Health Research in Alaska

A Report in Response to SJR 44
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AUGUST 2004

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Dedicated to Ruth Lister, Ph.D.

1944–2002
Who helped us start this effort and taught us so much about graceful endings.
Health Research in Alaska

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A
laska is a land of extremes—a land rich in natural and human resources. It is the largest state land mass and among the smallest in population. It is among the youngest of states in median age and has one of the fastest growing populations of elderly.

Over the last fifty years, Alaskan citizens have enjoyed dramatic gains in health status—and yet we are plagued with extremely high rates of violence, injury, and substance abuse. New chronic health conditions are emerging in previously healthy populations, and some old challenges like infectious diseases threaten to re-emerge.

With a population density of one person per square mile compared to the average U.S. population density of roughly 80 people per square mile, delivery of health care is both daunting and innovative.

From a research standpoint, Alaska has many attractive features. Alaska is the United States’ only arctic environment, and it has tremendous geographic and cultural diversity. In order to address health delivery challenges, health and human service leaders and educators have created some of the most inventive health care delivery systems in the nation, designed to overcome distance and low population density.

Health-related research activity has grown dramatically in Alaska in the last five years. The University of Alaska (UA) has garnered $45.3 million in National Institutes of Health (NIH) funding in the last four years. This contrasts with a few individually funded research projects prior to 1999, when Alaska was last in the nation in NIH funding. Other institutions such as the Alaska Native Tribal Health Consortium (ANTHC) and its partners have also received new NIH/IHS-funded research.

The NIH capacity-building programs for research-poor states have been a great help to Alaska and account for most program expansion. While these programs help build faculty and buy infrastructure to accomplish health research, they also demand improved rigor by scientists to identify relevant research themes, to produce findings, and ultimately to gain independent, competitive, peer-reviewed funding.

The health research agenda is much broader than any one funding source, host research institution or health problem. While solid efforts are underway in many fields, Alaska has huge research needs in virtually every field including biomedical, injury surveillance and prevention, behavioral health, health services, disability, gerontology, and maternal and child health. A chapter is devoted to each of these subjects.

There is growing collaboration among Alaska-based research stakeholders to work together to build a research agenda that is relevant to state
Executive Summary

needs, that is reasonable given our limitations, and that is supported by sound science.

Even with the progress to date, Alaska has a nascent research infrastructure. Alaska has no U.S. Department of Health and Social Services funded Centers of Excellence or study centers, although there are several promising fields in which we might be competitive in the future. One exception is the National Resource Center for American Indians, Alaska Natives and Native Hawaiian Elders, which was recently funded by the Department of Health and Human Services, Administration on Aging. The award was to the University of Alaska Anchorage.

The growth in research dollars has spurred the need for infrastructure to support the research enterprise. Faculty, graduate programs, laboratories, new equipment and solid research integrity protocols are all needed to create a favorable research climate. The University of Alaska built 73,500 square feet in needed science facilities, and additional refurbished and new buildings are being planned. More graduate programs may be offered. Research integrity has been strengthened both at the University and with Alaska Native organizations.

THE PURPOSE OF THE REPORT

This report was written in response to the Alaska State Legislature’s call for a state research and development plan. This report is a subset of a larger effort to look at the future of research and development across all disciplines and state needs.

This report draws heavily on existing material—nothing in this report is new information. What this report offers is a synthesis of existing health data, an inventory of some of the ongoing research activity in the nine theme areas, and an analysis of the gaps in existing knowledge that would benefit from new research.

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THE ORIGIN OF THE REPORT:

SENATE JOINT RESOLUTION MANDATE

This document, while sizable in its own right, was created in response to a larger vision to create a research and development plan for Alaska. The mandate began with the Alaska State Legislature in the spring of 2002. The second session of the 22nd Legislature passed Senate Joint Resolution 44, which requested that a coordinated research and development plan be
constructed with input from the Legislature to help expand and diversify Alaska’s economy.

The aim of the entire plan is to expand and diversify Alaska’s economy while helping to strengthen and maintain the health of state research institutions and protecting the health of Alaskans and the environment of Alaska. In part, the way the plan seeks to achieve these goals is by working to ensure that the state and federal governments work together. An Organizing Group was created with representatives from five Alaskan or Arctic research entities. The Group divided the task into six topic areas, of which the Social and Economic Needs of Alaskans was one. Work groups were formed for each of the six topic areas. Given the immensity of the task, the work groups further subdivided their topics into more manageable subject areas. The Social and Economic Needs of Alaskans was divided into eight subject areas. This report is the final product of one of those subject areas: Health and Biomedical Research in Alaska.

THE SUBJECT OF THE REPORT:
HEALTH AND BIOMEDICAL RESEARCH

The co-chairs of the health and biomedical research subject area were Karen Perdue, Associate Vice President, Health Programs for the University of Alaska, and George Happ, Ph.D., Director of the Alaska Biomedical Research Infrastructure Network at the University of Alaska.

The University of Alaska took the lead in coordinating the development of the state’s health and biomedical research agenda in response to SJR 44. Work began in late summer 2002 with the Health Research Task Force formed to work on the study. Over the next two years, the Task Force worked with representatives of state, federal, and community experts to identify research priorities and plan what form the study should take. Task Force members agreed that the research document should set broad research themes, but not dictate the activities of individual researchers. The definition of research was broadly applied so as to be inclusive of ongoing studies and activities.
Planning efforts focused on the greatest threats to the health and welfare of Alaskans, as well as other issues/areas that will attract the best researchers. The *Healthy Alaskans 2010*, published by the Alaska Department of Health and Social Services, provided an excellent road map for the groups to use in identifying state needs. The broad area of health and biomedical research was further divided into nine themes that comprise the chapter of this document. Focus groups of the key players in each area were formed around these themes. The focus groups provided information on recent research efforts and identified critical future research needs in the following nine themes:

**Biomedical Research**

Infectious disease  
Chronic disease  
Environmental health and toxicology  
Molecular basis of hibernation in mammals and its applications to novel human therapeutics  
Bioinformatics and systems biology

**Injury Surveillance & Prevention**

Motor vehicle fatalities and injuries  
Fall injuries  
Occupational fatalities  
Snowmachine and ATV injuries

**Health Disparities**

Environmental contamination/transboundary pollution  
Global climate change and the impact on health

**Behavioral Health**

Co-occurring substance abuse and mental health disorders  
Chronic and persistent mental illness  
Behavioral risk factors in chronic diseases  
Violence, suicide, and trauma  
Health aspects of living in an arctic and sub-arctic climates

**Health Services**

Shortage of health professionals  
Frontier models of health delivery  
Telemedicine  
Oral health care
Tribal ownership and management of clinics and hospitals
Complementary medicine integration

**Disability**

- Unemployment and underemployment among people with developmental disabilities
- Aging of disabled population
- Effect of disabilities on children
- Services for children with disabilities in foster care
- Rural issues
- General research

**Gerontology**

- Alaska specific research
- Health care related
- Policy research and pilot studies
- Quality improvement/best practices

**Maternal, Child, & Family Health**

- Adolescent health
- Pediatric anemia
- Asthma surveillance program
- Prenatal care
- Drinking and smoking during pregnancy and childhood
- Longitudinal study of children
- Obesity prevention

**Health Research Infrastructure**

- New facilities
- Additional graduate programs

The Task Force and the focus groups assembled to tackle the SJR 44 mandate had broad representation from all areas of the health field.

The Task Force and the focus groups assembled to tackle the SJR 44 mandate had broad representation from all areas of the health field. Progress toward the solution of most important problems these days requires the collaborative efforts of researchers from a wide range of disciplines. Without clarity of
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The aim of future health and biomedical research should be to strengthen the interactive network of competitively-funded researchers at the University and federal, state, and non-profit entities.

purpose, effective channeling of effort, and skilled management, the work of even the most brilliant scientists will be unlikely to meet the needs of the sponsor. This does not mean that all research must be tightly directed. To the contrary, individual efforts, particularly those that build expertise, explore questions, and exploit skill within important disciplines, are the basis for any major research program.

**STATE OF HEALTH RESEARCH IN ALASKA**

Alaska’s many health challenges require a significant base of excellent health and biomedical research within the state. Alaska’s overall health research infrastructure has improved greatly in recent years, although there is still much room to significantly strengthen and expand infrastructure.

Our fundamental strategy for growth is to enhance existing strengths and to use them as points of departure for new initiatives. The goal for Alaska is to develop broad, interactive, self-sustaining programs of major intellectual stature that utilize the special situations, people, and natural research models in Alaska. By carefully framing the research agenda, Alaskans can address research priorities that are highly important to its people.

Alaska has many excellent health and biomedical research scientists. The research community in Alaska includes state and federal agencies, the University of Alaska, and health delivery organizations such as hospitals, clinics, and Alaska Native health corporations. Collaborations among the research groups within the state and outside researchers are already common practice and are increasing.

Future health and biomedical research should be built at the intersections of existing areas of expertise. The aim should be to strengthen the interactive network among competitively-funded researchers at the University of Alaska and federal, state, and non-profit entities. This document begins with a review of the existing research units, proceeds to a synopsis of representative ongoing research projects, and finally focuses upon specific themes which are the priorities for expansion of Alaska’s health and biomedical research efforts.

One way federal agencies develop capacity in a particular field is to fund a center of excellence. Alaska does not currently have any centers of excellence focused solely on research, according to a study conducted by the Alaska Center for Rural Health. The study concluded there are over 20

*Healthy Alaskans 2010*, recently published by the State of Alaska, provides an excellent roadmap for the state to use in charting its future course in meeting state research and education needs.
such centers across the U.S. that serve Alaska or relate to issues of unique importance to the state.

In many ways it is understandable that Alaska’s health research infrastructure is not mature enough to compete for these centers. Center of excellence require a certain corpus of expertise to build upon. However, it is also true that, under this system, it is difficult to get unique issues of the state and its population addressed.

Alaska did receive its first health-related Center this year. The Department of Health and Human Services, Administration on Aging awarded the University of Alaska Anchorage a National Resource Center for American Indians, Alaska Natives and Native Hawaiian Elders.

In future years it will be important to compete for additional centers as a way to build capacity.

*Healthy Alaskans 2010,* recently published by the State of Alaska, provides an excellent roadmap for the state to use in charting its future course in meeting state research and education needs. The University of Alaska is committed to a long-term strategy to improve its capability in health and biomedical research and evaluation. Alaska is in an exciting phase: witnessing rapid expansion and improvement in health and biomedical research capacity.

The general challenge faced in Alaska is no different than that faced by many other states. If a vibrant health and biomedical research community is to be built that serves both as a vehicle for training students and as a means to address specific local research needs and opportunities, efforts must focus on a finite set of priority research targets.

Since resources are limited, investment needs to be selective. As individual research targets are chosen, the broad objective of creating greater biomedical capacity and intellectual capital in Alaska for Alaskans must remain a consideration so that infrastructure built for single projects can leverage proposals for funding of the next generation of research. The research themes need to be relevant to Alaska, and projects need to be of appropriate scale and sophistication. They need to utilize state-of-the-art technologies and concepts, and also be congruent with national priorities in order to win federal funding on a consistent basis.

**THE AIM OF THE REPORT**

This document aims to provide a guide to the health-related issues facing the state, the organizations providing leadership, expertise, and advocacy in certain areas; an overview of current and recent research conducted relating to those issues, and recommendations for future investments in Alaska’s health research system.

There is a chapter for each of the nine themes. The report concludes with a discussion of areas of focus for future health investments. In reading this report, be inspired by the dedication of those involved in the provision of health services and what they have accomplished thus far, and be moved to work with the health community to address the remaining challenges facing Alaska.
Overall Recommendations

The aim of this report is to document the current state of Alaska’s health as well as its current capacity for and the ongoing state of biomedical and health-related research. In the course of noting where the state stands, it also becomes clear where there is a need for additional investments and a need to strengthen and improve Alaska’s research efforts. While each chapter documents specific needs, we believe this report has made the case for why the following five overarching focus areas are vital to improving the health of Alaskans.

Why should Alaskans care about research? In addition to its role in learning and knowledge, research has great practical importance in two other ways.

First, it is an economically significant industry in its own right. Today the University of Alaska conducts over $133 million worth of sponsored research annually, leveraging state funds invested in university research by a ratio of 7:1. Today, over a thousand jobs can be directly tied to research. Growth of the health research enterprise means attracting talent from around the world to the state, an improved ability to “grow our own” and to keep Alaska’s best and brightest in the state.

Secondly, research can enhance the way we do business and can improve the health status of our citizens.

The research enterprise in Alaska depends on federal and state support. While federal funders demand scientific excellence, state leaders have a slightly different focus. In order to justify state investments in research, leaders need to understand how research is addressing real problems facing its citizenry. Currently, the state of Alaska invests very little in health research. It is incumbent on the health research community to communicate with state leaders about the value of current and new research. As the research community gains the ability to better articulate how research meets state needs, it might also attract foundations and other private support.

THE CONDUCT OF RESEARCH

With good reason, human subjects research is highly regulated. Moreover, Alaska-based researchers have a responsibility to go beyond the basic federal requirements when conducting research. An extremely important partner in health research is the Alaska Native community. Many, if not all, tribal organizations have instituted their own institutional review and intellectual property procedures. The U.S. Interagency Arctic Research Policy Committee approved a set of “Principles for the Conduct of Research in the Arctic” in 1990 and there exists the recent “Code of Research Ethics” drafted by the Alaska Native Science Commission.

It is essential for researchers working with this population to understand and embrace these guidelines in order to create a climate of trust for researchers to develop and flourish. It is equally essential for sponsors of research to understand that the pace of research may be necessarily slowed by adhering to these principles.
PARTNERSHIPS

A successful state research enterprise depends on the pooling of expertise and approaches across many projects addressing applied and basic scientific questions. With limited resources in a state with a small population, it makes sense for members of the research community to be mutually supportive. For instance, while the University of Alaska does not have its own medical school with clinical departments which deliver medical services, it has expertise in many areas such as genomics, biochemistry, molecular biology, physiology, and bioinformatics. The Alaska Tribal Health Consortium and tribal health organizations have research and clinical expertise. The Arctic Investigations Program of the Centers for Disease Control and the relevant state departments have the ability to surveil and assess for diseases and conditions and to analyze that information. The National Institute for Occupational Safety and Health (NIOSH) and other agencies have expertise in injury control.

Universities across the world are being funded to do research with Alaska’s people and its resources and this will always be the case. This is a desirable situation when it adds to a body of knowledge and the research is performed responsibly. But it is also desirable to build a core research capacity that is in-state and that can guide sponsors in the development of relevant research agendas. To be truthful, reliance on mostly an “import” model of research has led to a fragmented approach at best to unique problems in Alaska.

Throughout this document there are examples of growing research partnerships that are Alaska-based. Networks which connect research institutions are being deployed.

