than that of AI/AN residents statewide (22 vs. 27 per 10,000, respectively).1 The average number of suicide attempt hospitalizations among AI/AN residents of the NSB—approximately 11 hospitalizations per year—was similar during the periods 1991–2003 and 1999–2008.1,5

Suicidal Thoughts Among NSB Adults
The Survey of Living Conditions in the Arctic survey collected some data on suicidal thoughts among indigenous residents of circumpolar regions, all of which suffer from high rates of suicide. Compared with the other arctic indigenous regions surveyed, Iñupiat adults in the NSB had a similar likelihood of reporting a history of serious suicidal thoughts, both in the past year and during their lifetimes.8

Figure 3.10: Suicidal Thoughts Among Circumpolar Indigenous Populations

Self-Reported Suicidal Thoughts and Suicide Attempts Among NSB Youth
Adolescents and young adults, particularly Alaska Natives, are at the highest risk of dying from suicide in Alaska. Between 1991 and 2003, suicide attempt was the third leading cause of nonfatal injury hospitalization of North Slope Alaska Natives aged 0–19 years.5

According to 2005 Youth Risk Behavior Surveillance (YRBS) survey data, 16% of NSB high school students had seriously considered attempting suicide in the past 12 months. They were not, however, more likely to report seriously considering suicide than were their counterparts statewide or nationally.3
NSB high school students were, however, significantly more likely to have actually attempted suicide one or more times during the past year than were high school students in the nationwide sample.9

Among youth, suicidal thoughts and attempts are common. In a 2004 student survey, more than one in three NSB 12th graders reported having attempted suicide at least once in their lifetimes.10

Although males are more likely to complete suicides, suicide attempts are more common among female students.10 This pattern is seen throughout the U.S.
3.1.3.3. Suicide in the NSB, in Context

Suicide is a complicated phenomenon and one with devastating effects on families and communities. In 2004, the suicide rate in Alaska was more than double that of the rate in the U.S., giving it the highest rates in the U.S., and rates have not declined in the last decade. The northern and western rural regions of the state are most severely impacted. The age distribution of suicides in Alaska is also quite different than the national age distribution. In Alaska, young people aged 15–24 years have the highest risk of suicide. In 2009, the suicide rate for young men aged 15–24 years was 56 per 100,000, compared with an overall rate of 20 per 100,000. The suicide rate among young men is more than three times that of young women. By contrast, in the U.S. overall, older persons are disproportionately more likely to die of suicide.

Suicide is also an area of significant racial disparity. Suicide rates among Alaska Native peoples are higher than for any other ethnicity in the state and roughly twice the rate among white Alaskans. This disparity is especially evident among Alaska Native males in the 15- to 24-year-old age group, who have a staggering suicide rate of 142 per 100,000. According to one study, Alaska Native males have the highest documented suicide rates in the world. This racial disparity in suicide rates appears to have developed in the second half of the 20th century. In the 1950s, Alaska Natives had a suicide rate that was considerably lower than that of non-native Alaskans. Since 1960, the incidence of suicide among Alaska Natives has increased 500%, almost tripling in the 1960s and 1970s, then essentially leveling off at roughly twice statewide and four times national rates. Similar but even more dramatic increases in suicide have occurred among other circumpolar indigenous populations in the past 20–30 years, again reflecting an epidemic rise in suicide among northern indigenous youth.

3.1.4. Intentional Harm to Others: Assault, Homicide, Sexual Assault, and Domestic Violence

3.1.4.1. Assault, Homicide and Violent Crime Overall

Assault is the most common offense reported to local law enforcement in the NSB. Between 2000 and 2009, there were 2,525 assaults, including both simple and aggravated assault, reported to the NSB Police Department. The rate of assaults in reported in the NSB has not changed appreciably since 2000. Between 2000 and 2008, there were six deaths caused by homicide in the NSB. Half of these homicides were by the use of firearms.

During 2006–2009, the average annual violent crime rate in the NSB (including murder and non-negligent manslaughter, robbery, forcible rape, and aggravated assault) was higher than both the Alaska and U.S. rates. Crime rate comparisons must be made with extreme caution, however, because of the many factors that influence crime rates, such as the age composition of the population and local law enforcement and reporting practices.

Figure 3.15: Violent Crime: Average violent crime rate per 100,000 inhabitants, 2006–2009

*includes murder and non-negligent manslaughter, robbery, forcible rape, and aggravated assault (an unlawful attack by one person upon another for the purpose of inflicting severe or aggravated bodily injury). Data source: FBI Uniform Crime Reports
3.1.4.2. Sexual Assault

Sexual assault is defined as any sexual contact without consent. Official crime statistics collected at the state and national level include primarily rape and attempted rape by force. Whereas these statistics are important, they underestimate the actual number of cases of sexual assault significantly, as many incidents of sexual assault do not meet the strict case definition. Statutory rape (without force) and other sex offenses are not included in rape rates. Moreover, many victims who have experienced a sexual assault do not report the incident to authorities, particularly when alcohol or drugs have impaired one’s ability to give consent or recall details of the event.

Alaska has the highest rate of forcible rape in the country and has for much of the last three decades. In a 2010 telephone survey of English-speaking adult Alaskan women, 37% of women reported experiencing sexual violence and 26% reported experiencing forcible sexual assault in their lifetime. In the same survey, 4.3% of women reported experiencing sexual violence and 2.5% reported experiencing forcible sexual assault in the past year. These past-year estimates are 10- to 20-fold higher than the official annual forcible rape rate for Alaska based on crime reports, highlighting both the problem of underreporting and the scope of sexual violence in Alaska. Sexual assault is also an area of racial disparity. Alaska Native and Native American women are 2.5 times as likely to be raped or sexually assaulted as are other women in the U.S.

Forcible Rape: Data from the Uniform Crime Reporting System

According to the Uniform Crime Reporting surveillance system, between 2000 and 2009, the number of rapes reported to the NSB Police Department has ranged from one to 29 per year, averaging 16.5 cases/year for this time period. Multi-year average rates have decreased over this decade but remain higher than state and national rates.17,20

According to statistics collected by the Uniform Crime Reporting surveillance system, the average rate of forcible rape in the NSB between 2000 and 2009 was roughly three times the Alaska rate and more than seven times the U.S. rate for the same period. Such rate comparisons must be made with caution, particularly given the small population of the NSB. Although many variables affect crime and reporting rates in a community—including such factors as the demographic composition of the population, local law enforcement resources, economic and cultural factors, and citizen reporting practices—the data clearly suggest a disproportionate burden of sexual assault in the NSB, compared with state and national populations.
Sexual Assault Statistics from the NSB Police Department
The NSB Police Department has provided information from their records on the total number of sexual assault cases reported annually in the NSB since 2007, both for adults and children. These statistics emphasize the large proportion of cases in the NSB that involve children.

Sexual Assault Experience Among Adults: Data from BRFSS
In 2004–2006, the most recent years for which local data were available for this report, 9.3% (C.I. 4.0–20.1%) of the 73 adult NSB residents surveyed (including both men and women) reported that they had, at some time in their lives, been made to take part in sexual activity when they did not want to.24

Youth Sexual Assault Rate Estimates: Data from the 2005 YRBS Survey
In 2005, 7.5% of NSB high school students reported having been forced to have sex when they didn’t want to at some point in their lives. The percentage of NSB students reporting forced sexual intercourse was not significantly different from state and national estimates.9
3.1.4.3. Domestic Violence

Domestic violence, also referred to as intimate partner violence, is the greatest single cause of injury to women nationwide. In a 2010 telephone survey of English-speaking Alaskan adult women, 47.8% of women reported having experienced intimate partner violence (including both threats and physical violence) in their lifetimes, and 9.4% reported experiencing intimate partner violence in the past year. Domestic violence is also an area of racial health disparity, with Alaska Natives reporting experiencing higher rates of lifetime intimate partner violence than white Alaskans.

Domestic Violence Reported to Local Law Enforcement Agencies

Alaska does not currently collect standardized data on domestic violence incidents reported to local law enforcement agencies. According to information provided by the NSB Police Department for this report, the number of domestic violence calls to which the department responds can vary quite dramatically from year to year. Moreover, these statistics are not systematically tracked, and the wide variation in the two years of data provided raise questions about the reliability of this data.

In a 2003 analysis of domestic violence in the NSB, rates of reports of domestic violence to Barrow police were found to be more than six times the rate of reports made to Alaska state troopers statewide. Again, these reports represent only a fraction of domestic violence occurrences, however, as many victims do not report their victimization to authorities.
Self-Reported Experience of Domestic Violence: Data from BRFSS
In 2004–2006, the most recent years for which local data were available for this report, 29% (C.I. 15.6–47.2%) of the 72 adults NSB residents surveyed (including both men and women) reported having been hit, hurt, or threatened by an intimate partner at some time in their lives. During 2004–2006, 9.4% of NSB survey respondents also reported fearing for their safety or being physically hurt by a current or former intimate partner within the past five years.24

Pre-Pregnancy and Prenatal Physical Abuse
In an ongoing survey sampling women who have recently delivered infants, the Pregnancy Risk Assessment Monitoring System (PRAMS), women in the NSB were more than twice as likely as women statewide to report physical abuse by a husband or partner during the 12 months before pregnancy.25 Women in the northern region (including NSB, Northwest Arctic Borough, and Nome census areas) experienced the highest prevalence of pre-pregnancy physical abuse of all the regions studied. Women in the northern region were also the most likely to report having a controlling partner or one that made her feel unsafe.26

![Figure 3.22: Pre-Pregnancy Physical Abuse by Husband or Partner: Percent of women delivering live infants who reported abuse during the 12 months before pregnancy, 1996–2008](image)

Women who are abused during pregnancy are at greater risk for poor pregnancy outcomes.26 Women in the NSB experienced rates of prenatal physical abuse that were more than double rates in Alaska overall. During the period of 1996–2008, roughly one in 10 women in the NSB who delivered live births reported experiencing physical abuse by their husband or partner during pregnancy.25

![Figure 3.23: Prenatal Physical Abuse by Husband or Partner: Percent of women delivering live infants who reported abuse during pregnancy, 1996–2008](image)

Intimate Partner Violence Among Youth: Data from the 2005 YRBS Survey
In the 2005 YRBS survey, 13% of NSB high school students reported intimate partner violence in the past 12 months, compared to 9% of students nationwide. This difference was of borderline statistical significance.9
3.2. Determinants of Injury

Accidental injury, suicide, intimate partner violence, rape, and other types of assault occur in the context of specific sociocultural and physical environments that shape human behavior. Although they are separate phenomena, these different types of injury share a number of behavioral and environmental risk factors.

3.2.1. Alcohol and Substance Abuse

Alcohol and drugs play major roles in unintentional injury, suicide, intimate partner violence, and sexual and other types of assault. Alcohol and drug use statistics for the NSB are presented in Chapter 7: Mental and Behavioral Health, section 7.14.

- Among North Slope residents, 34% of all injury hospitalizations were recorded as alcohol-related, and 63% of assault injuries were documented to be alcohol-related (among Alaska Natives). Among Alaska Natives statewide, 40% of snowmachine-related, 45% of motor vehicle, and 30% of all ATV-related injury hospitalizations were recorded as alcohol-related. Among Alaska Natives statewide, 57% of all hospitalized suicide attempts were recorded as alcohol-related. These estimates are based on documentation of a positive blood alcohol test or breathalyzer result, and it is believed that they underestimate the true number of alcohol-related injuries.

- Alcohol is estimated to contribute to 85% of domestic violence cases and 80% of reported sexual assault cases statewide among Alaska Natives.

- Among 325 suicide cases statewide where investigating officers noted the presence or absence of alcohol or drug use, 61% of the cases involved drugs or alcohol. Among the 31% of cases where toxicology testing was performed, 72% of suicide victims tested positive for alcohol or drugs. This proportion was the same among Alaska Natives and non-Natives.

- According to the NSB Police Department, of the 11 suicides occurring in Barrow between 2004 and 2009, four were documented to be alcohol-related.

- In a 2007 study, suicide victims were found to be 22 times more likely than controls to have been treated for an alcohol-related visit in the 12 months prior to suicide, and most of these involved treatment for another injury.

- Among Alaska Natives statewide, alcohol was involved in 59% of domestic violence incidents reported to troopers in 2004.

Evidence from multiple studies suggests that more restrictive alcohol policies in Alaskan communities are associated with lower rates of alcohol-related injuries. While causation cannot be determined from the injury hospitalization trends shown in Figure 3.4, it is notable that, between 1991 and 2008, the lowest number of injury hospitalizations among NSB residents occurred in 1995, during the brief period that alcohol importation was banned in Barrow.
3.2.2. Economic, Social, and Cultural Factors

Sociocultural environment has a powerful effect on injury risk. Stress, lack of social support, cultural shifts, traumatic experiences, poverty, discrimination, and disempowerment all contribute to the environments in which suicide, accidents, and intentional harm to others are more likely to occur. Many of these economic, social and cultural factors in the NSB are discussed in Chapter 1. Social norms around safety practices, alcohol and drug consumption, the treatment of women, parenting and child supervision, suicide, and violence can also influence how people behave and influence the risk of injury.

- Early childhood environment: As injury is the leading cause of child death in Alaska, the early childhood environment is crucial in preventing these events. Moreover, negative experiences in early childhood—such as neglect, abuse, alcohol or drug problems in the home, experiences of discrimination—increase the risk of suicide. Persons who have witnessed intimate partner violence of a parent or guardian are also more likely to experience domestic violence themselves.
- Income and education: Those with an educational level of high school graduate or less are significantly more likely to experience intimate partner violence in their lifetime than is a college graduate. Being poor or "near poor" (<200% of poverty level) is also a risk factor for domestic violence.
- Subsistence way of life: Subsistence activities carry inherent risks, injury foremost among them. Hunting and whaling accidents have been known to Iñupiat for many generations. These risks are mitigated, however, through the use of traditional knowledge and the passing on of traditional skills to each generation.

3.2.3. Safety Practices

- Access to loaded firearms: Firearms are the most common mechanism used in completed suicides in Alaska, followed by suffocation (including hanging or strangulation), and poisoning. This was true for both Alaska Natives and non-Natives. In 2005–2007, 4.2% of adults surveyed in the NSB stated that there were loaded, unlocked firearms in the house.
- Helmet use: Helmets have been shown prevent a significant proportion of traumatic brain injuries from off-road vehicle accidents. In the 2010 NSB Census, only 18% of NSB household heads reported wearing a helmet when riding a snowmachine or four-wheeler, compared to 57% of adults statewide (snowmachine helmets only, as measured in a separate helmet observation study), and 21% of Alaska Natives surveyed in other regions. Iñupiat household heads were significantly less likely to report helmet use than were Caucasians or those of other ethnicities, and this association was statistically significant in all age groups except for 65+, where the number of non-Iñupiat riders was very small.

Figure 3.25: Percent of Adults Who Wear a Helmet When Riding a Snowmachine or Four-Wheeler

*Observed snowmachine helmet use.
NSB data source: 2010 NSB Census.
• Seatbelt use: Seatbelts have been shown to reduce injury and death from motor vehicle accidents. In the 2005 YRBS survey, 63% of NSB high school students surveyed stated that they never or rarely wore a seatbelt when riding in a car driven by someone else, compared with only 10% in national (2005) and 7% in statewide (2007) samples. In the early to mid-1990s, the most recent years for which adult data are available, roughly one-third of NSB adults reported never or seldom using a seatbelt.

• Other safety practices: Other safety practices impacting injury rates include the use of personal flotation devices and boating safety practices, use of smoke and carbon monoxide detectors, and workplace safety monitoring and enforcement. The NSB Fire Department has been actively involved in fire prevention and improving home safety in the NSB.

3.2.4. Physical Environment

• The physical environment in northern Alaska is harsh, and cold-related injuries such as frostbite and hypothermia are an ever-present risk in the arctic winter.

• Climate change may increase injury risk through impacts on sea and ice stability and decreased predictability of weather patterns.

• Industrial activity has the potential to increase injury risk through displacement of subsistence species to areas farther from villages, resulting in longer travel distances for subsistence hunting.

• Some have theorized that the long, dark winters play a role in suicides in Alaska, however, an analysis of suicide death data showed no seasonal or monthly pattern emerging over a 17-year period.

3.2.5. Availability of Local Law Enforcement, Public Safety, Criminal Justice Services, and Tribal Courts

Effective local law enforcement can enhance community safety and help prevent both unintentional and intentional injury. Municipal and borough police departments exist only in those communities with the economic resources to support them. Many villages in rural Alaska rely on Village Public Safety Officers (VPSO), typically local residents who engage in crime prevention and basic law enforcement under Alaska State Trooper oversight after a minimum of six weeks of training. A number of rural Alaska villages are either periodically or regularly without any local law enforcement personnel. The NSB Police Department is the second largest municipal law enforcement agency in Alaska, providing services to over 12,000 people, including the oil industrial complex at Prudhoe Bay. The NSB Police Department provides officers, on a rotating basis, to all the communities of the NSB.

• The Native Village of Barrow established a Tribal Court in 2001. Among other issues, the Tribal Court seeks to address drug and alcohol abuse among juveniles utilizing traditional cultural values.

Chapter 3 Endnotes

1. Alaska Native Tribal Health Consortium Injury Prevention Program. Aggregated data on non-fatal injury hospitalizations were provided for this report by Hillary Strayer, Senior Injury Prevention Specialist, based on analysis of Alaska Trauma Registry data.


9. Alaska Youth Risk Behavior Survey (YRBS): http://www.hss.state.ak.us/dph/chronic/school/YRBSresults.htm. NSB-specific data from 2005 survey was provided courtesy of the NSB School District. Weighted state-level data are not available from the 2005 survey, so the 2007 survey was used for statewide estimates.


38. 2010 NSB Census (Full report to be published this spring, available through NSB Planning Department).


42. Alzaharna, K. Chief of Police, NSB Police Department. Personal communication, December, 2009.

Chapter 4: Chronic Health Problems

Chronic diseases include such major health problems as diabetes and cardiovascular diseases, including high blood pressure, heart disease, and stroke. The conditions of being overweight and being obese are also included here under the category of chronic health problems. A number of other common disorders can also be included in this category, including degenerative arthritis and other rheumatic diseases, certain gastrointestinal problems, mental illnesses, and thyroid disorders. Chronic diseases are the leading causes of death and disability in the U.S., and they are also among the most preventable. Cancer, often categorized as a chronic disease, is discussed in a separate section, although it shares many risk factors with the other chronic diseases discussed in this chapter. Chronic respiratory diseases such as emphysema, or chronic obstructive pulmonary disease (COPD), and asthma, are discussed separately in the respiratory disease section.
4.1. Chronic Health Problems: Prevalence and Mortality

4.1.1. Cardiovascular Disease

Cardiovascular diseases are disorders involving the heart and blood vessels. Cardiovascular disease disproportionately affects those who are poor and less educated, but in Alaska, there does not appear to be a significant difference between rates among Native and non-Natives. In the past, Alaska Natives had lower rates of heart disease mortality than non-Natives, but that difference has now disappeared. Furthermore, Alaska Natives suffer from a high prevalence of cardiovascular risk factors such as obesity, high blood pressure, tobacco smoking, and diabetes, putting them at increased risk for future disability and death from both coronary heart disease and stroke.

4.1.1.1. Heart Disease and Stroke

Heart Disease Prevalence: Data from the 2010 NSB Census

In the 2010 NSB Census, 7% of household heads and 5% of all adult household members reported or were reported to have heart disease, compared with 12% of all adults in the U.S. The estimated prevalence in the NSB was lower than U.S. estimates for all age groups, although these comparisons must be made with caution because of other potential differences in the populations as well as the survey methods used. Heart disease, thus defined, may include not only coronary artery disease but also such problems as heart failure, rhythm abnormalities, and valve problems. Among NSB adults over 40 years of age, reported heart disease was slightly more prevalent among Iñupiat than other ethnic groups. Men were also more likely to report heart disease than were women. The prevalence of heart disease in the NSB was not associated with community of residence.

Heart Disease and Stroke Prevalence: Data from BRFSS

According to BRFSS survey data, in the combined years 2005–2007, the estimated percentages of NSB residents who had been told that they had had a heart attack (3%), had been diagnosed with angina or coronary artery disease (1%), or had had a stroke (1%) were slightly lower but not significantly different from statewide estimates. Any comparisons between NSB and statewide must be made with considerable caution because of the small number of respondents in the NSB, lack of adjustment for age differences in the population, and lack of post-stratification at the borough level.

Heart Disease Mortality

Heart disease has been a leading cause of death in the NSB for many decades. Nationwide, death rates from heart disease and specifically from coronary heart disease, its most common form, have been declining for several decades, and rates in Alaska have been following a similar downward trend since the early 1990s. Because NSB rates are based on fewer events, rates fluctuate more widely from year to year. While heart disease rates in the NSB do also seem to have trended downward during the 1990s, it is not clear that this trend has continued over the past decade.
Chapter 4: Chronic Health Problems

Figure 4.1: Heart Disease Mortality Rates: Average annual number of deaths per 100,000 population, 1990–2009

Rates are age-adjusted to the 2000 U.S. standard population.
U.S. rates are for the single, midpoint year of the five-year period noted.
NSB Rate for 2001–2005 is based on fewer than 20 events and must be interpreted with caution.

Stroke Mortality

In 2004–2006, stroke was the 5th leading cause of death in the NSB. Trends in stroke mortality in the NSB must be interpreted with extreme caution because of the low number of events (fewer than 20 deaths per time period); however, the apparent upward trend during the past decade raises concern about possible increasing burden of disease and death caused by stroke in the NSB. Nationwide and in Alaska, mortality rates from stroke are decreasing; among Alaska Natives, however, rates have not decreased significantly since 1980. In 2003–2007, stroke mortality rates among Alaska Natives were 30% higher than among U.S. whites. Unlike in the case of heart disease mortality, stroke mortality rates remain higher in Alaska as compared with national rates.

Figure 4.2: Stroke Mortality Rates: Average annual number of deaths per 100,000 population, 1990–2009

Rates based on fewer than six occurrences are not reported.
NSB rates are based on fewer than 20 occurrences per time period and must be interpreted with caution.
All rates are age-adjusted to the 2000 U.S. standard population.
U.S. rates are for the single, midpoint year of the five-year period noted.
4.1.1.2. High Blood Pressure

High blood pressure, or hypertension, is a cardiovascular condition that can lead to health problems such as stroke, heart attack, heart failure, and kidney failure. Because high blood pressure does not generally cause symptoms, the recognition of it requires an individual to seek out blood pressure screening or have contact with the healthcare system for another reason. It is estimated that about one-third of persons with high blood pressure are not aware that they have it. High blood pressure is more common among people who are overweight, lead a sedentary lifestyle, smoke, or have diabetes.

High Blood Pressure: Data from the 2010 NSB Census

The 2010 NSB Census collected data on the prevalence of high blood pressure in NSB communities. Overall, 28% of household heads reported that they had high blood pressure and 20% of all adult household members, including household heads, were reported to have high blood pressure. The prevalence of high blood pressure was not significantly associated with ethnic group except in the 40- to 64-year-old age group, where adults of other ethnicities were more likely to have been diagnosed with high blood pressure than Iñupiat or Caucasian adults. Men were slightly more likely than women to report a diagnosis of high blood pressure. The prevalence of high blood pressure was not significantly associated with community of residence. Comparing similar age groups, the prevalence of high blood pressure was similar among NSB adults and Alaskan adults overall.

High Blood Pressure: Data from BRFSS and SLiCA

According to BRFSS survey data, in the survey years 1994–2008, between 13% and 27% of NSB adults surveyed reported having been told they had high blood pressure. Estimates vary substantially from year to year because of the small numbers of respondents in the NSB, but unlike the pattern seen in diabetes rates, an upward trend in high blood pressure diagnoses is not apparent in the NSB. Estimates for Alaskan adults ranged between 19% and 25% for this period. Hypertension rates have been increasing in the U.S., with estimates for U.S. adults rising from 22% in 1995 to 28% in 2007. Statewide, the prevalence of high blood pressure is similar among Alaska Natives and non-Native Alaskan adults.

The SLiCA study also asked looked at high blood pressure. In this survey, 29% of Iñupiat ages 16 and over in the NSB reported having high blood pressure, compared with 17% of all respondents across the arctic indigenous regions combined.

4.1.1.3. Cholesterol

Elevated cholesterol is a risk factor for coronary artery disease and stroke, and often exists in combination with other risk factors, such as diabetes, obesity, and hypertension. As in the case of high blood pressure, elevated cholesterol generally does not cause symptoms and diagnosis requires a screening blood test. Our understanding of the role of cholesterol in cardiovascular disease has evolved over the past two decades, becoming increasingly complex. Screening practices and diagnostic criteria have also changed during that time. The availability of powerful cholesterol-lowering drugs has encouraged more aggressive screening, diagnosis, and treatment practices in recent years.

Cholesterol: Data from the 2010 NSB Census

In the 2010 NSB Census, 19% of household heads and 13% of all adult household members reported or were reported to have high cholesterol, both significantly lower than the 38% of Alaskan adults in the 2007 Alaska BRFSS telephone survey who reported a diagnosis of high cholesterol. These differences persisted when analyzed by individual age group, although differences may be due, in part, to differences in screening practices and level of awareness of the condition. In the NSB Census, Caucasians and those of other ethnic groups were significantly more likely to have been diagnosed with high cholesterol than were Iñupiat adults. Reported prevalence of high cholesterol among Iñupiat household heads was significantly related to community of residence, ranging from 5% in Point Lay to 29% in Anaktuvuk Pass. Of note, residents of Anaktuvuk Pass generally get their primary healthcare in Fairbanks rather than in Barrow, and it is possible that this difference reflects varying screening or treatment practices in these two healthcare settings. It may also reflect differences in diet or other factors.
Cholesterol: Data from BRFSS

According to BRFSS data, in the survey years 1994–2007, between 15% and 34% of NSB adults surveyed reported having been told they had high cholesterol. As with hypertension, the NSB sample size was small, and there was no obvious trend during this period. It is not clear why these estimates tended to be higher than those from the 2010 NSB Census. In Alaska and the U.S., the percentage of adults reporting a diagnosis of high cholesterol has increased significantly since the early 1990s.9

4.1.2. Diabetes

Type 2 diabetes, the most common form of diabetes by far, is a chronic condition marked by abnormally high levels of blood sugar. It generally develops when the body’s cells become progressively resistant to insulin, the main hormone responsible for regulating blood sugar. The risk of type 2 diabetes is increased by certain factors, including being overweight or obese, physically inactive, or of non-white race, or having family members with diabetes. Stress may also play a role. Like high blood pressure and high cholesterol, diabetes typically causes no symptoms until complications develop. Many people are unaware that they have diabetes or are at high risk of developing diabetes. Depending on the source of data, estimates of NSB diabetes prevalence vary substantially. Moreover, no data are available on residents who have not been tested for diabetes.

Nationwide, diabetes prevalence rates have doubled since 1980. Rates among some lower-48 American Indian tribes are among the highest in the world. Historically rare among Alaska Natives, type 2 diabetes rates have been rising rapidly across the state. Diabetes prevalence in Alaska Natives increased 148% between 1985 and 2004. Currently, there is no significant difference in self-reported diabetes prevalence between Alaska Natives and non-Natives.1

4.1.2.1. Diabetes Data from the 2010 NSB Census

The 2010 NSB Census results suggest that the overall adult diabetes prevalence in the NSB (6%) is similar to that among adults statewide (6%).1 The reported diabetes prevalence among NSB adults was similar to statewide estimates for all age groups. The overall adult diabetes prevalence in the NSB is slightly lower than the most recent national estimate from the National Health Interview Survey, but when analyzed by individual age groups, the differences are marginal.6 Of note, gestational diabetes, or diabetes occurring only during pregnancy, was not explicitly excluded from the NSB Census prevalence estimate, and so it is possible that the NSB Census estimate slightly overestimates the true prevalence of type 2 diabetes in the NSB.

According to 2010 NSB Census data, Iñupiat and Caucasian adults were significantly less likely to have a diagnosis of diabetes than were adults in other ethnic groups. The reported prevalence of diabetes in adults was significantly lower in the outlying villages than in Barrow, looking both at all ethnic groups combined (7% vs. 4%, respectively) and Iñupiat only (6% vs. 3%, respectively).3

Figure 4.3: Diabetes Prevalence* Among Adults, by Ethnic Group

*Rates reflect crude rates (not-age adjusted). In addition, pregnancy-related diabetes is excluded from state and national prevalence estimates and was not specifically excluded from the NSB census prevalence (generally adds 1% or less).

NSB data source: 2010 NSB Census.
Alaska data source: 2008 Alaska BRFSS.
4.1.2.2. Data from the Alaska Native Diabetes Program Registry

The Alaska Native Medical Center’s Diabetes Program maintains a statewide diabetes registry for Alaska Natives based on the health records database used by the local diabetes programs in each service area. These prevalence estimates use as a denominator the Alaska Native user population for the Indian Health Service (IHS) service area (all ages), resulting in prevalence estimates that are lower than for adults or household heads as measured in the 2010 NSB Census. Barrow service area age-adjusted diabetes prevalence in 2006 was the second lowest among Alaska Natives statewide, estimated at 2.8%.

Based on the Alaska Native Diabetes Program registry data, diabetes has increased among Alaska Natives in the North Slope: between 1990 and 2006, age-adjusted diabetes prevalence increased 132% in the Barrow service unit. Crude prevalence in the NSB is shown below, demonstrating more than a doubling of the burden of the disease in the region between 1985 and 2008.

The Alaska Native Diabetes Program registry crude prevalence estimate for 2008 for the NSB, 1.9%, is lower than the 2.9% reported diabetes prevalence for Iñupiat, all ages, from the NSB 2010 census. The registry uses strict diagnostic criteria, and it is likely that the NSB census estimates included some self-reported diabetes diagnoses that did not meet these strict criteria. The ANMC Diabetes Registry also calculates separate estimates for pre-diabetes and diabetes of pregnancy, some of which may have been included in the 2010 NSB Census estimates.
4.1.2.3. Diabetes Estimates from the Alaska BRFSS

Based on three years of Alaska BRFSS telephone survey data (2005–2007), the age-adjusted prevalence of self-reported diabetes among adults in the NSB was similar to state and national estimates. Again, the NSB BRFSS estimates are based on a small number of survey respondents.

Figure 4.6: Age-Adjusted Adult Diabetes Prevalence from the Alaska BRFSS Survey, 2005–2007

<table>
<thead>
<tr>
<th></th>
<th>NSB</th>
<th>Alaska</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>5.5%</td>
<td>5.7%</td>
<td>5.6%</td>
</tr>
</tbody>
</table>

NSB and Alaska data source: Alaska DHSS Diabetes Prevention and Control Program.
U.S. data: Centers for Disease Control and Prevention: Diabetes Statistics.
All rates are age-adjusted to the 2000 U.S. standard population.

4.1.2.4. Diabetes in Teens: Data from YRBS

In the 2010 NSB Census, fewer than 1% of adolescents aged 14–18 years were reported to have diabetes.³ In the 2005 YRBS survey, 4.6% (C.I. 2.5–8.3%) of NSB high school students reported having ever been told by a doctor that they had diabetes, compared with 2.8% of students sampled statewide in 2007.¹² This difference was not statistically significant. The reason for the discrepancy between the 2010 NSB Census and 2005 YRBS data is not entirely clear.

4.1.3. Obesity

Obesity and being overweight are among the most common chronic health problems in the country, together affecting roughly two-thirds of Americans.⁹ Obesity and being overweight are associated with a number of other chronic health problems, including high blood pressure, heart disease, diabetes, arthritis, certain cancers, and some types of respiratory problems. Those who are obese are far more likely to report poor general health than those who are not obese.

Estimation of population obesity rates typically utilizes a measure called body mass index (BMI), which is simply a ratio of weight to height. Weight and height may be measured, or, for survey data, self-reported. Whereas it is not a perfect indicator, for most populations, BMI correlates fairly well with percent body fat and is a good predictor of health risks associated with various weight categories. In some populations, however, BMI may be a less accurate predictor of weight status than percent body fat or other measurements. There is some evidence that this is the case in Alaska Native women.¹³ Percent body fat and other measurements, such as waist circumference, are typically not available at the population level, however, and are more difficult to obtain than BMIs calculated from reported height and weight. BMI has been shown to correlate well with health risks in diverse racial and ethnic populations.¹⁴

4.1.3.1. Obesity Data from the 2010 NSB Census

BMI data from the 2010 NSB Census demonstrate that being overweight and/or being obese are common among NSB household heads. Fewer than one-third of NSB household heads were at a healthy weight.³ The prevalence of being overweight and/or being obese did not vary significantly by ethnic group among NSB household heads,³ unlike adults at the state and national level.¹⁹ NSB household heads were slightly less likely to be overweight but more likely to be obese than were adults statewide, and estimates were similar to those for Alaska Natives statewide.¹
Household heads aged 30–39 years were most likely to be overweight or obese, and women were more likely to be obese than men (45% vs. 34%, respectively). The likelihood of obesity was also significantly associated with village of residence. Estimated obesity rates ranged from a low of 23% in Anaktuvuk Pass to a high of 48% in Point Hope. Anaktuvuk Pass household heads were the most likely to be within the healthy weight range (45%), while Wainwright household heads were least likely (23%) to be of a healthy weight.3

4.1.3.2. Obesity Trends: Data from BRFSS

BRFSS survey data also confirm that being overweight and/or being obese are common conditions in the NSB, with almost two-thirds of adults estimated to be either overweight (BMI ≥25 and <30) or obese (BMI ≥30). Whereas the estimated percentage of adults in the NSB who are overweight does not show a clear trend, obesity rates have increased in the NSB since the mid 1990s. The prevalence of obesity and being overweight has risen dramatically nationwide among both adults and children over the past three decades. Obesity rates have also risen statewide during this time period, more than doubling since 1991. Obesity is an area of racial and socioeconomic health disparity nationwide, with higher rates in racial minorities and those with lower education and income levels. In Alaska, obesity is more common among Alaska Natives than non-Natives statewide.1

Figure 4.8: Adult Obesity Trend Data from the BRFSS Survey:
Percent of adults who are obese (BMI ≥ 30), 1994–2008

*BMI=body mass index.
NSB data source: Sub-regional analysis of Alaska BRFSS data for 1994–2007 provided by Alaska Department of Health and Social Services, Chronic Disease Prevention and Health Promotion, Division of Public Health. 2006–2008 estimates are from the County Health Rankings website based on BRFSS data. NSB results are weighted according to the BRFSS rural region and not post-stratified to the NSB. Results are not age-adjusted.
Alaska and U.S. data are for the single, midpoint year of time period shown.
In 2006–2008, the NSB had one of the highest estimated adult obesity rates in the state, based on BRFSS survey data. Estimates vary from year to year, and rankings must be interpreted with caution due to small sample sizes and wide error margins.

Table 4.1: Adult Obesity Rates in Alaska, by Borough and/or Census Area, 2006–2008

<table>
<thead>
<tr>
<th>Borough</th>
<th>% of Adults Who Are Obese (BMI ≥ 30)</th>
<th>Error Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dillingham</td>
<td>37%</td>
<td>29–47%</td>
</tr>
<tr>
<td>NORTH SLOPE</td>
<td>37%</td>
<td>29–47%</td>
</tr>
<tr>
<td>Bethel</td>
<td>34%</td>
<td>29–41%</td>
</tr>
<tr>
<td>Bristol Bay</td>
<td>34%</td>
<td>24–47%</td>
</tr>
<tr>
<td>Lake and Peninsula</td>
<td>34%</td>
<td>24–47%</td>
</tr>
<tr>
<td>Prince of Wales-Outer Ketchikan</td>
<td>34%</td>
<td>26–44%</td>
</tr>
<tr>
<td>Skagway-Hoonah-Anagoon</td>
<td>34%</td>
<td>26–45%</td>
</tr>
<tr>
<td>Ketchikan Gateway</td>
<td>33%</td>
<td>28–39%</td>
</tr>
<tr>
<td>Southeast Fairbanks</td>
<td>33%</td>
<td>25–42%</td>
</tr>
<tr>
<td>Northwest Arctic</td>
<td>32%</td>
<td>25–41%</td>
</tr>
<tr>
<td>Valdez-Cordova</td>
<td>32%</td>
<td>26–39%</td>
</tr>
<tr>
<td>Nome</td>
<td>31%</td>
<td>25–39%</td>
</tr>
<tr>
<td>Wade Hampton</td>
<td>30%</td>
<td>23–38%</td>
</tr>
<tr>
<td>Aleutians West</td>
<td>29%</td>
<td>22–38%</td>
</tr>
<tr>
<td>Kenai Peninsula</td>
<td>29%</td>
<td>26–33%</td>
</tr>
<tr>
<td>Matanuska-Susitna</td>
<td>29%</td>
<td>24–34%</td>
</tr>
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<td>Sitka</td>
<td>29%</td>
<td>22–36%</td>
</tr>
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<td>Yakutat</td>
<td>29%</td>
<td>20–41%</td>
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<td>Aleutians East</td>
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<td>Denali</td>
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<td>Haines</td>
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</tr>
<tr>
<td>Juneau</td>
<td>27%</td>
<td>23–31%</td>
</tr>
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<td>Kodiak Island</td>
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<td>22–32%</td>
</tr>
<tr>
<td>Anchorage</td>
<td>26%</td>
<td>23–29%</td>
</tr>
<tr>
<td>Fairbanks North Star</td>
<td>26%</td>
<td>24–29%</td>
</tr>
<tr>
<td>Wrangell-Petersburg</td>
<td>25%</td>
<td>19–32%</td>
</tr>
</tbody>
</table>

Data source: County Health Rankings: Mobilizing Action Toward Community Health, citing data from U.S. BRFSS.

Child obesity is discussed separately in Chapter 6: Maternal and Child Health.

4.1.4. Arthritis and Chronic Pain

In the 2010 NSB Census, arthritis and/or chronic pain was second only to high blood pressure as the most common chronic health problem reported among adults. Twenty-nine percent of household heads and 21% of all adults reported or were reported to have daily pain or arthritis that limits activities or requires prescription pain medicine. Women were more likely than men to report this problem, and it was more common among Iñupiat than other ethnic groups (although the relationship with ethnic group was only statistically significant in the 40- to 64-year-old age group).

Arthritis is a growing problem in Alaska, and is associated with significant disability, cost, and suffering. The prevalence of reported doctor-diagnosed arthritis in Alaska increased 59% between 2001 and 2007, and among Alaskans aged 45–64 years, it increased 70%. Overall, persons with arthritis are more likely to report fair to poor overall health, and they often suffer from other chronic diseases.
Rheumatoid Arthritis: Rheumatoid arthritis is a chronic autoimmune disease causing inflammation of the joints and sometimes involvement of other organs. At Samuel Simmonds Memorial Hospital outpatient clinics, rheumatoid arthritis is among the top 10 visit codes, accounting for more than 650 visits in the Barrow service unit. This visit frequency may be due, in part, to the frequent laboratory monitoring required for many rheumatoid arthritis medications.

Osteoarthritis: Osteoarthritis, or degenerative arthritis, is the most common form of arthritis. It is associated with obesity, increasing age, and history of joint injury. Prevention of this common form of arthritis involves maintaining a healthy weight through diet and physical activity, and avoiding injury by protecting joints through stretching and appropriate gear and equipment.

4.1.5. Thyroid Disorders

Thyroid problems have been brought up as a health concern in at least one NSB community. Local anxiety about thyroid problems has likely been amplified by the unfortunate history of unethical thyroid function research involving the radioactive tracer Iodine 131 as well as by worries over environmental contamination from local industrial and global sources.

The 2010 NSB Census asked household heads whether they had ever been diagnosed with a thyroid problem. Overall, 6% of household heads and 4% of all adults reported or were reported to ever have had a thyroid problem. The prevalence of thyroid problems did not vary significantly by village of residence. National statistics are limited, but based on one analysis of National Health and Nutrition Examination Survey (NHANES) data, the lifetime prevalence of self-reported thyroid disorders among U.S. adults is slightly higher than the NSB prevalence estimate, approximately 9%. The difference in these estimates may be affected by differences in age composition of the populations. In the NSB and nationally, women are significantly more likely than men to report thyroid problems. Prevalence rates can also vary widely because of varying screening practices among providers and health systems, as thyroid disorders often have subtle symptoms, and require laboratory testing to confirm a diagnosis.

4.1.6. Periodontal Disease and Tooth Decay

Almost two-thirds of adults in the NSB have had at least one permanent tooth removed (excluding tooth loss because of trauma), a statistically significantly higher proportion than among Alaska or U.S. adults overall. About one-fourth of NSB adults have had six or more permanent teeth removed.

Figure 4.9: Percent of Adults with Any Permanent Teeth Removed

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<tr>
<td></td>
<td>64%</td>
<td>43%</td>
<td>44%</td>
</tr>
</tbody>
</table>

Tooth decay and periodontal disease can lead to loss of permanent teeth, resulting in difficulty chewing and eating a healthy diet. Periodontal disease can also worsen diabetes and may be a causal factor in a number of other health problems, including preterm delivery and cardiovascular disease. Chronic poor dentition is often a marker of poor overall health. Dental health among children is discussed in Chapter 6: Maternal and Child Health.
4.1.7. **Chronic Gastrointestinal Problems**

The fourth most common health problem reported by Inupiat adults in the NSB in the SLICA study was "stomach problems or intestinal ulcers," with 15% of Inupiat adults surveyed reporting experiencing these problems. Although sometimes minor and self-limited, gastrointestinal problems often become chronic. Gastritis, or inflammation of the stomach lining, as well as gastrointestinal ulcers are common in rural Alaska and are also thought to contribute to the high rate of chronic iron deficiency anemia through microscopic bleeding in the gastrointestinal tract. Gastrointestinal problems were not asked about in the 2010 NSB Census.

4.2. **Determinants of Chronic Health Problems**

Many of the chronic health conditions discussed in this chapter share a pattern of health determinants. Whereas genetic factors certainly play an important role, research suggests that a substantial portion of these diseases can be attributed to health-related behaviors as well as social, economic, and environmental factors. Again, personal behaviors are also strongly influenced by these external factors. In other words, the context of people’s lives drives much of human behavior, including many of the important behaviors that influence health.

4.2.1. **Health-Related Behaviors**

4.2.1.1. **Tobacco Smoking**

The high smoking rates in the NSB are discussed in detail in Chapter 1: Overall Health.

Whereas the effects of tobacco on respiratory diseases and cancer are often emphasized and generally well-known, tobacco smoking also plays a major role in the development of other chronic diseases, for example:

- It is estimated that smoking tobacco accounts for 30% of deaths from coronary heart disease and 18% of deaths from stroke.
- Tobacco use, especially cigarette smoking, is a known risk factor for periodontal disease.

4.2.1.2. **Diet and Nutrition**

Diet and nutritional factors in the NSB are discussed in detail in Chapter 1: Overall Health.

It has long been recognized that diet plays a major role in the development of chronic disease.

- Up to 30% of deaths from coronary heart disease are because of unhealthy diets. Unhealthy diets include those with inadequate intake of fiber, fruits, and vegetables, and excessive intake of processed food containing high levels of salt, sugar, and saturated fat and trans-fatty acids.
- Subsistence foods have been associated with lower rates of impaired glucose tolerance, a risk factor for diabetes, high blood pressure, and unfavorable cholesterol profiles. Bowhead whale blubber, an important subsistence food in the NSB, has been found to contain high levels of omega-3 fatty acids, which have been suggested or shown to be important in the prevention of many chronic diseases, including elevated blood pressure and cholesterol, heart disease, stroke, diabetes, arthritis, depression, and some cancers.
- Each additional serving of fruits and vegetables is associated with a 6% lower risk of stroke, an emerging leading cause of death in the NSB.
- Poor diet is a factor in many other chronic health problems such as chronic gastrointestinal problems, tooth decay, and periodontal disease.
- High consumption of soda and other sugar-sweetened beverages (SSBs) is associated with obesity, cardiovascular disease, tooth decay, diabetes, and other chronic health conditions.
4.2.1.3. Physical Activity

Physical activity data for the NSB are discussed in detail in Chapter 1: Overall Health.

Many studies have demonstrated that adequate levels of physical activity can reduce the risk of developing cardiovascular disease, diabetes, high blood pressure, certain cancers, chronic constipation, and other health problems such as chronic back pain and certain types of dementia.

- Those with an inactive lifestyle are twice as likely to develop coronary heart disease as those who are vigorously active, and women who walk briskly for half an hour each day reduce their risk of coronary heart disease by 35%.23
- Middle-aged men who are inactive are three times as likely to have a stroke as men who exercise vigorously.23
- Non-mechanized activity has been associated with reduced risk of hypertension among Alaska Natives.28

4.2.1.4. Alcohol and Substance Abuse

Alcohol and drug use data for the NSB are discussed in detail in Chapter 7: Behavioral Health.

In addition to their obvious social and psychological impacts, alcohol and substance abuse are associated with a number of chronic diseases, including chronic liver disease and other gastrointestinal problems, high blood pressure and other heart conditions, and certain cancers.