Scientific workshops which delve into areas of study, or discuss research findings should be encouraged, especially when they draw on the talents of academic experts, traditional or local knowledge, and develop Alaska-based expertise.

RESEARCH INFRASTRUCTURE

Health and biomedical research in the 21st century require investment in a range of disciplines, including biochemistry, genetics, genomics, proteonomics, molecular biology, systems biology, and bioinformatics, and the applications of these disciplines to basic science areas like physiology, microbiology, and immunology. For both basic and clinical research, Alaska requires sophisticated instrumentation, properly serviced laboratories, large computational capacity, and broad-band connectivity between sites in Alaska and to the rest of the world.

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1 Since 1971, the University of Alaska has been a partner in the WWAMI program, a multi-state educational effort to offer the first year of medical school to students at Washington State, University of Wyoming, University of Alaska, Montana State University, and University of Idaho. Largely because of the establishment of WWAMI, the number of Alaskans accepted into the University of Washington Medical School increased nine-fold between 1971 and 1988.
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Modern laboratory space is at a premium in Alaska. Between 1985 and 2004, no new biomedical research laboratory buildings were constructed at the University of Alaska. The need was partially addressed in 2004 by the addition of two modest laboratory buildings, the West Ridge Research Building (WRRB) in Fairbanks and the Ecosystems Biomedical Laboratory (EBL) in Anchorage, partially financed by state supported bond issues. Over $4 million from federal infrastructure grants provided instruments for these laboratories, and now many of the recently recruited scientists are able to pursue genetic and biomedical research with the latest techniques for molecular and cellular biology. The facility in Fairbanks houses not only wet bench biological space but also the Arctic Region Supercomputing Center and thus proximity favors expansion of partnerships between biologists and computational scientists. The hardware for broad-band connectivity for the university and between the university and the native health-CDC campus in Anchorage has been augmented with additional federal funding. However, much is left to be done. The immediate needs include:

- Modern animal quarters for physiology, biochemistry, pharmacological and behavioral research in Fairbanks and Anchorage. The next stage of construction in Fairbanks will alleviate some of these needs, but provision of a comparable facility in Anchorage is much needed and programmed for well in the future.

- Containment laboratories for research on infectious agents such as West Nile virus, influenza virus and others is being planned at the UAF campus, adjacent to the new animal facility. It may be that a new state virology public health laboratory will be constructed so that state diagnostic activities and university microbiology research can stimulate and complement one another.

- Student training at the undergraduate and graduate level requires exposure to research and involvement in research projects. The proposed Integrated Science Facilities at UAA and the Biological and Computational Science building at UAF are planned to provide classrooms and teaching laboratories close to research laboratories and thus will facilitate the involvement of students in the discovery of new knowledge at the same time and in the same site when and where they take coursework in the fundamentals of science.

- Broad-band connectivity and fast internet switches and other hardware advances spiral upward each year. Without repeated investments, year after year, in information technology hardware, software, and staff support, Alaska will run the risk of falling behind and missing out on opportunities to be at the forefront of biomedical research. The connectivity already present within the University needs to be extended to the rest of the health research community in Alaska and these research networks must be coupled efficiently with Alaska’s telemedicine infrastructure and with the national grid.
Expansion of the doctoral level biomedical research at UAF, parallel growth of research activities at UAA, and growth of research in the health delivery organizations will require federal competitive grants for support of the many basic science and clinical projects, and state funding for local applications of research technologies. The synergies of federal, state, and foundation support should allow us to keep begin to catch up with the need. With Alaska’s increases in its research capacity and the removal of its barriers to conducting research, comes enhanced competitiveness for merit reviewed grants. As Alaska’s health and biomedical research community grows in stature, it will continually become more self-sustaining. But unless we marshal local resources to jump start the priority health research capacity, we cannot regularly win federal grants.

ADVANCED GRADUATE AND PROFESSIONAL EDUCATION PROGRAM

It is critical for Alaskans that we have an in-state capacity to educate and train our citizens for health research and health delivery. We should build this educational enterprise with tight coordination to the research enterprise. Our premier research scientists will often also be our lead educators for graduate education and for training of the next generations of health researchers and health delivery professionals. It is important that we choose carefully our areas for advanced training and instruction so that they are appropriate for local talent and needs and are appropriate for a predominately rural state with a population of scarcely 600,000 people.

Since our resources are finite, we must restrict major investments to those sites where intellectual critical mass can be built. In turn, the critical mass of researchers must have the ability to become self-sustaining through repeated successful awards from federal competitive, merit-based grants. Since an intellectual community of sufficient size and an academic community with a fairly mature research culture are prerequisites, we believe that the development of advanced graduate programs at the doctoral level should emphasize leadership from the doctoral university campus in Fairbanks and include significant involvement of talented faculty and students at the urban campus in Anchorage. Representative themes and programs which should be priorities for further investments in graduate education include the following:

- **Biochemistry and molecular biology:** A doctoral program exists at UAF and its members include faculty from UAA.
- **Psychology:** A doctoral program which involves faculty participation from UAF and UAA has been proposed and its planning is proceeding.
- **Physiology:** The doctoral program at UAF, which is almost a half-century old, has recently undergone marked expansion and has strong collaborating faculty at UAA.
- **Bioinformatics and systems biology:** This program will involve faculty from biochemistry, biology, and computational sciences and...
could utilize the facilities at the Arctic Region Supercomputing Center in Fairbanks.

- **Environmental biomedicine:** Toxicology, epidemiology, and infectious disease research are expanding in Fairbanks and Anchorage and the intellectual community to sustain this thrust includes personnel from the health delivery organizations, state agencies, and the federal CDC facility in Anchorage. Furthermore, these themes build upon the well-developed ecology research and databases present in the University and elsewhere in Alaska.

- **Public health:** Full time faculty have been hired to deliver an academically strong Masters in Public Health to mid career students.

- **Nursing:** UA has collaborated with Oregon Health Sciences University to create doctoral education offerings for Alaskan students.

## THE NIH ROADMAP AND THE ALASKA RESEARCH

The U.S. National Institutes of Health has embarked on an innovative program to accelerate biomedical research and its application to treatment of disease. Alaska is engaged in a parallel congruent effort. The NIH initiatives are in three broad areas: discovery of new knowledge, facilitating partnerships in research, and accelerating clinical research. Likewise in Alaska, as this report highlights, we are strengthening our research infrastructure statewide, emphasizing partnerships that span across the state and among the many health-related institutions, and encouraging the applications of research to the unique context in Alaska and the needs of all Alaskans.

The NIH Roadmap originated from broad consultations with scientists, health care providers, and the public. The vision developed by identifying today’s scientific challenges, roadblocks to progress, and investments to overcome roadblocks. Priority areas were identified and refined in further inclusive discussions. As specific initiatives for actions were conceived, working groups were created for systematic planning and these led to implementation groups and the investment of resources.

By convergence rather than imitation, Alaska’s health planning which grew out of Senate Joint Resolution 44 has paralleled elements of the NIH process. Like NIH, Alaska has identified scientific themes, technologies, and other resources to allow new discovery. Alaskans have accelerated the creation of partnerships among the stakeholders, with emphasis upon government agencies (state, federal, and local), the university, the health providers, and non-profit entities. As new initiatives and partnerships develop, researchers remain mindful of encouraging wide community participation in continuing planning and in the implementation of the plan so that the enterprise develops knowledge and also translates it into Alaskan applications. Finally, Alaska is striving to fit our state priorities into national ones so that Alaska’s research community can be a full partner in the major health research programs supported by the National Institutes of Health.
Alaska faces many health challenges that require a significant base of excellent biomedical research in the state. Alaska’s overall research infrastructure for biomedicine needs to be significantly strengthened and expanded. The research projects of Alaska’s scientists and physicians need to be focused on the needs and opportunities of the state.

Alaska’s instate research excellence should become the foundation of education and training for careers in health and biomedicine. Alaskans require local access to modern biomedical and health research to address the urgent health needs in Alaska, to explore broad biomedical questions best studied in Alaskan environments, and to infuse 21st century concepts and technologies into students’ curricula in schools, colleges and postgraduate studies.

The fundamental strategy is to enhance existing strengths and to use them as points of departure for new initiatives. The goal for Alaska is to develop broad, interactive, self-sustaining programs of major intellectual stature that utilize the special situations, people, and natural biomedical research models in Alaska. By carefully framing their research questions, Alaskans can address research priorities that are highly important to Alaska, the nation, and the world and become part of the national agenda for biomedical research funding.

Alaska has excellent biomedical research scientists. Collaborations among the research groups within the state are already common practice. The biomedical research community in Alaska includes state and federal agencies, the University of Alaska, and health delivery organizations such as...
as hospitals, clinics, and Alaska Native health corporations. Further development of Alaska’s health and biomedical research should be built at the intersections of existing areas of expertise. The aim should be to strengthen the interactive network among competitively-funded researchers at the University of Alaska (UA) and federal, state, and non-profit entities.

This research plan for biomedicine begins with a review of the existing research units, proceeds to a synopsis of representative ongoing research projects, and finally focuses upon specific themes which are the priorities for expansion of Alaska’s biomedical research efforts.

**Biomedical Research Expertise in Alaska**

**GOVERNMENT AGENCIES**

**The Arctic Investigations Program of the CDC**

The Arctic Investigations Program (AIP), located on the Alaska Native Health Center campus in Anchorage, is a division of the federal Centers for Disease Control and Prevention (CDC). AIP is a descendant of the federal Arctic Health Research Center, founded in 1948. For the past half century, this U.S. Public Health Service group has worked closely with the Indian Health Service and the Alaska Native Health Center and, since 1997, the Alaska Native Tribal Health Consortium. In addition, AIP has research partnerships with agencies, hospitals, and universities, both in Alaska and across the nation.

**Alaska Department of Health and Social Services**

The Alaska Public Health Laboratories and the Section on Epidemiology are part of the state Department of Health and Social Services. These units have the prime responsibility for identifying disease-causing agents and providing timely information on the spread of communicable diseases. These units are charged with surveillance, outbreak investigation, and monitoring for the emergence of new infectious agents. The newly constructed Anchorage diagnostic Public Health Laboratory provides services in serology, parasitology, bacteriology, and mycology. The Fairbanks unit offers viral
diagnostic services including those for HIV, hepatitis, adenoviruses, rabies, rubella, herpes, rabies, influenza, and arthropod-borne viruses.

**ORGANIZATIONS DELIVERING HEALTH AND MEDICAL SERVICES**

**The Alaska Native Tribal Health Consortium**

The Alaska Native Tribal Health Consortium (ANTHC) is an independent non-profit organization that manages the statewide health services for Alaska Natives. Its governing board includes members from all 12 regional tribal corporations and two additional members from the larger villages. ANTHC recently received funding for a Native American Research Center for Health (NARCH) through the National Institute of General Medical Science (NIGMS) and the Indian Health Service (IHS).

**The Alaska Native Health Board/Alaska Native Epidemiology Center**

The Alaska Native Health Board (ANHB), established in 1968, is recognized as the statewide voice on Alaska Native health issues. ANHB is a 22-member board, with representation from Alaska’s Native regional health organizations and independent tribal public Law 93-638 compactors/contractors. The Health Directors of the regional health organizations serve as technical advisors to ANHB. The Alaska Native Epidemiology Center (the EpiCenter) was initiated in 1996 to improve the health of Alaska Natives by coordinating, collecting, analyzing, and disseminating timely, accurate, and essential epidemiological data to Alaska tribal health organizations.

**The Southcentral Foundation**

The Southcentral Foundation is a non-profit corporation formed under the authority of the Cook Inlet Region Native Corporation. Southcentral and ANTHC co-manage the Alaska Native Medical Center in Anchorage. Research projects of Southcentral include a prospective study of chronic disease in Alaska Natives and clinical programs on breast cancer.

Southcentral Foundation is a study site for a longitudinal study of American Indians and Alaska Natives funded by the National Cancer Institute. This prospective study is designed to determine how diet, physical activity, and other lifestyle and cultural factors relate to the development and progression of chronic diseases such as cancer, cardiovascular diseases, stroke, diabetes, chronic lung diseases, and age at time of death in a cohort of American Indians and Alaska Natives. Within the context of the cohort Southcentral Foundation researchers will evaluate how age of onset of
Over the past 50 years, UA has developed vigorous and diverse research in many disciplines important to Alaskans. Obesity, body fat pattern, and diabetes are related to the development of chronic diseases. Southcentral Foundation researchers also evaluate how diet, activity and lifestyle patterns relate to obesity, waist-to-hip ratio, diabetes, and age at onset of diabetes.

**Providence Alaska Medical Center**

Providence Alaska Medical Center is the largest hospital in Alaska and provides the most advanced medical equipment and treatment systems. At its main location in Anchorage, there are clinical centers for cancer, heart research, diabetes and nutrition, sleep disorders, and a children’s hospital. Providence Hospital sponsors and provides the link between the University of Washington School of Medicine and UA through Alaska’s Family Practice Residency Program, the only graduate medical education program in the state.

**Alaska Native Medical Center**

The Alaska Native Medical Center hospital is located in Anchorage on the Alaska Native Health Campus. It is managed by the Alaska Native Tribal Health Consortium and the Southcentral Foundation.

**Yukon Kuskokwim Health Corporation**

The Yukon Kuskokwim Health Corporation’s (YKHC) mission is focused on the health status of the people of the Yukon Kuskokwim Delta Region of Alaska. Its services include emergency care, family medicine, behavioral health, dental and optical care, as well as education and prevention programs.

**THE UNIVERSITY OF ALASKA**

The University of Alaska originated in Fairbanks as Alaska College of Agriculture and Mining in 1917. Over the past 50 years, UA has developed vigorous and diverse research in many disciplines important to Alaskans. The University of Alaska Fairbanks (UAF) established formal organized research institutes and doctoral programs a half century ago, and UAF remains the only UA campus with doctoral programs. UA investigators are...
Biomedical Research

nationally competitive for federal research funding, and most of that extramural research funding is focused through the research institutes at UAF. Biomedical research was one of the early priorities at UA in Fairbanks when the University became seriously involved in research after World War II. However, for the past several decades, biomedical research has been eclipsed by geophysics, oceanography, and ecosystem sciences. In addition, neither the Fairbanks campus nor the younger Anchorage campus created a professional school for medicine, dentistry, pharmacy, or veterinary medicine, and development of research infrastructure for biomedical disciplines has lagged behind that in physical or environmental sciences.

The leading source of grants for biomedical research in the United States is the National Institutes of Health (NIH). The NIH “R01 research grants” are awarded only after competitive merit reviews of proposals written by investigators. Competitive R01 independent investigator research grants from NIH are generally accepted as the “gold standard” that reflects the quality of biomedicine research programs. In comparison with other state universities, in 1999 UA ranked last in the nation in NIH R01 funding.

Since 1999, health and biomedical research and its supporting infrastructure have undergone something of a renaissance at UA. This new growth followed submission of proposals from UA faculty to NIH, which won competitive awards that provided partial funding for new faculty positions in Fairbanks and Anchorage. New buildings, constructed for biomedical researchers, are filled to capacity as soon as they are completed, and more facilities are in the planning stages to meet the rapidly growing needs of these recently-started and continuing research programs.

University of Alaska Fairbanks

In the early 1960s, the Institute of Arctic Biology (IAB) and the Institute of Marine Science (IMS) were created at UAF by the Alaska State Legislature. IAB was established to conduct research on the adaptations of organisms, including humans, to life in arctic and sub-arctic regions. The founding scientists of IAB included physiologists with research interests in metabolism and adaptations to cold in humans and other mammals. IMS had parallel programs in marine mammal physiology. These programs were complemented by the federal Arctic Health Research Center on the Fairbanks campus.

Brian Barnes, Ph.D., Director of the Institute for Arctic Biology, furthers his research on hibernation at the Toolik Field Station.
In 1967, the Arctic Health Research Center was constructed on the west ridge of the Fairbanks campus to house a federal Arctic Health Research Center. The Center’s research was directed toward infectious and non-infectious diseases of significance to Alaska Natives including mumps, pneumonia, cardiovascular diseases, hereditary diseases, parasites, and anemia. In parallel, IAB faculty launched a strong program in zoonotic diseases (diseases affecting wildlife and people). IAB researchers won an NIH graduate research training grant for biomedical research, and serious consideration was given to establishing a medical school in Fairbanks. Instead, in 1971 UA became a partner in the newly established WAMI program, a multi-state educational effort to offer the first year of medical school to students at Washington State University, University of Alaska, University of Idaho, and Montana State University. Largely because of the establishment of WAMI, the number of Alaskans accepted into the University of Washington Medical School increased nine-fold between 1971 and 1988.

In spite of this auspicious start, biomedical research at UA did not grow to be self-sufficient through competitive research grants in the next decades. The Alaska Health Research Center was closed in the early 1970s. IAB concentrated mostly on ecosystem and wildlife biology research. The Alaska component of the WAMI medical education program at UAF was closed in 1987 and reopened at UAA in 1989.

The rebuilding of biomedical research at UAF began with new physiology hires and with the creation of the interdepartmental Biochemistry and Molecular Biology (BMB) Program in 1990. The BMB interdepartmental program supports training for doctoral students and includes faculty who explore basic life sciences, from protein chemistry to paralytic shellfish poisoning. In 1994, IAB established a Core facility for DNA sequencing and genetic analyses of animals, plants, and microorganisms. The physiology faculty have become strong in studies of seasonality, metabolism, neuroscience, respiratory physiology, and hibernation physiology. IAB has come to assume the leadership role in promoting biomedical research at UA.

In 2003, the genetics and physiology programs at UAF were augmented by the establishment of a bioinformatics program which utilized the Arctic Region Supercomputing Center for analyses of biological data.

**University of Alaska Anchorage**

The University of Alaska Anchorage was formed in 1987 by the amalgamation of a pre-existing four year state college and a community college. Two years later in 1989, UAA became the new Alaska site for the WWAMI (the multi-state program now included the University of Wyoming), and first year medical education for Alaskans remains a responsibility of the University’s Anchorage campus. The College of Health and Social Welfare at UAA trains students for nursing and behavioral health occupations. The Community and Technical College (CTC) educates students in allied health careers. Several recently appointed faculty at
UAA have biomedical research expertise and are beginning to obtain external funding for their research. The Institute for Circumpolar Health Studies at UAA has expertise in health service research which is discussed elsewhere in this State Plan.

**Ongoing Biomedical Research Projects in Alaska**

Alaska’s research scientists in the health delivery organizations, universities, and government laboratories are energetically building a strong state biomedical research enterprise. The fundamental strategy is to work together on shared research priorities. Collaborations are the norm and the several federally-funded programs now underway to build biomedical research and its supporting infrastructure reflect cooperative efforts across the state as well as links to research partners in the continental United States.

**CHRONIC DISEASE RESEARCH**

Diabetes, heart disease, high blood pressure, arthritis and other chronic health problems as well as a number of cancers are serious problems for many Alaskans, as reflected in statistical data collected by the state Section of Epidemiology and the Alaska Native Epidemiology Center on the incidence arthritis, cancer, cardiovascular disease, and diabetes.

**Heart disease, stroke, and diabetes**

Heart disease is the second leading cause of death in Alaska, accounting for 607 deaths or approximately 21% of the state’s deaths in 2000. Stroke is the fourth leading cause of death in the state, accounting for 170 deaths or approximately 6% of the state’s deaths in 2000. The overall rates in Alaska are similar to those in the lower 48 states. Death rates from heart disease in Alaska Natives have been relatively constant over

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**ALASKA NATIVE AND U.S. AGE-ADJUSTED DEATH RATES**


<table>
<thead>
<tr>
<th>Cause of Death</th>
<th>Alaska Natives</th>
<th>U.S. All Races</th>
</tr>
</thead>
<tbody>
<tr>
<td>All causes</td>
<td>740.6</td>
<td>471.7</td>
</tr>
<tr>
<td>Malignant Neoplasms</td>
<td>182.3</td>
<td>123.6</td>
</tr>
<tr>
<td>Heart disease</td>
<td>129.1</td>
<td>126.6</td>
</tr>
<tr>
<td>Unintentional Injuries</td>
<td>101.5</td>
<td>30.1</td>
</tr>
<tr>
<td>Suicide</td>
<td>44.5</td>
<td>10.4</td>
</tr>
<tr>
<td>Alcohol related</td>
<td>54.2</td>
<td>6.1</td>
</tr>
</tbody>
</table>

Source: Alaska Native Tribal Health Consortium, June 2001
the past two decades. According to the Behavioral Risk Factor Surveillance System survey results in 2001, adults in Alaska reported the following major risk factors for heart disease and stroke: high blood pressure (22%); high blood cholesterol (29%); diabetes (4%); tobacco use (26%); and overweight or obese with Body Mass Index greater than or equal to 25 (64%). Among Alaska Natives, the factors of particular concern are tobacco use (42% are current smokers), changes in diet from traditional foods to western foods, rising rates of diabetes, hypertension, and high blood cholesterol.

Diabetes is the seventh leading cause of death in Alaska. Diabetes afflicts about 3% of the adult population; overall, the rates in Alaska are close to the national average. However, the incidence of diabetes has been steadily rising in Native Alaskans over the past 30 years, and this increase is presumed to be linked to greater overweight and obesity and an increasingly sedentary lifestyle.

Five ongoing projects in Alaska illustrate the diversity of research and surveillance efforts in heart disease, diabetes, and stroke:

- The Norton Sound Health Corporation is a partner with the Medstar Research Institute of Washington, DC, as a subcontractor for the Indian Health Service on a project entitled the “Genetics of Coronary Artery Disease in Alaska Natives.” The five-year project, which began in October 2000, is focusing on a family study of 1,200 individuals comprising 40 families of adults and children over the age of 18, primarily from two villages near Nome. The project includes a cardiology center at Cornell Medical School, a genetics center at Southwest Foundation for Biomedical Research, a coagulation laboratory at the University of Vermont, a central laboratory at Medlantic Research Institute, and investigators formerly associated with the University of Alaska.

- WISEWOMAN is a national CDC-funded program that tests the effectiveness of various lifestyle interventions to reduce risks of heart disease and other chronic diseases among uninsured women. WISEWOMAN is a national CDC-funded program that tests the effectiveness of various lifestyle interventions to reduce risks of heart disease and other chronic diseases among uninsured women.

- WISEWOMAN is a national CDC-funded program that tests the effectiveness of various lifestyle interventions to reduce risks of heart disease and other chronic diseases among uninsured women, with an emphasis on chronic disease behavioral risk factors such as physical inactivity and unhealthy diets. In Alaska, two Native health corporations, the Southeast Alaska Regional Health Consortium and the Southcentral Foundation, are funded by the CDC to conduct the WISEWOMAN program. Southcentral Foundation is conducting a randomized trial to determine whether Traditions of the Heart, a 12-week educational intervention, reduces the risk of cardiovascular disease in middle-aged Native women. Over 1,000 Native women have enrolled in Traditions of the Heart to date.

- The Alaska Diabetes Prevention and Control Program, funded by the CDC since 1986, conducts surveillance and collects vital statistics to define the prevalence of diabetes in Alaska. The Program also supports education and community intervention activities.
The Center for Alaska Native Health Research at the University of Alaska conducts research in genetics, dietary choices, nutrition, and behavioral health in relation to obesity, diabetes, and heart disease in Alaska Natives, in partnership with village corporations in southwestern Alaska and the Yukon Kuskokwim Health Corporation. This program will be discussed in more detail below.

The University of Utah is the headquarters for a three-year multi-state project funded by the National Cancer Institute to study the relationship between physical activity and health and disease in Alaska Natives and American Indians. This project, titled Education and Research Toward Health (EARTH), aims to validate a physical activity questionnaire and assess the correlations between physical activity and cancer and other chronic diseases. Enrollment in Alaska will begin in 2004.

Cancer Research

Many clinicians in Alaska, including those at the Alaska Native Medical Center, Providence Hospital, Alaska Regional Hospital, regional Native hospitals, and Fairbanks Memorial Hospital, collect data on the cancer incidence and on associations of cancers with various risk factors, including bacterial and viral infections. In most cases, the specimens are linked to health questionnaires. Much of this information is supplied to the State Section for Epidemiology, and the statistical information on Alaska Natives is collated and analyzed by the Alaska Native Tumor Registry. The cancer data is further reviewed in a context of larger national projects, many of which involve collaborators from the continental United States:

- A project on breast cancer and persistent organic pollutants examines whether pollutant levels are correlated with disease. In the first phase of this project, levels in banked sera did not differ between cases and controls and did not exceed those common across the country. In the second phase, tissues were collected from 200 women. Analyses of the samples are underway at the CDC.

Anne Lanier, M.D., Director of NARCH, reviews data from her cancer research.
Biomedical Research

- Alaska participates in a Mayo Clinic Cancer Center project on colorectal cancer and DNA mismatch repair.

- Alaska Natives are known to have exceedingly high rates of nasopharyngeal cancer, as well as a unique histologic type of salivary gland cancer (malignant lymphoepithelial lesion). Data is being collected on potential genetic and environmental risk factors, including infection with Epstein Barr Virus.

- The association between liver cancer and hepatitis viruses (hepatitis B and more recently hepatitis C) is being actively studied at the Alaska Native Medical Center. The project includes research on transmission, natural history, and biogenetics of these agents, and also prevention of infection and/or treatment of disease sequelae. Since 1982, all Alaska Native children in the state begin a hepatitis B immunization series at birth. All Alaska Natives who are carriers of hepatitis B are tested twice yearly for a tumor marker to identify liver tumors at an early, surgically resectable stage.

- *Helicobacter pylori* is a risk factor for stomach cancer, but not all people infected with the bacteria develop cancer. Almost all Alaska Natives are infected with *H. pylori*, generally by age ten. Studies are being conducted to understand the multiple genetic and environmental risk factors for infection.

- Infections by specific genotypes of human papilloma virus have been associated with cervical cancer in many populations. Alaskan researchers are examining whether similar correlations with particular genotypes of the virus are found in Alaska Natives.

**INFECTIONOUS DISEASE RESEARCH**

Infectious diseases present interesting challenges at the high latitudes of Alaska. Many infectious diseases occur at noticeably higher rates among Alaska Natives. A large portion of the research on infectious diseases in the state is led by the Arctic Investigations Program or involves AIP as a collaborator. The mission of the AIP is to prevent infectious disease morbidity and mortality in people of the Arctic and Subarctic with a special emphasis on diseases of high incidence and concern among Alaska Natives. AIP’s budget is largely from federal CDC sources. AIP partners include other NCID divisions, CDC, the Alaska Native Tribal Health Consortium, the Indian Health Service, the Native Health Corporations, the Alaska Department of Health and Social Services, Health Canada, the University of Alaska and other university partners out-of-state, and the Municipality of Anchorage Department of Health and Human Services.

**Staphylococcus aureus**

*Staphylococcus aureus* is a bacterium commonly found on the skin and in the nose of healthy people. Staphylococci can cause an occasional infection...
which can be minor (such as pimples, boils, and other skin conditions), or which can be serious and sometimes fatal (such as blood infections or pneumonia). The increasing frequency of antimicrobial resistance among infectious organisms is of great concern to both medical providers and the general public because of the possibility of the spread of multi-drug resistant germs through a community. Methicillin resistant *S. aureus* (MRSA) is resistant to all but the highest concentrations of the antibiotic methicillin, and often also to other commonly used antibiotics.

MRSA infections were originally found in hospitals and confined mostly to hospital patients, rising from 2% incidence in the isolates in 1947 to about 40% incidence in 1997. Although infections due to *S. aureus* have long been common among rural Alaskans, antibiotic resistance was not known until recently. Discovery of “community-acquired” MRSA in Alaska, acquired in persons with no exposure to the hospital system has raised concern.

Steam-bathing, a common practice in some regions of rural Alaska, was associated with a large outbreak of MRSA which caused boils in the village of Kotlik in 1984. Anecdotal reports from clinicians and laboratories in rural and urban Alaska indicate that infections due to MRSA are becoming increasingly common and thus present significant therapeutic challenges.

AIP was invited by the Yukon Kuskokwim Health Corporation to conduct an investigation into a large outbreak of community-acquired MRSA infections which occurred in Southwestern Alaska during 1999 and 2000. Over 80% of culture-confirmed *S. aureus* infections during this period were MRSA. In comparison with typical hospital-acquired MRSA, isolates from this outbreak were less likely to be resistant to multiple antimicrobial classes. Patients with MRSA skin infections were more likely to have used antibiotics in the 180 days before their infection than patients with methicillin-susceptible *S. aureus*.

These findings indicate a new epidemiology for MRSA in rural Alaska. Treatment and surveillance were modified accordingly as follows.

- First-line therapy for suspected *S. aureus* infections was changed from beta-lactam antimicrobials.
- Examination of mechanisms by which MRSA produces skin infections and increased surveillance and genotyping of organisms received through public health surveillance from participating hospitals in Alaska and distribution of the resulting data on a public health database of MRSA types found around the U.S. for purposes of comparing regional spread of MRSA types and outbreak detection.
- Determining the frequency of MRSA nasal carriage in Alaska and the risk of subsequent MRSA infections among healthy persons colonized by MRSA.

**Helicobactor pylori**

Infection with *Helicobactor pylori* is common in the United States. *H. pylori* causes ulcers and gastritis, and infected persons also have an
increased risk of developing mucosa-associated lymphoid tissue lymphoma and gastric cancer.