4.2.2. Socioeconomic Factors

Socioeconomic conditions in the NSB are discussed in detail in Chapter 1: Overall Health.

As with most areas of health, socioeconomic factors exert a strong influence on chronic disease risk through a variety of pathways, including but not limited to impacts on health-related behaviors. The chronic stress associated with poor job opportunities, lack of social support, exposure to violence and discrimination, and the lack of good educational experiences and opportunities at all ages have been associated with increased prevalence of many chronic diseases.

4.2.3. Physical Environment

Physical environment in the NSB is discussed in detail in Chapter 1: Overall Health.

The physical environment in which one lives affects the risk of developing chronic diseases through a variety of pathways.

- Opportunities for physical recreation: In recent years, growing attention has been paid to the importance of recreational opportunities in the prevention of chronic disease. These may take the form of gyms or basketball courts, walking or biking paths, space for traditional dance groups to meet, or simply access to natural environments.
- Air pollution: Poor air quality has been associated with an increased risk of cardiovascular disease,32 as well as asthma, chronic lower respiratory disease, and lung cancer.33–36
- Other environmental toxins and contaminants: Studying the links between environmental contaminants and chronic disease is difficult because of the multitude of potential exposures, the complex nature of chronic disease risk, and the often long period of time between exposure and development of disease. Moreover, the vast majority of chemicals in common use today have never been tested for safety, including their possible contributions to the risk of cancer and other chronic diseases. Nonetheless, decades of research have demonstrated that environmental contaminants clearly play a role in a number of major diseases in the U.S. Environmental contributions to cancer risk are briefly discussed in Chapter 2: Cancer. Other research has also explored possible connections between environmental pollutants and other chronic diseases such as diabetes37,38 and thyroid disorders.39,40

4.2.4. Access to Preventive Health Services

Access to various preventive health services in the NSB is discussed in detail in Chapter 1: Overall Health.

Health education, screening, and medical preventive measures can affect the likelihood of developing chronic diseases as well as the likelihood of experiencing complications or death from chronic disease.
Chapter 4 Endnotes


3. 2010 NSB Census (Full report to be published this spring, available through NSB Planning Department).


12. Alaska Youth Risk Behavior Survey (YRBS): http://www.hss.state.ak.us/dph/chronic/school/YRBSResults.htm. NSB-specific data from 2005 survey was provided courtesy of the NSB School District. Weighted state-level data are not available from the 2005 survey, so the 2007 survey was used for statewide estimates.


Nationwide, chronic respiratory diseases such as asthma and COPD are leading causes of restricted activity, hospitalizations, death, and across the state, respiratory illnesses are the number one reason for visiting a health practitioner. Historically, respiratory diseases have been a major cause of morbidity and mortality in rural Alaska, and respiratory problems remain a frequently cited health concern in NSB communities.\textsuperscript{1,2} Many respiratory diseases and symptoms are preventable through tobacco control, improved hygienic practices, vaccinations, reduction of air pollution, and other public and environmental health interventions.
5.1. Respiratory Disease Statistics

5.1.1. Prevalence of Chronic Respiratory Problems Such as Asthma, Emphysema, or Chronic Cough: Data from the 2010 NSB Census

Attempting to capture a spectrum of chronic respiratory conditions, the 2010 NSB Census asked household heads whether they or other household members had, in the last 12 months, had breathing problems such as asthma, emphysema, or a cough that does not go away.

**Adults:** Thirteen percent of household heads and 8% of all adults in the NSB reported or were reported to have experienced any of these problems. The estimated prevalence of these respiratory problems did not vary significantly by ethnic group, gender, or community of residence.

**Children:** Of children aged 0–17 years, 5% were reported by the household head to have had breathing problems such as asthma, emphysema, or a chronic cough in the past 12 months. The prevalence was not significantly different among ethnic groups except in the 10- to 17-year-old age group, in which children of other ethnic groups were more likely to be reported to have breathing problems than were Iñupiat or Caucasian children. The relationship between village of residence and the prevalence of breathing problems among children was not statistically significant.

5.1.2. Asthma

Asthma is a chronic condition that involves reversible tightening and inflammation of the airways, resulting in wheezing, coughing, chest tightness, and shortness of breath.

5.1.2.1. Asthma in Adults

**NSB Asthma Data from BRFSS**

Between 1999 and 2007, just over 10% of NSB adults surveyed in the Alaska BRFSS reported ever having been told by a health professional that they have asthma.\(^4\) This estimate is similar to the average state and national prevalence during this time period.\(^4,5\)

**Figure 5.1: Adult Asthma Prevalence from BRFSS: Percent of adults who were ever told by a health professional that they have asthma, 1999–2007**


NSB data source: Sub-regional analysis of Alaska BRFSS data provided by Alaska Department of Health and Social Services, Chronic Disease Prevention and Health Promotion, Division of Public Health.

NSB results are weighted according to the BRFSS rural region and not post-stratified to the NSB. Results are not age-adjusted.

Alaska and U.S. data are for single, midpoint year of time period shown.
NSB Asthma Data from SLiCA
In the SLiCA survey, 21% of NSB Iñupiat adults reported having asthma, roughly twice the lifetime prevalence estimated by BRFSS surveys and higher than the combined prevalence of asthma, emphysema, and chronic cough among Iñupiat adults in the 2010 NSB Census. Whereas results from the three surveys are not directly comparable, the reason for this wide discrepancy in prevalence estimates is not entirely clear. Often, asthma has not been clearly distinguished clinically from other chronic pulmonary diseases, such as emphysema or chronic bronchitis. This lack of diagnostic clarity may be contributing to the wide discrepancy in asthma prevalence estimates based on self-reported data.

Nuiqsut Asthma Study
In response to community concerns about asthma and pollution from nearby oil development activities, a 2003 study of respiratory illness in Nuiqsut examined inpatient and outpatient visits for respiratory illness in this village and a control village. Asthma accounted for 75% of respiratory illness visits in Nuiqsut and 81% in the control village. Representing just over 10% of the population, 47 residents were seen for asthma during that time period. Again, this was similar to statewide asthma prevalence estimates, although not directly comparable. An additional 16 residents (3.6%) were identified with non-asthma respiratory diseases. The Nuiqsut residents visited the clinic more than twice as often as in the control village. The increased number of visits was due largely to a few individuals with numerous visits for asthma-related problems. Only one age group (10- to 19-year-olds) showed a statistically significant higher rate of asthma visits than the control village.

5.1.2.2. Asthma Patterns in Alaska and the U.S.
Approximately 9% of the adult population of Alaska and 9% of U.S. adults report a current diagnosis of asthma. Overall, asthma prevalence appears to be lower in rural Alaska than in urban areas, particularly Anchorage. This pattern is similar to that seen in other parts of the country and the world and may be attributable to factors such as urban air pollution. This observed disparity may also be caused, in part, by lower availability of specialists and a lower likelihood of an asthma diagnosis being made in rural parts of the state.

Asthma prevalence has been increasing for many years in the U.S. and other developed nations, although it appears that in the U.S., asthma prevalence is starting to plateau or even decline slightly. Although asthma mortality in the U.S. has decreased since 1994, asthma mortality in Alaska increased between 1979 and 2002, and lifetime prevalence has increased slightly in Alaska over the last decade.

5.1.2.2. Pediatric Asthma

Pediatric Asthma Estimates from Medicaid Data
In a study looking at Medicaid recipients less than 20 years old for the years 1999–2002, non-Anchorage Alaska Natives consistently had the lowest estimated prevalence of asthma, compared with Alaska Natives living in Anchorage and non-Natives statewide. Estimates of child asthma prevalence vary widely among the rural areas, however. The NSB had the second lowest estimated prevalence of the four regions studied. The researchers thought that these differences may be caused, in part, by variation in provider practices in using asthma as a diagnosis and treating symptoms with asthma medications.

<table>
<thead>
<tr>
<th>Location</th>
<th>Asthma Diagnosis</th>
<th>Medication Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nome</td>
<td>3.5%</td>
<td></td>
</tr>
<tr>
<td>NSB</td>
<td>6.4%</td>
<td></td>
</tr>
<tr>
<td>NWAB</td>
<td>7.0%</td>
<td></td>
</tr>
<tr>
<td>Bethel</td>
<td>12.0%</td>
<td></td>
</tr>
</tbody>
</table>

NWAB=Northwest Arctic Borough
Teen Asthma Data from YRBS

In 2005, an estimated 13.8% (C.I. 10.0–18.7%) of NSB high school students had been diagnosed with asthma at some point in their lifetimes, compared with 18.2% of high school students in Alaska and 20.3% nationwide.11

Pediatric Asthma Patterns in Alaska and the U.S.

Based on BRFSS survey data collected in 2004, an estimated 8.4% of Alaskan children were reported to ever have been diagnosed with asthma in their lifetime. Current asthma prevalence among children, approximately 6% overall12,13 appears to be lowest in rural Alaska, compared with other regions12. Again, differences may reflect true differences in disease prevalence but also differences in diagnostic practices in different healthcare settings. Between 1999 and 2002, asthma prevalence among Medicaid recipients less than 20 years old appeared to increase, but this increase may have been caused, in part, by increased awareness and use of asthma as a billing diagnosis.10

Pediatric asthma is a common chronic illness and a major cause of healthcare expenditures nationwide. An estimated 14% of U.S. children less than 18 years of age have been diagnosed with asthma in their lifetime, while 9% are estimated to still have asthma.13 Children in poor families are significantly more likely to have ever been diagnosed with asthma or to still have asthma than are children from families who are not poor.14

5.1.3. Chronic Lower Respiratory Disease

Chronic lower respiratory disease (CLRD) and chronic lung disease are general terms that describe a number of respiratory ailments that involve irreversible damage to the lungs and reduced lung function. The most common form in adults is chronic obstructive pulmonary disease (COPD), a disease that includes both emphysema and chronic bronchitis. In this country, COPD is primarily caused by cigarette smoking, although environmental and genetic factors also play a role. In Alaska, COPD death rates have been higher among Alaska Natives than among whites since the mid-1980s. Between 1980 and 2007, mortality rates from COPD doubled among Alaska Natives while remaining stable among whites in Alaska.15

5.1.3.1. Chronic Lower Respiratory Disease Mortality in the NSB

CLRD emerged as a leading cause of death in the NSB in the mid-1980s and has been the 5th leading cause of death in the Borough for most years since 1990. Mortality rates from CLRD in the NSB remain roughly twice statewide and national rates.16,17 Among Alaska Natives, only the Arctic Slope’s death rate from COPD is significantly higher than the average rate for all other regions combined.15
**5.1.3.2. Prevalence of Chronic Lower Respiratory Disease in the NSB**

Limited data suggest that Inupiat in the NSB report emphysema at higher rates than do non-institutionalized U.S. adults.\(^6,15\) The data from the two surveys illustrated below are not adjusted for age differences in the population, and the survey methodologies were different. Comparisons must therefore be made with caution. These data do, however, suggest a higher prevalence of emphysema in NSB Inupiat, compared with national prevalence estimates.

In 2008, exacerbation of COPD was the most common admitting diagnosis among adults at Samuel Simmonds Memorial Hospital (SSMH), excluding childbirth.\(^18\) In the statewide analysis of Community Health Aide practice, chronic lung disease accounted for 25% of all lung problems assessed in NSB village clinics. Overall, the pattern of lung problems seen in NSB villages was similar to statewide data within the Alaska Native rural health system.\(^19\)

**5.1.3.3. Pediatric Chronic Lower Respiratory Disease**

Rural Alaska Native children have been found to be at particularly high risk of chronic lung disease,\(^20\) although most of the research in this area has occurred in the Yukon-Kuskokwim Delta (YK Delta). In the 2004 study, an estimated 21.5% of Alaska Native children in the YK Delta region experienced chronic productive cough without asthma diagnosis or symptoms.\(^21\) Similar studies have not been conducted in the NSB. In the 2010 NSB Census questionnaire, however, chronic cough was combined with asthma in a single survey question, yielding an estimated combined prevalence among children of only 5%, suggesting that the prevalence of respiratory disease among children in the NSB may be considerably lower than in the YK Delta region.\(^3\)
5.1.4. Respiratory Infections

5.1.4.1. Lower Respiratory Infection (LRI)

LRIs refer to infections affecting the lung tissue and air sacs, commonly referred to as pneumonia. In 2008, pneumonia was the leading reason for pediatric hospital admission at SSMH (excluding newborn admission). In 1998–2003, the incidence of outpatient-diagnosed LRI among Medicaid-enrolled children in the NSB was comparable with the statewide rates for Medicaid-enrolled children (38.4 and 42 per 100 child-years, respectively). Alaska, however, has one of the highest rates of LRI ever reported among Medicaid-enrolled children aged less than two years old. Among children, pneumonia is also an area of racial health disparity in Alaska. Among non-Natives, 3.3% of mothers reported that their two-year-olds had been diagnosed with pneumonia and treated with antibiotics in 2006. Among Alaska Natives, 24.5% of mothers, more than seven times as many, reported receiving a diagnosis of pneumonia in their two-year-olds.

5.1.4.2. Upper Respiratory Infection (URI)

URI is a nonspecific term used to describe the common cold, flu, and other infections involving the ears, nose, sinuses, throat, and airways. Although generally mild and self-limited, these infections lead to lost days of school and work, increases in healthcare costs, and can occasionally lead to more serious illness in vulnerable persons. URIs are the most common assessment made by NSB community health aides as well as community health aides statewide, accounting for about one-third of all visits. Acute URI is also the most commonly coded reason for an outpatient medical visit at SSMH.

Ear Infections

Ear infections are among the most common ailments suffered by infants and young children in the U.S. The 2010 NSB Census survey asked household heads whether they or other household members had, in the past 12 months, experienced frequent (three or more) or chronic ear infections. The estimated prevalence among NSB children aged 0–17 years was almost four times the estimated statewide prevalence, and the prevalence was similarly high in all ethnic groups. The prevalence also varied widely among North Slope communities, ranging from 10% in Kaktovik to 23% in Barrow.

Influenza

Influenza, or “the flu,” refers to a common systemic illness involving the upper respiratory tract, caused by the influenza virus. People with the flu typically experience cough, fever, fatigue, and muscle aches along with other symptoms, and they may or may not seek medical care. The severity of the illness depends on many factors, including the strains of viruses circulating in a given season and the underlying health condition of the person infected. Statewide, Alaska Natives experience higher rates of serious influenza infections than non-Native Alaskans. Every year, thousands of people in the U.S. die from complications of influenza. In 2009–2010, a new and very different flu virus called H1N1 spread worldwide and affected all regions of Alaska, including the NSB. This H1N1 flu was unusual in that nearly 90% of the deaths nationwide occurred among people younger than 65 years of age.
Bronchiolitis and RSV

Bronchiolitis is a common infection of the small airways, occurring most often in the winter months. It affects infants most severely and can result in prolonged illness, hospitalization, and sometimes respiratory failure. The most common cause of bronchiolitis is a virus called Respiratory Syncytial Virus (RSV). RSV infection is a major cause of illness and hospitalization in Alaska and, in particular, among Alaska Native infants, where rates far exceed U.S. rates.20

In the winter of 2006–2007, an outbreak of RSV occurred on the North Slope, resulting in the hospitalization of 53 infants and young children in Barrow. Twenty-eight children required transport to Anchorage for intensive care.27 RSV and bronchiolitis continue to be common health problems in children in the NSB, accounting for 25% of lung problems seen in NSB village clinics.19

5.2. Determinants of Respiratory Disease

The drivers, or determinants, of respiratory disease overlap with the various factors driving other aspects of health. Some of the specific factors known to affect respiratory health in communities are discussed in this section.

5.2.1. Determinants of Asthma

The causes of asthma are multiple and not completely understood. The development of asthma involves changes in the immune system’s response to certain exposures, resulting in inflammation of the Airways. In children especially, asthma is linked with environmental allergies such as those to pollen, dust, and smoke. Children who have had a severe viral pneumonia as infants, particularly from RSV, are also more likely to experience asthma.28

A number of environmental factors are known to trigger asthma or exacerbate asthma symptoms. NSB-specific data in these areas are discussed in Chapter 1: Overall Health, in the Physical Environment section.

- Indoor air quality: Exposures to tobacco smoke and exhaust from heating sources and nearby vehicles are potential triggers for asthma and exacerbations of asthma symptoms. Arctic residents are particularly vulnerable to indoor air pollution because of tightly sealed houses and poor ventilation, as well as prolonged time spent indoors.29,30 Inadequate indoor ventilation and air circulation can also increase the prevalence of allergenic indoor molds and animal dander.

- Outdoor air quality: Children living in proximity to roadways have more asthma symptoms, decreased lung function, more hospitalizations, and increased incidence of asthma exacerbations.12 This association with traffic density is thought to be caused by increased exposure to a number of components of vehicle exhaust, as well as increased aerosolization of dust and silt. Evidence suggests that course particulate matter such as dust is associated with increased outpatient visits and quick-relief asthma medication use among children.31,32

- Water and wastewater service: Respiratory infections are frequent triggers of asthma exacerbations. Adequate water supply in villages, which facilitates handwashing, has been associated with a decreased incidence of respiratory infections.33,34

5.2.2. Determinants of Chronic Lung Disease

By far the most important risk factor for CLRD in the U.S. is smoking. In the U.S., COPD is associated with a history of cigarette smoking in 80–90% of cases.35 Thus, although other factors may be contributory, the high rates of COPD and mortality from chronic lung disease are not surprising given the high rates of tobacco smoking in the NSB, discussed in Chapter 1: Overall Health.

Recurrent and severe LRIs during infancy and childhood also increase the risk of developing some types of chronic lung disease and reduced lung function. Current rates of LRI among NSB children do not appear to be higher than statewide rates, although at least one serious outbreak of RSV has occurred recently in the NSB, as described previously. The older generation of rural Alaska Natives suffered from a very high prevalence of respiratory infections such as tuberculosis during the last century,36 and the complications of these infections may still be contributing to the disparity in chronic lower respiratory morbidity and mortality seen in the NSB.
Indoor and outdoor air pollution, dust and chemicals in the workplace, and second-hand tobacco smoke also play a role in the development of chronic lung disease. In more developed countries, these environmental factors are estimated to contribute between 10 and 30% of the disease burden of COPD. As discussed in the Overall Health section, air quality data in the NSB are very limited, and the contribution of oil development-related air pollution to chronic lung disease and asthma in the NSB has not been fully determined. A recent study examining air quality in Nuiqsut, the village closest to oil development activities, has not found evidence of pollution at levels expected to have significant health effects, according to one of the investigators.

5.2.3. Determinants of Respiratory Infections

5.2.3.1. Influenza and Pneumococcal Immunization

Immunization of adults and children can reduce the incidence of influenza and pneumococcal respiratory illness in a community. As of June, 2010, pneumococcal vaccinations rates among elderly Alaska Natives in the NSB are close to the Healthy Alaskans 2010 target, but influenza vaccination rates in this high-risk group were less than 50%.

During the 2009–2010 flu season, seasonal influenza immunization rates among Alaska Native adults in the NSB were similar to those among Alaska Native adults statewide. Pediatric influenza vaccination rates were considerably lower than statewide rates, however. The 2009–2010 flu season was unusual in that public health efforts were largely focused immunizing against the epidemic H1N1 strain, which required a vaccine separate from the seasonal flu vaccine.
5.2.3.2. Behavioral and Environmental Factors

The transmission of respiratory infections depends on many of the same factors as other infectious diseases. In particular, crowding, poor nutrition and underlying health problems, tobacco smoking and secondhand smoke, inadequate water supplies, and poor ventilation and indoor air quality increase the risk of respiratory infections. Breastfeeding and handwashing can reduce the incidence of many infectious respiratory illnesses. Community education levels have also been shown to predict pediatric LRI rates and are an even better predictor than the educational level of mothers.

Chapter 5 Endnotes

1. North Slope Borough Health Department, Community Health Aide Program: Structured interviews with health aides from NSB villages, March 2010.
2. Atuangaruak R, resident and former community health aide, Nuiqsut, Alaska. Personal communication 12/09.
3. 2010 NSB Census
6. Poppel, Birger, Jack Kruse, Gérard Duhaime, Larissa Abyrutina. 2007. SLiCAREsults. Anchorage: Institute of Social and Economic Research, University of Alaska Anchorage. Data tables and other information about the study were accessed online at http://www.iser.uaa.alaska.edu/Projects/living_conditions/results.htm


25. Alaska Native Tribal Health Center Immunization Program. Rates provided by Tania Smallenburg, Immunization Nurse Coordinator, upon request.

26. *Seasonal Influenza (Flu): Key Facts about Influenza (Flu) and Flu Vaccine*, CDC Fact Sheet, accessed online at [http://www.cdc.gov/flu/keyfacts.htm](http://www.cdc.gov/flu/keyfacts.htm).


30. Alaska Department of Environmental Conservation: Division of Air Quality [http://www.dec.state.ak.us/air/index.htm](http://www.dec.state.ak.us/air/index.htm).

31. Chimonas, M.R., and B.D. Gessner: Airborne particulate matter from primarily geologic, non-industrial sources at levels below national Ambient Air Quality Standards is associated with outpatient visits for asthma and quick-relief medication prescriptions among children less than 20 years old enrolled in Medicaid in Anchorage, Alaska.” *Environmental Research* 102, no.3 (2007): 397–404.


"Indicators of maternal, infant, child, and adolescent health are among the most important worldwide indicators of health status and social well-being." These measures typically reflect, more than the success or failure of medical care or technology, the underlying socioeconomic and environmental conditions of a community. Coordinated public health efforts and access to healthcare for women and children can, however, have substantial impact on maternal and child health. Many of the factors that affect adult health—smoking, alcohol or drug use, diet, utilization of preventive healthcare, as well as environmental and social conditions—have amplified effects on the developing fetuses, infants, and youth. Moreover, health and experiences in these critical early life stages can have lifelong effects and influence the health of families and communities for generations.
6.1. Maternal and Child Health Statistics

6.1.1. General Health Status of Children in the NSB

6.1.1.1. General Children’s Health Status Data from the 2010 NSB Census

In the 2010 NSB Census, the vast majority of children in the NSB were reported to be in at least “good” general health. Children in the NSB were considerably less likely than Alaskan children overall to be reported to have “very good” or “excellent” general health, however.\(^2\) Within the NSB, reported general health status of Ifhupiat children was significantly worse than that of Caucasian children and those in other ethnic groups.\(^2\)

Reported general health status among children varied widely across the North Slope communities. The percentage of children reported to have very good to excellent health ranged from 38% in Atqasuk to 70% in Point Lay. Among Ifhupiat children, those living in Barrow were significantly more likely to be reported to have very good or excellent than were their counterparts in other North Slope villages as a whole (64% vs. 56%, respectively).\(^2\)

Table 6.1: Reported General Health Status of Children (0–17 Years) in NSB Villages

<table>
<thead>
<tr>
<th></th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>All NSB Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very good or</td>
<td>41%</td>
<td>38%</td>
<td>68%</td>
<td>66%</td>
<td>55%</td>
<td>66%</td>
<td>70%</td>
<td>54%</td>
<td>63%</td>
</tr>
<tr>
<td>Excellent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

nsB data source: 2010 NSB Census.

6.1.1.2. General Teen Health Status Data from YRBS

In 2005, an estimated 92.7% of NSB high school students described themselves as being in good to excellent health, with 9.3% reporting fair to poor health.\(^4\)

6.1.2. Child Mortality

6.1.2.1. Mortality Rates in Children Less Than 5 Years of Age

A common way to report child mortality rates is to look at the number of deaths in children less than age 5 years per 1000 live births in a year. This is called the “Under-5 Mortality Rate.” Looking at under-5
mortality rates in individual Alaska census areas for 1999–2008, a similar pattern to that seen with infant mortality emerges. The northern, interior, and southwest regions suffer from the highest death rates among children less than 5 years old. Among these remote rural census areas, however, the NSB had the lowest under-5 mortality rates for this 10-year period.5

Figure 6.2: Under-5 Mortality Rates, by Region: Number of children dying before their 5th birthday per 1000 live births per year, 1999–2008

6.1.2.2. Child Mortality, Ages 0–19 Years

Over the past decade, the death rate among all children and teens (ages 0–19 years) in the NSB has remained fairly stable and higher than the state and national average.5,6

Figure 6.3: Child Mortality Rate (Ages 0–19 Years): Number of deaths per 100,000 population, 1997–2008

*NSB rates are based on fewer than 20 occurrences per time period and must be interpreted with caution. NSB and Alaska data source: Alaska Bureau of Vital Statistics. U.S. Statistics were available for 2002, 2003, 2005 for ages 0–19 years. Data source: National Center for Health Statistics, accessed through the National MCH Center for Child Death Review. Child mortality statistics for the U.S. are typically calculated for age groups excluding infants less than 1 year and are, therefore, not directly comparable to Alaska census area data, where population estimates for children less than 1 year of age are not readily available.
6.1.2.3. Racial Disparities in Child Mortality in Alaska

The high child death rate is a major public health concern in Alaska, and reducing child deaths is a major public health challenge statewide. Alaskan children have 1.5 times the risk of death as other American children.1 Child mortality is also an area of racial health disparity. Young Alaska Native children are more than twice as likely to die before their 5th birthday as their white counterparts.5 Among children 1–4 years old (which excludes infant mortality), Alaska Native mortality was more than four times the non-Native rate (103.4 vs. 23.7 per 100,000).7

Figure 6.4: Under-5 Mortality Rates in Alaska, by Race: Number of children dying before their 5th birthday, per 1000 live births per year, 2006–2008

<table>
<thead>
<tr>
<th>Race</th>
<th>Mortality Rate (per 1000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska All Races</td>
<td>7.6</td>
</tr>
<tr>
<td>Alaska Native</td>
<td>14.1</td>
</tr>
<tr>
<td>White</td>
<td>5</td>
</tr>
</tbody>
</table>


6.1.2.4. Leading Causes of Child Death in Alaska

Young Children, Ages 0–9 Years: The leading cause of death to Alaska children from 1996 to 2005 was unintentional injuries,7 causing 40% of deaths in children ages 1–9 years. The unintentional injury death rate among young children in Alaska is nearly twice as high as that of all U.S. children. The most common unintentional injury deaths to children were motor vehicle accidents (including off-road vehicles), drowning, other accidents, and fires.7 The second leading cause of death to Alaska children was homicide, comprising 8% of deaths to children 1–4 years and 7% of deaths among 5–9-year-olds.7

Adolescents, Ages 10–14 Years: From 1996 to 2005, the leading cause of death to Alaskan adolescents was unintentional injury (49%), followed by suicide (11%). During this time period, the unintentional injury rate was significantly higher among Alaska Native adolescents, compared with non-Natives. The suicide rate among Alaska Native adolescents (5.7%) was twice that of non-Native adolescents (2.8 per 100,000).7

Teens (Ages 15–19): During 1996–2005, 82% of deaths among Alaskan teens were caused by unintentional injury, assault, and suicide. The leading cause of death among Alaska Native teens was suicide, accounting for 47% of deaths. Among non-Native teens, unintentional injury was the leading cause of death. The teen suicide rate was more than eight times higher among Alaska Native teens than among non-Native teens (110.8 vs. 13.1 per 100,000, respectively).7

6.1.3. Infant Mortality

The infant mortality rate (IMR) is an important marker of the overall health and well-being of a community, and this health indicator was also reviewed in the section on overall health. The IMR typically reflects such factors as living conditions, education and income level of parents, and access to primary care. IMR is also an important indicator of the health status of women and children in a community and, thus, is also included in this section on maternal-child health.

6.1.3.1. Trends in IMR

IMR statistics for the NSB are available from 1977. IMR has decreased markedly in the NSB since then, a pattern seen throughout rural Alaska. In the 1986–1995 death cohort, the NSB was one of only two regions with IMRs statistically significantly higher than the state IMR. Around 1990, however, the borough experienced a drop in the IMR, and by the 1998–1997 death cohort, although the IMR of the NSB remained higher than the statewide rate, this difference was no longer statistically significant. Nonetheless, the NSB’s IMR continues to be higher than the state average and roughly double the Healthy Alaskans 2010 target of 4.5 per 1000 live births.5
6.1.3.2. Regional IMR Comparison in Alaska

Looking at the 10-year period 1998–2008, one can see that the highest IMRs occurred in the northern, interior, and southwest regions of the state. Among these remote rural regions, the NSB had the lowest IMR, albeit higher than the urban centers and southeast Alaska.5

6.1.3.3. Neonatal vs. Post-Neonatal Infant Mortality

Post-neonatal deaths are defined as deaths occurring between 28 days and 1 year after birth. Causes of post-neonatal infant deaths include such causes as SIDS, accidents, injuries, and illness. Neonatal deaths are those occurring between birth and 28 days of life. Neonatal deaths are typically associated with prematurity, birth defects, and other complications of pregnancy and birth. During the 1990s and early 2000s, the high IMRs in the NSB were largely attributable to relatively high rates of post-neonatal death.5 This pattern was, and still is, typical (although not universal) throughout most of the northern, southwest, and interior rural regions of the state.5 During the most recent decade, however, infant mortality in the NSB has been comprised predominantly of neonatal deaths.5 This change in the composition of infant mortality in the NSB is not seen consistently in other regions of the state. Statewide, roughly half of infant
deaths during the past two decades occurred during the neonatal period and the other half during the post-neonatal period. Because of the very small number of events from a statistical standpoint, observed patterns in the NSB must be interpreted with caution.

A review of infant deaths in Alaska from 1992 to 2002 found that the leading causes of post-neonatal deaths, allowing for multiple causes, were SIDS (asphyxia of unknown cause), unintentional suffocation, congenital anomalies, infection, and physical trauma. Roughly half of post-neonatal deaths caused by trauma were found to be possible or probably victims of neglect or abuse. The primary contributing factors to neonatal deaths were preterm birth, contributing to almost half (48%) of all neonatal deaths, perinatal events, and infections.

### 6.1.4. Fetal Mortality

Fetal death rate refers to the number fetal deaths occurring after 20 weeks' gestation per 1000 live births plus fetal deaths. The fetal death rate in Alaska has remained fairly steady and slightly lower than the national rate. Fetal mortality has decreased among Alaska Native women over the last decade, resulting in a lower fetal death rate compared to non-Natives. From 1999–2008, the fetal death rate in the NSB (4.7 per 1000) was not significantly different from the Alaska rate (4.9 per 1000). The Healthy Alaskans 2010 target was to reduce the fetal death rate to 3.8 per 1000 live births.

### 6.1.5. Preterm Birth and Low Birth Weight

#### 6.1.5.1. Preterm Birth

Preterm birth is defined as birth at less than 37 weeks' gestation, and low birth weight (LBW) is defined as newborns weighing less than 2500 grams. These are two other important maternal-child health indicators. Preterm delivery is a leading cause of infant mortality, and it can be associated with life-long ill health effects such as respiratory problems, cerebral palsy, and blindness. Infants born preterm have much higher mortality rates compared with infants born at term and incur healthcare costs many times more than costs of term births.

Overall, the preterm birth rate in the NSB has been trending downward since the late 1970s but recently appears to have plateaued or even begun to increase. The rate of preterm births in the NSB has been consistently higher than statewide rates and the Healthy Alaskans 2010 target rate. Preterm birth is also an area of racial disparity. In 2007–2009, Alaska Native mothers in the NSB were five times as likely as white mothers to have a preterm birth (15.2% vs. 2.8%, respectively).
The national preterm birth rate has increased 30% since 1981. Although preterm birth has been on the rise in recent decades both statewide and nationally, a downward trend was seen in spontaneous preterm birth rates among Alaska Native populations statewide during 1989–2006. Preterm births because of medical intervention have increased, however, for both Alaska Native and non-Native women.

6.1.5.2. Low Birth Weight (LBW)

The majority of LBW babies are born preterm, and a majority of neonatal and a substantial portion of post-neonatal deaths occur among infants born at LBW. Rates of LBW births in the NSB have decreased since the late 1970s, with a nadir in the mid-1990s, but appear to be trending upward over the past 15 years. Rates in both the NSB and Alaska remain lower than U.S. rates overall.

Figure 6.8: Low Birth Weight: Number of infants weight less than 2500 grams per 100 live births, 1977–2009

6.1.6. Birth Defects

Congenital anomalies, or birth defects, are a leading cause of infant death and morbidity in children. In Alaska, it is estimated that birth defects contributed to 33% of neonatal and 20% of post-neonatal deaths during 1992–2002.

6.1.6.1. Any Major Congenital Anomaly

Based on a State of Alaska analysis of data from the Alaska Birth Defects Registry (ABDR) for the 1996–2002 birth cohort, the prevalence of major congenital anomalies in the NSB was higher than the statewide prevalence but virtually the same as the statewide prevalence for Alaska Natives. Birth defects are an area of racial health disparity, with higher rates among Alaska Natives, and this disparity persists after excluding fetal alcohol spectrum disorders (FASD) and controlling for identifiable risk factors. Some of the differences among regions and populations may be attributable to differences in surveillance methodology, reporting, and diagnostic and clinical practices. In addition, the estimates for children born in Alaska during 1996–2002 include all cases reported before January 1, 2005, regardless of the age at which the child was first reported to the ABDR. Many states include only children who were diagnosed or reported before their 1st birthday. Thus, comparisons with U.S. rates must also be interpreted with caution.
In the NSB, FASD was the most common anomaly, followed by cardiovascular anomalies (birth defects of the heart and blood vessels). Cardiovascular anomalies were the most common birth defects statewide, followed by FASD. Other specific types of anomalies in the NSB had fewer than 10 cases each during the time period studied and, therefore, rates are not presented individually.

6.1.6.2. Cardiovascular Anomalies

Cardiovascular anomalies range from mild and asymptomatic to life-threatening or fatal. The prevalence of cardiovascular anomalies in the NSB was about twice that for non-Natives statewide, but similar to rates among Alaska Native infants statewide. Of the different regions examined in the statewide analysis of birth defect registry data, southwest Alaska had the highest rate of cardiovascular anomalies, and the northern region, which included the NSB, as well as Northwest Arctic Borough and Bering Straits area, had the second highest prevalence.

6.1.6.3. Fetal Alcohol Spectrum Disorders

Fetal alcohol spectrum disorders (FASDs) describe infants with physical, mental, behavioral, or learning disabilities associated with maternal alcohol use during pregnancy. Approximately one in 10 infants diagnosed with FASD meet the case definition for the most severe form of the disorder, fetal alcohol syndrome, or FAS, which requires specific deficits including typical facial features, growth deficits, and neurodevelopmental deficits in the setting of prenatal alcohol exposure.

The prevalence of FASD in the NSB was more than three times the state average and 16 times the rate in non-Natives statewide, but similar to the statewide rate estimate for Alaska Natives. Aggressive case finding activities within the Alaska Native Health Services may explain some of the observed racial discrepancy. Of the different regions examined, the northern region had the highest prevalence of FASD, more than twice that of any of the other regions. Again, practice variation in screening, diagnosis, and reporting may account for some of the regional differences. Among Alaska Natives, however, the prevalence of FAS dropped almost 50% from children born in 1996–98 to those born in 2000–02.
6.1.7. Child Maltreatment

Child maltreatment is a complex phenomenon, encompassing varying degrees of neglect and mental injury, as well as physical and sexual abuse. Cases of child maltreatment often occur in homes where alcohol or drugs impair a parent’s ability to care for or protect a child, and child maltreatment is often seen in homes where other types of domestic abuse are occurring. Child neglect and other forms of maltreatment are contributing factors to general health status and many other health problems among children. Childhood trauma and maltreatment contribute to an adverse early child environment that can have devastating consequences throughout the lifespan.

The NSB experienced high rates of child maltreatment in 2006–2008 compared with the state average, similar to other northern and southwest remote rural areas of the state. Comparable, reliable rates are not available prior to 2006, when a statewide mandatory electronic data reporting system was implemented.17 The Healthy Alaskans 2010 target was a reduction in the rate of child maltreatment to less than 10 substantiated reports per 1000 children.1

In 2009, in the Northern region—including the offices of Barrow, Delta Junction, Galena, Kotzebue, McGrath, and Nome—55% of substantiated allegations were for neglect, 8% physical abuse, 1% sexual abuse, and 35% mental injury. Statewide, over 70% of substantiated allegations were for neglect, with only 17% for mental injury.17 Alaska has one of the highest documented infant physical abuse incidences reported in the literature for any state.18 Child maltreatment is also an area of racial health disparity, with rates of maltreatment-related infant deaths that are 3.2 times higher for Alaska Native than for non-Native infants.7 Again, differences in diagnosis and reporting practices may account for some of the regional and racial differences observed.
6.1.8. Common Health Conditions Among Children

6.1.8.1. Childhood Obesity

Obesity has become one of the most common health problems of childhood. Reversing the upward trend in childhood obesity has been identified as a major statewide\(^{19}\) and national public health goal.\(^{20}\) Being overweight and obese start early, and some overweight children already experience complications such as high blood pressure and diabetes by the time they reach their teenage years.

**Overweight/Obesity Data from NSB Public Health Nursing Records**

Body Mass Indexes (BMIs) were calculated based on measured height and weight for more than 1000 NSB children aged 3–18 years in the public health nursing database.\(^{21}\) Based on CDC standard definitions, half of the NSB children in this sample were either overweight or obese, and obesity prevalence estimates for children in the NSB\(^{21}\) are approximately 50% higher than among Alaskan children statewide.\(^{19}\) Because these are not random samples and the methods used in deriving these two estimates were somewhat different, comparisons must be interpreted with caution. Also, the years from which data were drawn for these estimates also differ, and this must be taken into consideration, especially given the upward trend in child obesity in recent decades.

Problems with overweight and obesity start early—roughly half of children in the 2008–2009 NSB sample were already overweight or obese upon starting kindergarten.\(^{21}\)

**Figure 6.13: Childhood Overweight and Obesity: Percent of children meeting BMI criteria for overweight and obesity**

![Graph showing the percentage of children meeting BMI criteria for overweight and obesity in the NSB and Alaska.](image)

Overweight is defined as having a BMI in the 85th to 95th percentile for age and gender. Obese is defined as having a BMI above the 95th percentile for age and gender.

NSB data source: NSB Public Health Nursing RPM database, single year estimate based on heights and weights taken from August, 2008 to August, 2009.


**Figure 6.14: Childhood Overweight and Obesity in the NSB, by Age: Percent of children meeting BMI criteria for overweight and obesity**

![Graph showing the percentage of children meeting BMI criteria for overweight and obesity by age in the NSB.](image)

NSB data source: NSB Public Health Nursing RPM database, single year estimate based on heights and weights taken from August, 2008 to August, 2009. Overweight is defined as having a BMI in the 85th to 95th percentile for age and gender. Obese is defined as having a BMI above the 95th percentile for age and gender.
Chapter 6: Maternal and Child Health

Obesity Data from NSB WIC Records and YRBS

Among NSB children enrolled in WIC between 2003 and 2009, more than one in three children ages 2–5 years met the current criteria for obesity, with a BMI greater than or equal to the 95th percentile for age and gender. This estimate was more than twice the nationwide estimate for 2008. The Healthy Alaskans 2010 target was for fewer than 10% Alaskan children enrolled in WIC to meet these criteria for obesity.

According to the 2005 YRBS survey data, 22% of NSB high school students were overweight (now categorized as obese, with BMI ≥95th percentile for age and gender), based on self-reported height and weight. The Healthy Alaskans 2010 target was for fewer than 5% of adolescents to meet these criteria for obesity.

Childhood Obesity in Alaska and the U.S.

According to a large nationwide survey of parents in 2007, approximately 33.9% of Alaskan children aged 10–17 years were estimated to be overweight or obese (BMI 85th to 95th or above the 95th percentile, respectively); the nationwide average was 31.6%. Childhood obesity is a major area of health inequality. Among non-white, non-Hispanic children—including Alaska Native and American Indian, African American, Native Hawaiian, and Asian and Pacific Islander—half of children were overweight or obese. Nationally, children living in poverty are also twice as likely to be overweight or obese as their counterparts with family incomes more than 400% of poverty.

6.1.8.2. Tooth Decay

Tooth decay is the most common chronic disease of childhood and can be associated with speech problems, difficulty eating and sleeping, and poor school performance.

Local NSB data from an ASNA sealant clinic in Barrow for 1st and 5th graders found 53.6% of these children to have cavities, with an average of 3.4 cavities per child. Roughly three-quarters of students in these grade levels participated in the clinic. At Samuel Simmonds Memorial Hospital (SSMH), more than 2900 treatments with prophylactic fluoride were recorded among school-aged children in 2008–2009.

Although data from other sources are not directly comparable to the NSB sealant clinic data, data from several oral health surveys are provided as a reference. A 2004 statewide oral health survey of 3rd-graders found that 43.5% of Alaska Native students had untreated caries, compared with 28% of Alaskan 3rd graders overall. Students living in rural Alaska had the highest prevalence of untreated caries (43.1%) as well as experience with dental caries (87%). No borough-level data were available from this survey. An Indian Health Service oral health survey report from 1999 also demonstrates significant disparity between American Indian/Alaska Native (AI/AN) children and the general school-aged U.S. population.

An oral health surveillance system is under development and will be able to track data at the regional level in the future.
6.1.8.3. Anemia

Pediatric anemia, a common condition, can lead to lifelong physical and cognitive deficits that persist even when the anemia is corrected. The most common cause of anemia in children is low iron stores, and iron deficiency anemia is estimated to occur in up to 10% of 1- to 3-year-olds nationwide. Women and children enrolled in WIC are at particularly high risk for anemia and are screened for anemia during visits. The Healthy Alaskans 2010 target was for fewer than 15% of children less than 5 years served by WIC to have anemia (hemoglobin or hematocrit below 5th percentile of CDC population).

Anemia prevalence among NSB children enrolled in WIC appears to be similar to the statewide average and follow the same pattern of declining prevalence with age up to 5 years. Among pregnant and post-partum WIC clients, however, anemia appears to be more common in the NSB than in Alaska overall. Variation in timing of hemoglobin measurement and other factors may account for some of this difference, and further examination would be helpful to confirm and explain the high rate of anemia in post-partum women in the NSB.

Iron-deficiency anemia is particularly common among rural Alaska Native children and pregnant and post-partum women, despite diets that are typically high in iron-rich foods. Among WIC clients, anemia rates have been shown to be higher overall in Alaska Natives, compared with non-Natives, but Alaska Natives living in coastal and urban regions have lower anemia rates than those in other areas.
6.1.8.4. Respiratory/Ear/Nose/Throat Problems
Respiratory problems are one of the most common ailments in children. These are discussed in Chapter 5: Respiratory Disease.

6.2. Determinants of Maternal and Child Health

6.2.1. Overview of the Determinants of Maternal and Child Health
Most maternal and child health problems—complications of pregnancy and birth, accidental injury, neglect and abuse, respiratory diseases, obesity, anemia, tooth decay, and many others—are strongly linked to the socioeconomic and physical environment in which families live. Income and poverty, adequate housing and sanitation, exposure to violence or abuse, maternal education level, social support and level of paternal involvement all affect maternal and child health in significant ways. Children's health is also particularly sensitive to a wide array of factors that create the physical, social, and economic environment in which they grow and develop—housing policies, local option laws that restrict access to alcohol, land use and access to safe recreational opportunities, law enforcement, educational environment, food security, water and sanitation infrastructure, environmental toxins, and many more.

The health and well-being of mothers have profound effects on children, both before and after birth. A fair amount of data is available on maternal factors, such as smoking, alcohol use, nutrition, family planning, prenatal care, breastfeeding, that affect infant and child health. Like other communities in remote rural Alaska, the NSB has relatively high rates of a number of factors associated with an increased risk of poor birth outcomes and child health. These behaviors cannot be viewed, however, outside of the context of the conditions in which the mother and family live.

Statistics on the age, educational level, and marital status of mothers are imperfect but useful markers of the mother’s socioeconomic environment and social support, both of which heavily influence the outcome of a pregnancy and the likelihood of a healthy family. Both unmarried status and teen pregnancy are associated with poor birth outcomes. A recent study found that, among both Alaska Native and non-Natives, the categories of unmarried and having a father’s name missing from the birth certificate were associated with the highest post-neonatal mortality rates. Other risk factors for poor birth outcomes include lack of prenatal care and maternal use of tobacco and alcohol during pregnancy. Prenatal health factors, such as diabetes, age, genetic factors, and use of certain medications, are associated with an increased risk of certain birth defects and poor pregnancy outcomes as well.

The causes of preterm birth and associated LBW are not completely understood, but preterm birth has been found to be associated with a number of maternal risk factors, including smoking, drug use, low prepregnancy weight, and age of the mother being less than 17 years or more than 35 years. Having a major congenital anomaly has also been found to be associated with birth to a teenage mother, or to a mother receiving late or no prenatal care or who reported drinking or smoking during pregnancy. Mothers or fathers with less than 12 years of education, a mother being unmarried, and maternal prenatal substance abuse are factors that have been found to be associated with an increased risk of infant physical abuse.

Well-child care and social services that support young families—for example, quality child care and early childhood education, nurse-family partnership programs, nutrition and breastfeeding support—are also vital to the well-being of mothers, infants, and children in a community, particularly those who are disadvantaged. Injury prevention efforts, such as seatbelt and helmet laws and personal flotation device programs, also affect the number of accidental deaths to children, the leading cause of child mortality in Alaska and the U.S.
### 6.2.2. Selected Maternal Risk Factors

Some of the specific factors that are associated with maternal and child health outcomes are reviewed later in this chapter; however, virtually all the determinants discussed in Chapter 1: Overall Health are also important influential factors in the health of children and families as well.

Compared with Alaska overall, the NSB has relatively high rates of a number of maternal characteristics associated with an increased risk of poor maternal and child health, including being unmarried, being a teenager, lack of a high school education, prenatal tobacco smoking, and late or no prenatal care. Many other communities in remote rural Alaska also have a high percentage of mothers with these risk factors, as can be seen in Figure 6.18.5

**Figure 6.18: Selected Maternal Risk Factors, by Region: Percent of mothers (delivering live infants) reporting risk factors, 2007–2009**

The data on maternal risk factors also demonstrate considerable racial disparities, both statewide and within the NSB. In the NSB in 2007–2009, Alaska Native mothers were more likely than white mothers to be unmarried, have less than 12 years of education, be less than 20 years old, report smoking during the last three months of pregnancy, or receive late prenatal care or an inadequate number of prenatal care visits. Data are not available for other individual racial groups in the NSB.5

### 6.2.3. Prenatal Tobacco Smoking

Prenatal smoking not only puts a fetus at increased risk, but after a baby is born, exposure to tobacco smoke is associated with an increased risk of SIDS, ear infections, pneumonia, and asthma exacerbations.31

Reported rates of smoking during pregnancy are high in the NSB—roughly three times statewide rates—and do not appear to be declining.5
Data collected in the PRAMS survey between 1996 and 2009 suggest that about 37% of NSB mothers smoked during the last 3 months of pregnancy—more than twice as high as in the state overall (17%). The NSB estimates were based on between 50 and 200 respondents per time period. The Healthy Alaskans 2010 target was for no more than 15% of women to report cigarette smoking during the last 3 months of pregnancy.

### 6.2.4. Prenatal Alcohol Use

Alcohol is particularly toxic to the developing fetus, and exposure to alcohol during pregnancy can result in a range of birth defects and learning and behavioral problems collectively referred to as FASD. Moreover, drinking during pregnancy can predict ongoing alcohol problems in the home that put infants and children at increased risk for neglect, abuse, unintentional injuries, and other harmful experiences.

Reported prenatal drinking levels have declined quite dramatically in the NSB over the past two decades, based on vital statistics data, collected shortly after delivery.

Data collected in the PRAMS survey between 1996 and 2008 suggest a similar downward trend. These estimates were based on a total of 50–200 respondents for each 5-year period.

### Figure 6.21: Prevalence of Prenatal Alcohol Use: Percent of women surveyed reporting drinking alcohol during the last 3 months of pregnancy, 1996–2008 PRAMS data

Data source: Alaska Pregnancy Risk Assessment Monitoring System. Analysis and data provided by the Alaska Department of Health and Social Services, Maternal and Child Health Epidemiology Unit of the Alaska Division of Public Health.
In Alaska, the strongest risk factors associated with any and regular alcohol consumption by the mother during the 3rd trimester were older age and marijuana or cocaine use. Other risk factors for any third-trimester drinking included cigarette smoking, greater education, the experience of domestic violence, non-Native race, the experience of significant life stressors, and residence in a community that did not restrict the sale of alcohol.33

6.2.5. Prenatal Care

Early and regular prenatal care provides the opportunity to educate women about healthful behaviors in pregnancy and the avoidance of harmful ones, provide vitamins including folic acid, and convey a great deal of information contributing to good pregnancy outcomes and a healthy start to infancy and early childhood. Prenatal care also allows early recognition and proper triage and management of high-risk conditions. Inadequate prenatal care is a risk factor for a number of poor infant and maternal health outcomes.

The NSB has experienced fairly dramatic trends in adequacy of prenatal care over the past 30 years. The percent of women receiving early and adequate PNC peaked in the 1990s and has been decreasing since then. A similar but less dramatic trend is seen in Alaska overall.5 It is not entirely clear how consistently prenatal visits in village clinics are included in the birth certificate statistics, and rates of early, or 1st trimester, initiation of care may be a better measure in rural Alaska. Nonetheless, the general downward trend in the number of women receiving both early and adequate prenatal care in recent years is concerning. Although it is doubtful that any single factor is driving these trends, in the NSB, the period of relative high rates of early and adequate prenatal care corresponds to a period in the 1990s when a relatively well-staffed and funded Public Health Nursing program coordinated a maternal and child wellness program comprised of prenatal and well-child care, nutrition, behavioral health, and other education, outreach, and social services.34

Women in NSB villages and other remote rural areas can face significant barriers to obtaining prenatal care, including the inconvenience and expenses associated with travel, separation from families, cultural barriers, and a fragmented system of care.34–36 Teen mothers often delay seeking care because of inadequate education about prenatal care and fears about others learning of the pregnancy.35 Community health aides do provide basic prenatal care services in villages, although the amount of prenatal care provided varies significantly among the NSB villages,37 and it is not clear how consistently these visits are captured in prenatal care statistics. Therefore, “adequate prenatal care” data must be interpreted with caution in rural Alaska, especially in comparing the NSB with statewide statistics. Nonetheless, the trend in adequate prenatal care estimates in the NSB roughly parallel the trend seen in first trimester prenatal care rates and raise concern about a decline in utilization of prenatal care in the region.
6.2.6. Maternal Health and Nutrition

The health and nutritional status of a mother can have significant effects on a developing fetus. Maternal health problems such as obesity, high blood pressure, and diabetes can lead to pregnancy complications and, sometimes, health problems for the infant.

6.2.6.1. Maternal Obesity

Women who are overweight or obese are at increased risk for a number of complications during pregnancy and delivery, including high blood pressure, diabetes, and an increased risk of operative delivery. During 1996–2008, the prevalence of pre-pregnancy overweight or obesity in the mother was almost 60% in the NSB, compared with the statewide average of approximately 40%. Data from between 50 and 200 PRAMS survey respondents in the NSB.
6.2.6.2. Gestational Diabetes

Because of hormonal changes, women are at increased risk of developing diabetes during pregnancy, especially women who are overweight or obese or who have a family history of diabetes. This form of diabetes is called gestational diabetes, and when it is not well-controlled, it is associated with a number of potentially serious complications. According to the Alaska Native Diabetes Program’s gestational diabetes registry, the number of cases of gestational diabetes in the NSB more than doubled between 1995 and 2005.

![Figure 6.25: Number of Gestational Diabetes in the NSB](image)

*There were fewer than six cases in 1985 and 1990.
Includes the villages of Anaktuvuk Pass, Atqasuk, Barrow, Kaktovik, Nuiqsut, Point Hope, Point Lay, and Wainwright
Data source: Alaska Native Diabetes Program Registry.

6.2.6.3. Folic Acid

Certain birth defects can be prevented by adequate maternal intake of folic acid (a type of B vitamin) before becoming pregnant and during the first trimester of pregnancy. These birth defects are collectively called neural tube defects (NTDs). Folic acid fortification of commercial grain products became required in 1998.38 In Alaska, survey data show an increase in awareness about the importance of folic acid for women of childbearing age between 1996 and 2001: knowledge of the benefits of folic acid among women who delivered a live birth increased from 63% in 1996 to 81% in 2001. Knowledge of benefits was lower among Alaska native women but there was a greater increase in knowledge in this group.38 NSB-specific data about folic acid intake are not available.

6.2.7. Prenatal Abuse by Husband or Partner

Women who are abused before or during pregnancy are at greater risk for poor pregnancy outcomes.7 Women in the northern region (including NSB, Northwest Arctic Borough, and Nome census regions) experienced the highest prevalence of pre-pregnancy physical abuse of all the regions studied. Women in the northern region were also the most likely to report having a controlling partner or one that made her feel unsafe.7 Women in the NSB experienced rates more than double the rates of prenatal physical abuse in Alaska overall. During the period 1996–2008, roughly one in 10 women in the NSB who delivered live births reported experiencing physical abuse by their husband or partner during pregnancy. Each 5-year time period represents data from between 50 and 200 PRAMS survey respondents in the NSB.32

![Figure 6.26: Prevalence of Prenatal Physical Abuse by Husband or Partner: Percent of women (delivering live infants) who reported abuse during pregnancy, 1996–2008](image)

Data source: Alaska Pregnancy Risk Assessment Monitoring System. Analysis and data provided by the Alaska Department of Health and Social Services, Maternal and Child Health Epidemiology Unit of the Alaska Division of Public Health.
6.2.8. Teen Birth Rates

Whereas the cultural acceptability and support available to teen mothers vary in different cultures, birth to a teenage mother is a risk factor for a number of poor health outcomes for infants and children. Teen (15–19 years) birth rates in the NSB remain more than twice statewide rates, and although teen birth rates have declined slightly in Alaska since the early 1990s, a similar downward trend is not apparent in the NSB.5

![Figure 6.27: Teen Birth Rate (Ages 15–19 Years): Number of births per 1000 females, 1993–2009](image)


6.2.9. Family Planning

Family planning can help increase the likelihood that babies are born to mothers at a time in their lives when they are prepared for parenthood and are able to provide a stable, secure home environment. Adequate time between pregnancies can also decrease the likelihood of complications during the subsequent pregnancy and birth.

Among NSB high school students surveyed in the 2005 YRBS, the most common method used to prevent pregnancy among both males and females was condoms. Overall, 28% of students who had had sex within the past 3 months reported using no method or being unsure of the method used to prevent pregnancy during their most recent sexual intercourse. Of the students who had had sexual intercourse within the past 3 months, the percentage of NSB high school students reporting the use of birth control pills was significantly lower than in the statewide sample (9.6% vs. 23%, respectively).4

![Figure 6.28: Methods Used by NSB High School Students to Prevent Pregnancy*](image)

*Among students who had had sexual intercourse within the past 3 months, the method used the most recent time.

Data source: 2005 and 2007 YRBS.
6.2.10. Breastfeeding

The benefits of breastfeeding have been very well documented. Breastfed infants have a lower rate post-neonatal infant death and may have reduced rates of SIDS and childhood obesity. Breastfeeding is associated with a decreased incidence of a number of child health problems, including meningitis, diarrheal illness, respiratory tract infection, ear infections, and others. A woman’s decision to initiate or continue breastfeeding may be influenced by a variety of factors, including the attitudes of family, friends, hospital staff, and community, education about breastfeeding benefits, exposure to formula marketing, convenience, physical discomfort, workplace environment, and the availability of breastfeeding support if problems arise.

6.2.10.1. Breastfeeding Data from the NSB WIC Program

While providing formula when desired, the Alaska WIC program supports breastfeeding through education and support programs and by providing enhanced food packages for breastfeeding mothers. Despite WIC’s support of breastfeeding, breastfeeding rates among mothers participating in WIC and Medicaid are typically lower than for mothers not receiving these services, both in Alaska and in the U.S.

Breastfeeding data are available from the NSB WIC program database. In 2010, 91% of post-partum women enrolled in WIC in the NSB initiated breastfeeding. Although 2010 saw an encouraging increase in the percentage of women initiating breastfeeding, by 1 month post-partum, fewer than half of women were still breastfeeding and by 6 months, only one in four women were still breastfeeding. Nationwide, in 2008, 62% of post-partum WIC clients reported ever initiating breastfeeding, and 27% were breastfeeding at 6 months.

Figure 6.29: Breastfeeding Initiation and Duration Among NSB WIC Clients

Data source: NSB Women, Infants, and Children Program, a division of the Alaska WIC Program. May include non-exclusive breastfeeding (supplementing with formula).

6.2.10.2. Breastfeeding Data from PRAMS

Based on data collected from post-partum women in the Alaska Pregnancy Risk Assessment Monitoring System, both breastfeeding initiation rates and continuation rates at 4 weeks post-partum did not change significantly in the NSB between 1996 and 2008, and rates remained below statewide averages. Each 5-year time period represents data from between 50 and 200 PRAMS survey respondents in the NSB.
Chapter 6: Maternal and Child health

Figure 6.30: Prevalence of Breastfeeding Initiation: Percent of women (delivering live infants) who reported initiating breastfeeding, 1996–2008 PRAMS data

A portion of women who initiate breastfeeding are not still breastfeeding at 1 month post-partum, although the majority continue for longer than this. The Healthy Alaskans 2010 target was for at least 80% of women to be breastfeeding at 1 month (4 weeks) after the birth of their babies.

Figure 6.31: Prevalence of Breastfeeding at 4 Weeks: Percent of women (delivering live infants) who reported continuing breastfeeding for at least 4 weeks, 1996–2008 PRAMS data

6.2.10.3. Breastfeeding in Alaska

Alaska has one of the highest breastfeeding rates in the nation. According to PRAMS survey data, a very high proportion of women in Alaska initiate breastfeeding and there is not a significant difference in breastfeeding initiation rates among Alaska Native and non-Native women statewide. Rates among WIC participants statewide are only slightly lower: 88% of WIC participants surveyed in the PRAMS survey in 2005 reported having initiated breastfeeding, and 65% reported breastfeeding for at least 8 weeks.

Analysis of PRAMS data shows the northern region of Alaska to have the lowest breastfeeding initiation rates and the largest decline between initiation and 8 weeks post-partum. Only half of women in the northern region were still breastfeeding 8 weeks after delivery. The percentage of Alaskan mothers working or in school at approximately 16 weeks post-partum did not differ appreciably by region or race.
6.2.11. Access to Healthcare and Other Services

As with overall health, maternal and child health depend on access to quality healthcare. In the NSB, health services for young families are shared by the NSB Health Department and SSMH, operated by ASNA. Well-child visits, school screenings, and childhood immunizations are primarily carried out by the NSB Public Health Nursing (PHN) program, with assistance from Community Health Aides. In recent years, PHN well-child visits and immunization rates, however, have often not met goals (see Chapter 8: Infectious Disease), in large part because of lack of sufficient staffing. The NSB Health Department also supports the Infant Learning Program for infants and young children with developmental needs, and runs the WIC and Integrated Behavioral Health programs, both of which serve the maternal, child, and teen populations. Prenatal care is currently provided at SSMH, with assistance from community health aides for village residents. In Barrow, care for sick children is provided by SSMH providers. In villages, sick-child care typically involves coordination between the community health aide program and providers at SSMH. High-risk pregnancies and children with special healthcare needs require travel to see specialists at Anchorage Native Medical Center and other urban hospitals. As discussed previously in Chapter 1, both the NSB PHN programs and SSMH suffer from chronic healthcare provider shortages and high staff turnover, impeding efforts to provide continuity of care and develop trusting relationships with young families.

6.2.12. Child Poverty

6.2.12.1. Poverty Rate Estimates for Those Less Than 18 Years of Age

Experiencing poverty during childhood adversely affects health over a lifetime. Child poverty estimates have fluctuated widely in the NSB over the past two decades. Nationally-set poverty levels do not currently take into account regional differences in cost of living.
In 2008, the NSB fared better than most other rural regions of the state. In 2009, child poverty estimates decreased further in the NSB, as seen in Figure 6.33.

### Table 6.2: Child Poverty: Estimated Percent of Residents Under Age 18 Years Living in Poverty, by Region, 2008

<table>
<thead>
<tr>
<th>Region</th>
<th>% Children in Poverty</th>
<th>Error Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wade Hampton</td>
<td>38%</td>
<td>28–47%</td>
</tr>
<tr>
<td>Yukon-Koyukuk</td>
<td>34%</td>
<td>25–43%</td>
</tr>
<tr>
<td>Bethel</td>
<td>29%</td>
<td>22–35%</td>
</tr>
<tr>
<td>Dillingham</td>
<td>27%</td>
<td>19–34%</td>
</tr>
<tr>
<td>Lake and Peninsula</td>
<td>26%</td>
<td>19–33%</td>
</tr>
<tr>
<td>Nome</td>
<td>26%</td>
<td>20–33%</td>
</tr>
<tr>
<td>Prince of Wales-Outer Ketchikan</td>
<td>22%</td>
<td>16–27%</td>
</tr>
<tr>
<td>Skagway-Hoonah-angoon</td>
<td>19%</td>
<td>16–22%</td>
</tr>
<tr>
<td>Southeast Fairbanks</td>
<td>19%</td>
<td>14–24%</td>
</tr>
<tr>
<td>Northwest Arctic</td>
<td>18%</td>
<td>13–23%</td>
</tr>
<tr>
<td>Yakutat</td>
<td>17%</td>
<td>12–21%</td>
</tr>
<tr>
<td>Haines</td>
<td>16%</td>
<td>12–21%</td>
</tr>
<tr>
<td>Wrangell-Petersburg</td>
<td>14%</td>
<td>10–18%</td>
</tr>
<tr>
<td>Kenai Peninsula</td>
<td>13%</td>
<td>10–16%</td>
</tr>
<tr>
<td>Aleutians East</td>
<td>12%</td>
<td>9–15%</td>
</tr>
<tr>
<td>Bristol Bay</td>
<td>12%</td>
<td>8–15%</td>
</tr>
<tr>
<td>Matanuska-Susitna</td>
<td>12%</td>
<td>9–15%</td>
</tr>
<tr>
<td>North Slope</td>
<td>12%</td>
<td>9–16%</td>
</tr>
<tr>
<td>Ketchikan Gateway</td>
<td>11%</td>
<td>8–14%</td>
</tr>
<tr>
<td>Anchorage</td>
<td>10%</td>
<td>8–12%</td>
</tr>
<tr>
<td>Sitka</td>
<td>10%</td>
<td>7–12%</td>
</tr>
<tr>
<td>Valdez-Cordova</td>
<td>10%</td>
<td>8–13%</td>
</tr>
<tr>
<td>Fairbanks North Star</td>
<td>9%</td>
<td>7–12%</td>
</tr>
<tr>
<td>Juneau</td>
<td>9%</td>
<td>7–11%</td>
</tr>
<tr>
<td>Kodiak Island</td>
<td>9%</td>
<td>7–12%</td>
</tr>
<tr>
<td>Aleutians West</td>
<td>8%</td>
<td>6–11%</td>
</tr>
<tr>
<td>Denali</td>
<td>8%</td>
<td>6–10%</td>
</tr>
</tbody>
</table>

Data source: County Health Rankings (citing data from SAPE).

### 6.2.12.2. Free and Reduced Lunch Program Eligibility Rates

The percentage of children eligible for free and reduced lunch gives a reasonable estimate of the number of children living in families with household incomes less than 185% of the poverty level.

In 2011, 44% of students enrolled in the NSB School District were eligible for the Free or Reduced Lunch program. Roughly one-third of Alaska school districts had lower percentages and two-thirds had higher percentages of students eligible for the program.
Table 6.3: Free and Reduced Lunch Program Eligibility: District Comparisons

<table>
<thead>
<tr>
<th>District</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Mary’s School District</td>
<td>88%</td>
<td>92%</td>
</tr>
<tr>
<td>Bering Strait School District</td>
<td>87%</td>
<td>88%</td>
</tr>
<tr>
<td>Yup’ik School District</td>
<td>91%</td>
<td>88%</td>
</tr>
<tr>
<td>Hydaburg City School District</td>
<td>94%</td>
<td>88%</td>
</tr>
<tr>
<td>Southwest Region Schools</td>
<td>91%</td>
<td>85%</td>
</tr>
<tr>
<td>Yukon Koyukuk School District</td>
<td>82%</td>
<td>85%</td>
</tr>
<tr>
<td>Alaska Gateway Schools</td>
<td>90%</td>
<td>84%</td>
</tr>
<tr>
<td>Yakutat School District</td>
<td>76%</td>
<td>81%</td>
</tr>
<tr>
<td>Annette Island School District</td>
<td>73%</td>
<td>79%</td>
</tr>
<tr>
<td>Kashunamut School District</td>
<td>75%</td>
<td>77%</td>
</tr>
<tr>
<td>Kuspuk School District</td>
<td>76%</td>
<td>77%</td>
</tr>
<tr>
<td>Lower Kuskokwim Schools</td>
<td>72%</td>
<td>77%</td>
</tr>
<tr>
<td>Lower Yukon School District</td>
<td>67%</td>
<td>76%</td>
</tr>
<tr>
<td>Craig City Schools</td>
<td>77%</td>
<td>75%</td>
</tr>
<tr>
<td>Iditarod Area Schools</td>
<td>64%</td>
<td>75%</td>
</tr>
<tr>
<td>Klawock City Schools</td>
<td>72%</td>
<td>74%</td>
</tr>
<tr>
<td>Northwest Arctic Borough School</td>
<td>72%</td>
<td>74%</td>
</tr>
<tr>
<td>Kake City Schools</td>
<td>68%</td>
<td>73%</td>
</tr>
<tr>
<td>Yukon Flats School District</td>
<td>74%</td>
<td>72%</td>
</tr>
<tr>
<td>Chatham School District</td>
<td>70%</td>
<td>71%</td>
</tr>
<tr>
<td>Lake Peninsula School District</td>
<td>66%</td>
<td>68%</td>
</tr>
<tr>
<td>Dillingham City Schools</td>
<td>71%</td>
<td>64%</td>
</tr>
<tr>
<td>Nome Public Schools</td>
<td>68%</td>
<td>64%</td>
</tr>
<tr>
<td>Southeast Island School District</td>
<td>72%</td>
<td>62%</td>
</tr>
<tr>
<td>Wrangell Public Schools</td>
<td>59%</td>
<td>61%</td>
</tr>
<tr>
<td>Haines Borough Schools</td>
<td>60%</td>
<td>59%</td>
</tr>
<tr>
<td>Aleutians East Borough Schools</td>
<td>56%</td>
<td>58%</td>
</tr>
<tr>
<td>Hoonah City Schools</td>
<td>68%</td>
<td>58%</td>
</tr>
<tr>
<td>Mt. Edgecumbe High School</td>
<td>40%</td>
<td>51%</td>
</tr>
<tr>
<td>Galena City Schools</td>
<td>46%</td>
<td>48%</td>
</tr>
<tr>
<td>Petersburg Public Schools</td>
<td>50%</td>
<td>47%</td>
</tr>
<tr>
<td>Kodiak Island Borough Schools</td>
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<td>45%</td>
</tr>
<tr>
<td>Cordova Public Schools</td>
<td>45%</td>
<td>44%</td>
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<tr>
<td>North Slope Borough School District</td>
<td>45%</td>
<td>44%</td>
</tr>
<tr>
<td>Bristol Bay Borough Schools</td>
<td>43%</td>
<td>43%</td>
</tr>
<tr>
<td>Copper River School District</td>
<td>43%</td>
<td>43%</td>
</tr>
<tr>
<td>Nenana City Public Schools</td>
<td>26%</td>
<td>43%</td>
</tr>
<tr>
<td>Kenai Peninsula School District</td>
<td>37%</td>
<td>42%</td>
</tr>
<tr>
<td>Delta Greely School District</td>
<td>38%</td>
<td>40%</td>
</tr>
<tr>
<td>Anchorage School District</td>
<td>37%</td>
<td>39%</td>
</tr>
<tr>
<td>Matanuska-Susitna Borough School District</td>
<td>36%</td>
<td>37%</td>
</tr>
<tr>
<td>Ketchikan Gateway Schools</td>
<td>33%</td>
<td>36%</td>
</tr>
<tr>
<td>Sitka Borough School District</td>
<td>27%</td>
<td>33%</td>
</tr>
<tr>
<td>Fairbanks North Star Borough Schools</td>
<td>28%</td>
<td>30%</td>
</tr>
</tbody>
</table>
Chapter 6: Maternal and Child health

Table 6.3: Free and Reduced Lunch Program Eligibility: District Comparisons

<table>
<thead>
<tr>
<th></th>
<th>Percent of Enrolled Students Eligible for Free or Reduced Lunch</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2010</td>
</tr>
<tr>
<td>Juneau School District</td>
<td>22%</td>
</tr>
<tr>
<td>Unalaska City School District</td>
<td>17%</td>
</tr>
<tr>
<td>Valdez City Schools</td>
<td>25%</td>
</tr>
<tr>
<td>Skagway City Schools</td>
<td>14%</td>
</tr>
</tbody>
</table>


Within the NSB School District, the percentage of students eligible for the Free or Reduced Lunch program varied quite widely among the village schools, from 25% in Nuiqsut to 81% in Wainwright in 2011.45

Table 6.4: Free and Reduced Lunch Program Eligibility: NSB Village School Comparisons

<table>
<thead>
<tr>
<th></th>
<th>Percent of Enrolled Students Eligible for Free or Reduced Lunch</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2010</td>
</tr>
<tr>
<td>Alak School (Wainwright)</td>
<td>77%</td>
</tr>
<tr>
<td>Harold Kaveolook School (Kaktovik)</td>
<td>82%</td>
</tr>
<tr>
<td>Nunamuit School (Anaktuvuk Pass)</td>
<td>63%</td>
</tr>
<tr>
<td>Tikigaq School (Point Hope)</td>
<td>75%</td>
</tr>
<tr>
<td>Meade River School (Atqasuk)</td>
<td>58%</td>
</tr>
<tr>
<td>Kita Learning Center (Barrow)</td>
<td>35%</td>
</tr>
<tr>
<td>Ipalook Elementary School (Barrow)</td>
<td>30%</td>
</tr>
<tr>
<td>Kali School (Point Lay)</td>
<td>39%</td>
</tr>
<tr>
<td>Barrow High School (Barrow)</td>
<td>29%</td>
</tr>
<tr>
<td>Eben Hopson Sr. Memorial Middle School (Barrow)</td>
<td>32%</td>
</tr>
<tr>
<td>Nuiqsut Trapper School (Nuiqsut)</td>
<td>34%</td>
</tr>
</tbody>
</table>


6.2.13. Family Violence and Child Maltreatment

Child maltreatment is discussed previously in this chapter as a significant children’s health problem in itself. It is also a major contributor to the early childhood environment and a determinant of both children’s and overall health status. Being in an unsafe home environment or witnessing violence among other family members has profound impacts on children’s health, increasing the immediate risk of harm as well as the long-term risk for lifelong physical and mental health problems.


Many common health problems among children—asthma and respiratory infections, injury, obesity, birth defects—are influenced by the physical environment in which a child lives. Examples include such factors as inadequate housing, indoor and outdoor air pollution, household and environmental toxins, unsafe or inadequate water supply or waste disposal, and unsafe or inadequate space for recreation and physical activity. Relevant data on the physical environment in the NSB are reviewed in Chapter 1: Overall Health.

Specific safety practices have been shown to affect the risk of childhood injuries and death. Some examples include the use of bike and off-road vehicle helmets, personal flotation devices and seatbelts; childproofing efforts in the home; firearm safety practices; and the use of smoke and carbon monoxide detectors. Placing infants on their backs to sleep and avoiding co-sleeping with an alcohol- or drug-impaired adult are important safety practices that have been shown to decrease the risk for SIDS.7 Awareness of proper infant sleep position has improved in Alaska following the initiation of the “Back to Sleep” campaign in 1996, and in
2005, 70% of Alaskan mothers placed their infants on their backs to sleep. There was no significant difference between Alaska Native and non-Native mothers in this practice. To the author’s knowledge, no NSB-specific data are available at this time regarding infant sleep position, although in the 1990s, the North Slope undertook a major campaign to reduce SIDS deaths through community education and a crib loan program.

6.2.15. Child Nutrition and Food Security

Reliable access to healthy foods is extremely important to children’s health and development. The term “food security” refers to the ability to procure enough food, at all times, for an active healthy life for all household members. NSB households, particularly Inupiat households, reported high levels of food insecurity in the 2010 NSB Census, as discussed in Chapter 1: Overall Health.

"Research indicates the following negative outcomes are associated with food insecurity among children: poor health status; more frequent colds, ear infections, and other health problems; greater incidence of hospitalization; higher levels of aggression, hyperactivity, and anxiety as well as passivity; difficulty getting along with other children, and increased need for mental health services; impaired cognitive functioning and diminished capacity to learn; lower test scores and poorer overall school achievement; and increased likelihood of repeating a grade, school absences, tardiness, and school suspension." Food insecurity, paradoxically, may also contribute to child obesity because families who do not have enough food tend to choose less expensive, high-calorie foods with low nutrients.

The high rates of children being overweight and obese in the NSB are discussed earlier in this chapter. Typically, excess calories are in the form of “empty” calories, offering little or no nutritional value. Sugar-sweetened beverages such as soda pop and sugared fruit drinks are estimated to contribute an additional 172 calories daily to the average child’s diet in the U.S. The high levels of consumption of sodas and other sugared beverages reported in the 2010 NSB Census are discussed in Chapter 1: Overall Health. Although data were not collected on consumption among NSB children, reported consumption levels were highest among lower household heads, and the high level of consumption of sugared beverages among household heads is likely a marker for high consumption among other household members, including children. Between 2003 and 2009, 16% of NSB children aged 2–5 years enrolled in WIC were actively identified as at-risk because of a parent reporting routinely feeding them sugar-containing fluids. Based on statewide estimates, 2010 NSB Census data for adults, and anecdotal reports, however, this estimate likely considerably underestimates the true level of sugared beverage consumption among preschool-aged children in the NSB.

The lack of specific nutrients can result in health problems in children. One nutrient commonly found to be deficient among children is vitamin D. Vitamin D deficiency leads to bone disorders such as rickets, and may also increase the risk of tuberculosis, dental caries, and autoimmune disorders. People living at northern latitudes and those with darker skin are at increased risk for vitamin D deficiency. Vitamin D deficiency has been found to be common in Alaskan children, particularly among those who are breastfed, and routine supplementation of breastfed infants with vitamin D is recommended. The NSB WIC office provides breastfed infants with a 1-month supply of infant vitamins containing vitamin D at the first postpartum visit only. Data on the prevalence of vitamin D deficiency are not available for NSB children. Iron deficiency is also extremely common among rural Alaskan children, particularly in the northern and southwestern regions. The cause of the low iron stores among rural Alaskan children is not entirely understood and is probably not caused by a single factor. Helicobacter pylori infection has been shown to be associated with iron-deficiency anemia among school-aged children in southwest Alaska; however, observed patterns make either nutritional deficiency or H. pylori infection unlikely to be the sole etiology of the high prevalence of anemia in rural Alaska. Among young children, persistent prenatal effects appear to contribute to high rates of iron-deficiency and anemia in children up to at least age 5 years.

6.2.16. Education

Adequate intellectual and social stimulation from early childhood through adolescence is necessary for optimal child development and health. Whereas a nurturing home environment is crucial, quality education at the preschool through high school level can also support healthy development and improve health and social outcomes later in life. Higher levels of educational attainment are associated with better overall health throughout the lifespan, particularly when this education is culturally affirming. Education in the NSB is discussed in Chapter 1: Overall Health.
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North Slope Borough Baseline Community Health Analysis

Chapter 6 Endnotes


2. North Slope Borough, 2010 Economic and Census Profile, Department of Planning and Community Services (forthcoming).


4. Alaska Youth Risk Behavior Survey (YRBS): http://www.hss.state.ak.us/dph/chronic/school/YRBSresults.htm. NSB-specific data from 2005 survey was provided courtesy of the NSB School District. Weighted state-level data are not available from the 2005 survey, so the 2007 survey was used for statewide estimates.


6. National Center for Health Statistics, accessed through the National MCH Center for Child Death Review (http://www.childdeathreview.org/home.htm). Child mortality statistics for the U.S. are typically calculated for age groups excluding infants under one, and are, therefore, not directly comparable to Alaska census area data, where population estimates for children under age one are not readily available.


14. Alaska Birth Defects Registry: NSB-specific data from the registry were provided by Gessner, B.: Alaska Department of Health and Social Services, Maternal and Child Health Epidemiology Unit.


17. Alaska Birth Defects Registry: NSB-specific data from the registry were provided by Gessner, B.: Alaska Department of Health and Social Services, Maternal and Child Health Epidemiology Unit.


35. North Slope Borough Health Department, Community Health Aide Program: Structured interviews with health aides from NSB villages, March 2010.

36. Patterson, D.: Director of Nursing, Samuel Simmonds Memorial Hospital, Barrow, Alaska. Personal communication, March 2010.

37. North Slope Borough Health Department, Community Health Aide Program: Village Clinic Monthly Reports, 2005–2008, courtesy of the NSB Health Department CHAP program.


41. Villanueva, T.: Clinical Director, Samuel Simmonds Memorial Hospital, Barrow, Alaska. Personal communication, March 2010.


Chapter 7: Mental and Behavioral Health

Mental health is an integral part of overall health. The World Health Organization defines mental health as “a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community.” In many indigenous communities, however, the mental health of the community, rather than the individual, is central to the definition of health.¹

Mental illness is the second leading cause of disability and premature mortality in the U.S.² The burden of disease is enormous, estimated to account for over 15% of the burden of disease in developed countries such as the U.S.—more than the disease burden caused by all cancers.³ Unlike many chronic illnesses, mental illness tends to begin early in life, resulting in disability during the time when one normally would be the most productive. It is estimated that half of lifetime mental illness cases begin by age 14 years.⁴ Like many other diseases, mental illness is strongly associated with socioeconomic factors such as income and education level, with significantly higher prevalence among those with lower education and income levels. It is also an area of health disparity between ethnic and racial groups. Nationally, the prevalence of mental disorders is similar for ethnic and racial minorities and whites; however, minorities are less likely to have access to and receive needed mental health services.⁵
7.1. Mental and Behavioral Health Statistics

7.1.1. Overall Mental Health

Assessing mental health at a population level presents significant challenges. One method of assessing overall mental health in a community is to ask survey respondents about how many days out of the past month their mental health was not good. In 2002–2008, compared with other communities in Alaska, adult NSB residents reported fewer than average mentally unhealthy days. The NSB had the second lowest average number of mentally unhealthy days in the state during this time period. Inupiaq cultural traditions, however, sometimes prevent open recognition and discussion of emotional suffering and may result in both under-reporting and under-diagnosis. The high rates of suicide, domestic violence, and child maltreatment in the NSB also point to underlying community mental and behavioral health issues and support the likelihood of underreporting of problems such as depression, post-traumatic stress disorder, addiction, and other related mental health conditions perhaps not captured in these statistics.

### Table 7.1: Mentally Unhealthy Days: Regional Comparison, 2002–2008: "Number of days in the last month mental health was not good"

<table>
<thead>
<tr>
<th>Region</th>
<th>Average Number of Mentally Unhealthy Days</th>
<th>Sample Size</th>
<th>Error Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake and Peninsula</td>
<td>1.2</td>
<td>80</td>
<td>0.5–1.9</td>
</tr>
<tr>
<td>North Slope</td>
<td>1.5</td>
<td>231</td>
<td>0.9–2.0</td>
</tr>
<tr>
<td>Aleutians West</td>
<td>1.8</td>
<td>151</td>
<td>0.8–2.8</td>
</tr>
<tr>
<td>Northwest Arctic</td>
<td>1.9</td>
<td>283</td>
<td>1.2–2.7</td>
</tr>
<tr>
<td>Kodiak Island</td>
<td>2</td>
<td>529</td>
<td>1.5–2.4</td>
</tr>
<tr>
<td>Denali</td>
<td>2.2</td>
<td>143</td>
<td>1.3–3.2</td>
</tr>
<tr>
<td>Wrangell-Petersburg</td>
<td>2.2</td>
<td>271</td>
<td>1.4–3.0</td>
</tr>
<tr>
<td>Bristol Bay</td>
<td>2.4</td>
<td>68</td>
<td>1.0–3.9</td>
</tr>
<tr>
<td>Skagway-Hoonah-Anagoon</td>
<td>2.4</td>
<td>137</td>
<td>1.5–3.3</td>
</tr>
<tr>
<td>Dillingham</td>
<td>2.5</td>
<td>223</td>
<td>1.5–3.5</td>
</tr>
<tr>
<td>Nome</td>
<td>2.5</td>
<td>390</td>
<td>1.8–3.1</td>
</tr>
<tr>
<td>Yukon-Koyukuk</td>
<td>2.5</td>
<td>325</td>
<td>1.8–3.2</td>
</tr>
<tr>
<td>Fairbanks North Star</td>
<td>2.8</td>
<td>2,849</td>
<td>2.6–3.1</td>
</tr>
<tr>
<td>Juneau</td>
<td>2.8</td>
<td>1,186</td>
<td>2.4–3.2</td>
</tr>
<tr>
<td>Bethel</td>
<td>2.9</td>
<td>638</td>
<td>2.1–3.6</td>
</tr>
<tr>
<td>Southeast Fairbanks</td>
<td>2.9</td>
<td>200</td>
<td>1.8–4.1</td>
</tr>
<tr>
<td>Haines</td>
<td>3</td>
<td>105</td>
<td>1.7–4.3</td>
</tr>
<tr>
<td>Anchorage</td>
<td>3.1</td>
<td>2,454</td>
<td>2.7–3.4</td>
</tr>
<tr>
<td>Wade Hampton</td>
<td>3.1</td>
<td>238</td>
<td>2.0–4.3</td>
</tr>
<tr>
<td>Kenai Peninsula</td>
<td>3.2</td>
<td>2,169</td>
<td>2.8–3.6</td>
</tr>
<tr>
<td>Prince of Wales-Outer Ketchikan</td>
<td>3.2</td>
<td>206</td>
<td>2.1–4.3</td>
</tr>
<tr>
<td>Sitka</td>
<td>3.2</td>
<td>323</td>
<td>2.3–4.1</td>
</tr>
<tr>
<td>Valdez-Cordova</td>
<td>3.3</td>
<td>399</td>
<td>2.4–4.2</td>
</tr>
<tr>
<td>Ketchikan Gateway</td>
<td>3.6</td>
<td>601</td>
<td>2.9–4.3</td>
</tr>
<tr>
<td>Matanuska-Susitna</td>
<td>3.7</td>
<td>735</td>
<td>2.9–4.6</td>
</tr>
<tr>
<td>Yakutat</td>
<td>3.7</td>
<td>69</td>
<td>1.4–6.0</td>
</tr>
<tr>
<td>Aleutians East</td>
<td>4.9</td>
<td>59</td>
<td>2.8–7.0</td>
</tr>
</tbody>
</table>

County Health Rankings. Data obtained from CDC BRFSS survey question: “Thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?” Respondents include non-institutionalized residents more than 18 years old with a land-line phone.
7.1.2. Depression and Anxiety

Depression is a common but complex mental illness, with both biological and environmental causes. Major depressive disorder, the most serious form of depression, is the leading cause of disability in the U.S. for ages 15–44 years. Roughly 14.8 million American adults, or about 6.7% of the U.S. population age 18 years and older, are affected by major depressive disorder in a given year. Depression often co-occurs with anxiety disorders, which affect an estimated 40 million adults, or 18.1% of the U.S. adult population, each year.4

7.1.2.1. Depression Among Adults

Limited data are available regarding adult depression in the NSB, and depression was not included in the 2010 NSB Census questionnaire for a variety of reasons. Based on a five-item screening scale used during the Survey of Living Conditions in the Arctic (SLiCA) study, investigators estimated the percentage of adult Iñupiat in the NSB who were most likely depressed at 6%.8 Comparisons with Alaskan Iñupiat populations and other circumpolar indigenous communities are shown below.

Whereas the questionnaire and survey methodologies vary considerably from Alaska BRFSS, the prevalence estimates from SLiCA are similar to statewide estimates for the prevalence of depression among Alaskan adults. According to the 2006 Alaska BRFSS, an estimated 6.7% of Alaskan adults currently have symptoms consistent with depression, 17.4% have ever been diagnosed with depression, and 12% have ever been diagnosed with anxiety during their lifetime.9 There were no significant differences in current depression among racial groups; however, Alaska Natives and American Indians had the highest prevalence of current symptoms consistent with depression (10%) and the lowest rates of lifetime diagnosis of depression (10%), suggesting possible under-diagnosis in this group. Current depression rates did not vary significantly by geographic region, but higher rates of current depression were associated with female gender, household income less than $25,000, low educational level, unemployment and unmarried or divorced status, fair to poor physical health, low levels of social support, lack of leisure time physical activity, current smoking, and asthma. Obese Alaskans had a higher prevalence of anxiety over a lifetime than those who were not obese.9

7.1.2.2. Depression Among Youth

Depression symptoms are common during the teenage years. Based on 2005 Youth Risk Behavior Survey (YRBS) data for the NSB School District, more than one in four high school students have experienced symptoms possibly indicating depression during the last year.10 The percentage of NSB high school students reporting depressive symptoms did not differ significantly from state or national estimates, however.
High school girls reported symptoms of depression more than twice as often as boys. This pattern is similar to that seen statewide and nationally.10

Mental health among Alaskan youth, and Alaska Native youth in particular, is of urgent concern because of the alarmingly high suicide rates in this group. Although reported rates of depression symptoms among Alaska Native high school students are similar to those among white students in Alaska and the U.S., the proportion of Alaska Native students who report actually having attempted suicide was twice the proportion of white Alaskan students in 2009.10 The percentage of Alaska Native students who seriously considered attempting suicide during the past 12 months was also higher than the percentage of white students (17.2% and 12.5%, respectively), but this difference was not statistically significant.10 Actual suicide rates among Alaskan youth, and among Alaska Native men in particular, are many times national averages, as discussed in Chapter 3: Injury. Available data on suicide in the NSB and Alaska are also discussed in Chapter 3: Injury.

7.1.2.3. Maternal Depression

Symptoms of depression are especially common during the weeks and months after delivery of an infant, and can range from mild and self-limited to severe and life-threatening. Maternal mental health, both during pregnancy and after delivery, affects families and can have long-term effects on children. For example, children of mothers experiencing mental health problems are at increased risk for attention deficit hyperactivity disorder (ADHD).11

In 2004–2008, 35.4% of the 70 NSB mothers participating in the PRAMS survey reported symptoms of postpartum depression. The prevalence of post-partum depression symptoms among NSB mothers was not significantly different from the prevalence among Alaskan mothers overall (27%) during this time period. In 2004–2007 PRAMS surveys, the northern (including the NSB, Northwest Arctic, and Nome regions) and southwest region of Alaska were the areas where post-partum mothers were the most likely to report symptoms of maternal depression.11
Figure 7.4: Maternal Depression Symptoms, by Region:
Percent of women (delivering a live infant) who reported symptoms of depression, 2004–2007 PRAMS data

Northern Region includes NSB, Northwest Arctic Borough, and Nome census area.

7.1.3. Severe and Persistent Mental Illness

Severe and persistent mental illness (SPMI) is profoundly disabling and resource-intensive. This category of mental illness includes a number of psychotic and non-psychotic mental illnesses that significantly impair an individual’s ability to function independently in their community. Individuals with serious mental illness typically require specialized psychiatric services, case management, and frequently hospitalization or even institutional care. Individuals may experience these types of mental illness in combination with alcohol or substance abuse, further complicating their care.

Very few local data exist regarding prevalence of SPMI in small rural populations, particularly in Alaska. Using a statistical technique that applies national data to small local regions, it is estimated that roughly one in 20 (5.39%) NSB adults and one in 14 (7.36%) NSB youth may be in need of specialized mental health services for serious mental illness. These estimates are considered very conservative and likely underestimate the true need. The NSB Integrated Behavioral Health Division recently transitioned to the electronic AKAIMS database and reporting system. This database may become a valuable source of population-level mental health information for the state of Alaska.

7.1.4. Alcohol and Substance Abuse

7.1.4.1. Alcohol and Drugs in the Home and Community

It has long been recognized that alcohol and drug use can have devastating effects on individuals, families, and communities. Alcohol is also implicated in many occurrences of interpersonal violence and injuries, as well as in the disintegration of family structure and well-being. Injuries and violence are particularly associated with “binge,” or periodic, heavy drinking.

Drug use has been cited as a community health concern in NSB communities. The trafficking and use of illegal drugs is linked to violent and non-violent crime, high-risk sexual behaviors, school failure, lost productivity, and other types of social pathology. Drug use during pregnancy can have particularly devastating effects of pregnancy outcomes.

Major efforts have been made in the NSB to combat the negative effects of alcohol in the community through local option laws banning local alcohol sales in Barrow and banning possession, sale, and importation of alcohol in the other North Slope villages. The NSB Health Department, Mayor’s Office Healthy Communities Initiative, and other local organizations have also sponsored drug and alcohol prevention and treatment programs, sobriety walks, barbeques, concerts, and other community events, and by actively supporting a strong Inupiaq culture and value system.

Drug and Alcohol Data from the 2010 NSB Census

In the 2010 NSB Census, household heads were asked about the effect of drugs and alcohol on the health of their household members and their community.
Impacts of Drugs and Alcohol on Household Members

A minority of household heads of all ethnic groups in the NSB thought that someone in their household had been hurt by alcohol or drugs in the past year. The response to this question did not vary significantly by age or gender; however, Inupiat household heads were three times as likely as Caucasian and twice as likely as those in other ethnic groups to report that a household member had been hurt by alcohol or drugs.14

Figure 7.5: Household Impact of Drugs and Alcohol in the NSB, by Ethnic Group: Percent of NSB household heads reporting that, in the past 12 months, a member of the household has been hurt by drugs or alcohol

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Never</th>
<th>Sometimes</th>
<th>Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>All NSB</td>
<td>19%</td>
<td>76%</td>
<td>5%</td>
</tr>
<tr>
<td>Other Ethnicities</td>
<td>12%</td>
<td>86%</td>
<td>3%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>7%</td>
<td>90%</td>
<td>3%</td>
</tr>
<tr>
<td>Inupiat</td>
<td>24%</td>
<td>70%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Data source: 2010 NSB Census.