Attention was focused on *H. pylori* among Alaska Natives when it was discovered that anemia caused by blood loss in the stool appeared to be associated with *H. pylori*. High rates of iron deficiency anemia had been observed among Alaska Natives dating back to the 1950s, when they were the focus of research at the Alaska Medical Research Center in Fairbanks. Anemia persisted despite adequate intake of nutrients offering optimum iron nutrition.

An association between anemia and *H. pylori* infection was suspected. In 1997, a CDC research team working with 140 Yupiks in Southwestern Alaska found that 99% of those with increased fecal blood loss had chronic active gastritis caused by *H. pylori*. To determine the prevalence of *H. pylori* in Alaska Natives, the CDC analyzed over 2,000 samples of serum collected in the 1980s from Alaska Native communities. Rates increased from 32% among 0 to 4 year olds and up to 86% in those 20 years or older. There was also an association between *H. pylori* infection and iron deficiency, especially in those under 20 years of age.

The AIP now coordinates laboratory-based surveillance for *H. pylori* infections in Alaska Natives through four regional hospitals and two tertiary care centers. The data show that *H. pylori* infections are more common among Alaska Natives than non-Natives and more common among rural compared with urban Alaska Native and non-Native residents. A high proportion of *H. pylori* isolates recovered from Alaska Native patients are resistant to commonly used antibiotics in this population. After treatment with antibiotics, 23% of Alaska Natives living in Anchorage become reinfected, and often the responsible bacteria are antibiotic resistant.

**Respiratory Syncytial Virus (RSV)**

The mortality from pneumonia for Native American infants is twice that of infants in the general U.S. population. Respiratory Syncytial Virus (RSV) is the most common cause of serious respiratory infections in infants and young children. The AIP now coordinates laboratory-based surveillance for *H. pylori* infections in Alaska Natives through four regional hospitals and two tertiary care centers. The data show that *H. pylori* infections are more common among Alaska Natives than non-Natives and more common among rural compared with urban Alaska Native and non-Native residents. A high proportion of *H. pylori* isolates recovered from Alaska Native patients are resistant to commonly used antibiotics in this population. After treatment with antibiotics, 23% of Alaska Natives living in Anchorage become reinfected, and often the responsible bacteria are antibiotic resistant.

**Respiratory Syncytial Virus (RSV)**

The mortality from pneumonia for Native American infants is twice that of infants in the general U.S. population. Respiratory Syncytial Virus (RSV) is the most common cause of serious respiratory infections in infants and young children. Active RSV surveillance in Southwest Alaska between 1993-96 showed a hospitalization rate of 156 per 1,000 infants under one year of age; this far exceeds U.S. reported rates.

In Alaska, RSV infection is a major cause of hospitalization for Native infants and often leads to infectious lung disease, including pneumonia and bronchiolitis. Rural Alaska Native children are at high risk of chronic lung disease including bronchiectasis, wheezing, and cough. The relationship between severe RSV illnesses in infancy and such chronic diseases has not been determined. In Southwest Alaska, ongoing surveillance is being used to determine trends in seasonality, severity, and rate of RSV hospitalizations; to correlate the effects of RSV infection in infancy with health later in childhood, and evaluate interventions. The Arctic Investigations Program and Native Health corporations are considering studies on the efficacy of candidate RSV vaccines or new monoclonal antibody products.
**Viral Hepatitis**

The mission of the Viral Hepatitis Program, a joint effort of the AIP and the Alaska Native Medical Center, is to investigate the natural history, prevention, and treatment of viral hepatitis and liver cancer in Alaska Native and American Indian population. Analysis of the genetics of the hepatitis B virus is ongoing—examining the disease as it occurs in different patients and regions of Alaska—with a view to correlating the genotype of the virus with the symptoms at clinical presentation and the course of the disease caused by all three major strains of hepatitis. In conjunction with the state Department of Health and Social Services, ANMC and AIP are continuing a long-term project to determine the longevity of the protection offered by a hepatitis vaccine administered to infants. Since the 1980s, the Viral Hepatitis Program has been recognized internationally for its community focus on viral hepatitis, including both epidemiological studies and numerous human vaccine efficacy trials. The program now has a state-of-the-art molecular biology laboratory at ANMC.

**NEW FEDERAL PROGRAMS TO STRENGTHEN RESEARCH CULTURE**

Research opportunities and capacities differ markedly in the various states of the United States. States like California or Massachusetts, with large patient populations and strong health and biomedical universities, receive billions of dollars from the NIH each year for biomedical research. States with low population lack a large critical mass of patients, have relatively few federal and state laboratories, few clinical research centers, and relatively small biomedical teaching and research programs in their colleges and universities. The NIH budget is about $27 billion per year. In 2000, Alaska was last among the 50 states in NIH research funding per capita. Alaskans are now addressing this significant biomedical research disparity.

In recent years, national concerns about scientific inequities and health disparities among states gave rise to new infrastructure building programs. Alaska is now eligible to apply for Institutional Development Awards (IDeA) for the NIH National Center for Research Resources (NCRR) and also for basic science support from the National Science Foundation (NSF-EPSCoR). For the targeted states, these programs build the research culture.

Brian McMahon, M.D., Director of the Hepatitis and Liver Disease Program at ANMC, reviews patient data as part of his research on viral hepatitis.
and infrastructure by strengthening selected areas of research which are particularly relevant to the state. The intent is that scientists in each biomedical discipline will subsequently become able to sustain their research programs by competing successfully for research funding. To build to that level, the NCRR and EPSCoR required each state to submit separate proposals to each program. State programs were funded only if their proposals had passed competitive peer-review.

In 2000 and 2001, Alaska won four competitive infrastructure-building awards from the NIH and one from NSF:

1. The Center of Biomedical Research Excellence (COBRE) grant was awarded in 2001 by the NCRR. The grant supports a Center for Alaska Native Health Research (CANHR) at the University of Alaska. CANHR is focused on health disparities involving Alaska Natives. CANHR utilizes genetics, epidemiology, and behavioral medicine for studies of body weight, nutrition, diabetes, and related health disparities such as heart disease in Alaska Natives. CANHR is based on a partnership between the University and Alaska Native health groups (ANTHC, the Yukon-Kuskokwim Health Corporation, and the Southcentral Foundation).

2. The Biomedical Research Infrastructure Network (BRIN) was created in 2001 by NCRR to promote state-based networks for biomedical research and training. The Alaska BRIN concentrated on developing research expertise at the interface of animal health and human health. BRIN is hiring faculty in molecular toxicology in order to assess the ways that environmental contaminants act on DNA and proteins and its successor program, named the IDeA Network for Biomedical Research Excellence (INBRE), will build research expertise in infectious diseases that affect both animals and people. The emphasis is on subsistence food species that may concentrate heavy metals, persistent organic pollutants, or other poisons. This research complements the contaminant monitoring projects that have been underway for years in various state departments such as Health and Social Services, Fish and Game, and Environmental Conservation, and the infectious disease research at the Arctic Investigations Program of the CDC in Anchorage.

3. The Alaska Specialized Neuroscience Research Program (SNRP) was funded jointly in 2000 by the NCRR and the National Institute for Neurological Diseases and Stroke. It aims to build the research programs of young researchers at UAF who study molecular and biochemical mechanisms used by brain cells to protect from damage.
The investigators use unique Alaskan biomedical model animals with research questions that concentrate on seasonal rhythms, thermoregulation, and hibernation. Each of the participants has a collaborative project with a more-experienced research mentor at a top-tier university in the Lower 48.

4. The Alaska Native American Research Center for Health (NARCH) is coordinated at ANTHC and includes researchers at Alaska Native hospitals in Alaska. It is funded by the National Institute for General Medical Sciences and the Indian Health Service with additional support from the CDC Arctic Investigations Program (both budgetary and personnel time). The objective of the national NARCH program is to develop centers to link Native American communities with organizations that conduct health research. The emphasis of Alaska NARCH is on disabilities in children, the use of telemedicine, disease prevention and prevalence, maternal nutrition, and dietary assessments.

5. The Experimental Program to Stimulate Competitive Research (EPSCoR) is co-funded by the NSF and the state of Alaska. The purpose of EPSCoR is to transform strong areas of science into excellent ones that sustain themselves by consistently winning funding from NSF competitive panels. The first EPSCoR award to UA in 2001 emphasized engineering, physiology, and genomics. With the help of EPSCoR funding, the DNA Core Facility was transformed by the addition of new DNA sequencers, robots, scanners, and other analytical instruments. EPSCoR has allowed an infusion of new talent in molecular genetics, physiology, microbiology, and bioinformatics.

Candidate Themes for Biomedical Research Priority in Alaska, 2004-2009

Biomedical research includes a wide spectrum from basic biochemistry in a research laboratory to evaluations of specific treatments for disease in clinical settings. In every state of the Union, the foci of biomedical research projects are driven by both long and short-term needs as well as the art of the possible for the time and place. For the long-term, broad ranging projects are envisioned such as a study of the physical chemistry of DNA to better design for new pharmaceuticals. For the short-term, the focus must be on more tractable studies, such as methodologies that permit evaluation of alternative protocols for clinical testing and diagnoses. This improvement would allow quick and reliable detection of infectious disease epidemics when people stream into hospital emergency rooms. Whether the research site is an isolated health delivery station or a modern, metropolitan, research medical center, the research pursued must be relevant and appropriate for each place. The premise is that commitment to research at every appropriate site enriches education and service delivery as well as providing needed answers to specific research questions.

FIVE PRIORITIES FOR EXPANDED EFFORTS IN BIOMEDICAL RESEARCH IN ALASKA

1. Infectious Disease
2. Chronic Disease
3. Environmental Health and Toxicology
4. The Molecular Basis of Hibernation in mammals and its applications to novel human therapeutics
5. Bioinformatics and Systems Biology
The general challenge faced in Alaska is no different than that faced by many other states. If a vibrant biomedical research community is to be built that serves both as a vehicle for training students and as a means to address specific local research needs and opportunities, efforts must focus on a finite set of priority research targets. Since resources are limited, investment needs to be selective. As individual research targets are chosen, the broad objective of creating greater biomedical capacity and intellectual capital in Alaska for Alaskans must remain a consideration so that infrastructure built for single projects can leverage proposals for funding of the next generation of research. The research themes need to be relevant to Alaska and projects need to be of appropriate scale and sophistication. They need to utilize state-of-the-art technologies and concepts, and also be congruent with national priorities in order to win federal funding on a consistent basis.

From discussions with many people across Alaska over the past two years, five overarching biomedical research areas have emerged as unifying themes. The three principal sectors involved in this research are the University of Alaska, state and federal agencies, and the health delivery community—Alaska Native, public and private.

The five themes suggested are listed in order of convenience. No rank ordering is intended. However, it is hoped that these themes and their further refinement will help Alaskans to come together and develop coherent action plans. The list is intended to provide guidance for defined specific research objectives. It also helps as fundamental capacities in genomics, biochemistry, physiology, microbiology, epidemiology, and bioinformatics are enlarged. The list can guide other fundamental science, which forms the underpinnings for modern biomedical research excellence.

Each of the themes utilizes existing expertise the University of Alaska, state and federal agencies, or the health delivery community. Each origi-
nates from Alaska’s unique resources and challenges, and each addresses both state and national biomedical priorities.

The target research themes are intended as neither exclusive nor exhaustive. They reflect an effort to be pragmatic in setting intermediate-term goals—exploiting Alaskan talent, emerging capacity, and current funding opportunities. A specific research plan devised at one point in time cannot respond to all Alaska’s needs and opportunities in the future or even in the present.

These biomedical research priorities complement other health research priorities, such as those for behavioral health and health service research, which are also integral to the SJR 44 effort to plan for health research in Alaska. It should be emphasized that all five of these biomedical themes are grounded in the technologies of molecular genomics and molecular medicine and use the analytical power of computational science and bioinformatics.

**Biomedical research and Alaska Native health disparities**

Research on health disparities includes work from wet-bench genetics and biochemistry as well as research in clinical settings. Because of its importance to Alaska, biomedical research on health disparities of Native and non-Native Alaskans is discussed in expanded form in a separate chapter of this report. New knowledge from basic and clinic research is closely linked to patient education, health policy for state and federal governments, and health service research. Through the broad-based health and biomedical community across Alaska, the intention is to facilitate the use of the latest medical approaches to a uniquely Alaskan context and the unique patient population. Since Alaska is small in population and our state research facilities are finite, many of the new answers to questions about clinical treatments for Alaskans may be suggested by research in Outside laboratories. Alaskans, working together, can strive to gain new insights that specifically benefit Alaskans by application and evaluation of both new protocols developed elsewhere and our own research results in Alaska settings for Alaska patient populations.

Alaska Native health disparities have an enormous impact on research objectives in the biomedical field and in many different areas of health. Because of their importance to Alaskans and because health disparities cut across many areas of health research, discussion of Alaska Native biomedical research disparities is contained in the Health Disparities section.

**INFECTIONOUS DISEASE**

Alaskan Natives were probably not infected with tuberculosis until it was first brought to Alaska by Russian whalers and fur traders, then repeatedly reintroduced by others including European explorers, Chinese cannery workers, and adventurers in search of gold. In part because *Mycobacterium tuberculosis* and other infectious agents decimated many Native villages, research and surveillance for infectious agents have became a major continuing interest here. The distinguished research
In 1958, AIP began a frozen serum bank of over 500,000 samples that can be linked to the medical records of Alaska Natives. The serum bank is an important, unique, biomedical research resource.

Arctic Investigations Program of the CDC

The mission of the AIP laboratory in Anchorage is the prevention of infectious diseases in people of the Arctic and Subarctic with special emphasis on prevention among Alaska Natives. As already noted, priority activities include prevention of diseases caused by *Streptococcus pneumoniae*, *Mycobacterium tuberculosis*, *Haemophilus influenzae* type b, *Helicobacter pylori*, methicillin-resistant *Staphylococcus aureus*, and respiratory syncytial virus (RSV), as well as control of viral hepatitis and botulism.

Approximately 35 epidemiologists and other scientific staff are based at the AIP facility on the Alaska Native Health Campus in Anchorage, Alaska. With appointment of new faculty at the University of Alaska in Anchorage and Fairbanks, collaborations between the university and AIP are expanding for studies of the prevalence of infectious agents, the mechanisms of their action, and of the epidemiology underlying their distribution and incidence in Alaska. In 1958, AIP began a frozen serum bank of over 500,000 samples that can be linked to the medical records of Alaska Natives. The serum bank is an important, unique, biomedical research resource. The Viral Hepatitis Program, which was discussed above, illustrates the close relationships between this federal unit and a diverse group of other investigators in Alaska.

**STATEWIDE SURVEILLANCE FOR INVASIVE BACTERIAL DISEASES**

Points represent participating hospitals and clinic laboratories across the state.