Response to this question varied significantly by the household head’s community of residence.

As a whole, compared with their counterparts living in Barrow, Inupiat household heads in other villages were significantly less likely to believe that a household member had been hurt by alcohol or drugs.14

Table 7.2: Inupiat Household Heads: Household Impact of Drugs and Alcohol, by Village: Percent who felt that, in the last year, a household member had been hurt by the effects of alcohol or drugs

<table>
<thead>
<tr>
<th>Village</th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>Villages other than Barrow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>24%</td>
<td>31%</td>
<td>35%</td>
<td>44%</td>
<td>28%</td>
<td>24%</td>
<td>16%</td>
<td>15%</td>
<td>25%</td>
</tr>
</tbody>
</table>

Data source: 2010 NSB Census
AKP=Anaktuvuk Pass

Impacts of Drugs and Alcohol on the Community

In the 2010 NSB Census, a large majority of NSB household heads reported believing that drugs or alcohol had affected the health of their community in the last year. About half of Inupiat household heads thought that the health of their community had been hurt often by alcohol or drugs in the past year, compared with almost three of four Caucasian household heads who thought this was true. Female household heads were more likely than males to believe that drugs or alcohol had affected the health of their community, but the responses did not vary significantly by age.14

Figure 7.6: Community Impact of Drugs and Alcohol in the NSB: Percent of NSB household heads reporting that, in the past 12 months, the health of the community has been hurt by drugs or alcohol

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Never</th>
<th>Sometimes</th>
<th>Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>All NSB</td>
<td>35%</td>
<td>39%</td>
<td>10%</td>
</tr>
<tr>
<td>Other Ethnicities</td>
<td>26%</td>
<td>11%</td>
<td>63%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>23%</td>
<td>3%</td>
<td>74%</td>
</tr>
<tr>
<td>Inupiat</td>
<td>39%</td>
<td>10%</td>
<td>51%</td>
</tr>
</tbody>
</table>

Data source: 2010 NSB Census.
Among Inupiat household heads, the response to this question varied significantly across the North Slope villages.

As a whole, those living in communities other than Barrow were significantly less likely than those living in Barrow to believe that the health of their community had “often” been hurt by alcohol or drugs in the past year.\(^\text{14}\)

Table 7.3: Inupiat Household Heads: Community Impact of Drugs and Alcohol, by Village: Percent who felt that, in the last year, the health of their community had been hurt by alcohol or drugs

<table>
<thead>
<tr>
<th></th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>Villages other than Barrow</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEVER</td>
<td>3%</td>
<td>28%</td>
<td>8%</td>
<td>14%</td>
<td>5%</td>
<td>11%</td>
<td>11%</td>
<td>13%</td>
<td>12%</td>
</tr>
<tr>
<td>SOMETIMES</td>
<td>41%</td>
<td>39%</td>
<td>36%</td>
<td>45%</td>
<td>48%</td>
<td>44%</td>
<td>49%</td>
<td>39%</td>
<td>43%</td>
</tr>
<tr>
<td>OFTEN</td>
<td>55%</td>
<td>33%</td>
<td>57%</td>
<td>41%</td>
<td>47%</td>
<td>45%</td>
<td>41%</td>
<td>49%</td>
<td>45%</td>
</tr>
</tbody>
</table>

Data source: 2010 NSB Census
AKP=Anaktuvuk Pass

Alcohol or Drug Problems in the Home: Data from SLiCA
In the SLiCA study, indigenous survey participants in Greenland were the least likely to report alcohol or drug problems in the home currently, and those in Chukotka, Russia were the most likely. Inupiat residents of the North Slope, the Northwest Arctic Borough, and the Bering Straits regions fell in between, with roughly one in three North Slope Inupiat residents 16 years or older reporting current problems with drugs or alcohol in the home.\(^\text{8}\)

Figure 7.7: Alcohol or Drug Problems in the Home: Circumpolar Indigenous Populations: Percent of survey respondents who reported often or always experiencing alcohol or drug problems in the home today

Data source: Poppel, 2007, SLiCA results (includes Inupiat/arctic indigenous residents aged 16 years and older).
According to study authors, differences of 10 percentage points or more between groups are likely to be significant.
Alaska region includes North Slope, Northwest Arctic Borough, and Bering Straits regions (Inupiat only).
Data were not available for Canada for this question.

Alcohol-Related Arrests
Alcohol-related offenses fluctuate significantly from year to year in the Borough, as seen in Figure 7.8. Alcohol-related arrests are tracked nationally, but arrest-rate comparisons between different communities and regions are problematic because of the potential for many confounding factors.
7.1.4.2. Self-Reported Alcohol Consumption and Binge Drinking

Self-Reported Binge Drinking Among Adults

Self-reported binge drinking estimates based on the BRFSS survey fluctuate from year to year because of small sample sizes, but averaged roughly 16% among NSB adults between 2001 and 2007.16

The estimated rate of self-reported binge drinking among adults in the NSB in 2005–2007 was not significantly different from statewide or national estimates.16

*Binge drinking is defined for men as having five or more drinks on one occasion; for women, it is defined as having four or more drinks on one occasion. U.S. and Alaska data source: Centers for Disease Control and Prevention (CDC) Behavioral Risk Factor Surveillance System (BRFSS).

NSB data source: Sub-regional analysis of Alaska BRFSS data provided by Alaska Department of Health and Social Services, Chronic Disease Prevention and Health Promotion, Division of Public Health.

NSB results are weighted according to the BRFSS rural region and not post-stratified to the NSB. Results are not age-adjusted.
Alcohol Use and Binge Drinking Among Youth

Alcohol use is common among youth, both in the NSB and across the country. In 2005, 68% of NSB high school students reported having had at least one drink of alcohol in their lives. This estimate was not significantly different from state (2007) or national estimates (2005). About one-fifth of NSB high school students reported having had their first drink (more than a few sips) before age 13 years, again similar to state and national estimates.10

In 2005, slightly fewer than one-third of NSB high school students reported having at least one drink of alcohol in the last 30 days, significantly lower than the national estimate.10

Figure 7.11: Self-Reported Alcohol Use Among High School Students: Percent of students who had at least one drink of alcohol on one or more of the past 30 days

Data source: 2005 and 2007 YRBS.

Binge drinking is a particularly dangerous form of alcohol use in adolescence and is a major contributing factor in unintentional injury, suicide, and assault, and unsafe sexual behavior. In 2005, slightly more than one in five NSB high school students reported having five or more drinks in a row in the last 30 days, not significantly different from state or national estimates. In the 2009 YRBS survey, the statewide estimates were not significantly different for Native vs. non-Native respondents, either for reported alcohol use in the last 30 days or for reported binge drinking.10

Figure 7.12: Self-Reported Binge Drinking Among High School Students: Percent of students who had 5 or more drinks of alcohol in a row on one or more of the past 30 days

Data source: 2005 and 2007 YRBS.

In a separate survey, the 2004 Developmental Youth Assets survey, more than half of high school seniors reporting using alcohol in the last 30 days, and heavy alcohol use, or “getting drunk,” accounted for a large proportion of overall use in youth.17
The single most common way that high school students reported obtaining alcohol was having it given to them by a person 18 years old or older. The most common place alcohol was drunk was at the home of another person.10

7.1.4.3. Self-Reported Drug Use

Self-Reported Drug Use Among Adults
Relatively few data are available regarding drug use among adults in the North Slope Borough. The 2004 SLiCA survey examined self-reported illegal and/or recreational drug use in the different arctic regions surveyed. In all regions, marijuana was by far the most commonly reported drug used. Fewer than 5% of survey respondents reported use of any other single illegal drug. The rate of self-reported marijuana use among Inupiat adults in the NSB was roughly twice the overall rate among indigenous residents of the circumpolar regions surveyed.8

Adverse health effects of marijuana include problems with learning and memory as well as some evidence of an increased risk of anxiety and respiratory problems.18 The illegal sale and non-therapeutic use of certain prescription drugs have also become a major public health concern nationwide. Data on the misuse of prescription drugs are not available for the NSB.

Self-Reported Drug Use Among Youth
Marijuana use is by far the most common illegal and/or recreational drug used by NSB high school students as well. According to the 2005 YRBS survey, reported marijuana use among NSB high school students was significantly higher than estimated use statewide and nationally.10
Statewide, in 2009, a significantly higher proportion of Alaska Native high school students than white high school students (58% vs. 40%, respectively) reported using marijuana one or more times during their life, and this difference was also statistically significant.\(^{10}\)

Among NSB high school students, reported use of drugs other than marijuana was considerably less common. Other than marijuana, methamphetamine was the most commonly reported illicit drug used by NSB high school students in 2005. Reported cocaine use among NSB high school students was significantly higher than state and national estimates, and reported inhalant use was significantly lower among NSB high school students than among students statewide and nationally.\(^{10}\)

Marijuana use increases with grade level but is not uncommon among younger NSB students, according to the 2004 Developmental Youth Assets Survey. Reported use of marijuana and other drugs occurs as young as 6th grade in a small minority of students.\(^{17}\)
7.2. Determinants of Mental and Behavioral Health

Like physical health, mental health is determined by a complex interaction of social, psychological, biological, and environmental factors. Although mental illness can affect anyone, the risk of mental illness is higher among socioeconomically disadvantaged individuals, and those experiencing discrimination, violence, or poor physical health.\(^1\)

The communities of the North Slope have experienced rapid and significant changes in their social, cultural, economic, and physical environment, many of which are discussed in the Chapter 1: Determinants of Overall Health. These changes have undoubtedly affected mental health in important ways, although research is limited on the effects these changes have had on mental and behavioral health in the region.\(^19\)

In his 1998 book, *Circumpolar Inuit—Health of a Population in Transition*, Peter Bjerregaard describes some of the changes experienced by circumpolar Inuit:

> During the last 40 years children have been brought up with values that were useful for hunters and hunter’s wives living in small communities: independence, self-reliance, non-interference with other people’s lives, and physical strength. As adolescents and adults they have had to cope with life...in a world that rewards formal education, language skills, and discussion instead of action. The great majority have adjusted admirably to the new situation, but for some the burden was too big. It has been posited...that...[w]hile the women were more or less able to continue their traditional roles as care-givers...the transition from hunter and sole breadwinner to wage-earner in a subordinate position or even unemployed was difficult for the men.\(^20\)

Research in Northern Canadian indigenous regions has demonstrated that suicide rates are lower in communities that have taken active steps to preserve and rehabilitate their own cultures.\(^21\) In the SLICA study, investigators found that a higher level of participation in subsistence, satisfaction with the amount of fish and game, the sense of local control over the management of natural resources and local environmental problems, an income above poverty level, and full-time work at least part of the year are all associated with higher levels of satisfaction with life. Inuit adults with higher levels of social support and who do not have alcohol problems in the home were also less likely to be depressed.\(^22\) Strong cultural values, high levels of participation in traditional subsistence activities, a relatively advantageous local economic environment, and a successful history of self-determination may be imparting resiliency to North Slope community members during difficult times. The many local activities that increase social interaction and local laws that restrict access to alcohol are also likely benefiting mental health in the community.
A number of frameworks have been developed to elucidate the many factors that determine mental health, although these are not specific to arctic or indigenous communities. In general, factors that predict good mental health include social inclusion, economic participation, and freedom from discrimination and violence.\(^1\)

![Figure 7.18: The Social Determinants of Mental Health](image)

Researchers have attempted to identify, based on the available evidence, the various individual risk and protective factors influencing mental health.\(^23\) These factors are presented in Table 7.4.

### Table 7.4: Social, Environmental, and Economic Determinants of Mental Health

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>Protective Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to drugs and alcohol</td>
<td>Empowerment</td>
</tr>
<tr>
<td>Isolation and alienation</td>
<td>Ethnic minorities integration</td>
</tr>
<tr>
<td>Lack of education, transport, housing</td>
<td>Positive interpersonal interactions</td>
</tr>
<tr>
<td>Neighborhood disorganization</td>
<td>Social participation</td>
</tr>
<tr>
<td>Peer rejection</td>
<td>Social responsibility and tolerance</td>
</tr>
<tr>
<td>Poor social circumstances</td>
<td>Social services</td>
</tr>
<tr>
<td>Poor nutrition</td>
<td>Social support and community network</td>
</tr>
<tr>
<td>Poverty</td>
<td></td>
</tr>
<tr>
<td>Racial injustice and discrimination</td>
<td></td>
</tr>
<tr>
<td>Violence and delinquency</td>
<td></td>
</tr>
<tr>
<td>War</td>
<td></td>
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<tr>
<td>Work stress</td>
<td></td>
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<tr>
<td>Unemployment</td>
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<tr>
<td>Displacement</td>
<td></td>
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\(^{23}\) Williams et al., 2005.

Stressful life events are associated with poor mental health, and adverse experiences in childhood have an especially profound effect.\(^1\) Common significant stressful events include such experiences as loss of a loved one, marital or relationship conflict, and financial problems. A personal history of physical or sexual abuse is a particularly strong predictor of mental health problems.\(^24,25\)

The early childhood environment is a crucial determinant of mental health throughout the lifespan. Supportive family, school, and community environments can help individuals build resilience, buffering the effects of economic adversity, loss, discrimination, and other risk factors for poor mental health.\(^26\)
Positive parenting and family functioning can moderate these risks by helping children to develop the underlying skills necessary to regulate emotions and manage problems.

Other factors such as spirituality and religious participation, creative expression, and engagement with the natural world can promote mental health. Interaction with nature and the health of one’s surrounding natural environment have been noted as important determinants of mental health. Time spent in a natural environment can have both physical and mental health benefits for children in particular. On the other hand, environmental degradation and disasters have significant negative effects on mental health. Communities affected by the Exxon Valdez oil spill were found to have an increased prevalence of anxiety and depressive disorders, and adolescents living through a prolonged drought in Australia had lessened levels of mental well-being.

As with physical health, access to mental and behavioral health treatment services is an important determinant of mental health. In the North Slope, mental and behavioral health services are provided primarily by the NSB Health Department, as described in the Chapter 1: Determinants of Overall Health. Local Integrated Behavioral Health Division management have voiced concerns about a number of unmet behavioral health needs, including such problems as the current lack of an local inpatient alcohol and drug rehabilitation center, lack of sufficient staffing for overnight observation of patients who are at risk to themselves, and the need for a transitional housing and support program for youth returning home from off-slope substance abuse treatment programs. A statewide analysis of mental health prevalence and services in Alaska estimates that Northern communities (including the NSB, NWAB, and Bering Straits regions) have high unmet need for specialized mental health and substance abuse services among both adults and children.

Chapter 7 Endnotes


10. Alaska Youth Risk Behavior Survey (YRBS): http://www.hss.state.ak.us/dph/chronic/school/YRBSresults.htm. NSB-specific data from 2005 survey was provided courtesy of the NSB School District. Weighted state-level data are not available from the 2005 survey, so the 2007 survey was used for statewide comparisons. Some 2009 YRBS survey results are also cited in this chapter.

Chapter 7: Mental and Behavioral health

[593x189] Chapter 7: Mental and Behavioral health

12. National Co-Morbidity Study—Replication. The NCS-R was a nationally representative survey carried out as a follow-up to the baseline NCS to assess prevalence, trends, and patterns of mental health and substance abuse disorders nationwide. Data accessed online at http://www.hcp.med.harvard.edu/ncs/.


Chapter 8: Infectious Disease

Historically, infectious diseases have brought terrible suffering to rural Alaskan communities. As late as 1950, infections caused almost one-half of the deaths among Alaska Natives and were still the leading cause of death overall in Alaska.\(^1\) Epidemics of smallpox in the 19th century and influenza and measles at the turn of the 20th century devastated entire Alaskan communities and threatened the survival of Alaska Native cultures, and tuberculosis remained a major cause of disability and death in rural Alaska well into the 1950s. Infectious hepatitis A and B, invasive Streptococcus pneumoniae, and Haemophilus influenzae infections also have very significant histories in rural Alaska.

Improved sanitation and living conditions, the advent of routine vaccinations, screening and treatment protocols, and other public health efforts have virtually eradicated some of these infections and dramatically lessened the effect of others. Some infections, such as Chlamydia trachomatis, a sexually-transmitted infection, and hepatitis C, have emerged in recent years as growing public health concerns, however. In addition, antibiotic-resistant strains of some bacteria have become major threats to health.

Infectious disease remains an area of racial health disparity in Alaska, with higher rates of many communicable diseases and higher rates of hospitalization for infectious diseases among Alaska Natives, compared with non-Natives.
8.1. Infectious Disease Statistics

8.1.1. Reportable Infectious Diseases (Excluding Sexually-Transmitted Infections)

Some serious infections must be reported to the Alaska Department of Public Health. Although reporting is invariably incomplete for some infections, the reporting of these diseases allows an examination of disease trends over a number of years for specific regions and populations. With the exception of sexually transmitted diseases, the number of cases of reportable infectious diseases in the NSB is very low, and thus diseases have been aggregated into categories and case numbers into multiple-year time periods. Because of the small number of cases of reportable infectious diseases each year, reliable rates for the NSB cannot be calculated for most individual reportable diseases. In general, however, trends in reportable infectious diseases in the NSB parallel those occurring statewide.²

8.1.1.1. Vaccine-Preventable Reportable Infections

The graph below shows a decline in vaccine-preventable diseases in the NSB between the early 1990s and the latter half of the decade. This pattern is primarily caused by a statewide hepatitis A outbreak in 1993 and the subsequent virtual disappearance of this disease following the institution of routine vaccination of all Alaskan children against hepatitis A in 1996. Statewide, new cases of hepatitis B are now rare, and rates of Haemophilus influenzae group B (HiB) meningitis and pneumococcal disease have decreased dramatically since the development and inclusion of these vaccines in the routine childhood immunization schedule. Cases of serious vaccine-preventable infections such as invasive pneumococcal disease, HiB, and pertussis, do still occur statewide and in the NSB, however. Between 2006 and 2009, there were at least six cases of these vaccine-preventable infections reported in the NSB.²

8.1.1.2. Tuberculosis

Tuberculosis remains an important public health issue in Alaska and in the NSB, requiring constant vigilance and preventive efforts. Over the last 25 years, the NSB has averaged fewer than one new case of tuberculosis per year,² for an average case rate of roughly 10/100,000 population per year over this time period. The Healthy Alaskans 2010 goal is to reduce new tuberculosis cases to less than 6.8 per 100,000,³ and the ultimate goal of the State of Alaska’s Tuberculosis Control Program is the elimination of this infection from the state.

8.1.1.3. Reportable Infectious Diarrheal Illness

Diarrheal, or enteric, infections are typically spread through contaminated food and water or contact with an infected individual. Diarrheal infections remain a leading cause of preventable death in developing countries. According to the Centers for Disease Control and Prevention, an estimated 76 million cases of food-borne illness and 5,000 associated deaths occur every year in the U.S. The number of cases of reportable infectious diarrheal illnesses has declined over the past 25 years in the NSB.² In the decade 1998–2007, the number of reported cases of diarrheal illness in the NSB did not exceed the expected number of cases based on a comparison with peer counties.⁴

8.1.1.4. Hepatitis C

Hepatitis C is a chronic, asymptomatic infection that increases the risk for liver cirrhosis and cancer. Unlike for infectious hepatitis A and B, there is no vaccine against hepatitis C. It can be contracted by having had a blood transfusion prior to the initiation of blood supply screening in 1992, injection drug use, and less commonly through sexual, household, or mother-to-newborn transmission. Since testing became widely available in the early 1990s, reported cases of chronic hepatitis C have risen steadily in the NSB,² paralleling statewide and national trends.
8.1.5. Reportable Parasitic Infections

Parasitic infections are a major burden of disease in many tropical and developing countries and in areas with poor sanitation facilities. Parasitic infections do not currently appear to represent a major threat to health in the NSB. Trichinosis is a potentially serious infection that can be contracted by eating the uncooked or undercooked meat of certain animals, including a number of arctic mammals, infected with the *Trichinella spiralis* parasite. In the NSB, there were 14 cases of trichinosis infection reported between 1986 and 1995 but none since 1995.2 Giardiasis is a diarrheal illness caused by a microscopic parasite called *Giadialamblia*. This parasite is found in soil, food, or water that has been contaminated with feces from infected humans or animals. Giardiasis statistics are included in the previous section under Infectious Diarrheal Illness, but specifically, there were 13 cases of giardiasis reported in the NSB between 1986 and 1995, five cases between 1996 and 2005, and no cases between 2006 and 2009.2

8.1.2. Reportable Sexually Transmitted Infections

Sexually transmitted infections (STIs) are infections that are passed from one person to another primarily through sexual activity. STIs are not new; they have been known for hundreds of years. These infections are caused by a variety of bacteria, viruses, and parasites. Individuals are often unaware that they are infected as many STIs have mild or delayed symptoms, but left untreated they can lead to infertility, chronic pain, and even death. Infection during pregnancy can result in premature birth, abnormal fetal growth, and potentially life-threatening illness in the newborn. Education and prevention efforts, screening, treatment, sexual contract tracing, and, in some cases, vaccination, have reduced the health burden of STIs; however, STIs remain a major public health concern in Alaska and worldwide. STIs are an area of regional and racial health disparity nationwide. African Americans and American Indian/Alaska Natives experience the highest rates of both chlamydia and gonorrhea, and rural Alaska and the southeastern region of the United States are the regions with the highest rates of these infections.5

8.1.2.1. Chlamydia

*Chlamydia trachomatis*, commonly known as chlamydia, is the most common reportable sexually transmitted infection and one with potentially serious complications, including pelvic inflammatory disease, infertility, ectopic pregnancy, preterm labor, and neonatal infections. Alaska's chlamydia infection rates are consistently among the highest in the nation.4 Alaska Natives, women, adolescents and young adults,5 and those living in northern and southwest rural regions7 are disproportionately affected. In 2007, the
Alaska Indian Health Service (IHS) region had the highest chlamydia rates of all IHS areas, and rates among Alaska Natives were more than five times U.S. rates.8

Mandatory reporting of chlamydia began in Alaska in 1996. Rates of infection in the state have been increasing steadily, more than tripling between 1996 and 2009.6 Chlamydia rates have increased in the NSB as well, although 2010 saw a slight decrease in the chlamydia rate. Increases in chlamydia rates and regional differences in rates may also, in part, reflect screening practices, availability of different diagnostic tests, consistency of reporting by providers and laboratories, and partner identification and testing practices.

Figure 8.2: Trends in Chlamydia Rates in the NSB, by Race: Number of cases reported per 100,000 population, 2001–2010

NSB chlamydia incidence rates are higher than statewide rates for comparable age groups.9 Again, differences and trends in testing, diagnosis, reporting, and case-finding must be considered in interpreting the available data.

Figure 8.3: Chlamydia Rates in High-Risk Age Groups: Number of cases per 100,000 persons, 2006–2008

The State of Alaska Department of Health and Social Services HIV/STD program recently made data publically available on chlamydia rates by age, race, and gender for all Alaska Native Health Corporation Regions. The Arctic Slope service region experienced the fourth highest rate in the state. Of note, the age-adjusted chlamydia rate for non-Native Arctic Slope residents (1204/100,000) was the highest rate among non-Natives of all the regions in 2010.
Chapter 8: Infectious Disease

8.1.2.2. Gonorrhea

Gonorrhea, another sexually transmitted infection, is less common than chlamydia. It also is associated with a number of potentially serious complications in both men and women, including genitourinary infections, pelvic inflammatory disease, infertility, ectopic pregnancy, joint infection, and preterm birth and neonatal infections.

After a period of decline in the 1980s and early 1990s following the implementation of the national gonorrhea control program in the mid-1970s, gonorrhea rates have been relatively stable in the U.S.\textsuperscript{5} During 2008–2009, 84% of states reported a decrease in gonorrhea rates.\textsuperscript{5} In 2009, however, Alaska experienced a 69% increase in the number of gonorrhea cases statewide, and this increase has continued in 2010.\textsuperscript{10} Alaska Natives and people living in southwest Alaska experienced the highest rates, whereas the northern region experienced the second highest rates.\textsuperscript{10} In the NSB, the increase in gonorrhea cases began in 2007, with 59 new cases, the highest number reported of any year for which data were available for the NSB.\textsuperscript{9} In 2009 and 2010, the annual gonorrhea rate declined somewhat but did not return to previous levels.
As is the case with chlamydia, the northern and southwest regions of the state, and particularly Alaska Native residents of these regions, continue to experience the highest gonorrhea rates in the state.
8.1.2.3. Human Immunodeficiency Virus (HIV)

HIV is the virus that can lead to acquired immunodeficiency syndrome, or AIDS. The CDC estimates that about 56,000 people in the U.S. contract HIV each year and that more than one million people are living with HIV in the United States. It is estimated that one in five (21%) of those people living with HIV is unaware of their infection.\footnote{11}

In the NSB, there were fewer than six reported cases of HIV between 1982 and 2008 and no new cases reported since 1995.\footnote{9} In Alaska, a cumulative total of 1,317 cases of HIV infection were reported during between 1982 and 2009, with 56 cases reported in 2009.\footnote{12}

HIV is spread primarily through unprotected sex and through sharing needles and other equipment used for injecting illegal drugs. Nationwide, approximately one-half of new HIV cases occur in men who have sex with men, although almost one in three new HIV infections are contracted through heterosexual contact and 12% through injection drug use.\footnote{11} Among women, 80% of new infections occur through heterosexual contact. HIV is an area of racial health disparity nationwide. African Americans continue to bear the greatest burden of HIV. In 2006, however, American Indian/Alaska Native females had an HIV diagnosis rate that was nearly twice that of white females, and rates among American Indian/Alaska Native males were slightly higher than among whites.\footnote{13}

8.1.2.4. Syphilis

No cases of infectious syphilis were reported among NSB residents from 1990 to 2008.\footnote{9} Syphilis is rare in Alaska, with the exception of an outbreak in 2004 affecting Anchorage, Fairbanks, and Southeast Alaska.\footnote{14}

8.1.3. Non-Reportable Infectious Disease

Most common infectious diseases are not reportable to the state health department and are thus more difficult to survey and track. These non-reportable illnesses include most common viral and bacterial upper and lower respiratory infections such as colds and flu, pneumonia, and ear, nose, and throat infections. Many other non-reportable infections impact the health of communities and families, including such things as gastrointestinal infections, or “stomach flus,” skin infections, and some sexually transmitted infections.

Respiratory infections, including upper and lower respiratory infections, respiratory syncytial virus (RSV), and influenza, are discussed separately in Chapter 5: Respiratory Disease.

Limited data are available at the community level for several other non-reportable infections.

8.1.3.1. Human Papilloma Virus (HPV)

HPV is the most common sexually transmitted infection in the United States. Some strains of this virus cause genital warts, and persistent infection with certain strains of HPV can put a woman at risk for cervical cancer. HPV infection is usually discovered during routine pap smears. HPV can be present without causing abnormalities on a pap smear, however, and abnormal pap smears can have causes other than HPV. The Screening for Life program in the NSB conducted 14,017 pap smears on 3012 women between January 1, 1991 and June 30, 2009. Of these, 2,832 were abnormal, and ultimately 238 were conclusively diagnosed with HPV-associated cervical disease.\footnote{16}

The estimated overall prevalence of HPV (the types associated with cervical cancer) in the U.S. is 23%, with the highest prevalence in teens and young women.\footnote{15} Comparable HPV surveillance data are not available for the NSB.
8.1.3.2. *Helicobacter pylori*

*Helicobacter pylori* is a bacterium associated with inflammation and ulcers of the stomach and intestinal lining. *H. pylori* infection is common in developing countries with poor sanitation, and has been found to be highly prevalent in rural Alaska. Based on stored blood samples from 1980 to 1986, the percentage of Alaska Natives statewide who had antibodies against *H. pylori* (indicating a current or past infection) was estimated to be 75%. The percentage of Alaska Natives in the NSB found to have these antibodies was similar, at 73%. The North Slope does not participate in ongoing *H. pylori* surveillance, and more recent data on the prevalence of *H. pylori* following major improvements in water and sanitation infrastructure in the NSB were not available at the time of writing.

8.1.3.3. Invasive and Drug-Resistant Organisms

The CDC Arctic Investigations Program conducts surveillance and research in Alaska on a number of invasive and antibiotic-resistant organisms such as methicillin-resistant *Staphylococcus aureus* (MRSA). Unfortunately, multiple attempts to obtain surveillance information for this report on invasive and antibiotic-resistant organisms in the NSB were unsuccessful.

8.2. Determinants of Infectious Disease

Infectious diseases occur because of a complex interplay between an individual, the infectious organism, and the environment. Nutrition, underlying health, genetic factors, and behaviors such as smoking and alcohol use, breastfeeding, handwashing, and sexual practices influence the risk of contracting and becoming ill with an infectious disease. Socioeconomic, demographic, and environmental factors also play important roles in the transmission of infections—poverty, crowding, migration patterns, water and sewage facilities, and climate change all have the potential to influence patterns of infectious diseases in communities. Antibiotic use and hospital infection control programs affect both infection transmission and antibiotic resistance patterns. Coordinated public health programs have been vital in reducing the burden of infectious diseases such as tuberculosis and gonorrhea through education, screening, treatment, contact investigation, and surveillance.

8.2.1. Determinants of Vaccine-Preventable Infections: Childhood Immunization Rates

Immunization has been a cornerstone of public health for many decades. Both the vaccination status of an individual and vaccination rates in the community determine the risk of contracting vaccine-preventable diseases. In general, coverage rates of 90% in a community will prevent spread of vaccine-preventable diseases. In rural Alaska, immunizing children is typically a joint effort between tribal health organizations (THOs) and public health nurses. In the NSB, the Public Health Nursing program, in coordination with the Community Health Aide Program, is responsible for immunizations.

In recent years, childhood vaccine schedules have become increasingly complex. Meanwhile, public health nursing programs across the state, including the NSB’s, have suffered from significant staffing shortages, hampering efforts to meet immunization goals. Immunization rates for two-year-olds in the NSB have remained slightly below the average for THO service areas statewide, although both remain below the Healthy Alaskans 2010 goal of 90% coverage.
Figure 8.7: Two-Year-Old Childhood Immunization Rates: Percent of children ages 19–35 months who have received the recommended series of immunizations*

*Coverage rates for 4DT33 series (4Dtap, 3Polio, 1MMR, 3HepB). Two-year coverage rates for the currently recommended 4DT33 series, which includes one varicella dose, are slightly lower for both the NSB and all THOs combined.

Data source: ANTHC Immunization Program.

AI/AN=American Indian/Alaska Native

8.2.2. Determinants of Other Reportable Infectious Diseases (Other than STIs)

Improvements in rural sanitation have been identified as the most important determinant of diarrheal diseases worldwide. Food production, distribution, and home and restaurant food-handling practices are other important factors in determining the burden of food-borne diarrheal illnesses. National food safety policies, farming and food processing practices, state and local health department food and water safety regulations and oversight, general household living conditions, and household food handling practices all influence the risk of infectious diarrheal and food-borne illness.

Tuberculosis is an old disease and has long been known to be associated with such factors as poverty, poor housing, malnutrition, and poor underlying health. High tuberculosis and hepatitis C rates are also seen in incarcerated populations and areas with a high prevalence of HIV/AIDS. Screening of high-risk populations, surveillance and case-finding, the use of preventive medication, and directly-observed therapy and intensive follow-up for active cases are successful public health strategies for reducing tuberculosis rates in communities.

Prevention of hepatitis C transmission is an area of active research, because a significant minority of infected individuals are unable to identify a source for their infection.

8.2.3. Determinants of Sexually Transmitted Infections

Sexual behavior is the primary determinant of STI risk, with number of sexual partners and condom use being the main factors. The prevalence of STIs in the community also determines the likelihood that an individual will contract an infection through sexual contact. Having one STI can also increase the risk of becoming infected with other STIs, including HIV. Alcohol and drug use, gender, age, social and cultural norms, and socioeconomic factors can all influence sexual behaviors and affect the risk of sexually transmitted infection. Active screening, treatment, and partner notification programs are important means of controlling STI rates in a population, and several STIs (HPV and hepatitis B) can be prevented through vaccination.

Studies have demonstrated that sexual behavior can be influenced by comprehensive sex education in schools and community-based interventions, although little information is available about the effectiveness of STD prevention programs in rural Alaska or in indigenous communities in general.
8.2.3.1. Sexual Behavior Among Youth

The Alaska YRBS survey collects information on sexual behavior among high school students. In general, reported sexual practices differed little between the NSB and state and national samples. In 2005, roughly half of NSB high school students reported having had sexual intercourse. The Healthy Alaskans target to help reduce teen pregnancy and STI transmission is for less than 35% of high school students to report having had sexual intercourse. Almost two-thirds of sexually active NSB high school students reported using a condom during the last sexual intercourse. The Healthy Alaskans 2010 target was that at least 75% of students report using a condom during the last sexual intercourse.

Figure 8.8: Sexual Behavior Among High School Students

| Data source: 2005 and 2007 YRBS. |
| There were no statistically significant differences between NSB estimates and state or national estimates. |

8.2.3.2. Other Determinants of STIs

The causes and social epidemiology behind the high rates of certain STIs in rural Alaska and among Alaska Natives in particular are areas of ongoing research. Evidence is also very limited on factors associated with condom use in indigenous communities, although there is some evidence that white male/Alaska Native female partner pairs are less likely to use condoms than other sexual partners. Sudden demographic and socioeconomic changes can effect sexual behavior, particularly among youth. A study in an oil “boombtown” in northeastern Canada identified ways in which sudden demographic and socioeconomic changes can impact sexual behavior among youth, fueling the spread of STIs: mobility of oil/gas workers, binge partying, high levels of disposable income, and gendered power dynamics. One study of adolescents in a Lower 48 American Indian tribe found that “youth faced intense pressures for early sex, often associated with substance abuse. Condoms were not associated with stigma, yet few seemed to value their importance for disease prevention.”
Chapter 8 Endnotes


16. Arctic Slope Native Association Screening for Life Program. Data provided upon request, from Med-IT database.


23. Alaska Youth Risk Behavior Survey (YRBS): http://www.hss.state.ak.us/dph/chronic/school/YRBSresults.htm. NSB-specific data from 2005 survey was provided courtesy of the NSB School District. Weighted state-level data are not available from the 2005 survey, so the 2007 survey was used for statewide estimates.


Appendix A
2010 NSB Census: Community Health Profiles

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Background

Recognizing that health is an important component of community life, the North Slope Borough (NSB) has added a new “Health” section to the questionnaire for the 2010 Economic Profile and Census Report. In collaboration with the 2010 NSB Census coordinator, Circumpolar Research Associates, and the Mayor’s Office, the NSB Health Department developed the new health questions in an effort to provide community health information where reliable data from other sources are not available, and to provide some basic measures of community health and health-related behaviors at the village level.

The health module in this year’s NSB Census is not intended to be a comprehensive examination of health in North Slope communities but was developed as a part of the NSB Health Department’s Baseline Community Health Analysis project. As part of this project, the development of the health questionnaire section and analysis of the new health data from the 2010 NSB Census was funded, in part, with National Petroleum Reserve—Alaska NPR-A grant funds made available through the Department of Commerce, Community, and Economic Development. The NSB Baseline Community Health Analysis report contains expanded discussions of the health topics included in the census as well as many other health topics, such as maternal-child health, injury, infectious disease, and cancer. It also examines the factors that influence health in the NSB as well as approaches to health promotion in the NSB.

In the NSB and village health profiles that follow, most results are analyzed by gender, age group, ethnic group, and community of residence. Where statistically significant relationships or differences are found, these will be noted (based on a chi-squared test, significance level p<0.05). In this report, the term “significant” refers to statistical significance, indicating that one can be quite sure (in this case 95% confident) that the differences seen between groups are not caused by chance alone, or the natural variation between different groups of people.

State and national comparison rates are provided as a general reference only. Interpretations of these comparisons must be made with caution because of differences in composition of populations as well as differences in survey methodologies and analysis. For example, many statewide and national estimates are based on the Behaviors Risk Factor Surveillance System survey (BRFSS), which is a telephone survey. Results from a telephone survey are not directly comparable to a door-to-door household survey like the NSB census for a variety of reasons. In general, face-to-face censuses such as this one provide more reliable data than telephone surveys.

Please see the “Technical Notes” section at the end of the NSB Community Health Profiles and the forthcoming 2010 Economic Profile and Census Report for further discussion of questionnaire development, survey methodology, and issues in data interpretation.

NSB Health Profile

Overview of the Results of the 2010 NSB Census Health Module

This overview represents a synthesis of the notable findings from the 2010 NSB Census health module. For further discussion of topics as well as for relevant graphs and data tables, the reader should refer to the detailed profiles that follow for the NSB overall and for each of the individual NSB communities. Again, the discussion that follows is not intended to be a comprehensive examination of health in the region. For an expanded analysis of community health in the NSB, please refer to the NSB Baseline Community Health Analysis.

A large majority of NSB residents had “good” to “excellent” reported general health status, a testament to the ability to adapt to a harsh physical environment as well as to extraordinary social, cultural, and economic changes. The overall good health of NSB residents also likely reflects substantial investments in public health and other health and social services, education, water and sanitation, and in supporting cultural values and subsistence activities. The findings from this census with regard to general health status are fairly consistent with estimates of self-reported general health in the NSB from the Alaska BRFSS. The BRFSS survey has been conducted in Alaska since the early 1990s and has shown a decline
in self-reported health status both in the NSB and statewide during this time. Please see the NSB Baseline Community Health Analysis for further discussion of trends in general health status in the NSB.

Adults of all age groups in the NSB were less likely to report very good or excellent health than were adults statewide. Moreover, reported health status among Iñupiat adults was considerably worse than that of Caucasians and those of other ethnic groups in the North Slope. This inequality, or “health disparity,” between general health status of Iñupiat and non-Iñupiat residents is similar to that seen statewide between Alaska Natives and non-Natives. Reported general health status among Iñupiat adults was similar to that of Alaska Natives statewide. Significant differences in general health status were also seen between Barrow and the other North Slope villages, with general health status being worse in the villages other than Barrow. These differences were observed both in adults and children and persisted when comparing Iñupiat residents only.

Children in the NSB also had considerably worse reported general health than children statewide. Moreover, Iñupiat children in the NSB were less likely to be reported to have very good to excellent health than were Caucasian children. Other than demonstrating a very high prevalence of frequent or chronic ear infections among NSB children, the health data gathered in this census did not explain the observed disparities in children’s general health in the NSB. For an expanded discussion of children’s health in the NSB, please refer to the NSB Baseline Community Health Analysis.

The considerable differences in reported health status between Iñupiat and non-Iñupiat residents, between NSB residents and their counterparts statewide, and between residents of Barrow and those in other villages (seen in both Iñupiat and all ethnicities) did not appear to be explained by differences in the prevalence of the chronic health conditions examined in this census. Other serious health problems not examined in this census, such as cancer, infectious diseases, and mental health conditions, may be contributing to health disparities. These observed disparities in overall health status are likely attributable to a complex interaction of socioeconomic, environmental, behavioral, and biological factors. Many of these factors were explored in the 2010 NSB Census. These so-called “health determinants” are discussed further in the NSB Baseline Community Health Analysis.

All the sections of the NSB Census report contain information about factors that can have profound effects on health. These sections shed light on some of the differences seen between groups—for example, education, housing, income, subsistence participation and food use, and social connectedness. Multivariate analyses that look at how these other factors are related to health in the NSB have not yet been carried out. Moreover, a single survey such as this cannot be used to draw conclusions about causes of health problems in a population. For further discussion of these so-called “determinants of health,” please refer to the NSB Baseline Community Health Analysis. Several findings from the new health module may help explain some part of these disparities in health status, however.

- **Food insecurity:** Iñupiat household heads were significantly more likely than non-Iñupiat in the NSB to report difficulty getting enough food—both subsistence and market foods—to sustain a healthy lifestyle for household members. This so-called “food insecurity” has been associated with a number of measures of poor health among both adults and children and may be a significant factor behind the poorer reported health among Iñupiat residents as well as in the NSB overall compared to the state as a whole. Iñupiat household heads in outlying villages were significantly more likely to report problems with food security than were Iñupiat household heads in Barrow, and they were also more likely to report not being able to get enough subsistence foods. Overall, food insecurity appeared to be more common in the NSB than in the state overall.

- **Tobacco:** NSB adults were more than twice as likely as adults statewide to report smoking tobacco. Iñupiat adults in the NSB were almost three times as likely to report smoking as Caucasian adults in the NSB and also 37% more likely to smoke than were Alaska Natives statewide. Tobacco smoking and second-hand smoke exposure has been linked to a myriad of health problems among both adults and children and may be contributing to the observed disparities in health status. Smoking rates were significantly lower in Barrow than in the other villages overall, looking at all ethnicities together and at Iñupiat residents only. These differences were seen in adults but were particularly striking in teens. Among household heads who smoked, those living in Barrow were significantly less likely than those living in other villages to report smoking at least one pack per day. These findings are particularly notable, given Barrow’s municipal tobacco tax and indoor air ordinance.

- **Impacts of alcohol and drugs:** Iñupiat household heads were three times as likely to report that a household member had been hurt by the effects of alcohol or drugs as were Caucasian household
heads and twice as likely as those in other ethnic groups. This finding is notable, given that data from other surveys suggests that binge-drinking rates among NSB teens and adults are not significantly different from statewide rates. Alcohol and drugs can have wide-reaching health effects, including Fetal Alcohol Spectrum Disorder in offspring of mothers drinking during pregnancy, increased rates of traumatic accidents, interpersonal violence, and suicide, and physical problems such as stomach ulcers, liver failure, and brain damage.

- Soda and sugared beverage consumption: NSB Iñupiat household heads reported significantly higher consumption of sodas and other sugar-sweetened beverages than household heads in other ethnic groups, and consumption was higher than among adults statewide. Iñupiat household heads living in villages other than Barrow also reported higher levels of consumption than did those living in Barrow.

- Safety/injury prevention practices: Helmet use on offroad vehicles was very low compared with statewide estimates and was significantly lower among NSB Iñupiat household heads than among those in other ethnic groups. Helmet use was the lowest in the outlying North Slope villages.

Of note, some health measures were significantly better in the outlying villages, compared to Barrow:
- Adult diabetes rates were lower in outlying villages than in Barrow (all ethnicities and Iñupiat only).
- Frequency of moderate physical activity was higher among household heads in other villages (all ethnicities and Iñupiat only), compared to those living in Barrow.
- Prevalence of frequent/chronic ear infections among children was higher in Barrow than in other villages (all ethnicities and Iñupiat only).
- Iñupiat household heads in other villages were less likely than their counterparts in Barrow to believe that a household member had been hurt by alcohol or drugs and less likely to believe that the health of the community was "often" hurt by alcohol or drugs in the last year.

Lack of health insurance has been linked to worse general health status. A large majority of North Slope household heads had some type of health insurance coverage—a higher percentage than among Alaska adults overall. NSB residents face a number of serious issues with healthcare access, however, including chronic provider and staff shortages and lack of continuity because of high turnover; the inconvenience, logistical difficulty, and costs associated with travelling long distances for care; and the difficulty navigating a complex and often fragmented healthcare system both within the NSB and when seeking care off-Slope.

Obesity has been described as a national epidemic, among both adults and children, and has serious health implications throughout the life span. BRFSS surveys have suggested that NSB adult obesity rates have been on the rise and may be among the highest in the state. Results from the 2010 NSB Census confirm that overweight and obesity are extremely common across the North Slope, with more than 70% of household heads estimated to be overweight or obese, based on standard definitions of these weight categories. Unlike at the state and national level, no significant differences were found among household heads in different ethnic groups. Obesity rates did vary widely across North Slope villages. NSB household heads were slightly less likely than adults statewide to be overweight but more likely to be obese.

NSB household heads are, overall, a fairly physically active group, with 44% reporting that they get at least 5 days a week of moderate physical activity lasting at least 30 minutes. Although it suggests that fewer than half of household heads are achieving the recommended level of moderate-intensity physical activity, this percentage is similar to statewide estimates for adults. Data were not collected on vigorous-intensity exercise or muscle-strengthening exercise, for which there are additional recommendations.