Source: CDC Alaska
With participation from hospitals and clinics across Alaska, AIP operates a surveillance system to monitor the occurrence of illnesses caused by the select group of bacteria listed above. This monitoring is done to document rates of diseases, to look for trends over time and across regions of the state, to provide additional laboratory testing and identification of the organisms and their specific characteristics, to provide current and historical data to aid in making and interpreting decisions that may affect public health, and to provide a basis for further study of the diseases and their occurrence in Alaska. The surveillance system is the result of an evolutionary process that began in 1980. Clinical laboratories across Alaska submit any isolate of a target organism to AIP. There are currently 25 clinical laboratories in the state, shown in the figure above.

In 1980, *Haemophilus influenzae* type b (Hib) was responsible for about 95% of bacterial meningitis occurring in children in the United States and was known to be a particular problem in rural Alaska. The surveillance system was initiated to collect all cases of Hib of all serotypes occurring in Alaska. Cases of Hib disease in Alaska decreased dramatically with the introduction in 1991 of conjugate vaccine for use on infants. Since that time, the surveillance system has provided a way to monitor the effects of changes in the vaccination program and to attempt to refine control programs. No cases of Hib were seen in Alaska Native children less than five years of age in 2001.

**The University of Alaska**

Since nearly a half century ago when the federal Public Health Service, Arctic Health Research Center was in Fairbanks, UAF has sustained active research in a variety of zoonotic diseases, which are transmitted from animals to humans. The infectious agents include large parasites such as the *Echinococcus* tapeworm, bacteria such as those responsible for brucellosis and tularemia, viruses like West Nile or those associated with influenza, and even unusual agents like the prions that appear responsible for Chronic Wasting Disease of deer and the related bovine spongiform encephalopathy (BSE) in cattle. These investigations at the University complement 20 years of ongoing surveillance of animal diseases at the Alaska Department of Fish and Game.

In 2004, the NIH BRIN program of the National Center for Research Resources was renamed the IDeA Network for Research Excellence (INBRE). The animal-to-human health nexus, which was pursued through toxicology and contaminants in subsistence species in the BRIN program (2001-2004), will be expanded to include infectious agents in the environment and especially zoonotic diseases. This infectious agents/zoonotic disease subtheme was developed through a series of planning meetings held in Anchorage and Fairbanks in 2002 and 2003. These consultations included university researchers and representatives from ANTHC, the Alaska Native Medical Center, AIP, the state Section of Epidemiology and state Public Health Laboratories, and the Alaska Department of Fish and Game.
At the start of the 21st century, Alaska presents a relatively pristine environment in contrast to the urbanized lower latitudes. This undisturbed locale offers advantages for research on the persistence and transmission of endemic infectious diseases and the emergence of new ones. Infectious disease morbidity and mortality are greater in the Native populations of Alaska than in Alaskans of predominantly European extraction. The changes in prevalence and genetics of disease agents can be explored with the powerful toolbox of modern molecular medicine. Such research is an especially high priority since September 11th as the United States strives to strengthen the knowledge base needed to combat bioterrorism. An expanded program directed toward zoonotic diseases is particularly appropriate in Alaska since animal-borne diseases have long been a public health priority.

INBRE proposes to examine epidemiology, evolution, ecology, and natural history of infectious agents. It will try to better understand the processes by which endemic diseases present in natural environments become epidemic. The goal of INBRE research at UA is an increased understanding of the biology of the diverse disease-causing agents, the development of predictive models of outbreaks, and the discovery and refinement of molecular diagnostics such that outbreaks can be fought with medicines based on molecular targets. Its UA setting is appropriate for basic and applied research rather than clinical research. Whenever appropriate, INBRE will continue and strengthen collaborations with other biomedical and health research in Alaska. It is expected that INBRE and other programs at UA can foster partnerships with the federal AIP, state health units, and health delivery organizations, whose primary roles include monitoring of infectious agents, developing and implementing strategies for disease prevention, and delivering clinical services across the state.

The research funding of BRIN/INBRE will particularly emphasize projects of the new faculty hired at Anchorage and at Fairbanks. These new faculty include wildlife and molecular toxicologists, a neurotoxicologist, an epidemiologist, and two investigators working with infectious disease. The specific topics for research could include:

- Introduction and transmission of human pathogens through animal and bird migrations to the North
- The impact of global climate warming and ecological change on emerging diseases in animals and humans in the Arctic and Subarctic
- Bioreervoirs of infectious agents for diseases, for example *Francisella tularensis* which causes tularemia
- Environmental correlates of episodic disease outbreak
- Natural toxins in seafood, including Paralytic Shellfish Poison (PSP)
- Epidemiology of hepatitis viruses in Native Alaskans
- Prion diseases, like mad cow disease and chronic wasting diseases of deer, remain ominous but unsubstantiated threats for Alaskan wildlife

- Ecology and evolution of host-parasite relationships in extreme fluctuating environments

- The incidence and natural history of rabies in the Arctic North Slope Borough—an ongoing research theme of IAB faculty and the state health laboratory in Fairbanks

### Alaska’s Native American Research Center for Health

As noted earlier, the NARCH grant from the National Institutes of Health and the Indian Health Service supports a research center administered by the Office of Alaska Native Research at ANTHC. NARCH encompasses several projects, each directed toward specific concerns of Alaska Natives. Projects analyzing infectious diseases are collaborations with the Arctic Investigations Program. The currently active NARCH projects include:

- An evaluation of risk factors and rates of infection involving the bacterium *Helicobacter pylori* (responsible for ulcers and some cancers) in Alaska Natives in Anchorage, Yukon Kuskokwim, Norton Sound, and Bristol Bay and a non-native comparison group in Anchorage

- A study of the rates and conditions of pneumococcal infection, which can cause pneumonia and meningitis, and the efficacy of vaccinations

- An investigation of the natural course and outcomes of chronic hepatitis B infections in Alaska Native children and adults with a view to understanding the disparity between rates of infection in Alaska Natives and non-Natives

### CHRONIC DISEASE

Medical statistics show that chronic diseases are major causes of mortality and morbidity in the 21st century. Much of the new knowledge about cancer, arthritis, heart disease, stroke, and lung diseases will be produced by large medical center research projects with access to large populations for clinical trials. Since Alaska is relatively small in population, and its instate research facilities are limited, many of the new answers to questions about novel treatments and new clinical approaches may be suggested by research in major Outside laboratories. However, Alaskans will remain active participants in application of these advances in a rural Alaskan context and with Alaska’s unique patient population. As discussed earlier, physicians and other researchers in urban hospitals in Anchorage and Fairbanks as well as in the Alaska Native health community are heavily involved in evaluation, expansion, and refinement of the latest medical approaches to a uniquely Alaskan context and a unique patient population. The Alaska Native Medical Center, the Alaska Native Tribal Health Consor-
The Southcentral Foundation, and the Yukon-Kuskokwim Health Corporation have strong partnerships with research centers outside the state and well-integrated initiatives among one another, as well as with Alaska Division of Public Health, the Arctic Investigations Program of the CDC, and the University of Alaska in Anchorage and in Fairbanks. Wherever there is local participation by Alaska Natives, researchers must insist that local rights and involvement follow the spirit and letter of the guidelines set forth by the Alaska Native Science Commission.

The Center for Alaska Native Health Research

The CANHR at the University of Alaska is funded by NIH’s National Center for Research Resources (NCRR). CANHR embraces a model for research that is collaborative with Yukon Kuskokwim Health Corporation (YKHC) and other Alaska Native partners, to define the needs and develop the research project. CANHR supports three major research areas: genetics of obesity, diet and nutrition, and cultural understandings of health, all of which are influenced by body weight. The major sites for this research are villages in southwestern Alaska. The first two areas fall within the general research priority of chronic diseases.

The intent of the CANHR genetics research is to identify genetic markers that are associated with body weight and obesity. Many different genes interact with environmental factors to influence body weight. Information will be collected on the current health condition of individuals, their family history of obesity, and blood sampling for DNA isolation (genetic material). Individual health status will be evaluated and family histories will be reviewed for any information that may facilitate our understanding of risk factors that lead to obesity and how these risk factors may influence the prevalence of obesity in future generations. The DNA that is extracted from the blood will be analyzed for genetic risk factors and lipid profiles that may contribute to the prevalence of obesity.

A second goal of CANHR is to hire new researchers who will increase the general capacity of the university to conduct biomedical research. The Center will hire an epidemiologist to help design scientific studies and has hired a statistician to help not only in the design of the studies, but also in organization and analysis of the resulting data. CANHR research in future years will extend to other chronic disease conditions, perhaps including heart disease and coronary artery disease, cancer, emphysema and progressive lung dysfunction.

The intent of the CANHR genetics research is to identify genetic markers that are associated with body weight and obesity.
NARCH and the Alaska Native Tribal Health Consortium

For many years, investigators at ANTHC have been collecting clinical data on the occurrence of cancers (liver, cervical, lung, multiple myeloma, and others). Alaska Natives diagnosed with cancer between 1984 and 1994 had a five-year survival rate that is 11.3% lower than that of US whites. Cancer-by-cancer the survival rates are comparatively good but the prevalence of quick-moving cancers that cannot be detected early, such as lung cancer, reduced overall chances of living five years after a cancer diagnosis. The epidemiological and clinical studies will continue to probe the reasons for this disparity.

Aleutian-Pribilof Island Association

The Aleutian-Pribilof Island Association has been awarded a grant from NIH to analyze the risks and benefits of eating traditional foods. Many Alaskan Natives obtain the majority of their diet through the harvest of wild foods, collected near the villages where they live. This project documents the diets of two Alaskan villages to develop a model for long-term tracking of traditional and non-traditional food consumption trends. The nutritional value and potential contaminant loads are also determined with the aim to provide a risk/benefit analysis of the consumption of traditional diets. UAA and ANTHC are partners in this project.

Southcentral Foundation

The Southcentral Foundation is an Alaska Native non-profit health corporation formed under the tribal authority of Cook Inlet Region, Incorporated. It is a collaborator in a national NIH-funded program, Education And Research Towards Health (EARTH), which investigates how diet, physical activity, and other lifestyle and cultural factors are related to chronic diseases such as cancer, cardiovascular disease, stroke, Type 2 diabetes, and respiratory diseases and the related mortality from these diseases. The project is conducted by Southcentral Foundation researchers in partnership with researchers from the University of Utah and the Black Hills Center for American Indian Health, and the Alaska Native Tribal Health Consortium.

ENVIRONMENTAL HEALTH AND TOXICOLOGY

Many general biomedical problems are intensified at high latitude, and those potentially linked to the deposition of environmental contaminants are of social, economic, and biomedical concern. Contaminants generated in industrial centers in the temperate zone are transported northward to Alaska, Canada, Scandinavia, Russia, and Siberia. They contribute to the slow degradation of the Arctic environment threatening the safety of subsistence foods for human consumption as well as the marketability of commercial seafoods.

Widespread concern about pollution and contaminants at high latitudes led to the circumpolar international Arctic Monitoring and Assessment Program (AMAP) and to an international conference on “Arctic Develop-
Since some contaminants, such as heavy metals, can directly damage DNA or alter chromosome structure, an understanding of the cellular recognition and repair is integral to estimating the risks and mechanism of action of contaminants.

Faculty at the University of Alaska carry out research on toxicology and contaminants at both the Fairbanks and Anchorage campuses. At UAF, projects in the Institute of Marine Sciences and the Department of Chemistry and Biochemistry focus on the monitoring the concentrations of mercury and other heavy metals in Alaska’s wildlife and fish. At UAA, a project funded by the National Science Foundation explores chromosome structure and DNA repair. Mutations in a variety of enzymes that control chromosome structure have been implicated in a number of cancers. This research has relevance to environmental contaminants since some contaminants, for example heavy metals, can directly damage DNA or alter chromosome structure. An understanding of the cellular recognition and repair of this damage is integral to estimating the risks and mechanism of action of contaminants.

Alaska IDeA Network for Biomedical Research (INBRE)

The Alaska INBRE program is in part an outgrowth of the May 2000 Anchorage conference. In 2001, UAF scientists submitted a proposal to NIH, focused on toxicology and environmental health. INBRE is the successor program to BRIN. INBRE researchers study basic cellular and molecular toxicology and wildlife as model systems that provide insights into mechanisms of mammalian adaptation to adversity. Because subsistence life styles are so widespread in Alaska, the health of wildlife is inexorably connected to the health of people.

Fish and wildlife resources have always been important to Alaskans. Research on fish and wildlife has become a strength of the University and in...
various state and federal laboratories in Alaska. All fish and wildlife contain chemical contaminants. In Alaska, environmental contaminants come not only from local sources, but also from lower latitudes. As they are passed up the food chain, these low-level substances become concentrated and variously modified according to the genetics of each species. The resulting toxicants might perturb physiology or gene expression within the subsistence food species or its human consumers.

The major emphasis is on mechanisms by which toxicants impact proteins, DNA, and cells. Toxic contaminants can disrupt the normal functioning of these genes and proteins and thus cause disease. Recent genomic data demonstrates that similar genes are shared among vertebrates. Since so many species manufacture almost identical proteins, the results from model organisms are often applicable to many other species, including humans.

INBRE is a network/partnership among Alaska’s college and university campuses that also includes the CDC’s AIP laboratory, the state health laboratories, the state Department of Fish and Game, and Alaska Native Tribal Health Consortium. The major university campuses involved in research are those at Fairbanks and Anchorage. UA has built a new research group which includes expertise in toxicologists, veterinary medicine, epidemiology, molecular biology, and bioinformatics. New research is in progress on the neurotoxicology, the impact of contaminants on immune systems, and mechanisms of dioxin action. Programs for training and recruitment of students into biomedical careers involve not only UAF and UAA, but also the other four- and two-year colleges in Alaska.

**ANTHC & NARCH: Clinical studies on contaminant impacts**

If there is a significant contaminant load in subsistence foods, the consequences might be reflected in rates of cancer and in effects on the health of infants and children. The ANTHC has led in coordinating studies to monitor exposure to contaminants like organochlorines and the impacts of toxicants from the environment or in the diet on the incidence of childhood illnesses and of cancers for all ages. Particularly notable is an ongoing study of contaminants and the cellular consequences in umbilical cords, collected just after birth.

**Impact of airborne contaminants on the health of Alaskans**

An ongoing NIH-funded study at UAA’s ICHS explores correlations between childhood asthma attacks and traffic air quality. Air quality in Alaskan cities is compromised by our gasoline blends (relatively high in benzene for our high latitudes), various non-industrial pollutants, and volcanic dust. In addition, the cold winter temperatures impede the degradation of chemical toxicants and provide special environments for cross-reactions among primary contaminants to produce various secondary agents of possible medical importance. This clinically-centered study at ICHS complements other research on surveillance, transport, and fate of contaminants in state and federal agencies as well as in engineering, geo-
The State of Alaska analyzes salmon, halibut, pike, and other foodfish for heavy metals, dioxins, and pesticides. Limited samples of Alaskan fish have not found levels of contaminants that cause concern.

physics, marine science, and environmental biology units of UA on several campuses. Alaska is an active participant in the Arctic Monitoring and Assessment Programme, which addresses the shared concerns, shared among the eight circumpolar nations, about contaminants which may be deleterious to Arctic and sub-Arctic peoples, including those that are transported by global processes to high latitudes.