Based on previous NSB censuses as well as other surveys, there is no evidence that smoking rates are decreasing in the NSB despite statewide and national tobacco control campaigns that have reduced smoking rates in other populations. A large majority of household heads who smoked in 2010 were interested in quitting, and a majority had tried to quit in the last year, although apparently with little success. Compared with the 2003 NSB Census, in 2010, household heads in Barrow and several other communities were less likely to report smoking one pack per day or more, however, possibly reflecting a response to the local tobacco tax and indoor air ordinance imposed in Barrow since the 2003 Census. Most smokers and almost all non-smokers ban smoking in the house, although a significant minority of smokers still permit smoking in the house. A comparison of teen smoking rate estimates based on household heads’ reports to previous anonymous surveys of middle and high school students in the NSB suggests that parents and other adults may often be unaware of tobacco smoking among adolescents in the household.
Responses to health-related questions varied widely across the North Slope communities. For example, the percent of adults reported to have very good to excellent general health ranged from only 21% in Atqasuk to 52% and 53% in Point Lay and Barrow, respectively. A similar pattern was seen for reported general health of children. The explanation for these wide disparities is not entirely clear. Responses to many of the other health-related questions also varied significantly among individual North Slope communities, and these findings are discussed in the sections later in this section.

Improving Health in North Slope Borough Communities

The results of the 2010 NSB Census health module suggest some obvious targets for improving community health. Programs such as the NSB Healthy Communities Initiative that support a healthy subsistence way of life, Iñupiaq values, and cultural activities have great potential to improve general health status and decrease health disparities by promoting community pride, self-esteem, and social networks. This and other programs that promote and facilitate physical activity and use of nutritious traditional foods may also combat obesity and other related chronic health problems. Based on 2010 NSB Census findings, other specific areas that could benefit from expanded North Slope-wide health promotion efforts include

- controlling and preventing tobacco use,
- working to reduce consumption of sodas and other sugar-sweetened beverages,
- increasing the use of helmets and other offroad vehicle safety practices,
- programs to improve food security that address access to both subsistence and market foods.

Continuing to invest in culturally-affirming educational and training opportunities and building the local health services workforce are also likely to reduce health disparities and improve the health of North Slope communities. The observed health differences across North Slope can also help guide local, culturally-tailored prevention and health promotion activities across the region.

The disparities seen in children’s health status warrant considerable attention. A growing body of research suggests that early childhood health and environment have lifelong physical and mental health effects. Moreover, health-related behaviors such as smoking, diet, and safety practices are often established during childhood and adolescence. Support of young families and maternal-child and adolescent health promotion efforts founded in the Iñupiaq value system are investments likely to benefit the community for generations to come.

The most effective community health promotion programs operate at multiple levels and involve collaboration and partnerships between multiple sectors of a community, many of which are not traditionally considered part of the public health team. Leadership both within and outside the health department is crucial, drawing on community strengths and Iñupiaq values and traditions to meet the health challenges each community faces. The NSB Health Department is actively seeking community input and partnerships with tribal leadership, educational institutions, and others to work toward creating communities that maximally support the health and well-being of all infants, children, adolescents, adults, and elders in the North Slope. For further discussion of health promotion in the NSB, please refer to the North Slope Borough Baseline Community Health Analysis.

Results of the 2010 NSB Census Health Questions

General Health

“Would you say that in general this household member’s health is poor, fair, good, very good, or excellent?”

Self-reported health has been shown to be one of the strongest predictors of illness, premature death, healthcare utilization, and hospitalization. Although perceptions and definitions of health can vary among individuals and across cultures, self-reported health is a useful way to compare overall health status across different populations and time periods.

General Health Status Among Adults

In the NSB census, household heads were asked to rate their own general health as well as that of other household members. Overall, a large majority of NSB adults (including household heads) reported being or were reported to be in good, very good, or excellent health. Reported general health status was similar among household heads and other adult household members, except in the 44- to 54-year-old
Reported general health among adults did not vary significantly by gender but was highly associated with age throughout the North Slope. In all age groups, NSB adults were less likely to have reported very good to excellent health than were Alaskan adults.1

Reported general health among NSB adults varied significantly by ethnic group. NSB Iñupiat adults in all age groups were less likely than Caucasians and those in other ethnic groups to report very good or excellent health and more likely to report fair or poor general health. Many factors may be contributing to this observed disparity, including differences in socioeconomic status, genetics, early childhood environment, health-related behaviors such as smoking and diet, and access to healthcare. Demographic factors may play a role as well; for example, differences in patterns of migration in and out of the region for employment, health, and other reasons. For a full discussion of the determinants of general health in the NSB, please refer to the NSB Baseline Community Health Analysis.

- Reported general health status among adults in the NSB was worse than for Alaskan adults overall, despite the fact the NSB adults are, as a group, younger than Alaskan adults.
- Reported general health status among NSB Iñupiat adults was similar to that of Alaska Native adults statewide, however, and health status among NSB Caucasian adults was similar to that of Caucasian adults statewide.
• The disparity between general health status among Alaska Natives and Caucasians statewide was similar to that seen among Iñupiat and Caucasians in the NSB.

Figure A.3: General Health Status Among Adults:
Percent with reported very good to excellent general health

In the NSB, the relationship between reported general health status and community of residence was statistically significant. Reported very good to excellent health status among NSB adults ranged from 21% in Atqasuk to 53% in Barrow. Atqasuk adults were also significantly more likely than those living in other North Slope villages to have fair to poor reported health. The reasons for this wide range of reported health status among the North Slope villages, and in particular, for the poor reported health status among Atqasuk residents, are not entirely clear and warrant further inquiry. Reported general health status was significantly better in Barrow than in the other North Slope villages as a whole, both in all ethnicities combined and among Iñupiat adults only.

Table A.1: Reported General Health Status of Adults in NSB Villages

<table>
<thead>
<tr>
<th></th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>All NSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Good to Excellent</td>
<td>32%</td>
<td>21%</td>
<td>53%</td>
<td>38%</td>
<td>39%</td>
<td>36%</td>
<td>52%</td>
<td>35%</td>
<td>46%</td>
</tr>
<tr>
<td>Fair to Poor</td>
<td>**</td>
<td>34%</td>
<td>13%</td>
<td>19%</td>
<td>22%</td>
<td>21%</td>
<td>10%</td>
<td>21%</td>
<td>16%</td>
</tr>
</tbody>
</table>

Barrow vs. Other North Slope Villages

<table>
<thead>
<tr>
<th></th>
<th>Barrow</th>
<th>Other North Slope Villages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
<td>Iñupiat only</td>
</tr>
<tr>
<td></td>
<td>All</td>
<td>Iñupiat only</td>
</tr>
<tr>
<td>Very Good to Excellent</td>
<td>50%</td>
<td>42%</td>
</tr>
<tr>
<td>Fair to Poor</td>
<td>17%</td>
<td>22%</td>
</tr>
</tbody>
</table>

**Cell count less than 5.

General Health Status Among Children

The NSB is one of the youngest regions in Alaska, with children making up the largest portion of the population. Health status in early life can have lifelong effects, and health-related behaviors such as tobacco use are often established during childhood and the teenage years as well. The health of children is profoundly affected by the social and physical environment at home, at school, and in the community.

In the 2010 NSB Census, household heads were asked about the general health status of children in the household. It is worth noting that health information for children was provided 74% of the time by parents, 12% by grandparents, and 11% by another relative who was identified as the household head. Proxy data, usually from parents or guardians, is also the standard for children’s health measures in national surveys.

• Within the NSB, reported general health status of Iñupiat children was significantly worse than that of Caucasian children and those in other ethnic groups.
• Children in the NSB were considerably less likely than Alaskan children overall to be reported to have very good or excellent general health.2
Reported general health status among children varied widely throughout the North Slope villages. The percentage of children reported to have very good to excellent health ranged from 38% in Atqasuk to 70% in Point Lay.

For an expanded discussion of children’s health and the determinants of maternal and child health, please refer to the NSB Baseline Community Health Analysis. Maternal and child health has been identified as a major area of health disparity in the NSB. The NSB Health Department is currently working with community partners on the development of the NSB Healthy Kids Initiative to address many of the health issues affecting infants, children, and teens in the NSB.

Table A.2: Reported General Health Status of Children (0–17 Years) in NSB Villages

<table>
<thead>
<tr>
<th></th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>All NSB Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Good to Excellent</td>
<td>41%</td>
<td>38%</td>
<td>68%</td>
<td>66%</td>
<td>55%</td>
<td>66%</td>
<td>70%</td>
<td>54%</td>
<td>63%</td>
</tr>
</tbody>
</table>

Barrow vs. Other North Slope Villages

<table>
<thead>
<tr>
<th></th>
<th>Barrow</th>
<th>Other North Slope Villages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Barrow</td>
<td>Other North Slope Villages</td>
</tr>
<tr>
<td></td>
<td>All</td>
<td>Ifliupiat only</td>
</tr>
<tr>
<td>Very Good to Excellent</td>
<td>68%</td>
<td>64%</td>
</tr>
</tbody>
</table>

**Chronic Health Conditions**

Chronic diseases are the leading cause of death and disability in the United States, and they are also among the most preventable. Chronic health problems also account for a high proportion of healthcare utilization and costs. Diabetes, in particular, has been of concern in Alaska, with rates increasing among Alaska Natives at a higher pace than in other groups. Please see the NSB Baseline Community Health Analysis for an expanded discussion of chronic health problems in Alaska and the NSB.

Household heads in the NSB were asked whether they or the other members of their households have experienced any of the following common chronic health problems:

"Has this household member ever been told by a health professional that he/she has"

- thyroid problems
- diabetes
- high blood pressure
- high cholesterol
- heart disease?"
“In the past 12 months, has this household member experienced

- frequent (three or more) or chronic ear infections
- daily or frequent pain, that may be because of such problems as arthritis, back problems, or injury, that limits their activities or requires prescription pain medication
- breathing problems such as asthma, emphysema, or a chronic cough that doesn’t go away?”

Certain health conditions—for example, thyroid problems, diabetes, high blood pressure, and high cholesterol—may not have symptoms until the problem is quite advanced. It is estimated that up to one-third of high blood pressure and diabetes cases, for example, are undiagnosed. Thus, the estimated prevalence of these health problems from survey data such as these (without any measurements or testing) reflects only known diagnoses and is thus influenced by the availability and use of primary care and other preventive health services. In communities where primary and preventive healthcare services are less available or less fully utilized, underdiagnosis of these health problems may be significant. Differences in prevalence among different groups can also reflect differing levels of awareness or understanding of health problems as well as varying screening practices in different healthcare settings.

**Chronic Health Problems in Adults**

**NSB Household Heads vs. Other Adult Household Members**

For household members other than the household heads, information was obtained by proxy from the household head (survey respondent). Overall, self-reported rates of chronic health problems were higher among household heads, a somewhat older group, than among other adult household members (mean age 45 vs. 37 years, respectively). Moreover, within individual age groups, the reported prevalence of most of the chronic health problems was significantly higher among household heads than among other adults in the household. This observed difference may reflect a true difference in the disease prevalence between these two groups, but it may also have occurred, in part, as a result of lack of full knowledge on the part of the household head regarding health problems in other household members. Prevalence estimates among household heads are likely to be based on the most accurate health information, while looking at all adult household members provides a larger sample of the NSB adult population but is likely to contain some inaccuracies, primarily in the form of underreported health problems. In this section, both groupings will be discussed.

**Comparison With State and/or National Prevalence**

Again, state and/or national disease rates are provided as a general reference and to provide a context for the results obtained in the NSB census. Interpretations of these comparisons must be made with caution because of differences in composition of populations as well as differences in definitions, survey methodologies, and data analysis.

Because the prevalence of most chronic diseases increases with age, the overall frequency with which NSB adults are reported to have chronic health problems would be expected to be slightly lower than the statewide average and the overall prevalence among NSB household heads slightly higher simply based on the age distribution of the groups. Unless otherwise noted, the prevalence estimates in this section are not adjusted for the differences in age composition of the population/samples.

- Reported thyroid disease among NSB adults was slightly lower than the estimate for adults nationwide, but again, this difference may, in part, reflect a difference in screening practices. State and national estimates for the prevalence of thyroid disease among specific age groups are not readily available.
- Reported diabetes prevalence among NSB adults was similar to statewide estimates for adults in all age groups. This finding is similar to results from the annual BRFSS survey conducted in the NSB and statewide. The overall adult diabetes prevalence in the NSB is slightly lower than the national estimate, but when analyzed by individual age groups, the differences are marginal.
- When reported high blood pressure was analyzed by age group, the NSB estimates were not significantly different from statewide estimates. This finding is also similar to those based on BRFSS survey estimates.
- Reported high cholesterol diagnoses among both household heads and among all adult household members were lower than the statewide estimate for adults in 2008, and these differences persisted when analyzed by individual age group. The estimated prevalence of high cholesterol among NSB adults here was considerably lower than from annual BRFSS surveys. The reason for this discrepancy is not clear.
• The prevalence of heart disease (including coronary artery disease or heart attack, congestive heart failure, rhythm, valve, or other problems) among both household heads and all adults in the NSB was lower than the national estimate for adults. Comparing individual age groups, the reported prevalence of heart disease remained lower than national estimates for adults although, again these comparisons must be made with caution.

• As is seen among NSB adults, arthritis and other types of chronic pain are common in Alaska and nationwide. In Alaska, 23% of adults surveyed reported doctor-diagnosed arthritis, 40% of whom report limitations of activity. An additional 19% of Alaskan adults report chronic joint symptoms possibly consistent with arthritis. Directly comparable statewide prevalence estimates for chronic pain, which may include other types of pain such as chronic headaches, back pain, and other musculoskeletal problems, are not available for comparison to NSB estimates.

• Although data are not truly comparable, the estimated prevalence of chronic respiratory problems among NSB adults appeared similar to state and national estimates. Based on estimates from other sources, this finding may represent a combination of a lower prevalence of asthma and a higher prevalence of emphysema in the NSB, compared with state and national estimates.

Table A.3: Chronic Health Problems: Adults

<table>
<thead>
<tr>
<th></th>
<th>NSB Household Heads Only</th>
<th>All NSB Adults (including household heads)</th>
<th>Alaska/U.S. Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ever told by a health professional have:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thyroid problem</td>
<td>6%</td>
<td>4%</td>
<td>9% (U.S.)¹</td>
</tr>
<tr>
<td>Diabetes</td>
<td>7%</td>
<td>6%</td>
<td>6% (Alaska)¹</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>28%</td>
<td>20%</td>
<td>25% (Alaska)³</td>
</tr>
<tr>
<td>High cholesterol</td>
<td>19%</td>
<td>13%</td>
<td>38% (Alaska)²</td>
</tr>
<tr>
<td>Heart disease</td>
<td>7%</td>
<td>5%</td>
<td>12% (U.S.)⁴</td>
</tr>
<tr>
<td><strong>In the past 12 months, experienced:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily pain or arthritis that limits activities or requires prescription pain medicine</td>
<td>29%</td>
<td>21% (see ref)⁵</td>
<td></td>
</tr>
<tr>
<td>Frequent/chronic ear infections</td>
<td>5%</td>
<td>4%</td>
<td>N/A</td>
</tr>
<tr>
<td>Chronic breathing problems (such as asthma, emphysema, or a chronic cough that won’t go away)</td>
<td>13%</td>
<td>8% (see ref)⁷</td>
<td></td>
</tr>
</tbody>
</table>

*Rates in this chart reflect crude rates, and are not adjusted for the different age compositions of the populations.

**Age, Gender, and Ethnic Group Differences in Chronic Health Problems**
As noted previously, all of the chronic health problems, with the exception of chronic ear infections, increased in prevalence with increasing age. Thyroid disease, diabetes, high blood pressure, cholesterol, and arthritis/chronic pain had statistically significant associations with ethnic group. Unlike general health status, the prevalence of chronic health problems was not consistently higher in one ethnic group or another, and the overall prevalence of chronic health problems did not appear to account for the significant disparity in general health status between Iñupiat and other ethnic groups.
Thyroid Problems: Among NSB adults, thyroid problems were reported more frequently among women than men (which is expected). Caucasian household heads aged 65 years and older reported a diagnosis of thyroid disease more frequently than those in other ethnic groups.

Diabetes: In the NSB, adults in ethnic groups other than Iñupiat or Caucasian were more likely have been diagnosed with diabetes than were Iñupiat or Caucasians. This difference was statistically significant in the 40- to 64-year-old and 65 and older age groups. Statewide, reported diabetes prevalence did not vary significantly by race, although nationwide, diabetes is more prevalent among certain non-white groups including African Americans, Latinos, and American Indians. Reported diabetes did not vary significantly by gender in the NSB.

High Blood Pressure: The prevalence of high blood pressure was not significantly associated with ethnic group except in the 40- to 64-year-old age group, where adults of other ethnicities were more likely to have been diagnosed with high blood pressure than Iñupiat or Caucasian adults. Statewide, the prevalence of reported high blood pressure was similar among Alaska Natives and non-Natives. In the NSB, male household heads were slightly more likely than female household heads to report high blood pressure.

High Cholesterol: Caucasians and those of other ethnic groups were significantly more likely to have been diagnosed with high cholesterol than were Iñupiat adults. Statewide, the prevalence of reported high cholesterol was similar among Alaska Natives and non-Natives. Reported high cholesterol among NSB adults did not vary significantly by gender.

Heart Disease: Reported heart disease (which includes coronary artery disease, heart failure, valve problems, heart rhythm problems, etc.) was slightly more prevalent among Iñupiat adults than among other ethnic groups in the 40- to 64-year-old and 65 and older age groups, although these differences were not quite statistically significant. Male household heads were significantly more likely than female household heads to report a diagnosis of heart disease (9% vs. 5%, respectively).

Chronic Ear Infections: Chronic ear infections were more prevalent among Iñupiat adults than among other ethnic groups, although this difference was only statistically significant in the 40- to 64-year-old age group. Female household heads were slightly more likely to report chronic ear infections than were male household heads, and this difference was statistically significant.

Arthritis and/or Chronic Pain: Arthritis and chronic pain were reported more frequently among Iñupiat adults than among other ethnic groups, although this difference was only statistically significant in the 40- to 64-year-old age group. Female household heads were significantly more likely to report arthritis/chronic pain than male household heads (32% vs. 25%, respectively). A similar gender difference in reported arthritis exists at the state level as well.

Respiratory Problems: The prevalence of respiratory problems among NSB adults did not vary significantly by ethnicity or gender.

Community of Residence: Comparing villages with respect to the prevalence of individual chronic diseases is difficult because of the small number of individuals with these health problems in each village. Looking at all ethnicities combined, the prevalence of diabetes among adults was significantly associated with community of residence, with Barrow having the highest proportion of residents reported to have diabetes and...
Nuiqsut and Point Lay having the lowest. The prevalence of high blood pressure was also associated with community of residence, with Atqasuk and Point Hope having the highest rates among adults and Point Lay having the lowest rate. High cholesterol was significantly associated with community of residence, with Atqasuk and Anaktuvuk Pass having the highest rates and Point Lay the lowest. The prevalence of chronic and/or frequent ear infections among adults was significantly associated with community of residence, with Point Lay and Nuiqsut having the highest estimated rates. None of the other reported chronic health problems had a statistically significant association with village of residence among adults.

Looking at Iñupiat residents only, the prevalence of reported individual chronic health problems was not significantly associated with community of residence for either household heads or all adults, except for high cholesterol, in which the relationship to community of residence was marginally statistically significant. Reported prevalence of high cholesterol among Iñupiat household heads was highest in Anaktuvuk Pass and lowest in Point Lay. Of note, residents of Anaktuvuk Pass generally get their primary healthcare in Fairbanks rather than in Barrow, and it is possible that this difference reflects varying screening or treatment practices in these two healthcare settings. It may also reflect differences in diet or other factors.

Comparing Barrow with the other North Slope villages, the prevalence of chronic health problems among both household heads and other adults was similar. Only one health condition, diabetes, was significantly different. The reported prevalence of diabetes in adults was significantly lower in the outlying villages than in Barrow, looking both at all ethnic groups combined and Iñupiat only.

Chronic Health Problems Among Children

The NSB census gathered limited data on chronic health problems among children. For further discussion of children’s health issues, please refer to the NSB Baseline Community Health Analysis. Of the chronic health problems examined in the census, only two were prevalent among household members under age 18 years: frequent and/or chronic ear infections and respiratory problems and/or asthma. For all other morbidities, the overall estimated prevalence among NSB children was less than 1%. The prevalence was not significantly different among ethnic groups for either chronic ear infections or respiratory problems, except in the 10- to 17-year-old age group, in which children of other ethnicities were more likely to be reported to have breathing problems than were Iñupiat or Caucasian children.

The overall prevalence of frequent/chronic ear infections among NSB children was almost four times the statewide estimate, while the prevalence of respiratory problems such as asthma was roughly the same as statewide estimates.8

Figure A.6: Chronic Health Problems Among NSB Children (Ages 0–17 Years)

*Alaska estimate for child respiratory problems is for current asthma diagnosis only, as reported by a parent. Alaska data source: Asthma National Survey of Children’s Health 2007.

Community of Residence: The reported prevalence of chronic ear infections among children was significantly related to community of residence, ranging from 10% in Kaktovik to 23% in Barrow. The prevalence of respiratory problems did not vary significantly by community of residence.
Table A.4: Chronic Health Problems Among Children (ages 0–17 years) in NSB Villages

<table>
<thead>
<tr>
<th></th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>All NSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequent (three or more) or chronic ear infections</td>
<td>20%</td>
<td>14%</td>
<td>23%</td>
<td>10%</td>
<td>18%</td>
<td>12%</td>
<td>15%</td>
<td>17%</td>
<td>19%</td>
</tr>
<tr>
<td>Breathing problems (such as asthma, emphysema, or a chronic cough that won’t go away)</td>
<td>5%</td>
<td>7%</td>
<td>6%</td>
<td>7%</td>
<td>8%</td>
<td>5%</td>
<td>*</td>
<td>*</td>
<td>5%</td>
</tr>
</tbody>
</table>

*Cell count less than five.

The prevalence of frequent or chronic ear infections in children was significantly higher in Barrow than in the other North Slope villages overall, both in all ethnic groups combined (23% vs. 15%, respectively), and in Iñupiat children only (25% vs. 15%, respectively).

Health Insurance

“Other than the eligible use of Indian Health Service, do you have health insurance?”

NSB household heads were more likely to have some form of health insurance (including the eligible use of Indian Health Service for those in Alaska Native or American Indian ethnic groups) than adults statewide.1

Table A.5: Health Insurance

<table>
<thead>
<tr>
<th></th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>All NSB</th>
<th>All Alaska</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have health insurance, including IHS eligibility</td>
<td>97%</td>
<td>100%</td>
<td>97%</td>
<td>90%</td>
<td>97%</td>
<td>99%</td>
<td>100%</td>
<td>99%</td>
<td>97%</td>
<td>82%1</td>
</tr>
<tr>
<td>Have health insurance, other than IHS eligibility</td>
<td>58%</td>
<td>70%</td>
<td>72%</td>
<td>38%</td>
<td>42%</td>
<td>52%</td>
<td>45%</td>
<td>59%</td>
<td>64%</td>
<td></td>
</tr>
</tbody>
</table>

Tobacco Smoking

Tobacco smoking is associated with numerous health problems, including many cancers, emphysema, heart disease and stroke, poor birth outcomes and childhood infections, and even impotence. Tobacco smoking is one of the most important modifiable behaviors influencing overall health and widely recognized as a top public health concern. Tobacco was introduced to Alaska Natives in the 1700s, when it was used as an article of trade, and it quickly became pervasive in rural Alaska. Today, rates of tobacco use among Alaska Natives are nearly twice as high as in non-Natives. Particularly high smoking rates have been noted in Inuit and Iñupiat regions across northern Alaska and Canada. Alaska Native youth also smoke at more than twice the rate of non-Native youth and have not experienced the decline in smoking rates seen in their non-Native counterparts. Previous surveys have suggested that the NSB has one of the highest smoking rates in Alaska, almost twice the statewide rate. Death rates in the NSB from lung cancer and chronic lung disease are considerably higher than statewide rates, and a number of maternal and child health problems associated with tobacco exposure are disproportionately high in the NSB.

Results from the 2010 Census, described in this section, demonstrate persistently high rates of tobacco smoking in the NSB and particularly among Iñupiat residents. For an expanded discussion of tobacco in the NSB, please refer to the NSB Baseline Community Health Analysis.

Estimated Smoking Rates

“Does this household member smoke tobacco (in any form)?”

Adult Tobacco Smoking

NSB adults (49%) were more than twice as likely to report smoking tobacco as adults statewide (22%). Iñupiat adults in the NSB were almost three times as likely to report smoking as Caucasian adults in the NSB and also 37% more likely to smoke than were Alaska Natives statewide.1
Gender: Male adults were significantly more likely to smoke than were female adults in the NSB.

Age: Among household heads, reported tobacco smoking varied by age, with reported smoking dropping to 34% in the 65 and older age group from roughly 50% in the other age groups.

Community of Residence: Among household heads, smoking rate was significantly associated with village of residence, with Barrow household heads the least likely to report smoking tobacco. Among Iñupiat household heads, the prevalence of tobacco smoking was also significantly related to village of residence, with slightly more than half (54%) of Point Hope household heads reporting smoking tobacco, and more than 70% of Iñupiat household heads reporting smoking in Kaktovik, Atqasuk, Point Lay, Nuiqsut, and Anaktuvuk Pass. Smoking rates were significantly lower in Barrow than in the other villages overall, looking at all ethnicities together and at Iñupiat residents only. These differences were seen in adults but were particularly striking in teens. Among household heads who smoked, those living in Barrow were significantly less likely than those living in other villages to report smoking at least one pack per day.
Table A.6: Tobacco Smoking Among NSB Household Heads

<table>
<thead>
<tr>
<th>Smoke tobacco in any form:</th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>All NSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>All household heads</td>
<td>65%</td>
<td>61%</td>
<td>44%</td>
<td>65%</td>
<td>62%</td>
<td>49%</td>
<td>58%</td>
<td>53%</td>
<td>50%</td>
</tr>
<tr>
<td>Iñupiat household heads</td>
<td>71%</td>
<td>73%</td>
<td>61%</td>
<td>75%</td>
<td>71%</td>
<td>54%</td>
<td>72%</td>
<td>59%</td>
<td>63%</td>
</tr>
</tbody>
</table>

Tobacco Smoking: Barrow vs. Other North Slope Villages

<table>
<thead>
<tr>
<th></th>
<th>Barrow</th>
<th>Other North Slope Villages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults: Smoke tobacco in any form</td>
<td>42%</td>
<td>56%</td>
</tr>
<tr>
<td>Among household heads who smoke, percent who smoke one or more packs per day</td>
<td>22%</td>
<td>21%</td>
</tr>
</tbody>
</table>

*AKP=Anaktuvuk Pass*

Change in Smoking Rates Over Time: Among household heads, overall adult smoking rates do not appear to have changed since the 2003 census.

Figure A.9: Tobacco Smoking Among NSB Household Heads in 2003 and 2010, by Village

Data sources: 2003 NSB Economic and Census Profile and 2010 NSB Census.

Tobacco Smoking Among Teens

The 2010 NSB Census did collect proxy data on child and/or teen tobacco smoking from household heads. A previous anonymous survey of high school students, the Youth Risk Behavior Surveillance (YRBS) survey, yielded a far higher smoking rate among NSB teens than the results of the NSB census estimate, however, suggesting that proxy information from household heads likely considerably underestimates the number of adolescent and teen smokers in the NSB. Moreover, the 2005 YRBS survey did not include students in alternative high schools, which typically have even higher smoking rates. Based on the YRBS survey data, estimated smoking rates among NSB high school students are roughly double statewide and national estimates. For further discussion of teen smoking, please refer to the *NSB Baseline Community Health Analysis*. 
In the 2010 NSB Census, gender was not significantly associated with teen smoking rates. Ethnic group, however, was associated with smoking. Iñupiat teens were significantly more likely to be reported to smoke than were Caucasian teens (18% vs. 12%, respectively). Reported teen smoking rates also varied widely across North Slope communities, with Nuiqsut having the highest reported tobacco smoking rate among teens and Barrow the lowest. Both among all ethnic groups combined and among Iñupiat teens only, reported smoking rates were significantly higher in Barrow than in the other North Slope villages overall.

### Table A.7: Teen Tobacco Smoking, by Community of Residence

<table>
<thead>
<tr>
<th></th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>NSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of Teens (ages 14–18 years) who smoke tobacco in any form*</td>
<td>32%</td>
<td>** 8%</td>
<td>26%</td>
<td>43%</td>
<td>12%</td>
<td>15%</td>
<td>31%</td>
<td>16%</td>
<td>15%</td>
</tr>
</tbody>
</table>

#### Barrow vs. Other North Slope Villages

<table>
<thead>
<tr>
<th></th>
<th>Barrow</th>
<th>Other North Slope Villages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of Teens (aged 14–18 years) who smoke tobacco in any form*</td>
<td>8%</td>
<td>11%</td>
</tr>
</tbody>
</table>

*According to the household head
**Cell count less than five.
AKP=Anaktuvuk Pass

### Amount Smoked (Adults)

“If you smoke, how much do you smoke?”

Among smokers, there was no statistically significant relationship between ethnicity and amount smoked each day. Male household heads were significantly more likely to smoke at least one pack per day than were female household heads.
Among household heads who smoked, amount smoked was significantly related to village of residence, with Kaktovik household heads most likely to smoke at least one pack per day. Both in all ethnic groups combined and among Iñupiat only, household heads in Barrow were significantly less likely to smoke at least one pack per day than were their counterparts in the other North Slope villages overall.

Table A.8: Amount Smoked, by Community of Residence

<table>
<thead>
<tr>
<th>Percent who report smoking one or more packs per day</th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>NSB</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>31%</td>
<td>26%</td>
<td>21%</td>
<td>44%</td>
<td>31%</td>
<td>23%</td>
<td>25%</td>
<td>23%</td>
<td>24%</td>
</tr>
</tbody>
</table>

Barrow vs. Other North Slope Villages

<table>
<thead>
<tr>
<th>Among household heads who smoke, percent who smoke one or more packs per day</th>
<th>Barrow</th>
<th>Other North Slope Villages</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>22%</td>
<td>21%</td>
</tr>
<tr>
<td>Iñupiat Only</td>
<td>29%</td>
<td>29%</td>
</tr>
</tbody>
</table>

AKP=Anaktuvuk Pass

Change in Amount Smoked Between 2003 and 2010: Smokers in several NSB communities do appear to be smoking fewer cigarettes per day in 2010 than in 2003.

Figure A.12: Of NSB Household Heads Who Smoked, Percent that Smoked at Least One Pack of Cigarettes per Day in 2003 and 2010

Data source: 2003 Economic and Census Profile and 2010 NSB Census.

Interest in Quitting and/or Attempts to Quit

“If you smoke or chew tobacco, are you interested in quitting?”

“During the last 12 months have you stopped smoking for one day or longer because you were trying to quit smoking?”

Interest in quitting was high throughout the NSB. Overall, 71% of household heads who smoked stated that they were interested in quitting, and this did not vary significantly by gender, ethnicity, or village of residence. Of all smokers, 62% had tried to quit in the last year, and female smokers were more likely to have tried quitting than male smokers. Interest in quitting and attempts to quit decreased with age.
Smoking in the House

“In the past month, how many hours per day was someone smoking in your house?”

Household tobacco smoke is a major source of indoor air pollution and is associated with a variety of health problems among non-smokers in the household. Infants and children are particularly vulnerable to tobacco smoke exposure, which is associated with increased rates of preterm birth and low birth weight, Sudden Infant Death Syndrome (SIDS), ear infections, and a variety of respiratory infections.

Previous NSB censuses have demonstrated that a vast majority of household heads are aware of the dangers of second-hand smoke. In 2010, 66% percent of NSB household heads who smoked and 95% of non-smokers did not permit smoking in the house, and this did not vary by ethnic group. Female and younger household heads were less likely to permit smoking in the house. Among smokers, permitting smoking in the house was significantly associated with village of residence, with Kaktovik household heads most likely to permit smoking in the house and Wainwright household heads least likely to permit it. Looking at Barrow compared with the other villages combined, there was not a significant difference in the proportion of household heads who permitted smoking in the house.

Table A.8: Among Household Heads Who Smoke, Percent Who Permit Smoking in the House

<table>
<thead>
<tr>
<th></th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>All NSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permit Smoking</td>
<td>40%</td>
<td>42%</td>
<td>31%</td>
<td>63%</td>
<td>35%</td>
<td>30%</td>
<td>35%</td>
<td>21%</td>
<td>33%</td>
</tr>
</tbody>
</table>

Support for Tobacco Tax

“Do you support a local tax on tobacco products to help fund a tobacco prevention or quitting program?”

Local tobacco taxes have been shown to discourage smoking in communities and can provide a source of revenue for a variety of programs that promote health. Barrow instituted a $1 per pack city tobacco tax in 2007. Overall, a slim majority (53%) of NSB household heads support a tobacco tax to support tobacco prevention and cessation programs. Non-smokers were more likely than smokers to support the tobacco tax. Caucasian non-smokers were the group most likely to support the tax (77%), and smokers of other ethnicities were the least likely to support the tax (36%). Support of a tobacco tax among household heads was significantly associated with village of residence, with the lowest level of support among household heads in Point Lay and the highest in Atqasuk (70%).

Table A.9: Among NSB Household Heads, Percent Who Support a Tobacco Tax to Fund Tobacco Prevention Programs

<table>
<thead>
<tr>
<th></th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>All NSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support Tax</td>
<td>48%</td>
<td>70%</td>
<td>58%</td>
<td>48%</td>
<td>43%</td>
<td>46%</td>
<td>34%</td>
<td>35%</td>
<td>53%</td>
</tr>
</tbody>
</table>
Overweight and Obesity

Obesity and being overweight are the most common chronic health problem in the country, together affecting roughly two-thirds of Americans. Obesity and being overweight are associated with a number of other chronic health problems, including high blood pressure, heart disease, diabetes, arthritis, certain cancers, and some types of respiratory problems. The prevalence of obesity has risen dramatically nationwide among both adults and children over the past three decades. Obesity rates have also risen statewide during this time period. Nationally, obesity is an area of socioeconomic and racial health disparity—those with lower levels of income and education and those in racial minorities (except Asian) are more likely to be obese—and in Alaska, obesity is more common among Alaska Natives than non-Natives. In the NSB census, household heads were asked to report only their own height and weight, so data on childhood obesity are not available from this census. For discussion of childhood obesity in the NSB, please refer to the NSB Baseline Community Health Analysis.

Body mass index (BMI) is a ratio of height to weight and is a common way to estimate the prevalence of being overweight and obese in a population. Estimated BMI was calculated for each household head based on his or her self-reported height and weight. Then, based on nationally set standard categories for BMI, each household head was categorized as “underweight” (BMI <18.5 kg/m²), “healthy weight” (BMI 18.5–24.9 kg/m²), “overweight” (BMI 25–29.9 kg/m²), or “obese” (BMI 30 or higher kg/m²).

Among NSB household heads, being overweight and obese were common. Fewer than one-third of household heads were at a healthy weight. The prevalence of being overweight and obese did not vary significantly by ethnic group, unlike at the state and national level. The ethnic disparities in the NSB in reported general health status do not appear to be explained by differences in obesity rates. NSB household heads were slightly less likely to be overweight but more likely to be obese than were adults statewide, similar to the pattern seen in Alaska Natives statewide.

![Figure A.14: Overweight and Obesity Among Adults, by Ethnic Group](image)

Alaska data source: 2008 BRFSS.
Overweight is defined as BMI ≥25 and <30, and obesity is defined as BMI ≥30.

Household heads aged 30–39 years were most likely to be overweight or obese, and women were more likely to be obese than men (45% vs. 34%, respectively).
Community of Residence: The likelihood of obesity was significantly associated with village of residence. Estimated obesity rates ranged from a low of 23% in Anaktuvuk Pass to a high of 48% in Point Hope. Anaktuvuk Pass household heads were the most likely to be within the healthy weight range (45%), whereas Wainwright household heads were least likely (23%) to be of a healthy weight. Looking at Barrow compared with the other North Slope villages combined, there were no significant differences in the prevalence of being overweight and obese.

Table A.10: Overweight and Obesity Among NSB Household Heads

<table>
<thead>
<tr>
<th></th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>All NSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overweight (BMI 25–29.9 kg/m²)*</td>
<td>32%</td>
<td>26%</td>
<td>34%</td>
<td>34%</td>
<td>38%</td>
<td>29%</td>
<td>17%</td>
<td>36%</td>
<td>33%</td>
</tr>
<tr>
<td>Obese (BMI 30 kg/m² or higher)*</td>
<td>23%</td>
<td>38%</td>
<td>40%</td>
<td>32%</td>
<td>33%</td>
<td>48%</td>
<td>46%</td>
<td>41%</td>
<td>39%</td>
</tr>
</tbody>
</table>

Physical Activity

"On average, how many days per week do you participate for at least 30 minutes in moderate exercise such as outdoor work, brisk walking, basketball, calisthenics, strenuous housework, or anything else that caused some increase in breathing or heart rate?"

Like a healthy diet, physical activity has many health benefits, both mental and physical. Regular exercise lowers the risk of diabetes, heart disease, and cancer and can also improve mood and concentration and help problems like back pain. Many factors influence the amount of exercise a person gets, including chronic health problems, social norms, educational and income level, occupation, leisure time, recreational opportunities and interest, and physical environment.

National guidelines recommend that adults get at least 150 minutes of moderate-intensity aerobic physical activity per week or 75 minutes of vigorous-intensity aerobic activity, as well as at least 2 days of muscle-strengthening activities. More time spent being physically active conveys even greater health benefits. In this census, household heads were asked about the frequency with which they engage in moderate physical activity.

Frequency of moderate physical activity was highly associated with age, with an increasing percentage of household heads in older age groups reporting never exercising for 30 minutes in a day on average. A substantial proportion of in older age groups still reported exercising for at least 30 minutes 5 or more days per week, however.
Overall, Caucasians were more likely to report 30 minutes of moderate exercise 2–4 days per week, compared with other ethnic groups, but this difference was only statistically significant in the 30- to 39-year-old age group, where Iñupiat household heads were more likely than Caucasians to report either once a week or less or 5 days a week or more.

**Community of Residence:** Reported frequency of physical activity was significantly associated with community of residence among household heads. Residents of Atqasuk were most likely to report getting, on average, no moderate exercise of 30 minutes duration per week and least likely to report 5 days or more per week (31%). Household heads in Point Lay and Wainwright reported the highest levels of exercise, with 59% reporting getting at least 30 minutes of moderate exercise 5 or more days per week.

Compared with their counterparts in Barrow, Iñupiat household heads in the other villages overall reported a significantly higher frequency of moderate physical activity.
Table A.11: Physical Activity Among Household Heads: Number of days per week, on average, get at least 30 minutes of moderate physical activity

<table>
<thead>
<tr>
<th></th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>All NSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Never”</td>
<td>18%</td>
<td>24%</td>
<td>16%</td>
<td>17%</td>
<td>19%</td>
<td>10%</td>
<td>8%</td>
<td>11%</td>
<td>16%</td>
</tr>
<tr>
<td>“Five days per week or more”</td>
<td>39%</td>
<td>29%</td>
<td>41%</td>
<td>50%</td>
<td>44%</td>
<td>49%</td>
<td>59%</td>
<td>59%</td>
<td>44%</td>
</tr>
</tbody>
</table>

Barrow vs. Other North Slope Villages

<table>
<thead>
<tr>
<th></th>
<th>Barrow</th>
<th>Other North Slope Villages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
<td>Iñupiat only</td>
</tr>
<tr>
<td>“Never”</td>
<td>16%</td>
<td>20%</td>
</tr>
<tr>
<td>“Five days per week or more”</td>
<td>41%</td>
<td>41%</td>
</tr>
</tbody>
</table>

Alaska data source: 2007 Alaska BRFSS.

Statewide Comparison: NSB household heads in all age groups were about as likely to report getting 5 or more days as adults statewide (44% vs. 47%). NSB household heads were slightly more likely to report never getting 30 minutes or more of moderate physical activity than were Alaskan adults in the same age groups (16% vs. 9% overall).

Figure A.18: Physical Activity Among NSB and Alaska Adults: Number of days per week with at least 30 minutes of moderate physical activity

Sodas and Other Sugar-Sweetened Beverages

“During the past week, on average, how many sweetened beverages such as soda pop (not diet), Kool-Aid or Tang, sweetened fruit juices, or energy/sports drinks did you drink per day?”

Sugar-sweetened beverages (SSBs) such as soda pop, fruit punch, sports and energy drinks, and sweetened milk, tea, and coffee drinks, are a major source of added sugar and calories in the U.S. and typically have very low nutrient value. High consumption of these beverages is associated with a number of health problems such as obesity, diabetes, cardiovascular disease, gout, and fatty liver disease, and tooth decay. Recent research also suggests a possible association between soda consumption and pancreatic cancer. Reducing the consumption of soda and other sugared beverages is one way to address the rising rates of obesity and related chronic diseases. In Alaska, rural residents have been found to drink considerably more soda per day than their urban counterparts. For further discussion of soda and other SSBs among both adults and children, please refer to the NSB Baseline Community Health Analysis.
Among NSB household heads, consumption of sodas and other SSBs was strongly associated with age. Younger age groups reported significantly higher levels of consumption than older groups. Household heads were asked only about their own consumption, thus data on children and teens are not available.

**Figure A.19: Average Number of Sodas and Other SSBs NSB Household Heads Report Drinking Each Day, by Age Group**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>None</th>
<th>&lt; 1 per day</th>
<th>About 1 per day</th>
<th>2-3 per day</th>
<th>3+ per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-29 years</td>
<td>16%</td>
<td>13%</td>
<td>10%</td>
<td>20%</td>
<td>42%</td>
</tr>
<tr>
<td>30-39 years</td>
<td>18%</td>
<td>13%</td>
<td>12%</td>
<td>28%</td>
<td>30%</td>
</tr>
<tr>
<td>40-49 years</td>
<td>26%</td>
<td>15%</td>
<td>12%</td>
<td>25%</td>
<td>22%</td>
</tr>
<tr>
<td>50-64 years</td>
<td>33%</td>
<td>20%</td>
<td>15%</td>
<td>18%</td>
<td>15%</td>
</tr>
<tr>
<td>65+ years</td>
<td>41%</td>
<td>18%</td>
<td>15%</td>
<td>15%</td>
<td>11%</td>
</tr>
</tbody>
</table>

**Ethnic Group:** Iñupiat household heads in the NSB reported significantly higher levels of SSBs consumption than did Caucasians and those of other ethnicities. Iñupiat household heads were more than six times as likely as Caucasian household heads to report drinking more than three of these beverages per day (31% vs. 5%, respectively). The relationship between ethnic group and consumption of sodas and other sugar-sweetened beverages was statistically significant in all age groups.

**Figure A.20: Average Number of Sodas and Other SSBs NSB Household Heads Report Drinking Each Day, by Ethnic Group**

<table>
<thead>
<tr>
<th>Ethnic Group</th>
<th>None</th>
<th>&lt; 1 per day</th>
<th>About 1 per day</th>
<th>2-3 per day</th>
<th>3+ per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iñupiat</td>
<td>16%</td>
<td>14%</td>
<td>12%</td>
<td>26%</td>
<td>31%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>53%</td>
<td>21%</td>
<td>13%</td>
<td>8%</td>
<td>5%</td>
</tr>
<tr>
<td>Other Ethnicities</td>
<td>39%</td>
<td>22%</td>
<td>15%</td>
<td>15%</td>
<td>10%</td>
</tr>
<tr>
<td>All NSB</td>
<td>26%</td>
<td>16%</td>
<td>13%</td>
<td>21%</td>
<td>24%</td>
</tr>
</tbody>
</table>

**Statewide Comparison:** NSB household heads were about half as likely to report drinking, on average, no sodas or other SSBs per day in the last week as adults statewide. NSB household heads were also more likely to report drinking two or more of these beverages per day than were adults statewide.
Appendix A: 2010 NSB Census: Community Health Profiles

Figure A.21: Average Daily Number of Sodas and Other SSBs Consumed by NSB Household Heads and Alaskan Adults

Community of Residence: Consumption of sodas and SSBs was significantly associated with community of residence among Iñupiat household heads. Of all the villages, household heads in Anaktuvuk Pass and Atqasuk were least likely to report drinking two or more of these beverages per day (49% and 48%, respectively) and most likely to report drinking none (25% and 21%, respectively). Iñupiat household heads in Nuiqsut were least likely to report drinking, on average, no sodas or SSBs per day (11%). More than 60% of Iñupiat household heads in Nuiqsut, Point Hope, Kaktovik, Point Lay reported drinking two or more of these beverages per day. Household heads living in villages other than Barrow, on the whole, reported higher levels of consumption of these beverages than did their counterparts in Barrow. This was true when comparing only Iñupiat household heads as well.

Table A.12: Soda and Sugar-Sweetened Beverage Consumption Among Iñupiat Household Heads

<table>
<thead>
<tr>
<th>Reported average daily consumption</th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>NSB Iñupiat</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>25%</td>
<td>21%</td>
<td>16%</td>
<td>15%</td>
<td>11%</td>
<td>16%</td>
<td>18%</td>
<td>14%</td>
<td>16%</td>
</tr>
<tr>
<td>2 or More</td>
<td>49%</td>
<td>48%</td>
<td>53%</td>
<td>65%</td>
<td>68%</td>
<td>66%</td>
<td>63%</td>
<td>64%</td>
<td>58%</td>
</tr>
</tbody>
</table>

Barrow vs. Other North Slope Villages

<table>
<thead>
<tr>
<th></th>
<th>Barrow</th>
<th>Other North Slope Villages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
<td>Iñupiat only</td>
</tr>
<tr>
<td>None</td>
<td>29%</td>
<td>16%</td>
</tr>
<tr>
<td>2 or More</td>
<td>39%</td>
<td>53%</td>
</tr>
</tbody>
</table>

Helmet Use

“Do you wear a helmet when riding a snowmachine or four-wheeler?”

Unintentional injuries are the leading cause of premature death in the NSB, and injury rates in the NSB are among the highest in the state. Accidents involving offroad motor vehicles are the leading cause of these injury deaths as well as the number one cause of traumatic brain injury. Helmets have been shown to prevent a significant percentage of these injuries and deaths. Please refer to the NSB Baseline Community Health Analysis for an expanded discussion of injury and particularly the role of alcohol in injuries.

A very low percentage of NSB household heads reported wearing a helmet when riding a snowmachine or four-wheeler (18%), compared with observed helmet use among adults statewide (57% use of snow-machine helmets). Iñupiat household heads were significantly less likely to report helmet use than were Caucasians or those of other ethnicities, and this association was statistically significant in all age groups except for 65-year-olds and older, where the number of non-Iñupiat riders was very small.
Reported helmet use was particularly low in villages other than Barrow. Looking at both all ethnic groups combined and at Iñupiat household heads only, Barrow residents were significantly more likely to wear helmets than those living in other villages.

Table A.13: Helmet Use: Wear a helmet when riding a snowmachine or four-wheeler (of household heads who ride them)

<table>
<thead>
<tr>
<th></th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>Villages other than Barrow</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Household Heads</td>
<td>11%</td>
<td>*</td>
<td>30%</td>
<td>*</td>
<td>9%</td>
<td>4%</td>
<td>*</td>
<td>*</td>
<td>5%</td>
</tr>
<tr>
<td>Iñupiat Household Heads</td>
<td>9%</td>
<td>*</td>
<td>17%</td>
<td>*</td>
<td>9%</td>
<td>4%</td>
<td>*</td>
<td>*</td>
<td>5%</td>
</tr>
</tbody>
</table>

*Cell count less than 5.

Food Security

The term “food security” refers to the ability to procure enough food, at all times, for an active healthy life for all household members. Food insecurity is a major public health concern and, paradoxically, can contribute to obesity and chronic diseases like diabetes because people who do not have enough food tend to choose cheaper, high-calorie food with low nutrient value. Food insecurity is also linked to many health problems among children, including poor general health status, more frequent colds and ear infections, decreased school performance, and higher levels of anxiety and aggression. In Alaska, residents of rural areas are at highest risk for food insecurity, where unemployment is high and problems are compounded by the expense and logistical difficulty of transporting food. Although local, subsistence food sources remain a very important source of nutritious food in rural Alaska, one in five adults and more than one in four children in rural Alaska are estimated to be living in food insecure households.9

NSB household heads were asked several questions about their household’s ability to procure enough food to sustain a healthy life for all household members.

“Last year were there times when your household found it difficult to get the food needed to eat healthy meals?”

Overall, 35% of NSB household heads reported having times last year when they found it difficult to get the food needed to make healthy meals.

“If yes, did this happen because they couldn’t get enough subsistence and/or store foods?”

Of the household heads who reported difficulty getting the food needed to eat healthy meals, 43% overall and 51% of Iñupiat household heads reported that this was because they could not get enough subsistence...
foods. The vast majority of household heads (90%) reporting difficulty getting food for healthy meals stated that it was because they couldn’t get enough store foods.

“Last year, were there times when members of your household did not have enough to eat?”

Overall, 26% of Iñupiat household heads reported times last year when household members did not have enough to eat.

**Figure A.22: Food Insecurity in the NSB, by Ethnic Group of Household Head**

<table>
<thead>
<tr>
<th>Percent of households with</th>
<th>19%</th>
<th>26%</th>
</tr>
</thead>
<tbody>
<tr>
<td>times last year when household members did not have enough to eat</td>
<td>3%</td>
<td>32%</td>
</tr>
<tr>
<td>Percent of households with</td>
<td>23%</td>
<td>34%</td>
</tr>
<tr>
<td>times last year when they weren’t able to get enough store foods for healthy meals</td>
<td>5%</td>
<td>31%</td>
</tr>
<tr>
<td>Percent of households with</td>
<td>3%</td>
<td>15%</td>
</tr>
<tr>
<td>times last year when they weren’t able to get enough subsistence foods for healthy meals</td>
<td>4%</td>
<td>14%</td>
</tr>
<tr>
<td>Percent of households with</td>
<td>20%</td>
<td>35%</td>
</tr>
<tr>
<td>times last year when it was difficult to get the foods needed for healthy meals</td>
<td>23%</td>
<td>39%</td>
</tr>
</tbody>
</table>

---

**Age and Gender:** None of the measures of food insecurity were significantly associated with the gender of the household head. Iñupiat household heads in the middle age groups were most likely to report that at times, household members did not have enough to eat. There was a similar relationship between age group and difficulty getting foods for healthy meals. The associations between age of household head and both measures of food insecurity were statistically significant. Age group was not significantly associated with whether Iñupiat household heads reported difficulty getting enough subsistence or store foods.

**Figure A.23: Food Insecurity Among Inupiat Households, by Age Group of Household Head**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>18-29 years</th>
<th>30-39 years</th>
<th>40-49 years</th>
<th>50-64 years</th>
<th>65+ years</th>
</tr>
</thead>
<tbody>
<tr>
<td>19%</td>
<td>31%</td>
<td>30%</td>
<td>44%</td>
<td>42%</td>
<td>42%</td>
</tr>
<tr>
<td>27%</td>
<td>42%</td>
<td>32%</td>
<td>42%</td>
<td>18%</td>
<td>35%</td>
</tr>
</tbody>
</table>

---

**Community of Residence:** Levels of reported food insecurity varied significantly across the North Slope. Iñupiat household heads living in villages other than Barrow were more likely than those living in Barrow to report food insecurity. They were more likely to report difficulty getting foods for healthy meals and also more likely to report difficulty getting enough subsistence foods, compared with Iñupiat household heads living in Barrow. They were also more likely to report household members who, at times, did not have enough to eat.
The significantly higher levels of food insecurity in villages other than Barrow persisted when looking only at Inupiat household heads. Among Inupiat household heads, those living in Anaktuvuk Pass were the most likely to report difficulty getting food for healthy meals, and a high proportion reported this difficulty to be caused by not being able to get enough subsistence foods. Almost one-half of Inupiat household heads in Anaktuvuk Pass reported household members who, at times last year, did not have enough to eat.

Table A.14: Food Insecurity in Households with Inupiat Household Heads

<table>
<thead>
<tr>
<th>Villages other than Barrow</th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of households that, at times last year, found it difficult to get the foods they needed to eat healthy meals</td>
<td>62%</td>
<td>56%</td>
<td>33%</td>
<td>39%</td>
<td>38%</td>
<td>38%</td>
<td>50%</td>
<td>47%</td>
</tr>
<tr>
<td>If yes, because not able to get enough subsistence foods</td>
<td>83%</td>
<td>41%</td>
<td>43%</td>
<td>58%</td>
<td>63%</td>
<td>64%</td>
<td>47%</td>
<td>41%</td>
</tr>
<tr>
<td>If yes, because not able to get enough store foods</td>
<td>78%</td>
<td>100%</td>
<td>87%</td>
<td>84%</td>
<td>84%</td>
<td>85%</td>
<td>100%</td>
<td>94%</td>
</tr>
<tr>
<td>Percent of households that, at times last year, had members who did not have enough to eat</td>
<td>49%</td>
<td>25%</td>
<td>22%</td>
<td>23%</td>
<td>28%</td>
<td>26%</td>
<td>26%</td>
<td>33%</td>
</tr>
</tbody>
</table>

Statewide and national food insecurity data are not easily comparable with NSB census data because the state and national surveys did not ask about subsistence food security or take into account lack of availability of many foods in remote communities. For reference, 10.8% of Alaska household surveyed were found to have some degree of food insecurity, and 4.4% were found to have “very low food security,” with disrupted eating patterns or reduced food intake. Although the NSB census data are not directly comparable with statewide estimates, the 2010 NSB Census results suggest that food insecurity is a serious problem across the North Slope and, like in other rural areas, exists at levels higher than statewide estimates.

Impacts of Drugs and Alcohol

It has long been recognized that alcohol and drug use can have devastating impacts on individuals, families, and communities. Alcohol and drug use are significant factors in accidental injuries, suicide, and interpersonal violence, and are associated with a number of other health problems. Major efforts have been made in the NSB to combat the negative effects of drugs and alcohol in the community through policy and prevention programs and by actively supporting a strong Inupiaq culture and value system. For further discussion of this topic, please refer to the NSB Baseline Community Health Assessment.

This year, all household heads were asked two questions about the effect of drugs and alcohol on the health of their household and community.

Household Impacts

“In the last 12 months, do you feel that anyone in your household has been hurt by alcohol or drugs?”

A minority of household heads of all ethnic groups in the NSB thought that someone in their household had been hurt by alcohol or drugs in the past year. The response to this question did not vary significantly by age or gender. Inupiat household heads were three times as likely as Caucasians and twice as likely as those in other ethnic groups to report a household member hurt by alcohol or drugs, however.
Figure A.24: Household Impact of Drugs and Alcohol in the NSB, by Ethnic Group: Percent of NSB household heads reporting that, in the past 12 months, a member of the household has been hurt by drugs or alcohol

<table>
<thead>
<tr>
<th>Ethnic Group</th>
<th>Often</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>All NSB</td>
<td>5%</td>
<td>19%</td>
<td>76%</td>
</tr>
<tr>
<td>Other Ethnicities</td>
<td>3%</td>
<td>12%</td>
<td>86%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>3%</td>
<td>7%</td>
<td>90%</td>
</tr>
<tr>
<td>Iñupiat</td>
<td>7%</td>
<td>24%</td>
<td>70%</td>
</tr>
</tbody>
</table>

Community of Residence: Response to this question varied significantly by the household head’s community of residence. Among Iñupiat household heads, those living in Kaktovik were most likely to report a household member being hurt by alcohol or drugs (44%) and those living in Wainwright and Point Lay were least likely to report this (15% and 16%, respectively).

As a whole, compared with their counterparts living in Barrow, Iñupiat household heads in other villages were significantly less likely to believe that a household member had been hurt by alcohol or drugs (35% vs. 25%, respectively).

Table A.15: Iñupiat Household Heads: Household Impact of Drugs and Alcohol, by Village: Percent who felt that, in the last year, a household member had been hurt by the effects of alcohol or drugs

<table>
<thead>
<tr>
<th>Villages other than Barrow</th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
</tr>
</thead>
<tbody>
<tr>
<td>AKP=Anaktuvuk Pass</td>
<td>24%</td>
<td>31%</td>
<td>35%</td>
<td>44%</td>
<td>28%</td>
<td>24%</td>
<td>16%</td>
<td>15%</td>
</tr>
</tbody>
</table>

Community Impacts

“In the last 12 months, do you feel that the health of your community has been hurt by the effects of alcohol or drugs?”

A large majority of NSB household heads thought that drugs or alcohol had affected the health of their community in the last year. About one-half of Iñupiat household heads thought that the health of their community had been hurt often by alcohol or drugs in the past year, compared with almost three of four Caucasian household heads who thought this was true. Female household heads were more likely than male household heads to believe that drugs or alcohol had affected the health of their community, but the responses did not vary significantly by age.

Figure A.25: Community Impact of Drugs and Alcohol in the NSB: Percent of NSB household heads reporting that, in the past 12 months, the health of the community has been hurt by drugs or alcohol

<table>
<thead>
<tr>
<th>Ethnic Group</th>
<th>Often</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>All NSB</td>
<td>57%</td>
<td>35%</td>
<td>9%</td>
</tr>
<tr>
<td>Other Ethnicities</td>
<td>63%</td>
<td>26%</td>
<td>11%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>74%</td>
<td>23%</td>
<td>3%</td>
</tr>
<tr>
<td>Iñupiat</td>
<td>51%</td>
<td>39%</td>
<td>10%</td>
</tr>
</tbody>
</table>

Data source: 2010 NSB Census.
Community of Residence: Among Iñupiat household heads, the response to this question varied significantly across the North Slope villages. Those living in Atqasuk were least likely to think that their community’s health was “often” hurt by alcohol or drugs (33%) and those living in Barrow were most likely (57%) to believe that this was true. Those living in Anaktuvuk Pass and Nuiqsut were least likely to report thinking that the health of their communities were “never” hurt by alcohol or drugs (3% and 5%, respectively). Iñupiat household heads living in Atqasuk were most likely to report thinking that the health of their community was never hurt by alcohol or drugs (28%).

As a whole, those living in North Slope villages other than Barrow were significantly less likely than those living in Barrow to believe that the health of their community had often been hurt by alcohol or drugs in the past year.

Table A.16: Iñupiat Household Heads: Community Impacted by Alcohol or Drugs: Percent who felt that, in the last year, the health of their community had been hurt by alcohol or drugs

<table>
<thead>
<tr>
<th></th>
<th>AKP</th>
<th>Atqasuk</th>
<th>Barrow</th>
<th>Kaktovik</th>
<th>Nuiqsut</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Wainwright</th>
<th>Villages other than Barrow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>3%</td>
<td>28%</td>
<td>8%</td>
<td>14%</td>
<td>5%</td>
<td>11%</td>
<td>11%</td>
<td>13%</td>
<td>12%</td>
</tr>
<tr>
<td>Sometimes</td>
<td>41%</td>
<td>39%</td>
<td>36%</td>
<td>45%</td>
<td>48%</td>
<td>44%</td>
<td>49%</td>
<td>39%</td>
<td>43%</td>
</tr>
<tr>
<td>Often</td>
<td>55%</td>
<td>33%</td>
<td>57%</td>
<td>41%</td>
<td>47%</td>
<td>45%</td>
<td>41%</td>
<td>49%</td>
<td>45%</td>
</tr>
</tbody>
</table>
Anaktuvuk Pass Health Profile

This village health profile provides a brief summary of the results of the 2010 NSB Census. The intent of this profile is to provide individual communities with information on some basic health measures at the village-level to guide community health promotion and planning efforts.

Please refer to the 2010 Census NSB Health Profile section for further discussion of each health question and an overview of the census health module results for the NSB. Also, please refer to the full NSB Baseline Community Health Analysis report for expanded discussions of each of the health topics addressed in this section as well as many more aspects of community health.

At the village-level, some of the small percentages are based on very small numbers of responses, making the estimates less reliable: cells based on fewer than five responses are not reported. NSB and Alaska estimates are provided for general reference only, and comparisons should be made with caution, as results are not adjusted for differences in the age composition of the populations. In addition, state and national survey methods may vary considerably from that used in the 2010 NSB Census.

Adults

Table A.17

<table>
<thead>
<tr>
<th></th>
<th>AKP Household Heads</th>
<th>NSB Household Heads</th>
<th>All AKP Adults*</th>
<th>All NSB Adults*</th>
<th>Alaska Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Health</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very good or excellent general health</td>
<td>33%</td>
<td>44%</td>
<td>32%</td>
<td>46%</td>
<td>56%1</td>
</tr>
<tr>
<td>Fair to poor general health</td>
<td>10%</td>
<td>20%</td>
<td>4%</td>
<td>16%</td>
<td>13%13</td>
</tr>
<tr>
<td>Chronic Health Problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thyroid problems</td>
<td>9%</td>
<td>6%</td>
<td>4%</td>
<td>4%</td>
<td>9% (U.S.)3</td>
</tr>
<tr>
<td>Diabetes **</td>
<td>7%</td>
<td>4%</td>
<td>6%</td>
<td>6% (Alaska)3</td>
<td></td>
</tr>
<tr>
<td>High blood pressure</td>
<td>26%</td>
<td>28%</td>
<td>17%</td>
<td>20%</td>
<td>25% (Alaska)3</td>
</tr>
<tr>
<td>High cholesterol</td>
<td>28%</td>
<td>19%</td>
<td>16%</td>
<td>13%</td>
<td>38% (Alaska)3</td>
</tr>
<tr>
<td>Heart disease</td>
<td>8%</td>
<td>7%</td>
<td>5%</td>
<td>5%</td>
<td>12% (U.S.)4</td>
</tr>
<tr>
<td>In the past 12 months, experienced:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily pain or arthritis that limits activities or requires prescription pain medicine</td>
<td>24%</td>
<td>29%</td>
<td>17%</td>
<td>21%</td>
<td>(see ref)9</td>
</tr>
<tr>
<td>Frequent (three or more) or chronic ear infections</td>
<td>8%</td>
<td>5%</td>
<td>4%</td>
<td>4%</td>
<td>N/A</td>
</tr>
<tr>
<td>Chronic breathing problems (such as asthma, emphysema, or a cough that won’t go away)</td>
<td>19%</td>
<td>13%</td>
<td>9%</td>
<td>8%</td>
<td>(see ref)9</td>
</tr>
<tr>
<td>Health Insurance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have health insurance, including IHS eligibility</td>
<td>97%</td>
<td>97%</td>
<td>83%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have health insurance, other than IHS eligibility</td>
<td>58%</td>
<td>64%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table A.17, continued

<table>
<thead>
<tr>
<th></th>
<th>AKP Household Heads</th>
<th>NSB Household Heads</th>
<th>All AKP Adults*</th>
<th>All NSB Adults*</th>
<th>Alaska Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Smoking</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke tobacco (in any form)</td>
<td>65%</td>
<td>50%</td>
<td>63%</td>
<td>49%</td>
<td>22%1</td>
</tr>
<tr>
<td>Of those who smoke:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke one or more packs per day</td>
<td>31%</td>
<td>25%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are interested in quitting</td>
<td>69%</td>
<td>71%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have tried to quit in the last 12 months</td>
<td>56%</td>
<td>62%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permit smoking in the house</td>
<td>40%</td>
<td>33%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support a tobacco tax to fund tobacco prevention or cessation programs</td>
<td>48%</td>
<td>53%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Overweight and Obesity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overweight (BMI 25–29.9 kg/m²)</td>
<td>32%</td>
<td>33%</td>
<td></td>
<td></td>
<td>37%1</td>
</tr>
<tr>
<td>Obese (BMI 30 kg/m² or higher)</td>
<td>23%</td>
<td>39%</td>
<td></td>
<td></td>
<td>28%1</td>
</tr>
<tr>
<td><strong>Physical Activity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never get 30 minutes of moderate exercise in a day</td>
<td>18%</td>
<td>16%</td>
<td></td>
<td></td>
<td>9%5</td>
</tr>
<tr>
<td>Get at least 30 minutes of moderate exercise 5 days per week or more</td>
<td>39%</td>
<td>44%</td>
<td></td>
<td></td>
<td>47%5</td>
</tr>
<tr>
<td><strong>Sugar-sweetened beverages (SSBs)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On average, drink no soda or other SSBs per day</td>
<td>30%</td>
<td>26%</td>
<td></td>
<td></td>
<td>53%10</td>
</tr>
<tr>
<td>On average, drink two or more sodas or other SSBs per day</td>
<td>43%</td>
<td>45%</td>
<td></td>
<td></td>
<td>30%10</td>
</tr>
<tr>
<td><strong>Food Security</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Times last year when household found it difficult to get the foods they needed to eat healthy meals</td>
<td>57%</td>
<td>35%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If yes, because not able to get enough subsistence foods to eat healthy meals</td>
<td>71%</td>
<td>43%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If yes, because not able to get enough store foods to eat healthy meals</td>
<td>80%</td>
<td>90%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent with household members who at times did not have enough to eat</td>
<td>40%</td>
<td>19%</td>
<td></td>
<td></td>
<td>(4–11%)12</td>
</tr>
<tr>
<td><strong>Safety: Helmet Use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wear a helmet when riding a snowmachine or four-wheeler (of household heads who ride on snowmachines or 4-wheelers)</td>
<td>11%</td>
<td>18%</td>
<td></td>
<td></td>
<td>(57%)13</td>
</tr>
<tr>
<td><strong>Drugs and Alcohol</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the past 12 months, felt a household member had been hurt by drugs or alcohol</td>
<td>23%</td>
<td>24%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the past 12 months, thought the health of their community had been hurt by drugs or alcohol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Often</td>
<td>57%</td>
<td>57%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sometimes</td>
<td>40%</td>
<td>35%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*includes both household head (survey respondent) and all other household members, as reported by the household head.

**Cell count less than five.

- Most adults in Anaktuvuk Pass reported or were reported to have at least “good” general health. Compared with the NSB as a whole, Anaktuvuk Pass residents were less likely to report very good to excellent health, but also less likely to report fair to poor health.
- The reported prevalence of the chronic health problems among Anaktuvuk Pass adults was similar to the prevalence in the NSB overall, with the exception of high cholesterol. Anaktuvuk Pass household heads (both Iñupiat only and all) were significantly more likely than their counterparts in other North Slope communities to report a diagnosis of high cholesterol. Of note, residents of Anaktuvuk Pass typically...
get their healthcare in Fairbanks rather than Barrow, and this difference may, in part, reflect different
screening practices in these different settings. It may also reflect differences in diet or other factors.
• Looking at both Iñupiat only and all adults, smoking rates are high in Anaktuvuk Pass, significantly
higher than in the other North Slope communities overall. Most smokers were interested in quitting.
• Anaktuvuk Pass household heads (both Iñupiat only and all) were significantly more likely to be at
a healthy weight and significantly less likely to be obese than were their counterparts in the other North
Slope communities overall.
• Reported physical activity levels among Anaktuvuk Pass household heads were similar to other North
Slope communities. Reported consumption of sodas and other sugared beverages was high, similar to
other North Slope communities.
• The levels of reported food insecurity were very high in Anaktuvuk Pass. Anaktuvuk Pass household
heads were significantly more likely to report difficulty getting foods for healthy meals and particu-
larly getting enough subsistence foods, than were household heads in the other villages combined.
Anaktuvuk Pass households were twice as likely as households in other communities to have house-
hold members who, at times last year, did not have enough to eat.
• As in other villages, reported helmet use among Anaktuvuk Pass household heads was very low.
• Anaktuvuk Pass household heads were equally as likely to report household and community effects of
alcohol or drugs as were household heads in the other North Slope communities overall.

Children (0–17 years)

Table A.18

<table>
<thead>
<tr>
<th></th>
<th>AKP Children</th>
<th>NSB Children</th>
<th>Alaska Children</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Health</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very good or excellent general health</td>
<td>41%</td>
<td>63%</td>
<td>89% (2)</td>
</tr>
<tr>
<td><strong>Chronic Health Problems</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the past 12 months, experienced:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequent (three or more) or chronic ear infections</td>
<td>20%</td>
<td>19%</td>
<td>5% (2)</td>
</tr>
<tr>
<td>Chronic breathing problems (such as asthma, emphysema, or a cough that won’t go away)</td>
<td>5%</td>
<td>5%</td>
<td>6% (current asthma) (2)</td>
</tr>
<tr>
<td><strong>Teen Tobacco Smoking (ages 14–18 years)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke tobacco (in any form)</td>
<td>32%</td>
<td>16%</td>
<td>Not comparable</td>
</tr>
</tbody>
</table>

As reported by the household head. All the other chronic health problems had a prevalence of less than 1% among children in the NSB and were not analyzed or reported by individual village.

**Based on other NSB surveys, this value likely significantly underestimates the prevalence of smoking among children and teens as it is not comparable to anony-
mous self-administered surveys used to estimate teen smoking rates statewide and nationally. According to the 2005 YRBS survey, NSB high school students
were about twice as likely to smoke as Alaskan high school students overall.

• The majority of children in Anaktuvuk Pass were reported to have at least good general health.
• The general health status of children in Anaktuvuk Pass was significantly less likely to be reported
as very good or excellent than in other North Slope communities overall, however. This difference
persisted when looking at Iñupiat children only.
• The percentage of children with very good to excellent health in Anaktuvuk Pass was less than half
the statewide estimate.
• The prevalence of chronic ear infections in Anaktuvuk Pass was similar to that for the NSB overall but
roughly four times the estimated prevalence for Alaskan children overall.
• The prevalence of breathing problems, such as asthma, in Anaktuvuk Pass children was similar to that
among children in the NSB and Alaska overall.
• Reported teen smoking was twice as common in Anaktuvuk Pass as in the NSB overall. Looking at
Iñupiat teens only, the reported teen smoking rate in Anaktuvuk Pass (30%) was higher than among the
other villages overall (18%), but this difference was not statistically significant.
Atqasuk Health Profile

This village health profile provides a brief summary of the results of the 2010 NSB Census. The intent of this profile is to provide individual communities with information on some basic health measures at the village-level to guide community health promotion and planning efforts.

Please refer to the 2010 Census NSB Health Profile section for further discussion of each health question and an overview of the census health module results for the NSB. Also, please refer to the NSB Baseline Community Health Analysis report for expanded discussions of each of the health topics addressed in this section as well as many more aspects of community health.

At the village-level, some of the small percentages are based on very small numbers of responses, making the estimates less reliable: cells based on fewer than five responses are not reported. NSB and Alaska estimates are provided for general reference only, and comparisons should be made with caution, as results are not adjusted for differences in the age composition of the populations. In addition, state and national survey methods may vary considerably from that used in the 2010 NSB Census.

### Adults

#### Table A.19

<table>
<thead>
<tr>
<th>General Health</th>
<th>Atqasuk Household Heads</th>
<th>NSB Household Heads</th>
<th>All Atqasuk Adults*</th>
<th>All NSB Adults*</th>
<th>Alaska Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very good or excellent general health</td>
<td>22%</td>
<td>44%</td>
<td>21%</td>
<td>46%</td>
<td>56%⁴</td>
</tr>
<tr>
<td>Fair to poor general health</td>
<td>41%</td>
<td>20%</td>
<td>34%</td>
<td>16%</td>
<td>13%⁵</td>
</tr>
</tbody>
</table>

**Chronic Health Problems**

Ever told by a health professional have:

| Thyroid problems | 10% | 6% | 7% | 4% | 9% (U.S.)³ |
| Diabeties | ** | 7% | 4% | 6% | 6% (Alaska)³ |
| High cholesterol | 22% | 19% | 17% | 13% | 38% (Alaska)³ |
| Heart disease | ** | 7% | 4% | 5% | 12% (U.S.)³ |

In the past 12 months, experienced:

| Daily pain or arthritis that limits activities or requires prescription pain medicine | 24% | 29% | 20% | 21% | (see ref)⁶ |
| Frequent (three or more) or chronic ear infections | ** | 5% | ** | 4% | N/A |
| Chronic breathing problems (such as asthma, emphysema, or a cough that won’t go away) | 10% | 13% | 5% | 8% | (see ref)⁷ |

#### Health Insurance

| Have health insurance, including IHS eligibility | 100% | 97% | 83%⁴ |
| Have health insurance, other than IHS eligibility | 70% | 64% |
Appendix A: 2010 NSB Census: Community Health Profiles

Table A.19, continued

<table>
<thead>
<tr>
<th></th>
<th>Atqasuk Household Heads</th>
<th>NSB Household Heads</th>
<th>All Atqasuk Adults*</th>
<th>All NSB Adults*</th>
<th>Alaska Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke tobacco (in any form)</td>
<td>61%</td>
<td>50%</td>
<td>61%</td>
<td>49%</td>
<td>22%</td>
</tr>
<tr>
<td>Of those who smoke:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke one or more packs per day</td>
<td>26%</td>
<td>25%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are interested in quitting</td>
<td>89%</td>
<td>71%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have tried to quit in the last 12 months</td>
<td>54%</td>
<td>62%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permit smoking in the house</td>
<td>42%</td>
<td>33%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support a tobacco tax to fund tobacco prevention or cessation programs</td>
<td>70%</td>
<td>53%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overweight and Obesity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overweight (BMI 25–29.9 kg/m²)</td>
<td>26%</td>
<td>33%</td>
<td></td>
<td>37%*</td>
<td></td>
</tr>
<tr>
<td>Obese (BMI 30 kg/m² or higher)</td>
<td>38%</td>
<td>39%</td>
<td></td>
<td>28%*</td>
<td></td>
</tr>
<tr>
<td>Physical Activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never get 30 minutes of moderate exercise in a day</td>
<td>24%</td>
<td>16%</td>
<td></td>
<td>9%*</td>
<td></td>
</tr>
<tr>
<td>Get at least 30 minutes of moderate exercise 5 days per week or more</td>
<td>29%</td>
<td>44%</td>
<td></td>
<td>47%*</td>
<td></td>
</tr>
<tr>
<td>Sugar-sweetened beverages (SSBs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On average, drink no soda or other SSBs per day</td>
<td>29%</td>
<td>26%</td>
<td></td>
<td>53%*</td>
<td></td>
</tr>
<tr>
<td>On average, drink two or more sodas or other SSBs per day</td>
<td>39%</td>
<td>45%</td>
<td></td>
<td>30%*</td>
<td></td>
</tr>
<tr>
<td>Food Security</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Times last year when household found it difficult to get the foods they needed to eat healthy meals</td>
<td>59%</td>
<td>35%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If yes, because not able to get enough subsistence foods to eat healthy meals</td>
<td>34%</td>
<td>43%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If yes, because not able to get enough store foods to eat healthy meals</td>
<td>100%</td>
<td>90%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent with household members who at times did not have enough to eat</td>
<td>20%</td>
<td>19%</td>
<td></td>
<td>(4–11%)*</td>
<td></td>
</tr>
<tr>
<td>Safety: Helmet Use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wear a helmet when riding a snowmachine or four-wheeler (of household heads who ride on snowmachines or 4-wheelers)</td>
<td>**</td>
<td>18%</td>
<td></td>
<td>(57%)*</td>
<td></td>
</tr>
<tr>
<td>Drugs and Alcohol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the past 12 months, felt a household member had been hurt by drugs or alcohol</td>
<td>27%</td>
<td>24%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the past 12 months, thought the health of their community had been hurt by drugs or alcohol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Often</td>
<td>42%</td>
<td>57%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sometimes</td>
<td>35%</td>
<td>35%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Includes both household head (survey respondent) and all other household members, as reported by the household head.
**Cell count less than five.

- Adults in Atqasuk were half as likely to report very good to excellent health and twice as likely to report fair or poor health as were adults in the NSB overall. These differences persisted when looking at Iñupiat adults only. Reported general health among Atqasuk adults was also considerably lower than for Alaskan adults overall.
- No single chronic health problem seemed to account for this lower-than-average reported general health among adults. There were no statistically significant differences between Atqasuk and the other North Slope communities overall for any of the chronic health problems examined.
• Household heads in Atqasuk reported significantly lower levels of physical activity than their counterparts in other North Slope communities. It is possible that this finding reflects an inability to exercise because of poor overall health status of some of the residents. Lower levels of physical activity could also be contributing to poorer overall health status. Comparing Iñupiat household heads only, differences in reported physical activity were no longer statistically significant.

• Tobacco smoking rates among Atqasuk adults were high, similar to other North Slope communities overall. Almost nine in ten household heads who smoked reported wanting to quit, but only slightly more than half had tried to quit in the last year. A large majority supported a tobacco tax to support tobacco prevention and cessation programs.

• Like in other NSB communities, Atqasuk households reported high levels of food insecurity. Household heads (Iñupiat only and all) were significantly more likely than in other North Slope communities overall to report difficulty getting foods for healthy meals. About one-third of these couldn’t get enough subsistence foods and all of these reported not being able to get enough store foods. Atqasuk household heads were not significantly more likely than in other North Slope communities overall to report household members who did not have enough to eat, however.

• Reported helmet use was very low among Atqasuk household heads.

• Iñupiat household heads in Atqasuk were less likely than Iñupiat household heads in other North Slope communities as a whole to report believing that their community had been hurt by alcohol or drugs in the last year. The percent reporting believing that household members had been hurt by alcohol or drugs was similar to the other communities overall, however.

**Children (0–17 years)**

Table A.20

<table>
<thead>
<tr>
<th></th>
<th>Atqasuk Children</th>
<th>NSB Children</th>
<th>Alaska Children</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Health</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very good or excellent general health</td>
<td>38%</td>
<td>63%</td>
<td>89% (2)</td>
</tr>
<tr>
<td><strong>Chronic Health Problems</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the past 12 months, experienced:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequent (three or more) or chronic ear infections</td>
<td>14%</td>
<td>19%</td>
<td>5% (2)</td>
</tr>
<tr>
<td>Chronic breathing problems (such as asthma, emphysema, or a cough that won't go away)</td>
<td>7%</td>
<td>5%</td>
<td>6% (current asthma) (2)</td>
</tr>
<tr>
<td><strong>Teen Tobacco Smoking (ages 14–18 years)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke tobacco (in any form)</td>
<td>15%</td>
<td>16%</td>
<td>Not comparable</td>
</tr>
</tbody>
</table>

As reported by the household head. All the other chronic health problems had a prevalence of less than 1% among children in the NSB and were not analyzed or reported by individual village.

**Based on other NSB surveys, this value significantly underestimates the prevalence of smoking among children and teens as it is not comparable to anonymous self-administered surveys used to estimate teen smoking rates statewide and nationally. According to the 2005 YRBS survey, NSB high school students were about twice as likely to smoke as Alaskan high school students overall.

• Children in Atqasuk (both Iñupiat and all) had reported general health status that was significantly worse than children in other North Slope communities and in Alaska overall.

• No single health problem examined in the census seemed to account for this observation among Atqasuk children, and the prevalence of chronic ear infections and respiratory problems was similar to children in other villages slope-wide.
Appendix A: 2010 NSB Census: Community Health Profiles

Barrow Health Profile

This village health profile provides a brief summary of the results of the 2010 NSB Census. The intent of this profile is to provide individual communities with information on some basic health measures at the village-level to guide community health promotion and planning efforts.

The largest community within the NSB and the regional center for governmental and commercial activity, Barrow has a more ethnically diverse population than the other NSB villages. Because of Barrow’s relatively larger population, the health measures described in this section were, in most cases, able to be analyzed by gender, age group, and ethnic group—the two largest groups, Iñupiat and Caucasian, and a third group comprised of all other ethnicities represented in the NSB. Notable findings and differences among these groups are discussed in the text and presented in graphs and tables for each topic.

Please refer to the 2010 Census NSB Health Profile section for further discussion of each health question and an overview of the census health module results for the NSB. The NSB Health Profile also examines health differences between Barrow and the other North Slope communities as a whole. Please refer to the NSB Baseline Community Health Analysis report for expanded discussions of each of the health topics addressed below as well as many more aspects of community health.

NSB and Alaska estimates are provided for general reference only, and comparisons should be made with caution, as results are not adjusted for differences in the age composition of the populations. State and national survey methods may also vary considerably from that used in the 2010 NSB Census.

General Health

Table A.21: Reported General Health Status Among Adults

<table>
<thead>
<tr>
<th></th>
<th>Barrow Household Heads</th>
<th>NSB Household Heads</th>
<th>All Barrow Adults*</th>
<th>All NSB Adults*</th>
<th>Alaska Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Good or Excellent</td>
<td>50%</td>
<td>44%</td>
<td>53%</td>
<td>46%</td>
<td>56%</td>
</tr>
<tr>
<td>Fair to Poor</td>
<td>17%</td>
<td>20%</td>
<td>13%</td>
<td>16%</td>
<td>13%</td>
</tr>
</tbody>
</table>

A large majority of Barrow adults reported or were reported to have at least good general health. Slightly more than half of Barrow adults (51% of household heads and 53% of all adult household members) had very good to excellent, reported general health, and 17% of household heads (13% of all adults) had fair or poor reported general health. These estimates are fairly similar to current estimates of overall health among adults in national surveys such as the annual BRFSS telephone survey.

Self-reported general health varied significantly by ethnicity. Except in the older-than-65 years age group, Caucasian household heads were most likely to report very good to excellent health and were the only group to report better general health than their statewide counterparts. A high percentage of residents aged 65 years and older of other ethnicities reported very good to excellent health, although this group represented a very small group.

As noted in the NSB Health Profile, reported general health status of adults living in Barrow was significantly better than in the other villages, as a whole. This was true when comparing all ethnic groups combined and when comparing Iñupiat adults only.
Children (under age 18 years) in Barrow were considerably less likely than their statewide counterparts to be reported by the household head as having very good to excellent health. Reported general health status among Iñupiat children was significantly lower than among Caucasian children or children of other ethnic groups. The largest discrepancy was found in the 10- to 17-year-old age group, where 66% of Iñupiat children, 94% of Caucasian children, and 78% of children of other ethnic groups were reported to have very good to excellent health.

As noted in the NSB Health Profile, the reported general health status of children in Barrow was significantly better than of children living in other North Slope communities, as a whole.

Chronic Health Conditions

Household heads were asked whether they or the other members of their households have experienced any of a number of common chronic health problems.

Table A.22: Chronic Health Conditions Among Adults

<table>
<thead>
<tr>
<th>Ever told by a health professional have:</th>
<th>Barrow Household Heads</th>
<th>NSB Household Heads</th>
<th>All Barrow Adults*</th>
<th>All NSB Adults*</th>
<th>Alaska Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thyroid problems</td>
<td>6%</td>
<td>6%</td>
<td>4%</td>
<td>4%</td>
<td>9% (U.S.)³</td>
</tr>
<tr>
<td>Diabetes</td>
<td>8%</td>
<td>7%</td>
<td>7%</td>
<td>6%</td>
<td>6% (Alaska)²</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>27%</td>
<td>28%</td>
<td>21%</td>
<td>20%</td>
<td>25% (Alaska)²</td>
</tr>
<tr>
<td>High cholesterol</td>
<td>19%</td>
<td>19%</td>
<td>14%</td>
<td>13%</td>
<td>38% (Alaska)²</td>
</tr>
<tr>
<td>Heart disease</td>
<td>7%</td>
<td>7%</td>
<td>4%</td>
<td>5%</td>
<td>12% (U.S.)⁴</td>
</tr>
<tr>
<td>In the past 12 months, experienced:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily pain or arthritis that limits activities or requires prescription pain medicine</td>
<td>28%</td>
<td>29%</td>
<td>22%</td>
<td>21%</td>
<td>(see ref)⁹</td>
</tr>
<tr>
<td>Frequent (three or more) or chronic ear infections</td>
<td>5%</td>
<td>5%</td>
<td>4%</td>
<td>4%</td>
<td>N/A</td>
</tr>
<tr>
<td>Chronic breathing problems (such as asthma, emphysema, or a cough that won't go away)</td>
<td>12%</td>
<td>13%</td>
<td>7%</td>
<td>8%</td>
<td>(ref)⁹</td>
</tr>
</tbody>
</table>

Household Heads

Among household heads, the most common chronic health problems reported were pain and/or arthritis, high blood pressure, high cholesterol, and chronic respiratory problems. Overall, the reported prevalence of chronic health problems among Barrow household heads was similar to statewide estimates, with the exception of high cholesterol, which was reported at only about half the statewide rate.

Age: All of the chronic health problems (except chronic ear infections) varied significantly by age, with increasing prevalence in older age groups.

Ethnic Group: Iñupiat and Caucasian household heads were significantly less likely to report a diagnosis of diabetes than were those belonging to other ethnic groups (p<0.05). The estimated prevalence of diabetes in ethnic groups other than Iñupiat and Caucasian was more than twice the statewide estimate for adults. Iñupiat were significantly more likely to report a diagnosis of heart disease, chronic ear infections, and chronic pain and/or arthritis than were the other groups (p<0.05). The prevalence of thyroid problems and chronic respiratory problems did not vary significantly by ethnicity, although Iñupiat Barrow residents aged 65 years and older were roughly twice as likely to report chronic respiratory problems as were those of other ethnic groups.

Gender: Men were significantly more likely to report diabetes and heart disease than were women, and women were significantly more likely to report thyroid problems, arthritis and/or chronic pain, and chronic ear infections than were men.
All Adult Household Members

Household heads were also asked about chronic health problems among household members. Estimates obtained through proxy information tended to be slightly lower for all adults in the household than for household heads themselves, likely reflecting the slightly younger age distribution of this group. These lower estimates may also reflect a lack of full knowledge among the household heads of the health problems of other household members. Overall patterns of disease prevalence were quite similar between the groups, however.

Adult Iñupiat household members were more than twice as likely as their Caucasian counterparts to experience arthritis and/or chronic pain and significantly more likely to have chronic ear infections. Caucasian household members were more likely than Iñupiat to have been told they have high cholesterol. Adult household members of ethnicities other than Iñupiat or Caucasian were significantly more likely than Iñupiat to report a diagnosis of diabetes or high cholesterol. They were less likely than Iñupiat to report thyroid problems, heart disease, chronic ear infections, or arthritis and/or chronic pain, however. There was not a significant relationship between reported respiratory problems and ethnicity among Barrow adults.

As noted in the NSB Health Profile, the estimated prevalence of adult diabetes was higher in Barrow than in the other North Slope villages as a whole. This was true when comparing all ethnic groups combined and when comparing Iñupiat adults only.
Chronic Health Problems in Children

Fewer than 1% of household members less than 18 years of age were reported to have any of the chronic health problems mentioned previously, except ear infections and respiratory problems. The 2010 Census did not include a number of common chronic health conditions in children, such as dental decay and attention and/or developmental problems.

Significantly more Iñupiat children were reported to have frequent or chronic ear infections than were Caucasian children or those of other ethnic groups (p<0.05). There was not a significant relationship between reported respiratory problems and ethnicity among Barrow children. Overall, the reported prevalence of breathing problems among Barrow children (6%) was fairly similar to statewide estimates of current asthma among children statewide (5%–6%). The prevalence of frequent or chronic ear infections among children is the highest in Barrow among all the North Slope villages and is more than four times the statewide estimate.

Tobacco Smoking

Smoking Among Household Heads

Overall tobacco smoking rates among Barrow household heads were roughly twice those of statewide rates. Smoking rates among Iñupiat household heads were roughly three times those of statewide smoking rates. Among Barrow household heads, reported tobacco smoking was significantly more common among Iñupiat than among either Caucasians or other ethnicities. In all ethnic groups, male household heads were significantly more likely to smoke tobacco than female household heads. Reported tobacco smoking did not vary significantly by age group, although reported smoking was lowest in the 65 years and older age group.
Tobacco Smoking Among All Barrow Household Members

When household heads were asked about tobacco smoking in other household members, estimates for all adults were slightly lower but showed a similar pattern as far as ethnic and gender differences.

Figure A.32: Reported Tobacco Smoking Among All Barrow Household Members

As discussed in the NSB Health Profile, household heads’ reporting of tobacco smoking among high-school-aged household members in this survey likely underestimated the teen smoking rates, based on estimates from other surveys. Also, as noted in the NSB Health Profile, teen smoking rates in Barrow were significantly lower than in the other North Slope villages, as a whole. This was also true when looking at Iñupiat teens only.

Amount Smoked: Among Barrow household heads, men were more than twice as likely as women to report smoking one or more packs per day (29% vs. 13%, respectively). Amount smoked did not vary significantly by ethnic group.

Figure A.33: Among Smokers, Amount Smoked

Smoking in House: Among Barrow household heads, 69% of smokers and 95% of non-smokers did not allow smoking in the house. Younger household heads were significantly less likely to permit smoking in the house.

Interest in Quitting Smoking: Among Barrow household heads who smoked, 70% of smokers stated that they are interested in quitting, and this did not differ significantly by age, ethnicity, or gender.

Tried Quitting Smoking: Among Barrow household heads who smoked, 61% reported stopping smoking for one day or longer in the last year because they were trying to quit. This did not differ significantly by ethnicity or age, but women were more likely than men to have tried quitting (68% vs. 56%, respectively).

Support Tobacco Tax: Of the 86% of household heads who answered this question, a majority (59%) supported a tobacco tax to support tobacco prevention programs. Caucasians were the ethnic group most likely to support the tax.
Health Insurance

Health insurance coverage was relatively high in Barrow. When eligibility for Indian Health Service-funded care is included, over 97% of Barrow household heads report having some form of health insurance, compared to only 83% statewide.1

A majority of Barrow household heads had health insurance other than eligible use of healthcare-funded through the Indian Health Service.

Table A.23: Health Insurance Other Than IHS Eligibility

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iñupiat</td>
<td>59%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>96%</td>
</tr>
<tr>
<td>Other Ethnicities*</td>
<td>88%</td>
</tr>
<tr>
<td>Total</td>
<td>73%</td>
</tr>
</tbody>
</table>

*A small percentage of “other ethnicity” were Alaska Native or American Indian and, thus, also eligible for IHS-funded services.

Obesity

According to standard BMI guidelines, roughly one in four Barrow household heads were at a healthy weight and almost three of four were overweight or obese, based on self-reported height and weight.

Overweight and obesity were common in all age groups. The likelihood of being overweight or obese did not vary significantly by ethnic group or gender.
Barrow household heads were slightly less likely to be overweight but more likely to be obese than were adults statewide.