**Government Agencies: Monitoring of contaminants in the environment**

Biomedical research on contaminants complements other efforts of state and federal agencies. The federal EPA and state Department of Environmental Conservation, NOAA, and other agencies have extensive monitoring programs for atmospheric and water-borne contaminants. For example, the State of Alaska analyzes salmon, halibut, pike, and other foodfish for heavy metals, dioxins, and pesticides. Limited samples of Alaskan fish have not found levels of contaminants that cause concern. Sample collectors include the Alaska Department of Fish and Game, NOAA (Sablefish Survey), International Pacific Halibut Commission and Native Fishermen. Samples are shared with universities in Idaho, Washington, and Alaska and EPA to further work in evaluating toxicology and salmon health issues.

**HIBERNATION GENOMICS AND PHYSIOLOGY**

Extreme environmental conditions, like those encountered in Alaska, allow researchers to probe fundamental biomedical questions in novel experimental settings that can clarify the underlying physiological, biochemical, and genetic response mechanisms. Global weather patterns, seasonal changes in day length and temperature, migrations of animals, and isolation at high latitude environments pose significant health challenges. As already discussed, the adaptations of hibernators provide natural biological models for understanding how the brain controls metabolism.

The research on hibernation genomics exploits Alaska’s unparalleled access to natural biological models to probe a cutting edge interface be-
tween the control of gene expression and regulation of organ and whole organism energetics and physiology. Hibernators epitomize adaptations to stress, including the ability to reversibly enter a true state of “suspended animation.” As more is understood about hibernation, that knowledge can be applied to develop novel therapies in human medicine, especially for the stabilization of victims of stroke, heart attack, and trauma.

Through years of study of Arctic hibernating mammals, UAF scientists at the Institute of Arctic Biology have helped define the field of hibernation biology and physiology. Hibernation research and metabolic regulation in extreme environmental conditions has been a focus of research at Fairbanks since the University first began biomedical research in the 1960s.

Hibernation in mammals is not merely a depression of metabolism during winter; it is a precisely orchestrated physiological process by which organs and organ systems quickly shut down so that they consume less energy and require fewer resources, such as oxygen and energy. Recording from the brain of an awake animal or person reveals a symphony of electrical impulses and waves. However, activity in the brain of the hibernator is close to silent, yet the brain continues to monitor core functions. Albeit slowly, and with uncanny accuracy in the regularity of the intervals, the hibernating brain directs the body to raise its temperature to allow higher levels of organ function for short episodes (see Figure).

Many kinds of mammals, including one primate, enter hibernation. An understanding of the regulation of hibernation in animal models should provide new insights for human physiology. Alaskan animals, notably the Arctic ground squirrel and the black bear, are champion hibernators and thus appear to be the best such models.

With the tools of modern molecular biology, it has been learned that the control of hibernation occurs at the level of regulation of gene expression. The explosion of research on the human genome and the accompanying revolution in comparative genomics enable biologists and medical researchers to link physiological consequences to their underlying regulations in the readout and modulation of genes. The expertise of new and continuing faculty at UA, the recent additions of new instruments that provide state-of-the-art technologies for studying gene expres-
sion, and the ability to mine the data with the computational power available at the Arctic Region Supercomputing Center in Fairbanks position researchers to do molecular physiology at many levels of gene expression and gene regulation.

Results of research on hibernation genomics have exciting potential applications to medical practice—perhaps allowing longer-term preservation of human organs for transplantation or extending the “golden hour” after a traumatic physical injury by stabilizing the badly-injured victims of natural disasters or of battlefield wounds.

UAF’s vigorous research on hibernation in ground squirrels and bears has been supported by research grants awarded to individual UAF investigators from NSF, NIH, and the Department of Defense (DOD), and more recently by SNRP and EPSCoR. The funded projects include analyses of gene expression in hibernating bears and ground squirrels, the neuropharmacology of hibernation, the role of antioxidants in protecting neurons from damage, and the onset and arousal phases of hibernation. EPSCoR, CANHR, and BRIN have allowed UA to greatly expand instrumentation for genomic studies, to support students, to hire tenure-track faculty in physiology and bioinformatics, and to begin to strengthen molecular biology at the University.

**BIOINFORMATICS AND SYSTEMS BIOLOGY**

In a broad sense, the word “bioinformatics” refers to the use of computers in life sciences applications. “Systems biology” is the application of engineering principles such as robotics and automation, to a variety of high-throughput measurements of a variety of biologically important molecules, including DNA, proteins, and small molecules. Some examples of common and naturally occurring small molecules and/or organisms that produce them include infectious agents such as viruses and bacteria, contaminants, pharmaceuticals, and caffeine. The merger of bioinformatics and systems biology involves automated data collection and management, analysis, visualization, integration, and interpretation.

Alaska’s universities are forging the way to bring in and develop these capabilities to insure safety in the food supply and environment and also find, understand, and potentially develop detection and intervention in a variety of common illnesses affecting Alaskan’s and humanity in general. The University has a long history in studying adaptations that allow organisms to flourish in the wild under normally stressful conditions related to extreme temperatures to help understand how wild organisms can bounce back from physiological conditions that would kill humans by triggering heart attacks, stroke, respiratory shock, and neurodegenerative disorders. Somehow, wild organisms survive and flourish in these extreme states and provide excellent insight into how animals can cope with physiological stress. If researchers find out how these organisms are able to do this, they can then apply the results to a variety of serious illnesses affecting millions of people worldwide. Systems biology takes advantage of many fields of study at Alaska’s universities including biology, engineering, mathematics,
computer science, physics, and the substantial investment in the Arctic Region Supercomputing Center in Fairbanks.

**Self-sustaining Biomedical Research in Alaska—2010 and Beyond**

It is important that commitments to the target priorities in hibernation genomics and environmental health remain strong for the rest of this decade so that each research group may have time to generate its own income streams, to interface with more partners inside and outside Alaska, to begin applying the results from research to clinical practice, and to measurably reduce health disparities.

Each of the five target research priorities discussed above should become vigorous self-supporting programs within the decade. The new infrastructure awards like CANHR, NARCH, BRIN and INBRE fund only the establishment of the program, not their continuation in subsequent years. Investigators at the university, and also at agencies, are expected to secure their own follow-on funding from competitive sources for specific research projects. Grants for some of these projects can be sought from private foundations and state agencies. The major federal prospects for research funding are the National Institutes of Health (including the Institutes for Diabetes and Digestive Diseases, Neurological Disease and Stroke, Environmental Health Sciences, Cancer, General Medical Sciences, and Allergy and Infectious Diseases), the Centers for Disease Control and Prevention, the Department of Defense, the Department of Energy, and the interagency bioterrorism programs. Proposals to fund large multidisciplinary projects about hibernation have already been submitted to the federal government for funding from NIH and DOD.

By 2010, progress should be reviewed and decisions made regarding how to shift the emphases for the succeeding decade of coherent investment. New insights from the advent of genomic science, changes in health disparities, emerging infectious diseases, increasing knowledge of disease etiology, and increased local capabilities, all may require new directions for biomedical research in Alaska.

The two overarching core technologies in modern biomedicine are molecular biology and bioinformatics. The technologies of molecular biology are already integral to many standard clinical tests, and research technologies must continually be updated to push the envelope for applications to Alaska’s problems. Research in genomics has given rise to proteonomics, glycomics, lipidomics, metabolomics, and toxicogenomics. As appropriate, researchers at both the basic and clinical levels must be conversant and competent in these research approaches.

Molecular biology is generating exponentially growing data streams that can only be understood by using mathematical and computational science. Computational biology is rising in importance and is sure to continue as a major wave of the future. The blizzard of data requires many new kinds of computational analysis, improved paradigms, development of new soft-
Biomedical Research

With the impressive capacities of the Arctic Region Supercomputing Center in Fairbanks and the intellectual capital of newly-appointed faculty, Alaska is positioned to bring that computational capacity to bear on biomedical research questions. Bioinformatics will increasingly enable genetic analyses, new deeper insights into a fundamental understanding of the living state and lead to practical applications for disease diagnosis, prevention, and treatment.

Alaska must continue to develop expertise in the state-of-the-art technologies if it is to be involved in the next, as yet undiscovered core technologies of the future. New technologies tend to build on one from the other, such that competence today breeds continued competence in the future.

Alaska’s biomedical research has strong components and shows promise to become much stronger. Alaska is poised to be a part of the new medicine, both in research and in practice. Alaska has a promising research enterprise, which is building on decades of research data and activity in the health delivery organizations, the state and federal agencies, and the University of Alaska. The recent federal infrastructure grants have allowed coalescence and extension of research interests, cooperation in planning, and coordination of implementation.

A small suite of unifying themes have been identified for short- and intermediate-term research investments. Investments have already been committed toward these goals. Within the last decade, NIH, the CDC, Alaska Native organizations and the State of Alaska have funded renovations and construction of new buildings for biomedical research on the Alaska Native Health campus and elsewhere in Anchorage and at the University in Anchorage and Fairbanks. Yet there is much more to be done to bring Alaska’s facilities up to the level needed for modern biomedicine. There are major limitations in the quantity and quality of modern experimental laboratories, animal quarters for experiments, and facilities for containment of potential pathogens facing Alaskan researchers. These disparities of infrastructure must be addressed in order to enhance the state’s capabilities for molecular biomedicine.
The goal of injury surveillance and prevention research is to understand patterns of injury occurrence and control the incidence and consequences of these injuries. The steps involved in this process include surveillance of injury causes, identification of risk factors, data-driven and community-defined intervention strategies, and analytic evaluations.

**SITUATION AND EXPERTISE IN ALASKA**

Alaska has higher than average rates of injuries. Among people age 5 to 44, unintentional injuries were the leading cause of death between 2000 and 2002. Among those up to age 4 and between ages 45 to 54, unintentional injuries were the second leading cause of death. For the seven-year period between 1991 and 1997, 30,000 hospitalized injuries were reported to the Alaska Trauma Registry. There is a wide range of injury prevention topics relevant to Alaska, from firearms safety to bike helmet usage. There are many agencies in the state working on injury prevention projects and researching the prevalence of certain injuries and the effectiveness of prevention programs.

Within Alaska’s state government, responsibility for injury prevention falls under the Department of Health and Social Services, Division of Public Health, Section of Community Health and EMS (CHEMS). CHEMS is responsible for maintaining the Trauma Registry, which receives informa-
Injury Surveillance & Prevention

Pedestrian injuries are the second leading cause of death for Alaskan children between 1 and 4 years old.

Accidents involving pedestrians, both fatal and non-fatal, are among the top ten reasons Alaskans are hospitalized in all age groups except among infants and people ages 15 to 34. Pedestrian injuries are the second cause of death for Alaskan children between 1 to 4 years old and the third cause of death for slightly older children, ages 5 to 9. An analysis of pedestrian injuries in Alaska from 1996 to 1999 through the Trauma Register shows that there were 336 pedestrian injuries, one-third of which were found to be alcohol-related on the part of the pedestrian. Just over 40% of the injuries occurred in Anchorage, with Fairbanks a distant second at 6%, Ketchikan third with 3%, and Barrow, Homer, Bethel, and Palmer following at 2%. Alaska’s pedestrian injury rates/100,000 are highest for people
from birth to four years old (20.7) followed by the 60 to 69 age group, which had a rate of 18.2 injuries/100,000.

**Featured research:**

- The evaluation of the Pedestrian Safety Project operated by the Alaska Injury Prevention Center focuses on the impact of the project. The project targets elementary school students and their parents and involves providing education on pedestrian safety and safety devices (reflectors and back-packs with reflectors) on pedestrian safety.

**FALL RELATED INJURIES**

Falls are the leading cause of injuries resulting in hospitalization among Alaskans in general, and fall-related injuries remain the most common cause of hospitalization for all age groups except among people 15 to 34 years old.

**Featured research:**

- The Ice Cleats Program, run by the Kodiak Area Native Association, is evaluating the effectiveness of ice cleats in preventing falls among elders.

- SEARHC is reviewing narratives of fall-related injuries among the elderly for the Indian Health Service’s Fellowship Project.

- The Mat-Su Fire Department is analyzing statistics on fall-related injuries among the elderly in the area to guide the development of a prevention program.

**FIREARM SAFETY**

In one year, 25 children and teenagers in Alaska died from gunfire, resulting in a youth firearm death rate nearly three times the national average. In the 0-19 age group there were equal numbers of unintentional and suicidal firearm injuries, although there were only 16 unintentional firearm deaths compared to 62 suicide fatalities. The percentage of cases that were fatal among the unintentional firearm injuries was 18%, compared to 66% fatalities among suicide attempts. Of 90 fatal firearm injuries to youth in the 15-19 age group, 64% were suicides.

**Featured research:**

- Alaska DHSS, CHEMS and Alaska Native Tribal Health Consortium evaluated gun owner compliance with firearm cabinet and trigger lock usage. Published results are available in the journal *Injury Prevention*.

- The Firearm-Related Deaths in the Alaska Native Population study, conducted by the Alaska Injury Prevention Center, is analyzing Alaska Native death certificates for firearm-related fatalities from 1990-1992.
TRAUMATIC BRAIN INJURY

Between 1996 and 1998 there were 1,932 hospitalizations or deaths from traumatic brain injuries (TBI) among Alaska residents. Alaska has an average incidence of 105.2 TBI per 100,000 population. This TBI rate is approximately 10% higher than the national TBI rate. The rates of TBI vary dramatically from one region of the state to another. The Interior region has the highest rate with 277.1 TBI per 100,000 population while the Aleutians have the lowest regional rate with 60.8 TBI per 100,000 people. TBI rates also vary by gender with men sustaining most of the injuries. The rate for women of all ages was 62.0 per 100,000 while the rate for all men was more than double that at 144.5 per 100,000. There is also an enormous disparity in TBI rates by race and ethnicity. The TBI rate for Alaska Natives is 285% greater than the rate for non-Alaska Natives (214.3 versus 55.6).

TBI is an expensive problem. The average direct costs of an injury (e.g., initial medical costs) are $22,000. Direct costs represent only 12% of overall lifetime costs with loss productivity and caregiver expenses being a huge expense. Only 8% of TBI survivors are able to return to the job they previously held within six months of sustaining a TBI. The lifetime costs are so high because 80% of adults with TBI cannot be left unattended. It is encouraging that 88% of TBI could be prevented by proper helmet use. Helmets should be used while riding a motorcycle, snowmachine, ATV, or bicycle and by children while skiing and participating in other potentially dangerous activities.