![Figure A.36: Overweight and Obesity: Barrow Household Heads and Alaskan Adults](image)

**Physical Activity**

Overall, about 40% of Barrow household heads reported achieving the recommended goal of getting at least 30 minutes of moderate exercise 5 or more days per week, whereas 14% reported never doing so. These estimates are similar to the estimates derived from the 2007 Alaska BRFSS telephone survey.

Level of exercise did not vary significantly among different ethnic groups. Among Inupiat and Caucasian household heads, younger respondents were more likely than their older counterparts to report getting moderate exercise at least twice a week and less likely to report never exercising. As noted in the NSB Health Profile, household heads in other North Slope villages, as a whole, were more likely than Barrow household heads to report getting 30 minutes or more of moderate exercise at least 5 days a week.

![Figure A.37: Exercise Among Barrow Household Heads: Number of days per week get 30+ minutes of moderate exercise](image)

**Soda and Other Sugar-Sweetened Beverage (SSB) Consumption**

Consumption of SSBs was highest among Inupiat household heads and lowest among Caucasian household heads. Consumption varied significantly among ethnic groups, with Caucasians more likely to report not drinking SSBs at all and Inupiat more likely to report drinking more than three per day.
Appendix A: 2010 NSB Census: Community Health Profiles

Among Iñupiat, consumption of SSBs varied significantly by age, with younger household heads more likely to report higher levels of consumption.

Barrow household heads were less likely to report no consumption of these beverages and more likely to report drinking two or more per day than were adults statewide. As noted in the NSB Health Profile, however, Barrow household heads—both Iñupiat and all—reported drinking significantly fewer of these beverages than their counterparts in the other North Slope villages as a whole.

Helmet Use

Overall, only 29% of Barrow household heads who rode snowmachines or four-wheelers reported wearing helmets when riding. Reported helmet use was significantly lower among Iñupiat household heads, compared to Caucasian and those of other ethnicities. Overall helmet use among household heads in Barrow, and particularly among Iñupiat, was considerably lower than statewide estimates for snowmachine helmet use (57%). As discussed in the NSB Health Profile, however, helmet use was higher in Barrow than in the other North Slope villages, as a whole, both among Iñupiat and all ethnic groups combined.

Food Security

In Barrow, more than one in four household heads reported difficulty getting the foods needed to eat healthy meals. One in three Iñupiat household heads reported such difficulty, a significantly higher proportion than among Caucasians or other ethnicities. This measure did not vary significantly by age or gender. Barrow household heads were less likely than household heads slope-wide to report difficulty getting foods for healthy meals. As noted in the NSB Health Profile, Iñupiat household heads living in Barrow were significantly less likely than their counterparts in the other North Slope villages overall to report difficulty getting food for healthy meals.

The vast majority of Barrow household heads reporting difficulty getting food to eat healthy meals reported that it was because of not being about to get enough store foods. Among Iñupiat reporting difficulty getting foods for healthy meals, however, almost half also reported that it was because they couldn’t get enough subsistence foods.
Table A.24: Food Insecurity in Barrow: Subsistence and Store Foods

<table>
<thead>
<tr>
<th></th>
<th>Among household heads reporting difficulty getting foods for healthy meals, percent who couldn't get enough subsistence foods</th>
<th>Among household heads reporting difficulty getting foods for healthy meals, percent who couldn't get enough store foods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iñupiat</td>
<td>46%</td>
<td>91%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>11%</td>
<td>97%</td>
</tr>
<tr>
<td>Other Ethnicities</td>
<td>20%</td>
<td>97%</td>
</tr>
<tr>
<td>Total</td>
<td>36%</td>
<td>93%</td>
</tr>
</tbody>
</table>

Overall, 14% of Barrow household heads reported that, at times last year, household members did not have enough to eat. Overall, Barrow reported lower levels of food insecurity than did the NSB as a whole. Within Barrow, however, Iñupiat household heads were seven times more likely than were Caucasian household heads to report household members who, at times, did not have enough to eat.

As noted in the NSB Health Profile, Barrow household heads were significantly less likely than those in the other North Slope villages overall to report household members who did not have enough to eat. This was true looking at Iñupiat only as well as all ethnic groups combined.

**Figure A.43: Food Insecurity in Barrow: Percentage of household heads reporting “Last year, at times household members did not have enough to eat”**

Among Iñupiat households, there was a significant relationship between the age of the household head and the likelihood of having household members who did not have enough to eat at time. Household heads in the youngest and oldest age groups were less likely than were those in the middle age groups to report household members not having enough to eat.

**Figure A.44: Food Insecurity in Barrow Iñupiat Households, by Age Group of Household Head: Percent of household heads reporting that, last year, household members at times did not have enough to eat**
Alcohol and Drug Problems

Impact on Household

Three of four Barrow household heads did not believe that anyone in their household had been hurt by alcohol or drugs in the past year. Iñupiat household heads were significantly more likely than were Caucasians or those in other ethnic groups to report that a household member had been hurt by alcohol or drugs in the last year. Responses to this question did not vary significantly by gender or age group. As noted in the NSB Health Profile, Iñupiat household heads living in Barrow were significantly more likely than their counterparts in the other North Slope villages overall to believe that a member of their household had been hurt by alcohol or drugs in the last year.

Impact on Community

Caucasian household heads in Barrow were more likely than Iñupiat household heads to report thinking that the health of the community had “often” been hurt by alcohol and drugs in the last year. Among Caucasians, the responses to this question differed significantly by gender, with Caucasian women the most likely to believe that the health of the community had often been hurt by alcohol or drugs in the last year. Responses did not vary significantly by age group.
Kaktovik Health Profile

This village health profile provides a brief summary of the results of the 2010 NSB Census. The intent of this profile is to provide individual communities with information on some basic health measures at the village-level to guide community health promotion and planning efforts.

Please refer to the 2010 census NSB Health Profile section for further discussion of each health question and an overview of the census health module results for the NSB. Also, please refer to the NSB Baseline Community Health Analysis report for expanded discussions of each of the health topics addressed below as well as many more aspects of community health.

At the village-level, some of the small percentages are based on very small numbers of responses, making the estimates less reliable: cells based on fewer than five responses are not reported. NSB and Alaska estimates are provided for general reference only, and comparisons should be made with caution, as results are not adjusted for differences in the age composition of the populations. In addition, state and national survey methods may vary considerably from that used in the 2010 NSB Census.

## Adults

Table A.25

<table>
<thead>
<tr>
<th></th>
<th>Kaktovik Household Heads</th>
<th>NSB Household Heads</th>
<th>All Kaktovik Adults*</th>
<th>All NSB Adults*</th>
<th>Alaska Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Health</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very good or excellent general health</td>
<td>35%</td>
<td>44%</td>
<td>38%</td>
<td>46%</td>
<td>56%</td>
</tr>
<tr>
<td>Fair to poor general health</td>
<td>21%</td>
<td>20%</td>
<td>19%</td>
<td>16%</td>
<td>13%‡</td>
</tr>
<tr>
<td><strong>Chronic Health Problems</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ever told by a health professional have:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thyroid problems</td>
<td>**</td>
<td>6%</td>
<td>**</td>
<td>4%</td>
<td>9% (U.S.)³</td>
</tr>
<tr>
<td>Diabetes</td>
<td>7%</td>
<td>7%</td>
<td>5%</td>
<td>6%</td>
<td>6% (Alaska)²</td>
</tr>
<tr>
<td>Heart disease</td>
<td>**</td>
<td>7%</td>
<td>4%</td>
<td>5%</td>
<td>12% (U.S.)⁴</td>
</tr>
<tr>
<td>In the past 12 months, experienced:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily pain or arthritis that limits activities or requires prescription pain medicine</td>
<td>31%</td>
<td>29%</td>
<td>22%</td>
<td>21%</td>
<td>(see ref)²</td>
</tr>
<tr>
<td>Frequent (three or more) or chronic ear infections</td>
<td>**</td>
<td>5%</td>
<td>3%</td>
<td>4%</td>
<td>N/A</td>
</tr>
<tr>
<td>Chronic breathing problems (such as asthma, emphysema, or a cough that won’t go away)</td>
<td>15%</td>
<td>13%</td>
<td>9%</td>
<td>8%</td>
<td>(see ref)²</td>
</tr>
<tr>
<td><strong>Health Insurance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have health insurance, including IHS eligibility</td>
<td>90%</td>
<td>97%</td>
<td></td>
<td></td>
<td>83%¹</td>
</tr>
<tr>
<td>Have health insurance, other than IHS eligibility</td>
<td>38%</td>
<td>64%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Smoking</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke tobacco (in any form)</td>
<td>65%</td>
<td>50%</td>
<td>66%</td>
<td>49%</td>
<td>22%</td>
</tr>
<tr>
<td>Of those who smoke:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke one or more packs per day</td>
<td>44%</td>
<td>25%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are interested in quitting</td>
<td>64%</td>
<td>71%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have tried to quit in the last 12 months</td>
<td>54%</td>
<td>62%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permit smoking in the house</td>
<td>63%</td>
<td>33%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support a tobacco tax to fund tobacco prevention or cessation programs</td>
<td>48%</td>
<td>53%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

"Appendix A: 2010 NSB Census: Community Health Profiles"
### Table A.25, continued

<table>
<thead>
<tr>
<th></th>
<th>Kaktovik Household Heads</th>
<th>NSB Household Heads</th>
<th>All Kaktovik Adults*</th>
<th>All NSB Adults*</th>
<th>Alaska Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overweight and Obesity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overweight (BMI 25–29.9 kg/m²)</td>
<td>34%</td>
<td>33%</td>
<td></td>
<td></td>
<td>37%¹</td>
</tr>
<tr>
<td>Obese (BMI 30 kg/m² or higher)</td>
<td>32%</td>
<td>39%</td>
<td></td>
<td></td>
<td>28%¹</td>
</tr>
<tr>
<td><strong>Physical Activity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never get 30 minutes of moderate exercise in a day</td>
<td>17%</td>
<td>16%</td>
<td></td>
<td></td>
<td>9%⁵</td>
</tr>
<tr>
<td>Get at least 30 minutes of moderate exercise 5 days per week or more</td>
<td>50%</td>
<td>44%</td>
<td></td>
<td></td>
<td>47%⁵</td>
</tr>
<tr>
<td><strong>Sugar-Sweetened Beverages (SSBs)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On average, drink no soda or other SSBs per day</td>
<td>21%</td>
<td>26%</td>
<td></td>
<td></td>
<td>53%¹⁰</td>
</tr>
<tr>
<td>On average, drink two or more sodas or other SSBs per day</td>
<td>55%</td>
<td>45%</td>
<td></td>
<td></td>
<td>30%¹⁰</td>
</tr>
<tr>
<td><strong>Food Security</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Times last year when household found it difficult to get the foods they needed to eat healthy meals</td>
<td>40%</td>
<td>35%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If yes, because not able to get enough subsistence foods to eat healthy meals</td>
<td>44%</td>
<td>43%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If yes, because not able to get enough store foods to eat healthy meals</td>
<td>88%</td>
<td>90%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent with household members who at times did not have enough to eat</td>
<td>19%</td>
<td>19%</td>
<td></td>
<td></td>
<td>(4–11%)¹²</td>
</tr>
<tr>
<td><strong>Safety: Helmet Use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wear a helmet when riding a snowmachine or four-wheeler (of household heads who ride on snowmachines or 4-wheelers)</td>
<td>**</td>
<td>18%</td>
<td></td>
<td></td>
<td>(57%)³¹</td>
</tr>
<tr>
<td><strong>Drugs and Alcohol</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the past 12 months, felt a household member had been hurt by drugs or alcohol</td>
<td>35%</td>
<td>24%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the past 12 months, thought the health of their community had been hurt by drugs or alcohol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Often</td>
<td>41%</td>
<td>57%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sometimes</td>
<td>45%</td>
<td>35%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Includes both household head (survey respondent) and all other household members, as reported by the household head.

**Cell count less than five.

- A large majority of Kaktovik adults reported general health status to be at least good, although the proportion of adults (both Iñupiat and all adults) reported to have very good to excellent health was lower than that in the other North Slope communities overall and lower than the statewide estimate for all adults.
- The prevalence of chronic health problems among Kaktovik adults was similar to adults in the NSB as a whole, with no statistically significant rate differences between Kaktovik and the other communities combined.
- Looking both at Iñupiat only and all adults, those living in Kaktovik were significantly more likely to smoke than in the other North Slope communities overall.
- Kaktovik household heads who smoked were significantly more likely to report smoking at least one pack of cigarettes per day than were adults in the other North Slope communities combined.
- Looking both at Iñupiat household heads and all, Kaktovik household heads who smoked were significantly more likely than those in other North Slope communities overall to permit smoking in the house.
- Obesity and soda or sugared beverage consumption were high among Kaktovik household heads, as they were throughout the NSB. Physical activity levels were similar to other North Slope communities and to statewide estimates.
- Reported food insecurity was high in Kaktovik, similar to other North Slope communities as a whole.
• Kaktovik household heads were significantly more likely than were household heads in other North Slope communities to believe that a member of their household had been hurt by alcohol or drugs in the last year. This difference persisted when comparing Iñupiat household heads only.

**Children (0–17 years)**

Table A.26

<table>
<thead>
<tr>
<th></th>
<th>Kaktovik Children</th>
<th>NSB Children</th>
<th>Alaska Children</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Health</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very good or excellent general health</td>
<td>66%</td>
<td>63%</td>
<td>89%2</td>
</tr>
<tr>
<td><strong>Chronic Health Problems</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the past 12 months, experienced:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequent (three or more) or chronic ear infections</td>
<td>10%</td>
<td>19%</td>
<td>5%1</td>
</tr>
<tr>
<td>Chronic breathing problems (such as asthma, emphysema, or a cough that won’t go away)</td>
<td>7%</td>
<td>5%</td>
<td>6% (current asthma)3</td>
</tr>
<tr>
<td><strong>Teen Tobacco Smoking (ages 14–18 years)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke tobacco (in any form)</td>
<td>26%</td>
<td>16%</td>
<td>Not comparable</td>
</tr>
</tbody>
</table>

As reported by the household head. All the other chronic health problems had a prevalence of less than 1% among children in the NSB and were not analyzed or reported by individual village.

**Based on other NSB surveys, this value likely significantly underestimates the prevalence of smoking among children and teens as it is not comparable to anonymous self-administered surveys used to estimate teen smoking rates statewide and nationally. According to the 2005 YRBS survey, NSB high school students were about twice as likely to smoke as Alaskan high school students overall.

• Reported general health status among Kaktovik children was similar to reported health status of NSB children as a whole but worse than that of children statewide.

• Kaktovik children were significantly less likely than children in other North Slope communities to have had frequent or chronic ear infections in the last year. The prevalence of these problems was still twice that of the statewide estimate, however.

• The percentage of Kaktovik teens reported (by the household head) to smoke was high but not significantly different from the percentage in the other North Slope communities combined, looking at either Iñupiat only or teens from all ethnic groups combined.
Nuiqsut Health Profile

This village health profile provides a brief summary of the results of the 2010 NSB Census. The intent of this profile is to provide individual communities with information on some basic health measures at the village-level to guide community health promotion and planning efforts.

Please refer to the 2010 Census NSB Health Profile section for further discussion of each health question and an overview of the census health module results for the NSB. Also, please refer to the NSB Baseline Community Health Analysis report for expanded discussions of each of the health topics addressed below as well as many more aspects of community health.

At the village-level, some of the small percentages are based on very small numbers of responses, making the estimates less reliable: cells based on fewer than five responses are not reported. NSB and Alaska estimates are provided for general reference only, and comparisons should be made with caution, as results are not adjusted for differences in the age composition of the populations. In addition, state and national survey methods may vary considerably from that used in the 2010 NSB Census.

Adults

Table A.27

<table>
<thead>
<tr>
<th></th>
<th>Nuiqsut Household Heads</th>
<th>NSB Household Heads</th>
<th>All Nuiqsut Adults*</th>
<th>All NSB Adults*</th>
<th>Alaska Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Health</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very good or excellent general health</td>
<td>40%</td>
<td>44%</td>
<td>39%</td>
<td>46%</td>
<td>56%^1</td>
</tr>
<tr>
<td>Fair to poor general health</td>
<td>25%</td>
<td>20%</td>
<td>22%</td>
<td>16%</td>
<td>13%^2</td>
</tr>
<tr>
<td><strong>Chronic Health Problems</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ever told by a health professional have:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thyroid problems</td>
<td>6%</td>
<td>6%</td>
<td>3%</td>
<td>4%</td>
<td>9% (U.S.)^3</td>
</tr>
<tr>
<td>Diabetes</td>
<td>**</td>
<td>7%</td>
<td>2%</td>
<td>6%</td>
<td>6% (Alaska)^3</td>
</tr>
<tr>
<td>Diabetes</td>
<td>**</td>
<td>7%</td>
<td>2%</td>
<td>**</td>
<td>9% (U.S.)^4</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>30%</td>
<td>28%</td>
<td>17%</td>
<td>20%</td>
<td>25% (Alaska)^3</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>30%</td>
<td>28%</td>
<td>17%</td>
<td>20%</td>
<td>25% (Alaska)^3</td>
</tr>
<tr>
<td>High cholesterol</td>
<td>16%</td>
<td>19%</td>
<td>12%</td>
<td>13%</td>
<td>38% (Alaska)^3</td>
</tr>
<tr>
<td>Heart disease</td>
<td>8%</td>
<td>7%</td>
<td>7%</td>
<td>5%</td>
<td>12% (U.S.)^4</td>
</tr>
</tbody>
</table>

In the past 12 months, experienced:

|                                | Nuiqsut Household Heads | NSB Household Heads | All Nuiqsut Adults* | All NSB Adults* | Alaska Adults |
|                                |                         |                     |                     |                 |               |
| Daily pain or arthritis that limits activities or requires prescription pain medicine | 38% | 29% | 25% | 21% | (see ref)^5 |
| Frequent (three or more) or chronic ear infections | 8% | 5% | 8% | 4% | N/A |
| Chronic breathing problems (such as asthma, emphysema, or a cough that won’t go away) | 8% | 13% | 7% | 8% | (see ref)^7 |

**Health Insurance**

|                                |                         |                     |                     |                 |               |
|                                |                         |                     |                     |                 |               |
| Have health insurance, including IHS eligibility | 97% | 97% | 97% | 97% | 83%^1 |
| Have health insurance, other than IHS eligibility | 42% | 64% | 42% | 42% | 64% |
### Table A.27, continued

<table>
<thead>
<tr>
<th>Smoking</th>
<th>Nuiqsut Household Heads</th>
<th>NSB Household Heads</th>
<th>All Nuiqsut Adults*</th>
<th>All NSB Adults*</th>
<th>Alaska Adults*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoke tobacco (in any form)</td>
<td>62%</td>
<td>50%</td>
<td>62%</td>
<td>49%</td>
<td>22%</td>
</tr>
<tr>
<td>Of those who smoke:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke one or more packs per day</td>
<td>31%</td>
<td>25%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are interested in quitting</td>
<td>71%</td>
<td>71%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have tried to quit in the last 12 months</td>
<td>59%</td>
<td>62%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permit smoking in the house</td>
<td>35%</td>
<td>33%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support a tobacco tax to fund tobacco prevention or cessation programs</td>
<td>43%</td>
<td>53%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Overweight and Obesity

| Overweight (BMI 25–29.9 kg/m²) | 38% | 33% | | 37%* |
| Obese (BMI 30 kg/m² or higher) | 33% | 39% | | 28%* |

### Physical Activity

| Never get 30 minutes of moderate exercise in a day | 19% | 16% | | 9%* |
| Get at least 30 minutes of moderate exercise 5 days per week or more | 44% | 44% | | 47%* |

### Sugar-Sweetened Beverages (SSBs)

| On average, drink no soda or other SSBs per day | 14% | 26% | | 53%* |
| On average, drink two or more sodas or other SSBs per day | 58% | 45% | | 30%* |

### Food Security

| Times last year when household found it difficult to get the foods they needed to eat healthy meals | 38% | 35% | | |
| If yes, because not able to get enough subsistence foods to eat healthy meals | 53% | 43% | | |
| If yes, because not able to get enough store foods to eat healthy meals | 87% | 90% | | |
| Percent with household members who at times did not have enough to eat | 25% | 19% | | (4–11%)* |

### Safety: Helmet Use

| Wear a helmet when riding a snowmachine or four-wheeler (of household heads who ride on snowmachines or 4-wheelers) | 9% | 18% | | (57%)* |

### Drugs and Alcohol

| In the past 12 months, felt a household member had been hurt by drugs or alcohol | 28% | 24% | | |
| In the past 12 months, thought the health of their community had been hurt by drugs or alcohol | | | | |
| Often | 54% | 57% | | |
| Sometimes | 42% | 35% | | |

*Includes both household head (survey respondent) and all other household members, as reported by the household head.
**Cell count less than five.

- Three-quarters of Nuiqsut household heads reported their health to be at least good, with one in four reporting fair to poor health, not significantly different from the other North Slope communities combined. The percentage of Nuiqsut adults reported to have very good to excellent health was lower than adults statewide, but similar to Alaska Native adults statewide (42%).
• The prevalence of chronic pain and/or arthritis in Nuiqsut household heads was higher than in the other North Slope communities as a whole, and the prevalence of chronic ear infections among adults (Iñupiat only and all adults) was higher in Nuiqsut than in the other North Slope communities overall.

• Reported adult tobacco smoking was high, significantly higher than in the rest of the North Slope communities combined and almost three times the statewide adult smoking rate.

• Nuiqsut household heads were less likely than household heads in the other North Slope communities overall to support a tobacco tax to fund tobacco prevention programs.

• Reported soda and sugared beverage consumption among Nuiqsut household heads was high compared with statewide estimates and significantly higher than among household heads in the other North Slope communities combined.

• One in four Nuiqsut household heads reported household members who, at times last year, did not have enough to eat. This rate was similar to the rate among Iñupiat households slope-wide.

• Helmet use was very low, similar to other North Slope villages.

• Slightly more than one in four Nuiqsut household heads reported feeling that a household member had been hurt by alcohol or drugs in the past year, but most believed that alcohol or drugs had hurt the health of the community. These percentages did not differ significantly from those in other North Slope communities overall, looking at either all household heads or Iñupiat household heads only.

### Children (0–17 years)

**Table A.28**

<table>
<thead>
<tr>
<th></th>
<th>Nuiqsut Children</th>
<th>NSB Children</th>
<th>Alaska Children</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Health</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very good or excellent</td>
<td>55%</td>
<td>63%</td>
<td>89%2</td>
</tr>
<tr>
<td><strong>Chronic Health Problems</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the past 12 months,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>experienced:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequent (three or more)</td>
<td>18%</td>
<td>19%</td>
<td>5%2</td>
</tr>
<tr>
<td>Chronic ear infections</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(such as asthma,</td>
<td>8%</td>
<td>5%</td>
<td>6% (current asthma)2</td>
</tr>
<tr>
<td>emphysema, or a cough</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>that won’t go away)</td>
<td>8%</td>
<td>5%</td>
<td>6% (current asthma)2</td>
</tr>
<tr>
<td><strong>Teen Tobacco Smoking (ages 14–18 years)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>smoke tobacco (in any</td>
<td>43%</td>
<td>16%</td>
<td>Not comparable</td>
</tr>
<tr>
<td>form)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As reported by the household head. All the other chronic health problems had a prevalence of less than 1% among children in the NSB and were not analyzed or reported by individual village.

*Based on other NSB surveys, this value likely significantly underestimates the prevalence of smoking among children and teens as it is not comparable to anonymous self-administered surveys used to estimate teen smoking rates statewide and nationally. According to the 2005 YRBS survey, NSB high school students were about twice as likely to smoke as Alaskan high school students overall.

**Table A.28**

<table>
<thead>
<tr>
<th></th>
<th>Nuiqsut Children</th>
<th>NSB Children</th>
<th>Alaska Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very good or excellent</td>
<td>55%</td>
<td>63%</td>
<td>89%2</td>
</tr>
<tr>
<td><strong>Chronic Health Problems</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the past 12 months,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>experienced:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequent (three or more)</td>
<td>18%</td>
<td>19%</td>
<td>5%2</td>
</tr>
<tr>
<td>Chronic ear infections</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(such as asthma, emphysema,</td>
<td>8%</td>
<td>5%</td>
<td>6% (current asthma)2</td>
</tr>
<tr>
<td>or a cough that won’t go away)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Reported general health status among Nuiqsut children was significantly worse than among children in the other North Slope communities overall, and this difference persisted when looking only at Iñupiat children. The percentage of Nuiqsut children with very good to excellent reported general health was considerably lower than the statewide estimate.**

**Rates of chronic ear infections and breathing problems among Nuiqsut children were not significantly different from children in the other NSB communities combined.**

**Tobacco smoking among teens (as reported by the household head) was notably and significantly more common in Nuiqsut than in the rest of the North Slope communities overall, and this difference remained when looking at Iñupiat teens only.**
Point Hope Health Profile

This village health profile provides a brief summary of the results of the 2010 NSB Census. The intent of this profile is to provide individual communities with information on some basic health measures at the village-level to guide community health promotion and planning efforts.

Please refer to the 2010 Census NSB Health Profile section for further discussion of each health question and an overview of the census health module results for the NSB. Also, please refer to the NSB Baseline Community Health Analysis report for expanded discussions of each of the health topics addressed below as well as many more aspects of community health.

At the village-level, some of the small percentages are based on very small numbers of responses, making the estimates less reliable: cells based on fewer than five responses are not reported. NSB and Alaska estimates are provided for general reference only, and comparisons should be made with caution, as results are not adjusted for differences in the age composition of the populations. In addition, state and national survey methods may vary considerably from that used in the 2010 NSB Census.

 Adults

Table A.29

<table>
<thead>
<tr>
<th></th>
<th>Point Hope Household Heads</th>
<th>NSB Household Heads</th>
<th>All Point Hope Adults*</th>
<th>All NSB Adults*</th>
<th>Alaska Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Health</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very good or excellent general health</td>
<td>32%</td>
<td>44%</td>
<td>36%</td>
<td>46%</td>
<td>56%</td>
</tr>
<tr>
<td>Fair to poor general health</td>
<td>29%</td>
<td>20%</td>
<td>21%</td>
<td>16%</td>
<td>13%</td>
</tr>
<tr>
<td><strong>Chronic Health Problems</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thyroid problems</td>
<td>7%</td>
<td>6%</td>
<td>3%</td>
<td>4%</td>
<td>9% (U.S.)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>6%</td>
<td>7%</td>
<td>5%</td>
<td>6%</td>
<td>6% (Alaska)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9% (U.S.)</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>34%</td>
<td>28%</td>
<td>22%</td>
<td>20%</td>
<td>25% (Alaska)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24% (U.S.)</td>
</tr>
<tr>
<td>High cholesterol</td>
<td>17%</td>
<td>19%</td>
<td>10%</td>
<td>13%</td>
<td>38% (Alaska)</td>
</tr>
<tr>
<td>Heart disease</td>
<td>10%</td>
<td>7%</td>
<td>5%</td>
<td>5%</td>
<td>12% (U.S.)</td>
</tr>
<tr>
<td><strong>In the past 12 months, experienced:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily pain or arthritis that limits activities or requires prescription pain medicine</td>
<td>28%</td>
<td>29%</td>
<td>19%</td>
<td>21%</td>
<td>(see ref)</td>
</tr>
<tr>
<td>Frequent (three or more) or chronic ear infections</td>
<td>**</td>
<td>5%</td>
<td>3%</td>
<td>4%</td>
<td>N/A</td>
</tr>
<tr>
<td>Chronic breathing problems (such as asthma, emphysema, or a cough that won’t go away)</td>
<td>16%</td>
<td>13%</td>
<td>10%</td>
<td>8%</td>
<td>(see ref)</td>
</tr>
<tr>
<td><strong>Health Insurance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have health insurance, including IHS eligibility</td>
<td>99%</td>
<td>97%</td>
<td></td>
<td>83%</td>
<td></td>
</tr>
<tr>
<td>Have health insurance, other than IHS eligibility</td>
<td>52%</td>
<td>64%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Smoking</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke tobacco (in any form)</td>
<td>49%</td>
<td>50%</td>
<td>47%</td>
<td>49%</td>
<td>22%</td>
</tr>
<tr>
<td>Of those who smoke:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke one or more packs per day</td>
<td>23%</td>
<td>25%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are interested in quitting</td>
<td>75%</td>
<td>71%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have tried to quit in the last 12 months</td>
<td>69%</td>
<td>62%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permit smoking in the house</td>
<td>30%</td>
<td>33%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support a tobacco tax to fund tobacco prevention or cessation programs</td>
<td>46%</td>
<td>53%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Table A.29, continued</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>-----------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Point Hope Household Heads</td>
<td>NSB Household Heads</td>
<td>All Point Hope Adults*</td>
<td>All NSB Adults*</td>
<td>Alaska Adults</td>
</tr>
<tr>
<td><strong>Overweight and Obesity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overweight (BMI 25–29.9 kg/m²)</td>
<td>29%</td>
<td>33%</td>
<td></td>
<td></td>
<td>37%1</td>
</tr>
<tr>
<td>Obese (BMI 30 kg/m² or higher)</td>
<td>48%</td>
<td>39%</td>
<td></td>
<td></td>
<td>28%1</td>
</tr>
<tr>
<td><strong>Physical Activity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never get 30 minutes of moderate exercise in a day</td>
<td>10%</td>
<td>16%</td>
<td></td>
<td></td>
<td>9%5</td>
</tr>
<tr>
<td>Get at least 30 minutes of moderate exercise 5 days per week or more</td>
<td>49%</td>
<td>44%</td>
<td></td>
<td></td>
<td>47%5</td>
</tr>
<tr>
<td><strong>Sugar-Sweetened Beverages (SSBs)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On average, drink no soda or other SSBs per day</td>
<td>19%</td>
<td>26%</td>
<td></td>
<td></td>
<td>53%10</td>
</tr>
<tr>
<td>On average, drink two or more sodas or other SSBs per day</td>
<td>60%</td>
<td>45%</td>
<td></td>
<td></td>
<td>30%10</td>
</tr>
<tr>
<td><strong>Food Security</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Times last year when household found it difficult to get the foods they needed to eat healthy meals</td>
<td>36%</td>
<td>35%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If yes, because not able to get enough subsistence foods to eat healthy meals</td>
<td>59%</td>
<td>43%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If yes, because not able to get enough store foods to eat healthy meals</td>
<td>86%</td>
<td>90%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent with household members who at times did not have enough to eat</td>
<td>24%</td>
<td>19%</td>
<td></td>
<td></td>
<td>(4–11%)12</td>
</tr>
<tr>
<td><strong>Safety: Helmet Use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wear a helmet when riding a snowmachine or four-wheeler (of household heads who ride on snowmachines or 4-wheelers)</td>
<td>4%</td>
<td>18%</td>
<td></td>
<td></td>
<td>(57%)13</td>
</tr>
<tr>
<td><strong>Drugs and Alcohol</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the past 12 months, felt a household member had been hurt by drugs or alcohol</td>
<td>24%</td>
<td>24%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the past 12 months, thought the health of their community had been hurt by drugs or alcohol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Often</td>
<td>51%</td>
<td>57%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sometimes</td>
<td>40%</td>
<td>35%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Includes both household head (survey respondent) and all other household members, as reported by the household head.

**Cell count less than five.

- Adults in Point Hope (both Iñupiat only and all) were less likely to report very good to excellent health and more likely to report poor to fair health than were adults in the other North Slope communities combined.
- The prevalence of chronic health problems was similar in Point Hope adults and adults slope-wide, however.
- Overall, the adult smoking rate in Point Hope was similar to that among NSB adults. Looking at Iñupiat household heads, however, the smoking rate in Point Hope was lower than the rate among Iñupiat household heads in the other North Slope communities combined. Smoking rates among adults in Point Hope are still more than double Alaska rates. Three-quarters of household heads who smoke report wanting to quit.
- Almost half of Point Hope household heads meet criteria for obesity, based on national BMI standards. The difference in obesity prevalence between Point Hope household heads and those in other North Slope communities combined was not statistically significant.
- Consumption of sodas and other sugared beverages was high in Point Hope. Point Hope household heads (all ethnicities) were significantly more likely to report drinking two or more sodas or other sugared beverages than were household heads in the other North Slope communities overall and twice as likely as adults statewide.
• More than one in three household heads in Point Hope reported difficulty getting the foods needed to eat healthy meals, and almost one in four reported that there were times last year when a household member did not have enough to eat. Comparing Iñupiat households only, Point Hope household heads were about as likely as household heads in the other villages to report difficulty getting subsistence and/or store foods for healthy meals, and to report a household member who at times did not have enough to eat.

• Helmet use was low in Point Hope, similar to other North Slope villages.

• About one in four Point Hope household heads reported thinking that a household member had been hurt by alcohol or drugs in the last year, but most believed that the community had been hurt by drugs or alcohol. These estimates were similar to other villages slope-wide.

**Children (0–17 years)**

Table A.30

<table>
<thead>
<tr>
<th>General Health</th>
<th>Point Hope Children</th>
<th>NSB Children</th>
<th>Alaska Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very good or excellent general health</td>
<td>66%</td>
<td>63%</td>
<td>89%2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chronic Health Problems</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>In the past 12 months, experienced:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequent (three or more) or chronic ear infections</td>
<td>12%</td>
<td>19%</td>
<td>5%2</td>
</tr>
<tr>
<td>Chronic breathing problems (such as asthma, emphysema, or a cough that won’t go away)</td>
<td>5%</td>
<td>5%</td>
<td>6% (current asthma)2</td>
</tr>
</tbody>
</table>

**Teen Tobacco Smoking (ages 14–18 years)**

| Smoke tobacco (in any form)                                 | 12%                | 16%          | Not comparable |

As reported by the household head. All the other chronic health problems had a prevalence of less than 1% among children in the NSB and were not analyzed or reported by individual village.

**Based on other NSB surveys, this value likely significantly underestimates the prevalence of smoking among children and teens as it is not comparable to anonymous self-administered surveys used to estimate teen smoking rates statewide and nationally. According to the 2005 YRBS survey, NSB high school students were about twice as likely to smoke as Alaskan high school students overall.

• Reported general health among children in Point Hope (the percentage with very good or excellent health) was similar to children in the other villages overall but worse than among children statewide.

• The percentage of children reported to have frequent or chronic ear infections was significantly lower in Point Hope than in the other villages combined, but still more than twice the statewide estimate.

• Point Hope had the lowest reported teen smoking rate of all the North Slope communities except Barrow, but again, estimates based on the household head’s report are likely to substantially underestimate the true teen smoking rate.
Point Lay Health Profile

This village health profile provides a brief summary of the results of the 2010 NSB Census. The intent of this profile is to provide individual communities with information on some basic health measures at the village-level to guide community health promotion and planning efforts.

Please refer to the 2010 Census NSB Health Profile section for further discussion of each health question and an overview of the census health module results for the NSB. Also, please refer to the NSB Baseline Community Health Analysis report for expanded discussions of each of the health topics addressed below as well as many more aspects of community health.

At the village-level, some of the small percentages are based on very small numbers of responses, making the estimates less reliable: cells based on fewer than five responses are not reported. NSB and Alaska estimates are provided for general reference only, and comparisons should be made with caution, as results are not adjusted for differences in the age composition of the populations. In addition, state and national survey methods may vary considerably from that used in the 2010 NSB Census.

### Adults

#### Table A.31

<table>
<thead>
<tr>
<th></th>
<th>Point Lay Household Heads</th>
<th>NSB Household Heads</th>
<th>All Point Lay Adults*</th>
<th>All NSB Adults*</th>
<th>Alaska Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Health</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very good or excellent general health</td>
<td>48%</td>
<td>44%</td>
<td>52%</td>
<td>46%</td>
<td>56%¹</td>
</tr>
<tr>
<td>Fair to poor general health</td>
<td>12%</td>
<td>20%</td>
<td>10%</td>
<td>16%</td>
<td>13%¹</td>
</tr>
<tr>
<td><strong>Chronic Health Problems</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ever told by a health professional have:</td>
<td>**</td>
<td>6%</td>
<td>** 4%</td>
<td>** 6%</td>
<td>9% (U.S.)³</td>
</tr>
<tr>
<td>Thyroid problems</td>
<td>**</td>
<td>6%</td>
<td>**</td>
<td>4%</td>
<td>** 9% (Alaska)³</td>
</tr>
<tr>
<td>Diabetes</td>
<td>**</td>
<td>7%</td>
<td>** 6%</td>
<td>6%</td>
<td>6% (Alaska)³</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>16%</td>
<td>28%</td>
<td>12%</td>
<td>20%</td>
<td>25% (Alaska)³</td>
</tr>
<tr>
<td>High cholesterol</td>
<td>**</td>
<td>19%</td>
<td>6%</td>
<td>13%</td>
<td>38% (Alaska)³</td>
</tr>
<tr>
<td>Heart disease</td>
<td>**</td>
<td>7%</td>
<td>6%</td>
<td>5%</td>
<td>12% (U.S.)³</td>
</tr>
<tr>
<td>In the past 12 months, experienced:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily pain or arthritis that limits activities or requires prescription pain medicine</td>
<td>22%</td>
<td>29%</td>
<td>16%</td>
<td>21%</td>
<td>(see ref)⁶</td>
</tr>
<tr>
<td>Frequent (three or more) chronic ear infections</td>
<td>12%</td>
<td>5%</td>
<td>8%</td>
<td>4%</td>
<td>N/A</td>
</tr>
<tr>
<td>Chronic breathing problems (such as asthma, emphysema, or a cough that won’t go away)</td>
<td>10%</td>
<td>13%</td>
<td>8%</td>
<td>8%</td>
<td>(see ref)⁷</td>
</tr>
<tr>
<td><strong>Health Insurance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have health insurance, including IHS eligibility</td>
<td>100%</td>
<td>97%</td>
<td>83%</td>
<td>83%¹</td>
<td></td>
</tr>
<tr>
<td>Have health insurance, other than IHS eligibility</td>
<td>45%</td>
<td>64%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Smoking</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke tobacco (in any form)</td>
<td>58%</td>
<td>50%</td>
<td>60%</td>
<td>49%</td>
<td>22%¹</td>
</tr>
<tr>
<td>Of those who smoke:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke one or more packs per day</td>
<td>25%</td>
<td>25%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are interested in quitting</td>
<td>82%</td>
<td>71%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have tried to quit in the last 12 months</td>
<td>67%</td>
<td>62%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permit smoking in the house</td>
<td>35%</td>
<td>33%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support a tobacco tax to fund tobacco prevention or cessation programs</td>
<td>34%</td>
<td>53%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table A.31

<table>
<thead>
<tr>
<th></th>
<th>Point Lay Household Heads</th>
<th>NSB Household Heads</th>
<th>All Point Lay Adults*</th>
<th>All NSB Adults*</th>
<th>Alaska Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overweight and Obesity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overweight (BMI 25–29.9 kg/m²)</td>
<td>17%</td>
<td>33%</td>
<td>37%1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obese (BMI 30 kg/m² or higher)</td>
<td>46%</td>
<td>39%</td>
<td>28%1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Physical Activity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never get 30 minutes of moderate exercise in a day</td>
<td>8%</td>
<td>16%</td>
<td>9%5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Get at least 30 minutes of moderate exercise 5 days per week or more</td>
<td>59%</td>
<td>44%</td>
<td>47%5</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sugar-Sweetened Beverages (SSBs)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On average, drink no soda or other SSBs per day</td>
<td>25%</td>
<td>26%</td>
<td>53%10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On average, drink two or more sodas or other SSBs per day</td>
<td>53%</td>
<td>45%</td>
<td>30%10</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Food Security</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Times last year when household found it difficult to get the foods they needed to eat healthy meals</td>
<td>51%</td>
<td>35%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If yes, because not able to get enough subsistence foods to eat healthy meals</td>
<td>48%</td>
<td>43%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If yes, because not able to get enough store foods to eat healthy meals</td>
<td>96%</td>
<td>90%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent with household members who at times did not have enough to eat</td>
<td>22%</td>
<td>19%</td>
<td>(4–11%)12</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Safety: Helmet Use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wear a helmet when riding a snowmachine or four-wheeler (of household heads who ride on snowmachines or 4-wheelers)</td>
<td>**</td>
<td>18%</td>
<td>(57%)9</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Drugs and Alcohol</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the past 12 months, felt a household member had been hurt by drugs or alcohol</td>
<td>13%</td>
<td>24%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the past 12 months, thought the health of their community had been hurt by drugs or alcohol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Often</td>
<td>44%</td>
<td>57%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sometimes</td>
<td>48%</td>
<td>35%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Includes both household head (survey respondent) and all other household members, as reported by the household head.

**Cell count less than five.

- Of Point Lay adults, 90% reported or were reported to be in at least good general health. General reported health status among Point Lay adults was the highest among North Slope communities with the exception of Barrow. The difference in health status among Point lay adults and that of adults in other North Slope communities overall was not statistically significant, however.
- The prevalence of reported chronic health problems was relatively low in Point Lay, although estimates are based on a very small number of respondents because of the small size of the village, making the estimates less reliable.
- Adults in Point Lay were significantly less likely than adults in other North Slope communities overall to report or be reported to have high blood pressure but more likely to have frequent or chronic ear infections.
- Smoking rates were high in Point Lay. Looking at all adults and at Iñupiat adults only, those living in Point Lay were significantly more likely to smoke than were their counterparts in the other North Slope communities overall. More than four of five smokers were interested in quitting.
- Obesity was common among Point Lay household heads, similar to other North Slope villages, but higher than statewide estimates.
• Point Lay household heads were fairly physically active as a group. Almost 60% of Point Lay household heads reported getting 30 minutes of moderate physical activity at least five days per week on average, and fewer than one in ten reported no days with 30 minutes of moderate physical activity.
• Consumption of sodas and other sugared beverages was high among Point Lay household heads, similar to other North Slope communities, but higher than statewide estimates.
• Food insecurity was not uncommon in Point Lay, similar to other North Slope communities. Half of Point Lay household heads reported difficulty, at times, getting the food needed for healthy meals. Of these, half reported not being able to get enough subsistence foods and almost all reported difficulty getting enough store foods. One in five household heads reported that at times in the last year, a household member did not have enough to eat.
• Helmet use was very low in Point Lay, similar to other North Slope villages.
• A large majority of Point Lay household heads did not believe that alcohol or drugs had hurt a member of their own household in the last year. More than 90% thought that the health of their community had been hurt by alcohol or drugs in the past year, however.

Children (0–17 years)

Table A.32

<table>
<thead>
<tr>
<th></th>
<th>Point Lay Children</th>
<th>NSB Children</th>
<th>Alaska Children</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Health</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very good or excellent general health</td>
<td>70%</td>
<td>63%</td>
<td>89%2</td>
</tr>
<tr>
<td><strong>Chronic Health Problems</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the past 12 months, experienced:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequent (three or more) or chronic ear infections</td>
<td>15%</td>
<td>19%</td>
<td>5%2</td>
</tr>
<tr>
<td>Chronic breathing problems (such as asthma, emphysema, or a cough that won’t go away)</td>
<td>**</td>
<td>5%</td>
<td>6% (current asthma)2</td>
</tr>
<tr>
<td><strong>Teen Tobacco Smoking (ages 14–18 years)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke tobacco (in any form)</td>
<td>15%</td>
<td>16%</td>
<td>Not comparable</td>
</tr>
</tbody>
</table>

As reported by the household head. All the other chronic health problems had a prevalence of less than 1% among children in the NSB and were not analyzed or reported by individual village.

*Based on other NSB surveys, this value likely significantly underestimates the prevalence of smoking among children and teens, and it is not comparable to anonymous self-administered surveys used to estimate teen smoking rates statewide and nationally.

**Cell count less than five.

• Almost all children in Point Lay were reported to be in at least good general health. The percentage of children reported to have very good to excellent health was similar to other North Slope communities overall but still lower than the statewide estimate.
• The reported prevalence of breathing problems such as asthma or chronic cough was very low among Point Lay children.
• Reported teen smoking prevalence in Point Lay was similar to that in the NSB overall.
Wainwright Health Profile

This village health profile provides a brief summary of the results of the 2010 NSB Census. The intent of this profile is to provide individual communities with information on some basic health measures at the village-level to guide community health promotion and planning efforts.

Please refer to the 2010 Census NSB Health Profile section for further discussion of each health question and an overview of the census health module results for the NSB. Also, please refer to the NSB Baseline Community Health Analysis report for expanded discussions of each of the health topics addressed below as well as many more aspects of community health.

At the village-level, some of the small percentages are based on very small numbers of responses, making the estimates less reliable: cells based on fewer than five responses are not reported. NSB and Alaska estimates are provided for general reference only, and comparisons should be made with caution, as results are not adjusted for differences in the age composition of the populations. In addition, state and national survey methods may vary considerably from that used in the 2010 NSB Census.