The Alaska Trauma Registry data show that 35% of the motorcycle crash victims under 18 reportedly were not wearing a helmet.
Featured research:

- A observational helmet use study by the Alaska Injury Prevention Center completed in May 2001 reports that helmet use on snow machines was 46%, while ATV helmet use was reported at 13%. Bicyclist helmet use averaged 31%, far below the 82% usage rate seen nationwide. Helmet use rates were lowest in rural areas.

- An evaluation of the effectiveness of the ATV Rider Safety program in increasing the number of children wearing helmets while riding ATVs is being conducted by the Bristol Bay Area Health Consortium.

- The Alaska Native Tribal Health Consortium is evaluating the effectiveness of their program in increasing the number of children wearing helmets while riding ATVs in rural communities.

- An observational study of helmet use among skiers and snowboarders was conducted at Eaglecrest ski area in Juneau during the winter of 2001-2002. Skiers were more likely to wear helmets than snowboarders and youth were more likely to wear helmets than adults. However, the majority of people were not wearing helmets. The Winter 2002 observation found 75% of all observed people were not wearing helmets. The Spring 2002 observation found 81% of all observed people were not wearing helmets.

WATER SAFETY

Between 1994-1998, drowning claimed the lives of 222 Alaskans. This figure represents 11% of the injury deaths during that period. Young children and adolescents are especially at risk (commercial fishing drownings are addressed under occupational safety). In the 15 years from 1980 through 1994, 100 children and adolescents (age 0-14) died in Alaska due to drowning. Alaska’s drowning rate for children and teenagers is almost two and a half times the national average and significantly higher than that of any other state.
Featured research:

- The Alaskan Marine Safety Training Program, run by the Alaska Marine Safety Education Association, is analyzing the effectiveness of the program in reducing marine injuries and deaths.

- The Alaska Injury Prevention Center conducted an observational study of the Kids Don’t Float program. The program provides child-sized personal floatation devices (PFDs) for complimentary public use near water access points. More children were observed wearing PFDs at locations with a Kids Don’t Float station than those locations without the program.

MOTOR VEHICLE SAFETY

In Alaska between 1994 and 1998, 16% of fatal injuries were sustained during motor vehicle accidents. According to the National Highway Transportation Safety Association (NHTSA), in 1999 the total number of traffic fatalities in Alaska was 76; 12.26 fatalities per 100,000. The national average was 15.26 fatalities per 100,000 people. While Alaska has a lower fatality rate than the national average when measured by fatality per unit of population, Alaska has a higher fatality rate than the national average when measured by vehicle mile traveled.

Among the 76 total traffic fatalities in 1999, 40 involved some alcohol and 32 involved high blood alcohol levels. Thus, 53% of the 1999 fatalities were alcohol-related with 43% involving high levels. While these numbers are still too high, the number of alcohol-related traffic fatalities decreased by 27% between 1982 and 1999.

Featured research:

- The Alaska Injury Prevention Center is researching the costs of seatbelt non-use in motor vehicles injury.

### TRAFFIC FATALITIES IN ALASKA AND THE U.S., 1975-1999

<table>
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<tr>
<th>Year</th>
<th>ALASKA</th>
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<td>1985</td>
<td>127</td>
<td>3.2</td>
</tr>
<tr>
<td>1990</td>
<td>98</td>
<td>2.5</td>
</tr>
<tr>
<td>1998</td>
<td>70</td>
<td>1.6</td>
</tr>
<tr>
<td>1999</td>
<td>76</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Alaska DHSS Community Health & Emergency Medical Services (CHEMS) analyzed linked traffic crash and hospital data to compare young and adult driver crashes in Alaska. Analysis revealed that young drivers were 2.9 times more likely than adult drivers to be involved in crashes with a hospitalized crash victim and 2.6 times more likely to be involved in a fatal crash.

**OCCUPATIONAL SAFETY**

In the 1980s, Alaska had an occupational fatality rate five times the national average; it ranked last among the states and the District of Columbia in rates of occupational deaths. In 1991, in response to this situation, the Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health (NIOSH) opened an office in Anchorage. Since 1990, Alaska has experienced a 49% overall decline (from 82 deaths in 1990 to 42 deaths in 1999) in work-related deaths, including a 67% decline in commercial fishing deaths. Even with these improvements during the 1990s, 648 Alaskan workers died from job-related injuries: 217 commercial fishermen; 107 civilian pilots; 47 military personnel; and 26 loggers. Causes of death were drowning (219), aircraft crashes (192), being crushed (53), intentional injuries (47), motor vehicle crashes (29), and falls (26). According to the Alaska Fatality Assessment and Control Evaluation (FACE) project, from 1990 through 2000 in Alaska, the average annual rate of traumatic work-related deaths was 22 per 100,000 workers.

Data collected by the Alaska Trauma Registry indicated the highest numbers of reported work-related injuries by industry were in construction, commercial fishing, logging, and seafood processing. However, logging had the highest incident rate with over 16 work-related injuries per 1,000 logging industry workers in 1998. Hospitalization for injuries has a massive effect on employers and workers in Alaska, including suffering, lost work, and disability.
The combination of unintentional and intentional injuries continue to kill more Alaskans between 5 and 44 years old than any other cause.

### ALASKA OCCUPATIONAL FATALITIES

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Drowning</td>
<td>137 37%</td>
<td>79 29%</td>
</tr>
<tr>
<td>Aviation Crashes</td>
<td>103 28%</td>
<td>89 32%</td>
</tr>
<tr>
<td>All Other</td>
<td>127 35%</td>
<td>109 39%</td>
</tr>
<tr>
<td>Total</td>
<td>367 100%</td>
<td>277 100%</td>
</tr>
</tbody>
</table>

**Featured research:**

- The Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health (NIOSH) is researching fatal and non-fatal work injuries.

- NIOSH is researching the types of injuries affecting seafood processing workers in order to develop injury prevention guidelines and worker education materials.

- The Amchitka Workers project was funded by the Department of Energy through a contract with the Alaska District Council of Laborers. The purpose of this project was to assist in the preparation, utilization, and analysis of a health survey for workers who participated in the activities surrounding the testing of nuclear warheads on Amchitka Island in the 1960s and 1970s. The Institute of Circumpolar Health Studies (ICHS) at the University of Alaska Anchorage statistically reviewed and interpreted the survey results. The data were being compiled by Zenith Administrators, and the results of histories, physical examinations, and laboratory tests (devoid of personal identifiers) were sent to ICHS on a quarterly basis. The project was a three-year effort.

**Candidate Themes for Injury Surveillance & Prevention Research Priority in Alaska**

The combination of unintentional and intentional injuries continue to kill more Alaskans between 5 and 44 years old than any other cause. Even after 20 years of prevention efforts, injury rates in Alaska are still astoundingly high. Injuries are costing Alaska the lives of its youth. For those between 5 and 34 years old, injuries (unintentional, suicide, and homicide) comprise the top three causes of death.

Past research findings have influenced regulation and prevention efforts. The implementation of new regulations and the ongoing preven-
tion efforts of the large community working together to reduce injury rates have combined to create this success. Even accounting for the progress that has already been made, there is still considerable work to be done to continue reducing injuries and deaths in Alaska. There is a wealth of data in the Alaska Trauma Registry that could be used to answer more questions about injury.

The rates of some types of injuries highlighted above may realistically be further reduced without additional research by expanding programs that have a proven track record such as the Kids Don't Float program. Other areas still need additional examination of causes, data collection to confirm prevalence, as well as studies to examine the effectiveness of current and proposed prevention efforts.

Suicide is the leading cause of injury death in Alaska; substantial suicide prevention work is conducted by some of the agencies involved in other aspects of injury prevention. However, data outlining the scope of the problem, ongoing research regarding suicide, and calls for future research are addressed in the behavioral health section of this document. Assault is the third leading cause of injury deaths as well as the third leading cause of injuries requiring hospitalization. While assault is a significant problem that is impacting the health of Alaskans, anger management and domestic violence are addressed in the behavioral health portion of this document. Assault is also a problem that should be addressed in concert with law enforcement. All recommendations for further research outlined below relate to unintentional injuries.

Given limited resources to conduct injury prevention research, suggestions for additional research areas are listed in order of priority. Determination of research priority was made based on how detrimental an area’s current impact is on Alaska’s population. Considering that there are a multitude of activities that lead to unintentional injuries and deaths, as well as a wide range of injury types, the areas highlighted below cannot be interpreted to be comprehensive. The less-than-exhaustive list acknowledges limited financial and human resources to carry out any recommendations. Most of the categories include areas where injuries are exacerbated by conditions specific to Alaska or areas where the rates of such injuries are substantially higher than in other areas of the country.

**Future research needed on injury prevention:**

- Analysis of the actual costs of injury (not just the costs that insurers are willing to pay)
- Surveillance of rates and types of injuries incurred by the elderly (in particular falls—role of weather, ice)
- Basic research involving multi-factorial analysis of the impacts of services, environments, and regulations on injury prevention
- Measurement of the effectiveness of interventions on a community
MOTOR VEHICLE FATALITIES AND INJURIES

Motor vehicle accidents are the second leading cause of accidental death among Alaskans as well as the second leading cause of injuries requiring hospitalization. Given that Alaska only has as many miles of roads as Vermont, a state with 2% of Alaska’s geographic area, the rate of injury and death in motor vehicle accidents is tragically high. More research is needed to address this issue and analyze the actual costs of injuries, including complete medical costs (those covered by insurance and out-of-pocket expenses), costs related to lost productivity, suffering, and additional expenses incurred.

FALL INJURIES

Falling is the leading cause of injury resulting in hospitalization among Alaskans. Additional research is needed to examine the role climate plays in falls, particularly among the elderly. Improved surveillance of the rates of falls by age group, types of injuries, and season or weather conditions is also needed.

OCCUPATIONAL FATALITIES

Deaths caused by drowning and plane crashes are the fourth and fifth leading causes of accidental death. The majority of these fatalities are incurred while on the job. The drowning rates for commercial fishermen have improved markedly with the implementation of new regulations requiring additional safety gear. Likewise, deaths in the helicopter logging industry have also decreased dramatically with new regulations. Further studies are necessary to determine which regulations are effective and to examine the accident data to suggest new safety measures.

SNOWMACHINE AND ATV INJURIES

Snowmachine and ATV use is very common throughout the state for recreational purposes as well as for transportation in rural communities. Thanks to past research, the geographic areas and segments of the population (primarily young males) that are least likely to wear helmets are known. Helmet use campaigns, education (including information about the impact of traumatic brain injury), and other prevention measures should be evaluated to determine their effectiveness on a given community or segment of the population.
Acknowledgments

The following people and organizations contributed significantly to this process. Contributions of their time, thoughts, and expertise are greatly appreciated.

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Carl Hild, University of Alaska Anchorage, Division of Health Sciences

Ryan Hill, Alaska Native Tribal Health Consortium

Brad Husberg, National Institute for Occupational Safety and Health

Mark Johnson, Department of Health and Social Services, Division of Public Health, Community Health and EMS

John Middaugh, Department of Health and Social Services, Division of Public Health, Epidemiology Section

Martha Moore, Department of Health and Social Services, Division of Public Health, Community Health and EMS

Karen Pearson, Department of Health and Social Services, Division of Public Health

Ron Perkins, Alaska Injury Prevention Center

Brian Saylor, University of Alaska Anchorage, Division of Health Sciences
In Alaska, as in nearly all areas of the country, one large challenge for the health care system is the elimination of health disparities. In Healthy Alaskans 2010, health disparities are defined as “differences in health status that occur by gender, race or ethnicity, education or income, disability, living in rural localities or sexual orientation.” Some differences in health status between groups are biologically determined (such as cervical cancer and prostate cancer) other differences are related to more complex interactions of biology and behavior. Some examples of the latter include men being more likely to die of heart disease or suicide than women, while women are more likely to attempt suicide and have a greater risk for Alzheimer’s disease.

SITUATION AND EXPERTISE IN ALASKA

Alaska’s most sizable and pervasive group differences in health status are those between Alaska Natives and the majority white population in the state. Over the last 50 years, tribal health and public health entities over decades have made great strides in improving the health status of Alaska Natives. However, disparities persist and some are even increasing. In Healthy Alaskans 2010, targets have been set for health status indicators for all racial and ethnic groups. Having these target goals enables efforts to be focused on those health status indicators and population groups that need additional health promotion and disease prevention efforts.

This chapter is intended as an overview of the problem of health disparities in Alaska. Information about disparities between Alaska Natives
Health Disparities

Many groups in the state are concerned about health disparities and research the prevalence of such disparities.

### ALASKA NATIVE/U.S. AGE-ADJUSTED DEATH RATES

<table>
<thead>
<tr>
<th>Cause of Death</th>
<th>Alaska Native</th>
<th>US (All Races)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All causes</td>
<td>740.6</td>
<td>471.7</td>
</tr>
<tr>
<td>Malignant Neoplasms</td>
<td>182.3</td>
<td>123.6</td>
</tr>
<tr>
<td>Heart disease</td>
<td>129.1</td>
<td>126.6</td>
</tr>
<tr>
<td>Unintentional Injuries</td>
<td>101.5</td>
<td>30.1</td>
</tr>
<tr>
<td>Suicide</td>
<td>44.5</td>
<td>10.4</td>
</tr>
<tr>
<td>Alcohol related</td>
<td>54.2</td>
<td>6.1</td>
</tr>
</tbody>
</table>

Source: Alaska Native Tribal Health Consortium, June 2001

and whites on specific health issues is contained in the chapter dealing with that issue.

Biomedical and health research on health disparities includes work in clinical settings and emphasizes application, evaluation, and expansion of the latest medical approaches to a uniquely Alaskan context and a unique patient population. Since Alaska is small in population and Alaskan state research facilities are finite, many of the new answers to questions about clinical treatments for Alaska Natives may be suggested by research in outside laboratories. Working together, Alaskans can strive to gain new insights that specifically benefit Alaska Natives by application and evaluation of both new protocols developed elsewhere and those research results in Alaska settings for Alaska patient populations.

Many groups in the state are concerned about health disparities and collect research data on the prevalence of such disparities. There are a number of particularly notable research programs on disparities, including the Alaska Native Science Commission, the Center for Alaska Native Health Research (CANHR) at UA, the Alaska Native Tribal Health Consortium and its NARCH project, and a variety of projects connected with the regional health corporations. These efforts are an excellent start to addressing the large Native health disparities. Additional projects should be undertaken to ensure that these disparities do not continue indefinitely. Wherever there is local participation by Alaska Natives, researchers must insist that local rights and involvement follow the spirit and letter of the guidelines set forth by the Alaska Native Science Commission.