Adults

Table A.33

<table>
<thead>
<tr>
<th></th>
<th>Wainwright Household Heads</th>
<th>NSB Household Heads</th>
<th>All Wainwright Adults*</th>
<th>All NSB Adults*</th>
<th>Alaska Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Health</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very good or excellent general health</td>
<td>38%</td>
<td>44%</td>
<td>35%</td>
<td>46%</td>
<td>56%±</td>
</tr>
<tr>
<td>Fair to poor general health</td>
<td>25%</td>
<td>20%</td>
<td>21%</td>
<td>16%</td>
<td>13%±±±</td>
</tr>
<tr>
<td><strong>Chronic Health Problems</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ever told by a health professional have:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thyroid problems</td>
<td>4%</td>
<td>6%</td>
<td>4%</td>
<td>4%</td>
<td>9% (U.S.)³</td>
</tr>
<tr>
<td>Diabetes</td>
<td>4%</td>
<td>7%</td>
<td>4%</td>
<td>6%</td>
<td>6% (Alaska)²</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>23%</td>
<td>28%</td>
<td>14%</td>
<td>20%</td>
<td>25% (Alaska)²</td>
</tr>
<tr>
<td>High cholesterol</td>
<td>15%</td>
<td>19%</td>
<td>10%</td>
<td>13%</td>
<td>38% (Alaska)³</td>
</tr>
<tr>
<td>Heart disease</td>
<td>7%</td>
<td>7%</td>
<td>5%</td>
<td>5%</td>
<td>12% (U.S.)³</td>
</tr>
<tr>
<td>In the past 12 months, experienced:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily pain or arthritis that limits activities or requires prescription pain medicine</td>
<td>27%</td>
<td>29%</td>
<td>21%</td>
<td>21%</td>
<td>(see ref)²</td>
</tr>
<tr>
<td>Frequent (three or more) or chronic ear infections</td>
<td>6%</td>
<td>5%</td>
<td>4%</td>
<td>4%</td>
<td>N/A</td>
</tr>
<tr>
<td>Chronic breathing problems (such as asthma, emphysema, or a cough that won’t go away)</td>
<td>16%</td>
<td>13%</td>
<td>10%</td>
<td>8%</td>
<td>(see ref)²</td>
</tr>
<tr>
<td><strong>Health Insurance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have health insurance, including IHS eligibility</td>
<td>99%</td>
<td>97%</td>
<td>83%±</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have health insurance, other than IHS eligibility</td>
<td>59%</td>
<td>64%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Smoking</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke tobacco (in any form)</td>
<td>53%</td>
<td>50%</td>
<td>55%</td>
<td>49%</td>
<td>22%±</td>
</tr>
<tr>
<td>Of those who smoke:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke one or more packs per day</td>
<td>23%</td>
<td>25%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are interested in quitting</td>
<td>61%</td>
<td>71%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have tried to quit in the last 12 months</td>
<td>59%</td>
<td>62%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permit smoking in the house</td>
<td>21%</td>
<td>33%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support a tobacco tax to fund tobacco prevention or cessation programs</td>
<td>35%</td>
<td>53%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table A.33

<table>
<thead>
<tr>
<th></th>
<th>Wainwright Household Heads</th>
<th>NSB Household Heads</th>
<th>All Wainwright Adults*</th>
<th>All NSB Adults*</th>
<th>Alaska Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overweight and Obesity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overweight (BMI 25–29.9 kg/m²)</td>
<td>36%</td>
<td>33%</td>
<td></td>
<td></td>
<td>37%¹</td>
</tr>
<tr>
<td>Obese (BMI 30 kg/m² or higher)</td>
<td>41%</td>
<td>39%</td>
<td></td>
<td></td>
<td>28%¹</td>
</tr>
<tr>
<td><strong>Physical Activity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never get 30 minutes of moderate exercise in a day</td>
<td>11%</td>
<td>16%</td>
<td></td>
<td>9%²</td>
<td></td>
</tr>
<tr>
<td>Get at least 30 minutes of moderate exercise 5 days per week or more</td>
<td>59%</td>
<td>44%</td>
<td></td>
<td>47%³</td>
<td></td>
</tr>
<tr>
<td><strong>Sugar-Sweetened Beverages (SSBs)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On average, drink no soda or other SSBs per day</td>
<td>19%</td>
<td>26%</td>
<td></td>
<td>53%⁴</td>
<td></td>
</tr>
<tr>
<td>On average, drink two or more sodas or other SSBs per day</td>
<td>57%</td>
<td>45%</td>
<td></td>
<td>30%⁵</td>
<td></td>
</tr>
<tr>
<td><strong>Food Security</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Times last year when household found it difficult to get the foods they needed to eat healthy meals</td>
<td>46%</td>
<td>35%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If yes, because not able to get enough subsistence foods to eat healthy meals</td>
<td>36%</td>
<td>43%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If yes, because not able to get enough store foods to eat healthy meals</td>
<td>95%</td>
<td>90%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent with household members who at times did not have enough to eat</td>
<td>30%</td>
<td>19%</td>
<td></td>
<td>(4–11%)⁶</td>
<td></td>
</tr>
<tr>
<td><strong>Safety: Helmet Use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wear a helmet when riding a snowmachine or four-wheeler (of household heads who ride on snowmachines or 4-wheelers)</td>
<td>**</td>
<td>18%</td>
<td></td>
<td>(57%)⁷</td>
<td></td>
</tr>
<tr>
<td><strong>Drugs and Alcohol</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the past 12 months, felt a household member had been hurt by drugs or alcohol</td>
<td>15%</td>
<td>24%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the past 12 months, thought the health of their community had been hurt by drugs or alcohol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Often</td>
<td>51%</td>
<td>57%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sometimes</td>
<td>38%</td>
<td>35%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹Includes both household head (survey respondent) and all other household members, as reported by the household head.
²Cell count less than five.

• A majority of Wainwright adults reported or were reported to be in at least good general health. Looking at both all adults and Iñupiat only, those living in Wainwright were less likely to report very good or excellent health, and more likely to report fair or poor health than were adults in other North Slope communities overall.
• The prevalence of chronic health problems among Wainwright household heads and other adults was similar to that in other North Slope communities. Only the prevalence of high blood pressure among Wainwright adults was significantly lower than in other North Slope communities overall.
• Smoking rates were high among household heads and other adults in Wainwright, similar to other North Slope communities overall. About three in five smokers reported wanting to quit, and only one in five allow smoking in their houses. Only 35% support a tobacco tax to fund prevention programs.
• The prevalence of being overweight and obese was high among Wainwright household heads, similar to other North Slope communities overall.
• Almost three in five Wainwright household heads reported getting 30 minutes of moderate physical activity at least 5 days a week, a significantly higher proportion than in the other North Slope communities overall.
• Consumption of sodas and other sugared beverages was high among Wainwright household heads. Comparing all household heads, consumption was higher in Wainwright than in the North Slope communities overall, but looking at Iñupiat household heads only, this difference was not statistically significant.

• Food insecurity was common in Wainwright, with 30% of household heads reporting that at times last year a household member did not have enough to eat. Looking at Iñupiat only, this proportion was significantly higher than in the other North Slope villages overall. Of the 46% of Wainwright household heads reporting difficulty getting foods for healthy meals, about one-third stated that this was because they couldn’t get enough subsistence foods, whereas almost all reported difficulty getting enough store foods for healthy meals.

• Helmet use was very low among Wainwright household heads, similar to other North Slope villages.

• A large majority of household heads in Wainwright did not believe that a member of their household had been hurt by alcohol or drugs in the last year. The proportion of Iñupiat household heads in Wainwright who thought that a member of their household had been hurt by alcohol or drugs was significantly lower than that among Iñupiat household heads in other North Slope villages overall. Still, almost nine in ten Wainwright household heads thought that the health of their community had been hurt by alcohol or drugs in the last year.

### Children (0–17 years)

<table>
<thead>
<tr>
<th></th>
<th>Wainwright Children</th>
<th>NSB Children</th>
<th>Alaska Children</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Health</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very good or excellent general health</td>
<td>54%</td>
<td>63%</td>
<td>89%2</td>
</tr>
<tr>
<td><strong>Chronic Health Problems</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the past 12 months, experienced:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequent (three or more) or chronic ear infections</td>
<td>17%</td>
<td>19%</td>
<td>5%2</td>
</tr>
<tr>
<td>Chronic breathing problems (such as asthma, emphysema, or a cough that won’t go away)</td>
<td>**</td>
<td>5%</td>
<td>(current asthma)2</td>
</tr>
<tr>
<td><strong>Teen Tobacco Smoking (ages 14–18 years)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke tobacco (in any form)</td>
<td>31%</td>
<td>16%</td>
<td>Not comparable</td>
</tr>
</tbody>
</table>

As reported by the household head. All the other chronic health problems had a prevalence of less than 1% among children in the NSB and were not analyzed or reported by individual village.

*Based on other NSB surveys, this value likely significantly underestimates the prevalence of smoking among children and teens as it is not comparable to anonymous self-administered surveys used to estimate teen smoking rates statewide and nationally. According to the 2005 YRBS survey, NSB high school students were about twice as likely to smoke as Alaskan high school students overall.

**Cell count less than five.

• The majority of children in Wainwright were reported by the household head to have at least good general health. The proportion reported to have very good to excellent health was significantly lower than in the other North Slope communities overall and lower than statewide estimates. Looking at Iñupiat children only, reported general health status in Wainwright was similar to that among Iñupiat children in other North Slope communities overall.

• The reported prevalence of breathing problems such as asthma or chronic cough was low among Wainwright children.

• Reported tobacco smoking among teens (ages 14–18 years) in Wainwright was significantly more common than among teens in other North Slope communities overall. This difference remained significant when comparing Iñupiat teens only.
Technical Notes

For a full discussion of the methods used in this census, please refer to the forthcoming 2010 NSB Economic Profile and Census Report.

All health questions were asked as they pertained to the household heads themselves, and for a smaller number of questions, the household head was also asked to serve as a proxy, answering the questions as they pertained to the other members of the household. The quality of this “proxy data” depends, of course, on how much the household head knows about the health of other household members. With the addition of the new health section, the census team also included an “informed consent,” to be signed by all survey respondents and survey takers, outlining the voluntary basis of participation, the right to refuse to answer any questions, the sensitive nature of some of the questions, and any possible risks or harms associated with participation, such as emotional distress. Participants were also informed that neither their names nor any other identifying information would be attached to any of their responses when results were released.

The length of the existing census questionnaire precluded including questions on many health-related topics despite the acknowledged paucity of local data. Many questions were taken from existing, validated survey questionnaires and facilitate comparisons with state or national estimates, whereas other questions were customized to answer specific questions relevant to NSB communities, even when external benchmarks may not be available. Some topics were thought not to be appropriate for the NSB census. For example, while recognizing the importance of mental health and the relative lack of local data in this area, the census team ultimately decided not to include questions about mental and/or emotional problems for a variety of reasons, including the complex nature of mental health symptoms and diagnoses, lack of training in this area among the census takers, and the inability to guarantee complete privacy within all areas where the surveys took place. Other important health topics—for example cancer, infectious diseases, and suicide—were not included, as these topics are better examined through other types of studies and through the use of existing data sources such as disease registries and state databases. None of these omissions should in any way be interpreted as stigmatizing or de-emphasizing the importance of any particular disease or health issue.

The goal of this census was to survey as many households in the community as possible. It is not possible to reach all households, however, and thus the percentages reported below are only estimates of the “true” percentage. Overall, 71% of NSB households participated in the census, based on the total estimated number of households from Borough records. The total number of households surveyed, the estimated number of households in the community, and the total number of persons for which data, including health data, were collected is shown.

<table>
<thead>
<tr>
<th>Community</th>
<th>Household Head sample size (Number of households participating in survey)</th>
<th>Total estimated number of households in community</th>
<th>Total number of persons on which health data were collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td>80</td>
<td>102</td>
<td>288</td>
</tr>
<tr>
<td>Atqasuk</td>
<td>61</td>
<td>68</td>
<td>231</td>
</tr>
<tr>
<td>Barrow</td>
<td>943</td>
<td>1449</td>
<td>3122</td>
</tr>
<tr>
<td>Kaktovik</td>
<td>68</td>
<td>83</td>
<td>234</td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>103</td>
<td>125</td>
<td>375</td>
</tr>
<tr>
<td>Point Hope</td>
<td>165</td>
<td>209</td>
<td>636</td>
</tr>
<tr>
<td>Point Lay</td>
<td>50</td>
<td>69</td>
<td>185</td>
</tr>
<tr>
<td>Wainwright</td>
<td>134</td>
<td>166</td>
<td>464</td>
</tr>
<tr>
<td>North Slope Borough</td>
<td>1604</td>
<td>2271</td>
<td>5535</td>
</tr>
</tbody>
</table>

Using a statistical calculation, a range can be determined within which there is 95% confidence of the true percentage that exists—called the “95% confidence interval.” These ranges vary, depending on the size of the population, the percentage of households surveyed, and the percentage of respondents in each response category—for example, the proportion of respondents answering “yes” or “no” to a question about a history of diabetes. The maximum 95% confidence intervals (assuming 50% of respondents in
each response category) are as follows for each of the NSB communities. The more unequal the propor-
tions in each response category, the narrower the range will be.

<table>
<thead>
<tr>
<th>Community</th>
<th>95% confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td>± 5.2%</td>
</tr>
<tr>
<td>Atqasuk</td>
<td>± 4.1%</td>
</tr>
<tr>
<td>Barrow</td>
<td>± 1.9%</td>
</tr>
<tr>
<td>Kaktovik</td>
<td>± 5.2%</td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>± 4.2%</td>
</tr>
<tr>
<td>Point Hope</td>
<td>± 3.6%</td>
</tr>
<tr>
<td>Point Lay</td>
<td>± 7.5%</td>
</tr>
<tr>
<td>Wainwright</td>
<td>± 3.8%</td>
</tr>
<tr>
<td>North Slope Borough</td>
<td>± 1.4%</td>
</tr>
</tbody>
</table>

Appendix A Endnotes

7. Approximately 8% of the non-institutionalized U.S. adult population reports a current diagnosis of asthma and 2% report a current diagnosis of emphysema. Summary of Health Statistics for Adults: National Health Interview Survey, 2008. Based on 2004 BRFSS data, an estimated 8% of Alaskan adults have a current diagnosis of asthma. State of Alaska Department of Health and Social Services: Asthma in Alaska, 2006 Report. In a 2007 survey, 6.4% of Alaskan children were estimated to currently have asthma, compared to 9% nationwide. National Children’s Health Survey, 2007.
9. Alaska Youth Risk Behavior Survey (YRBS): [http://www.hss.state.ak.us/dph/chronic/school/YRBSresults.htm](http://www.hss.state.ak.us/dph/chronic/school/YRBSresults.htm). NSB-specific data from 2005 survey was provided courtesy of the NSB School District. Weighted state-level data are not available from the 2005 survey, so the 2007 survey was used for statewide estimates.
11. Refers to snowmachine helmet rates only, includes both urban (81% use) and rural populations (47% use). Section in Injury prevention and Emergency Medical Services, Division of Public health, Alaska Department of Health and Social Services, 2006. Helmet Observation Study. Juneau, AK.
12. Statewide food insecurity data are not comparable to NSB census data, in part, because national/state questions did not ask about subsistence food security or take into account lack of availability of foods in local stores. For reference, 10.8% of Alaska household surveyed were found to have some level of food insecurity, and 4.4% were found to have “very low food security,” with disrupted eating patterns or reduced food intake. Estimates were higher for rural Alaska (20% of households food insecure). Alaska Division of Public Health Chronicles Vol. 1, Issue 4, August 2008: Food Insecurity in Alaska.
Appendix B
References and Data Sources

Published Journal Articles, Books, and Academic Presentations ........................................ 310
Additional Data Sources (annotated) ................................................................. 317
Published Journal Articles, Books, and Academic Presentations


Chimonas, M.R.,and B.D. Gessner: Airborne particulate matter from primarily geologic, non-industrial sources at levels below national Ambient Air Quality Standards is associated with outpatient visits for


Rarig, A.: Personal communication—dependency ratios.


Appendices

Additional Data Sources (annotated)


2010 NSB Economic Profile and Census Report, North Slope Borough Department of Planning and Community Services (referred to in report as the 2010 NSB Census)

The 2010 NSB Census is the fourth in a series of local household surveys undertaken by the NSB to enumerate the local population for each community and examine topics such as employment, subsistence participation, income, housing characteristics, Iñupiaq language proficiency, and residents’ attitudes on a variety of topics. Previous censuses were conducted in 1992, 1998, and 2003, although the instrument and survey design have been modified somewhat over that period.

The 2010 census, funded and coordinated by the North Slope Borough, was contracted out to Circumpolar Research Associates (CRA), who developed the instrument, selected and trained the census enumerators (primarily graduate students), entered the data, and are currently completing the data analysis, using the SPSS software program. This year, a new health module was added to the questionnaire upon request by the NSB Health Department, as part of the Baseline Community Health Analysis project. The Health Department’s contractor for this project, Dr. McAninch, collaborated with CRA and the Borough to develop the health module and analyze and write up the health sections for the 2010 Census report and for inclusion in this Baseline Community Health Analysis report.

After mapping all the occupied structures in each community, the 2010 NSB Census-takers conducted face-to-face interviews, attempting to reach every household in each NSB community. Sampling proportions ranged from 65% in Barrow (i.e., 943 households interviewed of a total of 1,449) to nearly 90% in some of the smaller communities. The total number of households surveyed, the estimated number of households in the community, and the total number of persons for which data, including health data, were collected is shown. The total estimated households for each community were determined by analyzing utility (primarily electricity) hookup data provided by the Borough. Standard error’s of the proportion range from 1.9% to 7.5%, depending on the community. For the NSB as a whole, with 1604 households interviewed of total of 2,271, the standard error is 1.4%. Household heads participating in the census were 48% male and 52% female. Household heads participating in the census were 69% Iñupiat, 19% Caucasian, and 12% of other ethnic groups.

<table>
<thead>
<tr>
<th>Community</th>
<th>Household Head sample size (Number of households participating in survey)</th>
<th>Total estimated number of households in community</th>
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</tr>
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<tbody>
<tr>
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<td>Nuiqsut</td>
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<td>375</td>
</tr>
<tr>
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<td>165</td>
<td>209</td>
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<td>134</td>
<td>166</td>
<td>464</td>
</tr>
<tr>
<td>North Slope Borough</td>
<td>1604</td>
<td>2271</td>
<td>5535</td>
</tr>
</tbody>
</table>

For each household, an attempt was made to interview the adult who identified himself or herself as the “household head,” a household member who was available and likely to have the greatest familiarity with household economics, health of household members, level of subsistence participation, etc. The respondents, or household heads were asked all the questions as they pertained to themselves and then a smaller subset of questions as they pertained to all other household members, acting as a proxy. With the addition of the new health section, the census team also
included an “informed consent,” to be signed by all survey respondents and census enumerators, outlining the voluntary basis of participation, the right to refuse to answer any questions, the sensitive nature of some of the questions, and any possible risks or harms associated with participation, such as emotional distress. Participants were also informed that neither their names nor any other identifying information would be attached to any of their responses when results were released.


**Alaska Bureau of Vital Statistics (ABVS):** [http://www.hss.state.ak.us/dph/bvs/data/default.htm](http://www.hss.state.ak.us/dph/bvs/data/default.htm).

The Alaska Bureau of Vital Statistics is responsible for managing vital records in the State of Alaska, including birth, death, fetal death, and divorce and marriage certificate data, as well as reports of adoption. Data used in this report are derived primarily from information included in birth and death certificates records and are updated on a continual basis by ABVS. Upon request, the Research Unit of the ABVS provided data and statistics for the NSB in the areas of mortality, historical leading causes of death, leading causes of premature death, life expectancy, birth statistics, prenatal care, and prenatal risk factors. Other ABVS data, including child mortality and selected maternal and child data were also obtained from ABVS Annual Reports, and additional data available on the main ABVS Data and Statistics website shown above.

**Alaska Cancer Registry:** [http://www.hss.state.ak.us/dph/bvs/data/default.htm](http://www.hss.state.ak.us/dph/bvs/data/default.htm).

The Alaska Cancer Registry (ACR) is a population-based cancer surveillance system and is funded by the Centers for Disease Control and Prevention (CDC). ACR collects data on all newly diagnosed cases of cancer (including benign brain) for the State of Alaska. Age-adjusted cancer mortality data are also available at the above website for the years 1996–2007, generated by the ACR using mortality data provided by the ABVS. Data are suppressed for a given cancer type if there are five or fewer cases (unless there are zero cases). Data tables are provided for diagnosis year, borough, sex, and race.

**Alaska Department of Environmental Conservation:**
- Division of Air Quality: [http://www.dec.state.ak.us/air/index.htm](http://www.dec.state.ak.us/air/index.htm).
- Diesel Strategy: [http://www.dec.state.ak.us/air/anpms/ulsd/dieselhealth.htm](http://www.dec.state.ak.us/air/anpms/ulsd/dieselhealth.htm).
- Contaminated Sites Program Database: [http://www.dec.state.ak.us/SPAR/CSP/db_search.htm](http://www.dec.state.ak.us/SPAR/CSP/db_search.htm).

**Alaska Department of Labor and Workforce Development (AK DOLWD):** [http://almis.labor.state.ak.us/?PAGEID=67&SUBID=115](http://almis.labor.state.ak.us/?PAGEID=67&SUBID=115).

The AK DOLWD website provides state, borough/census area, and village level population, unemployment, and income statistics and links to a number of other economic topics such as cost of living.

**Alaska Department of Motor Vehicles:** [http://www.state.ak.us/dmv/research/curreg07.htm](http://www.state.ak.us/dmv/research/curreg07.htm).

**Alaska Diabetes Control Program:** [http://www.hss.state.ak.us/dph/chronic/diabetes/prevalence.htm](http://www.hss.state.ak.us/dph/chronic/diabetes/prevalence.htm).

This Alaska Department of Health and Social Services program provides borough and census area-specific estimated prevalence and estimated population with diabetes for recent 3-year periods, based on Alaska BRFSS survey data:


Based at the Alaska Native Medical Center, this program (among many other services) collects and annually updates case numbers for diabetes, pre-diabetes, and gestational diabetes among Alaska Natives in all Alaska Native service units, based data entered into the RPMS clinical database in each service area. Specific laboratory result-based criteria are used for case definition and
inclusion in the registry. Diabetes registry data for the Barrow service unit were provided by Meera Narayanan, MS, RD, CDE.


This report contains data for Alaska Natives on a broad spectrum of health topics. It also contains regional profiles for a subset of health indicators.


This report presents data for Alaska Natives statewide on injury deaths and hospitalizations, utilizing data from Alaska Bureau of Vital Statistics and the Alaska Trauma Registry. The report includes a regional injury profile for the Arctic Slope, summarizing data on injuries among Alaska Natives residing in any village within the North Slope Borough.


PRAMS was developed by the Centers for Disease Control and Prevention as part of an initiative to reduce infant mortality and low birth weight. It is an ongoing, population-based surveillance system designed to identify and monitor selected maternal behaviors and experiences that occur before and during a woman’s pregnancy and during the early infancy of her child. The Alaska PRAMS Project was initiated in 1990. Self-administered surveys are mailed to a random sample of mothers (approximately one in six mothers of newborns) who have recently had a live birth, and phone interviews are attempted with those who do not respond to the mailed survey. Much of the data cited in this report has been taken from the Alaska Maternal and Child Health Data Books, published by the Maternal and Child Health Epidemiology unit of the Alaska Department of Health and Social Services and available online as PDF files. The NSB-specific data were provided by Bradford Gessner, M.D., M.P.H., and Kathy Perham-Hester of the Maternal and Child Health epidemiology Unit of the Alaska Division of Public Health. These data were provided in rolling 5-year averages, with between 100 and 200 responses in the NSB available for analysis for each 5-year period.


**Alaska Trauma Registry:** [http://www.hss.state.ak.us/dph/ipems/injury_prevention/trauma.htm](http://www.hss.state.ak.us/dph/ipems/injury_prevention/trauma.htm).

The Alaska Trauma Registry is an information system that collects data on serious injuries from all of Alaska’s acute care hospitals. Injuries include trauma, poisoning, suffocation, and the effects of reduced temperature. Data are available upon request and were provided in summary form for injury hospitalizations by type of injury, and for traumatic brain injury specifically, occurring in the North Slope region.
Alaska Youth Risk Behavior Survey (YRBS): [http://www.hss.state.ak.us/dph/chronic/school/YRBSresults.htm](http://www.hss.state.ak.us/dph/chronic/school/YRBSresults.htm)

The Alaska YRBS is part of a national surveillance system developed by the Centers for Disease Control and Prevention. The anonymous survey has been administered to a sample of high school students every other year since 1995 to monitor the prevalence of health risk behaviors among Alaska’s youth. For the first time, in 2009, the survey was administered to students in both traditional and alternative high schools.

NSB School District results are available only for 2005, when 71% of students (327 survey respondents) from NSB traditional public schools (not alternative schools) participated in the survey. Aggregated results from this survey year were provided for this report courtesy of the NSB School District. Statewide representative data are not available for 2005 and so 2007 statewide data are used for reference. The NSB School District recently participated in a second YRBS survey, but results were not yet available at the time of writing.


American Cancer Society: [http://www.cancer.org](http://www.cancer.org/)


Arctic Slope Native Association Barrow Dental Clinic: February 22nd–26th Sealant Clinic Report. Prepared by Dr. Kimlea Medlin, provided for this report by Dr. Amanda Gaynor-Ashley, Program Director, March, 2010.

Arctic Slope Native Association Screening for Life Program. Data provided upon request, from Med-IT database.


BRFSS is an ongoing national telephone survey funded by the Centers for Disease Control and Prevention that estimates the prevalence of behavioral risk factors and certain health problems in the general population. Alaska has been administering the survey annually since 1991. Each year, a random sample of approximately 2,500 is drawn in Alaska, with oversampling in rural areas. Every year, the same core module of questions is asked, and additional modules of questions are asked about certain health topics of interest. Therefore, not all questions are asked in all years.

The survey data are adjusted, or weighted, for each region to compensate for the over-representation of population subgroups in the survey sample population so that the sample data better reflect the total population of the region sampled. Results are typically
reported accompanied by a 95% confidence interval, indicating the range in which the true value for the population has a 95% likelihood of lying.

All BRFSS questions have been shown to be at least moderately reliable and valid and the sampling methodology has been well tested; however, some precautions must be taken in interpreting BRFSS data. First, all data are self-reported and do not include any data from health records, actual measurements, or laboratory testing. All self-reported data may be subject to bias, misunderstanding, or misrepresentation. Second, the telephone sampling method includes only land-line phones and, therefore, excludes households without telephones or with only cellular telephones. Households without land-line telephones may be different in various ways from those with them, and thus, the survey sample may not be representative of the entire population. This problem has become of growing concern in recent years. Third, the results are not age-adjusted and thus comparison of different regions or subpopulations can be affected by the different age compositions of the populations.

Census-tract level data for the NSB, were provided upon request by Charles Utermohle, Ph.D., from the State of Alaska Department of Health and Social Services, Division of Public Health, Chronic Disease Prevention and Health Promotion program. NSB data are weighted only according to the demographic composition of the “rural” region of Alaska and were not post-stratified to reflect the NSB population composition specifically. To increase the available sample size at the borough level, results were combined for 3-year periods. Results were reported only when the sample for a given question included at least 50 respondents. Because of the small sample sizes at the borough level, the 95% confidence intervals tend to be wide and estimates fluctuate considerably from year to year.

Some state-level statistics and information were obtained from the 2006, 2007, and 2008 Alaska BRFSS Reports, available on the main Alaska BRFSS website shown above. In addition, multi-year BRFSS data were utilized in the County Health Rankings, which are also referenced in this report.


Burden of Injury to Alaska Natives: Arctic Slope Native Association, Executive Summary. Analysis of ABVS and Alaska Trauma Registry data by Alaska Native Epidemiology Center. Provided courtesy of the NSB Health Department.
Appendix B: References and Data Sources


This report provided aggregated survey data on health-related attitudes and behaviors of 6th–12th graders in the NSB. The survey was administered anonymously in November, 2004 throughout the NSB School District.


This volume is part of a planning process involving participants from across the state with the common goal of improving community health in Alaska. It provides baseline measures on numerous health topics at the state level and sets targets for 2010 that, if achieved, would reflect improved health status in the state. It is meant to provide a framework for action at the local and state level.


This volume offers an alternative to the standard strategic health plan. This plan addresses the targets and indicators in Volume I through 14 stories of community-based efforts for public health improvement.


This national data repository contains clinical and administrative information from encounter records from facilities reporting to the IHS data system. Data were provided, upon request, for this report on leading reasons for inpatient and outpatient visits to Samuel Simmonds Memorial Hospital (SSMH).


Nageak, E.: NSB Health Department Health Educator. Personal communication, January 26, 2011. States sources as “what I have learned from the Elders and from knowledgeable presenters.”


National Co-Morbidity Study—Replication. The NCS-R was a nationally representative survey carried out as a follow-up to the baseline NCS to assess prevalence, trends, and patterns of mental health and substance abuse disorders nationwide. Data accessed online at http://www.hcp.med.harvard.edu/ncs/.


    This is a randomly sampled telephone survey, in which a household adult who knows the most about the randomly-selected child’s health is asked questions on a variety of health topics. Approximately 1,800 interviews are collected per state and results are weighted to represent the population of non-institutionalized children ages 0–17 years.


North Slope Borough Health Department, Community Health Aide Program: Village Clinic Monthly Reports, 2005–2008, courtesy of the NSB Health Department CHAP program.

North Slope Borough Health Department, Community Health Aide Program: Structured interviews with health aides from NSB villages, March 2010.
Appendix B: References and Data Sources


North Slope Borough Police Department report, courtesy of NSB Health Department.

North Slope Borough Public Health Nursing program Resource Patient Management System (RPMS):

Body-mass index (BMI) percentiles for age/gender were provided by NSB PHN program upon request in August, 2009 for NSB children aged 3–18 years. The RPMS database was queried for BMIs for children who had been seen either by a public health nurse or other health provider in a clinic or school and had had a height and weight taken on the same day within the past year and entered into the database. Prenatal patients were excluded, and the villages of Point Hope and Anaktuvuk Pass were not included. This sample of more than 1,000 children, while not a representative sample of all children in the NSB, represents more than half of the public health nursing database for children and teens in this age group and likely provides a reasonable estimate of the BMI distribution in the community. A very large proportion of children and adolescents in the NSB are seen by public health nursing for immunizations, well-child care, and other screening services.

North Slope Borough Women, Infants and Children (WIC) Program, a division of the Alaska WIC Program. Upon request, WIC personnel queried the WIC program database for breastfeeding initiation and duration rates and low hemoglobin rates (USDA Risk 201) for the years 2003–2009.


Aggregated annual number of substantiated cases and substantiated unique victims were provided upon request for the Barrow office, as well as combined number of cases for the comparison community offices of Bethel, Nome, and Kotzebue for the years 2006, 2007, and 2008. Data for neglect, physical abuse, sexual abuse, and mental injury were provided in aggregate. Statewide data were obtained online from the above website. Rates were calculated using year 2000 U.S. census 0–17 year age-group population estimates for villages covered by each regional office.


SLiCA was an international joint effort involving a partnership of researchers and indigenous organizations in Greenland, Canada, Norway, Sweden, Finland, Denmark, Russia, and the United States (Alaska). The purpose of the study was to advance understanding of changing living conditions among Inuit and Saami peoples and the Indigenous peoples of Chukotka. In Alaska, 700 Iñupiat participated in the study in three sub-regions, the North Slope Borough, the Northwest Arctic Borough, and the Bering Straits region. In-person interviews were conducted with Inupiat residents aged 16 and higher in each of these regions in 2003–2004.

Aggregated data from this study were made available for public use and was referenced in various sections in this report pertaining to the health, well-being, and socioeconomic circumstances of the Iñupiat population of the NSB. Comparisons noted in this report do not include an analysis of statistical significances, as we utilized publically available aggregated data. Study authors state that "For interpreting differences in percentages, a conservative assumption is to use a difference of at least 10 percentage points as a threshold for concluding that there is a significant difference. In most cases smaller differences are significant. For interpreting differences in means, a conservative assumption is to use a difference of one or more as a threshold for concluding that there is a significant difference." Data tables and other information about the study were accessed online at http://www.iser.uaa.alaska.edu/Projects/living_conditions/results.htm.


Seasonal Influenza (Flu): Key Facts about Influenza (Flu) and Flu Vaccine, CDC Fact Sheet. Accessed online at http://www.cdc.gov/flu/keyfacts.htm.


Shepro C., D. Maas, and D. Calloway, North Slope Borough 2003 North Slope Borough Economic Profile and Census Report: This report represents the results of a periodic household census commissioned by the North Slope Borough that examines the current population, economic status, employment, subsistence participation, and attitudes of the entire NSB population.


A program of the National Cancer Institute, SEER provides information on cancer incidence and survival in the United States based on data from population-based cancer registries covering approximately 26% of the U.S. population.


University of Alaska Anchorage Justice Center: http://justice.uaa.alaska.edu/links/lawenforcement/ak_localpds.html.


Data available from the 2000 U.S. census at the county (borough) and city (village) level on general, social, economic, and housing characteristics of residents.


The U.S. Census Bureau, along with other federal agencies, provides annual estimates of selected income and poverty measures at the state, county, and school district level. The estimates combine data from administrative records such as tax returns and food stamp program records, the nationwide American Community Survey, annual population estimates, and the decennial U.S. census.


Provides an overview of key health indicators at the county level, drawn primarily from national surveys, U.S. census, and vital statistics data. Also provides comparison to a group of “peer” communities, selected on the basis of similarity in a number of factors, including population size, poverty, age, and frontier status. Some data are not available for the NSB due to small population size.


Appendix C
Selected Resources for Community-Based Health Promotion and Disease Prevention

General Community Health Promotion Resources ............... 332

Health Promotion Resources by Topic .......................... 332
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Injury Prevention Resources ........................................ 333
Maternal and Child Health Resources .............................. 333
Family Violence Prevention Resources ............................ 334
Cancer Prevention Resource ........................................ 334
General Community Health Promotion Resources

1. Healthy Alaskans 2010 Volume II: Strategies for Improved Health; Creating Healthy Communities: An Alaskan Talking Circle, Alaska Department of Health and Social Services Division of Public Health, November 2002. http://www.hss.state.ak.us/DPH/targets/ha2010/volume_2.htm. This volume offers an alternative to the standard strategic health plan. This plan addresses the targets and indicators in Volume I through 14 stories of community-based efforts for public health improvement.

2. CDC Healthy Communities Program: Works with communities through state and national partnerships to improve community leaders’ skills and commitments of establishing, advancing, and maintaining effective population-based strategies that reduce the burden of chronic disease and achieve health equity. Links to community action guides and toolkits. http://www.cdc.gov/healthycommunitiesprogram/.


4. CDC Community Health Program Services: Builds healthy communities and eliminates health disparities by providing national leadership in community health promotion and disease prevention through innovative programs. http://www.cdc.gov/nccdphp/dach/chaps/.


Health Promotion Resources by Topic

Nutrition and Obesity Prevention Resources


3. Provides school-based, healthcare-based, community-based, and mass-communication-based goals and strategies, along with links to many Alaska DHSS programs and resources.


5. Healthy Foods North www.healthyfoodsnorth.ca/.

6. Healthy Alaskans 2010: Strategies for Improved Health, pg 69, example of Dillingham’s Ped/Bike path. Funding sources are discussed.

Tobacco Prevention and Control Resources

5. Robert Wood Johnson Tobacco Policy Change Program Collaborative: Provides funding and technical assistance for community and regional organizations in tobacco control initiatives. http://www.tobaccopolicychange.org/FAQsProg-list0.html#3221.

Injury Prevention Resources


Maternal and Child Health Resources

Family Violence Prevention Resources

1. Healthy Alaskans 2010: Strategies for Improved Health: Creating Healthy Communities: An Alaskan Talking Circle:
   - b. The Mothers’ Club.


Cancer Prevention Resource

Village 1

These are themes emerging from a brief student survey conducted by the NSB Health Department in Spring, 2010. These were open-ended written questions, and students were not given answers to choose from. Survey responses were anonymous.

What do you feel are important health problems in your community? (17 responses)

<table>
<thead>
<tr>
<th>Health Problems in Community</th>
<th>Number of students mentioning problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td>10</td>
</tr>
<tr>
<td>Smoking</td>
<td>9</td>
</tr>
<tr>
<td>Adults smoking around kids</td>
<td>2</td>
</tr>
<tr>
<td>Drugs/marijuana</td>
<td>9</td>
</tr>
<tr>
<td>Harassment/threatening/teasing/abusing</td>
<td>6</td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Cancer</td>
<td>1</td>
</tr>
<tr>
<td>AIDS/HIV</td>
<td>1</td>
</tr>
</tbody>
</table>

What things do you feel are affecting health in your family or community? (17 responses)

<table>
<thead>
<tr>
<th>Things affecting health in community/family</th>
<th>Number of students mentioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
<td>13</td>
</tr>
<tr>
<td>Adults smoking around kids</td>
<td>3</td>
</tr>
<tr>
<td>Kids/teens getting tobacco from adults</td>
<td>2</td>
</tr>
<tr>
<td>Alcohol abuse</td>
<td>6</td>
</tr>
<tr>
<td>Drugs/marijuana</td>
<td>5</td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Junk food</td>
<td>1</td>
</tr>
<tr>
<td>No helmets</td>
<td>1</td>
</tr>
<tr>
<td>Problems with access to health care</td>
<td>1</td>
</tr>
<tr>
<td>Physical abuse</td>
<td>1</td>
</tr>
</tbody>
</table>
Do you have ideas about how the Borough can help improve health in your community? (18 responses)

Community gatherings/discuss problems with community members:
• “Talk to people about drugs, harassing other people, and alcohol abuse.”
• “Talk to the adults about harassing other people’s kids, because most times the kids who get harassed don’t tell their parents, and they keep it in and the kids who get harassed develop some kind of behavior problem. Convince people to at least consider to stop smoking in their houses.”
• “Have a meeting with all the people in the community about kids having tobacco.”
• “Have community gatherings about making our village a healthier community.”

Improve enforcement and eliminate importation of tobacco, alcohol, and drugs:
• “Not sell any tobacco anymore.”
• “Not sell any tobacco products or anything illegal in the village.”
• “Take all the tobacco, alcohol, weed, and beer away. Let the kids quit getting scared because of this.”
• “Let police search people who enter a town.”
• “To ban all the drugs and get a dog to sniff the drugs and alcohol.”
• “Security at the airlines in barrow to keep them out of the towns.”

Restrict tobacco in public places/around children:
• “Stop letting people in public and kids zones smoke there.”

Improve access to quality health care:
• “More doctors coming through the villages of Alaska. More dental help.”
• “Get better workers for the clinic.”

More access to healthy foods:
• “Healthy things to eat.”
• “Village store.”

Make better individual choices/personal responsibility:
• “Don’t smoke cigarettes.”
• “Don’t smoke weed.”

Improve environment:
• “More healthy environments.”

Enforce helmet laws:
• “Enforce the law of the helmet.”

Provide more activities for teens, adults:
• “More activities and other things, so that teens and adults don’t do drugs.”
Village 2

These are themes emerging from a brief student survey conducted by the NSB Health Department in Spring, 2010. These were open-ended written questions, and students were not given answers to choose from. Survey responses were anonymous.

What do you feel are important health problems in your community? (17 responses)

<table>
<thead>
<tr>
<th>Health Problems in Community</th>
<th>Number of students mentioning problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
<td>7</td>
</tr>
<tr>
<td>Alcohol</td>
<td>7</td>
</tr>
<tr>
<td>Drugs/marijuana</td>
<td>8</td>
</tr>
<tr>
<td>“Sickness”/respiratory/“germs”</td>
<td>6</td>
</tr>
<tr>
<td>Soda/unhealthy foods/nutrition</td>
<td>4</td>
</tr>
<tr>
<td>Cancer/chronic diseases</td>
<td>3</td>
</tr>
<tr>
<td>Teenage pregnancy</td>
<td>1</td>
</tr>
<tr>
<td>Bad sleeping habits</td>
<td>1</td>
</tr>
<tr>
<td>“Failure to communicate”</td>
<td>1</td>
</tr>
<tr>
<td>Health care, preventive care access</td>
<td>1</td>
</tr>
</tbody>
</table>

What things do you feel are affecting health in your family or community? (17 responses)

<table>
<thead>
<tr>
<th>Things affecting health in community/family</th>
<th>Number of students mentioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol abuse</td>
<td>13</td>
</tr>
<tr>
<td>Drugs/marijuana</td>
<td>11</td>
</tr>
<tr>
<td>Smoking</td>
<td>7</td>
</tr>
<tr>
<td>Second-hand smoke</td>
<td>2</td>
</tr>
<tr>
<td>Unhealthy foods/fatty or oily foods/soda</td>
<td>4</td>
</tr>
<tr>
<td>“Failure to communicate”</td>
<td>2</td>
</tr>
<tr>
<td>Lack of discipline, not focusing on academics, “playing games and cell phones”</td>
<td>2</td>
</tr>
<tr>
<td>Pollution</td>
<td>2</td>
</tr>
<tr>
<td>Germs</td>
<td>2</td>
</tr>
<tr>
<td>Snowmobile/ATV accidents</td>
<td>1</td>
</tr>
</tbody>
</table>
Do you have ideas about how the Borough can help improve health in your community? (16 responses)

Eliminate importation of drugs, alcohol, and cigarettes to the village:
- “Yes, they can stop all the people from bringing drugs, alcohol, cigarettes, and all those stuff. Even medication.”
- “By not sending drugs and alcohol to the village.”
- “Stop selling smokes in our stores, stop bringing weed and alcohol in our village.”
- “By stop selling smokes to people and selling weed, jugs.”
- “Stop selling smokes to stores.”
- “Stop selling cigarettes.”

More health fairs:
- “Have like health fairs.”
- “They can have health fairs annually.”
- “Continue health fairs.”
- “Having annual Health Fairs. It was always nice to have little workshops at the clinic like for menopause or other health issues.”

Sports/activities:
- “They can have special health camps. They can try and have year round sports.”
- “They can make a snowmachine/ATV track.”

Community Health Meetings:
- “Yeah...having annual health meetings.”

Improve access to healthy foods:
- “By bringing in healthy food to Wainwright.”

Adults setting good examples, focus on family:
- “Set the example by not smoking or abusing alcohol, emphasize commitment to family, spouses, and children.”

Tobacco quit line:
- “People can start a quit line.”
## Appendix E

### Letters of Support

<table>
<thead>
<tr>
<th>Letter</th>
<th>Page</th>
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</thead>
<tbody>
<tr>
<td>ICAS Letter</td>
<td>342</td>
</tr>
<tr>
<td>NSB Health Board Letter</td>
<td>343</td>
</tr>
</tbody>
</table>
North Slope Borough
Department of Health and Social Services
PO Box 69
Barrow, AK 99723

Director Leavitt,

We are thankful for the presentation to our Board and staff members at ICAS’ regular Board meeting on April 12, 2012, on the upcoming Baseline Community Health Analysis Report. We recognize the importance of developing a community health assessment for all North Slope communities so that we may better understand and address the important health issues our communities are facing.

It is our hope that the information contained within the report will generate positive outcomes, including raising awareness among community residents, and serving as a foundation for monitoring changes in health trends over time. We especially are grateful for the village-level information that will be available in the report, as we believe this will be valuable for our communities. It will assist our communities in prioritizing health issues so that action plans can be developed to address both positive and negative health trends. It will also be useful in securing grant funding for health-focused programs and prevention efforts, and evaluating changes in health trends over time.

On behalf of the Inupiat Community of the Arctic Slope Board, it is our pleasure to write this letter of support in publishing the upcoming Baseline Community Health Analysis Report, including village-level information, which will be made available to the public once it is published. We believe the information contained within this report will serve our communities well, and will be an important resource for our communities in developing focused health efforts to address health trends.

Sincerely,

George Edwardson
President
Inupiat Community of the Arctic Slope
North Slope Borough
Health Advisory Board
P.O. Box 69
Barrow, Alaska 99723
Phone: (907) 852-0366
Fax: (907) 852-0389

May 18, 2012

Re: Baseline Community Health Analysis Report

Director Leavitt,

We, the North Slope Borough Health Advisory Board, are enthusiastically writing this letter of support for the Baseline Community Health Analysis Report and within it, the publication of health data specific to our North Slope communities. As a Board that represents every North Slope community, we understand the many health issues that our communities experience, and know that this report will be an invaluable resource in addressing those issues that result in positive outcomes.

The report will be valuable and beneficial to all North Slope communities, for use in grant applications for health-focused programs and prevention efforts, in creating action plans for healthier communities, and monitoring health trends over time. It will also serve as a foundation for health impact assessments, will assist health professionals and organizations in assessing health priorities, and be used as a reference for resources, data, and village-level health information.

We believe this report to be a tool for not only health-focused organizations but for the individual, for the community, and for our region. We can change negative health outcomes by educating ourselves on current health trends within our communities, and utilizing resources for the specific purpose of becoming a healthier individual, a healthier community, and a healthier region.

Kiita!

Sincerely,

Roberta Leavitt, Chairperson
NSB Health Advisory Board