Chris Mandregan, Alaska Area Director for IHS, and Dr. Charles Grimm, Director of IHS tour Alaska reviewing the situation.
Health Disparities

Research Focus on Eliminating Health Disparities among Alaska Natives

ALASKA NATIVE SCIENCE COMMISSION (ANSC)

The Alaska Native Science Commission (ANSC) was created to bring together research and science in partnership with the Alaska Native community. It serves as a clearinghouse for proposed research, an information base for ongoing and past research and an archive for significant research involving the Alaska Native community. ANSC provides information, referral and networking services for researchers seeking active partners in the Alaska Native community.

The mission of the Alaska Native Science Commission is to endorse and support scientific research that enhances and perpetuates Alaska Native cultures and ensures the protection of indigenous cultures and intellectual property. ANSC provides information to Alaska Native communities regarding science and research that impacts their health, life, culture and environment.

Goals of the ANSC are to facilitate the inclusion of local and traditional knowledge into research and science; participate in and influence priorities for research; seek participation of Alaska Natives at all levels of science; provide a mechanism for community feedback on results and other scientific activities; promote science to Native youth; encourage Native people to enter scientific disciplines; and ensure that Native people share in the economic benefits derived from their intellectual property.

ANSC provides resources to the Alaska Native community and science and research through projects such as the Traditional Knowledge and Contaminants Project. The project documents traditional knowledge and local observations about environmental changes throughout Alaska through regional meetings. ANSC provides mini-grants to communities including laboratory analyses of traditional foods. A small grants program enables communities to identify and address their environmental concerns through community-based research. Searchable features at www.nativeknowledge.org include the Alaska traditional knowledge and Native foods database, a resource guide for tribes, a summary of Native concerns by region, a contaminants database, quality assurance project plan guideline, and current science information relevant to Alaska Natives.

The Alaska Native Science Commission also:

- Sponsored the Alaska Native Community Resources Directory, a statewide list of Native scientists, experts and other community resources;
- Oversees the Alaska Native Regional Research Plans which identifies community research protocols, prioritized research topics and community contacts;
- Sponsors the Alaska Native Science Internship which places Alaska Native college students in science and research fields;
Supports the development of the Traditional Food Safety Program which establishes collaboration among state, federal, Native, tribal entities to address issues of environmental contaminants and effects on traditional food and human health.

**CENTER FOR ALASKA NATIVE HEALTH RESEARCH (CANHR)**

The Center for Alaska Native Health Research is funded by National Institute of Health’s National Center for Research Resources. CANHR embraces a model for research that is collaborative. At every stage of the research, faculty and staff will be working with tribal groups and agencies to frame research questions, to develop methodologies and procedures; and to interpret and apply data to prevention and treatment. At the heart of the CANHR are three specific research projects related to important aspects of weight; e.g., diet and nutrition, behavior, and genetics. Obesity involves biological, behavioral, and dietary factors. Each of the three projects contributes to an understanding of how these factors interact to determine overall body weight and its consequences on health. CANHR will collaborate with Yukon-Kuskokwim Health Corporation (YKHC) and other Alaska Native partners, to define the needs and develop the research project.

One major goal is to increase local capacity to do health research. In working with YKHC, CANHR intends to support local hires both for coordination as well as for collection of research data. The Center has increased its presence in southwestern Alaska by working with YKHC to hire a research coordinator to gather information from residents of the region and to assist in developing ongoing collaboration with the villages and corporation. There is and will be ongoing and active dialogue on the data itself and on the conclusions suggested by the data. This partnership will lead to development of efforts aimed at prevention of health disparities related to diet and obesity.

A second goal of the Center is to hire new researchers who will increase the general capacity of the university to conduct biomedical and health research. The Center will hire an epidemiologist to help design scientific studies and has hired a statistician to help with the design of the studies, but also in organization and analysis of the resulting data. CANHR has also hired a research coordinator to assist in organizing the fieldwork.

CANHR research in future years will extend to other disease conditions, perhaps including heart disease and coronary artery disease, cancer, emphysema and progressive lung dysfunction.

**NATIVE AMERICAN RESEARCH CENTER FOR HEALTH (NÁRCH)**

A grant from the National Institutes of Health and the Indian Health Service supports the Native American Research Center for Health. The NÁRCH grant is administered by the Office of Alaska Native Research at Alaska Native Tribal Health Consortium. The Alaska NÁRCH is a cluster of projects, each directed toward specific concerns of Alaska Natives. Those projects analyzing infectious disease are collaborations with the Arctic Investigations Program in Anchorage. There is a strong emphasis on supporting the development of Alaska Native researchers.
The research efforts of NARCH are devoted to study the following:

- A retrospective epidemiological study of the prevalence of disabilities among Alaskan Native children in the years 1984-89 in order to address prevention, early identification of disabling conditions, and early intervention to maximize rehabilitation

- A comparison of telemedicine versus standard care in the treatment of ear infections

- An evaluation of risk factors and rates of infection involving the bacterium *Helicobacter pylori* (responsible for ulcers and some cancers) in Alaska Natives in Anchorage, Yukon Kuskokwim, Norton Sound, and Bristol Bay and a non-native comparison group in Anchorage

- A study of the rates and conditions of *pneumococcal* infection, which can cause pneumonia and meningitis, and the efficacy of vaccinations

- An investigation of the natural course and outcomes of chronic *Hepatitis B* infections in Alaska Native children and adults with a view to understanding the disparity between rates of infection in Alaska Natives and non-Natives

- An evaluation of the nutrient value of subsistence foods and their importance to pregnant women and their babies. The studies will focus on Alaska Native women in the North Slope, Yukon Kuskokwim, and Aleutian/Pribilof Island areas

**REGIONAL HEALTH CORPORATIONS**

Many regional health corporations host or participate in health research. Following are just a few examples of the many research projects connected with regional health corporations:

- With grants from the CDC, Southcentral Foundation carries out early detection programs for breast and cervical cancer.

- Southcentral Foundation is conducting a randomized trial of a 12-week intervention designed to reduce heart disease in middle-aged Native women.

- Southcentral Foundation is also a study site for a longitudinal study of American Indians and Alaska Natives funded by the National Cancer Institute to investigate how diet, physical activity, and other lifestyle and cultural factors relate to the development and progression of chronic diseases such as cancer, cardiovascular diseases, stroke, diabetes, chronic lung diseases, and age at time of death.

- The Norton Sound Health Corporation is a partner with the Medstar Research Institute of Washington DC as a subcontractor for the Indian Health Service on a project entitled the Genetics of Coronary
Artery Disease in Alaska Natives (GOCADAN). The five-year project, which began in October 2000, is focusing on a family study of 1,200 individuals comprising 40 families of adults and children over the age of 18, primarily from two villages near Nome. The project includes a cardiology center at Cornell Medical School, a genetics center at Southwest Foundation for Biomedical Research, a coagulation laboratory at the University of Vermont, a central laboratory at Medlantic Research Institute, and investigators formerly associated with the University of Alaska.

Researchers from Yale University, in collaboration with the Southeast Alaska Regional Health Consortium (SEARHC), are conducting a study examining the effectiveness of two drugs to help reduce alcohol craving. A reduction in craving helps a person in treatment concentrate on receiving help, rather than being preoccupied with the “loss of drinking.” The five-year study, which began in early 2003, will involve 200 Alaska Native adults with alcohol problems. Those people meeting the criteria (having a residence and a minimum four day abstention) will receive a combination of two drugs, Naltrexone (to reduce alcohol cravings) and Zoloft (an anti-depressant) for 16 weeks in combination with counseling. Researchers plan to follow-up with clients three times to assess their long-term outcomes.

The Yukon-Kuskokwim Health Center (YKHC) and the Mayo Clinic Nicotine Dependence Center are working together to reduce the use of iqmik in the region. Iqmik, also known as “punk ash,” is a mixture of commercial chewing tobacco and the ash of a fungus that grows on birch trees. YKHC is working with the Mayo Clinic to research the use and health effects of iqmik in the region.

CONDUCTING RESEARCH AMONG NORTHERN PEOPLES

As mentioned throughout this report, many tribal health entities are fully engaged in monitoring, conducting and partnering in health research activities. These organizations have instituted strong institutional review procedures for determining what research should be conducted and under what circumstances. These efforts are pivotal to ensuring that responsible research is conducted in the future.

It is important that researchers working with all Alaska’s people, particularly indigenous people, conduct research with the goal of promoting mutual
respect and communication between scientists and residents. In Alaska’s history, research on peoples of the north have been conducted in ways that have not promoted these values. This has created an understandable environment of mistrust of the value of research.

All researchers working in the north have an ethical responsibility toward the people who live there, their cultures and the environment. The Principles for Conduct of Research in the Arctic were prepared by the Interagency Social Science Task Force in response to a recommendation by the Polar Research Board of the National Academy of Sciences and at the direction of the Interagency Arctic Research Policy Committee. Another set, The Code of Research Ethics, has been prepared by the Alaska Native Science Commission. These principles lay out important protocols which are fully endorsed in this plan. They have been endorsed and promoted by the Alaska Native Science Commission.

Adherence to these principles and the human subjects review procedures at the tribal level means researchers must incorporate the time to complete the reviews into their project plans. While the review often improves the research, it can add a year or more to any project. Funding agencies such as the National Institutes of Health (NIH), must acknowledge this as well since scientists are under time pressure to publish results.

Organizations like the Alaska Native Science Commission, the Alaska Native Epidemiology Center, and the Alaska Tribal Health Consortium and others have done a good job in educating scientists about this issue. In addition, they have made considerable effort to educate and inform community members about the value of research.

In March 2004, an historic gathering entitled Alaska Native Health Research Conference 2004: Making It Work for You was convened in Anchorage. The conference was aimed at community and tribal leaders and it 1) provided a forum to share the results of past research projects, 2) briefed participants on current research projects, and 3) provided a forum for regional research committees to share their philosophies, preferences and factors that lead to successful research.

**ININVOLVING ALASKA NATIVES IN THE CONDUCT OF RESEARCH**

Involving more Alaska Natives in health research that affects their communities is one of the keys to using research results to improve the health and welfare of Alaska Natives. Many organized research programs discussed in this section are engaged in efforts to educate and train Alaska Natives to conduct research.

**Featured research:**

- One new and significant effort to involve Alaska Natives in health research has been funded by NIH in the last year, the Alaska Native Research Partnership for Health (ANSRPH) Project. ANSRPH is the result of a $1.1 million grant, awarded to the Institute for Circum-
polar Health Studies at the University of Alaska Anchorage, in an outgrowth of the activities of the Center for Alaska Native Health Research. The Center’s aim is to develop a stable and useful research infrastructure for the study of health and welfare among Alaska Native people.

ANSRPH is an important part of the infrastructure development efforts. It is a collaborative project with the Alaska Native Epidemiology Center and the Copper River Native Association. The program has three approaches to enhancing Alaska Native health research capabilities throughout the state. First, Alaska Natives will be mentored and trained to initiate and conduct health science research. Second, non-Native researchers will be trained to work effectively and respectfully in cross-cultural settings. Last, the researchers will foster health science research partnerships among various Alaska Native associations, health care delivery systems, and research organizations.

The federal award comes to the university through the National Institutes of Health and the National Center on Minority Health and Minority Disparities. It is closely linked with the Center for Alaska Native Health Research. ANSRPH’s ultimate objective is to establish a permanent center for minority health research training. The training activities will be administered through the University of Alaska Anchorage.

The Alaska Department of Health and Social Services has ongoing injury prevention initiatives. One such project was the Injury Disparities cooperative agreement that included participation of the Alaska Native Epidemiology Center, the Institute of Social and Economic Research at the University of Alaska Anchorage, the Turning Point communities, and injury prevention specialists from Tribal and regional agencies as well as the Alaska Center for Injury Prevention and the Division of Public Health staff from several programs. These efforts arose due to higher rates of intentional and unintentional injuries suffered by the Alaska Natives when compared to the rest of the population.

Researchers from the University of Alaska Fairbanks have been and will be working in close collaboration with colleagues in villages of the Arctic Ocean coast examining the impacts of contaminants on health. As an example, there are two primary objectives of a proposed research project through two NIH initiatives (CANHR AND INBRE):

- Document the affects of food processing on nutritive value and select contaminants concentration (i.e., PCBs, DDTs, mercury, cadmium) in tissues of subsistence use mammals and relate these to known exposure criteria (tolerable daily intake levels);
Determine nutrient concentrations in terrestrial and marine mammal tissues used as food for general human health, compare to recommended daily allowances or intake criteria, and determine the likely offset (prevent) diabetes, obesity, and cardiovascular disease.

Data collected through these proposed research projects would then support a risk assessment and expanded food sampling proposal as part of a larger proposed effort that would provide data to other ongoing statewide efforts in Alaska. The collected data would be used to address several additional research objectives related to environmental contaminants and transboundary pollution:

- Estimate the consumption rate of subsistence use mammals considered important by the community.
- Determine the nutritive intake and estimate the potential disease preventative qualities of these foods based on nutrients analyses (from this pilot research and expanded analyses with a larger proposal) and propose biochemical and molecular studies to explore these mechanisms if not well known.
- Estimate contaminants exposure (based on previously estimated consumption rates) and associated risk and provide insight into potential biomarkers for determining effects or impacts (i.e., serum monoamine oxidase, contaminant metabolites). Some of this has been done without knowing consumption rates and patterns and is not adequate for providing consumption advice.
- Determine the overall risk of avoiding these food products (loss of nutrients v. possible decreased exposure to contaminants) as compared to store bought foods. This is the real question people of rural Alaska need answered considering the limited food choices.

The Alaska Native Science Commission (ANSC) received funds from the U.S. Environmental Protection Agency to develop a program for community-based research as part of its Traditional Knowledge and Contaminants project. The University of Alaska Anchorage; Center for Indigenous Peoples’ Nutrition and Environment at the University of Montreal, Canada; National Marine Fisheries Service, Environmental Conservation Division; and the Alaska Native Science Commission served as the primary team leaders on the project.

Analyses were conducted for organochlorine pesticides, PCBs and heavy metals. Samples of several key species were taken including: varieties of salmon, lake fish, moose, caribou, ptarmigan, duck, beluga, seal, and berries.

The Alaska Native Science Commission (ANSC) and the Alaska Native Health Board (ANHB) have collaborated on the Alaska
A coordinated approach is needed to conduct monitoring research, education and other programs to ensure that Alaskans can make informed health choices about wild food sources.

Traditional Diet Survey, with ANHB conducting the community survey and ANSC coordinating sampling, training and laboratory analysis. Funds were received from the Agency for Toxic Substances and Disease Registry (ATSDR) for this project. Sampling is underway for several communities who participated in the diet survey and results are expected by year end.

Candidate Themes for Health Disparity Research Priority in Alaska

Throughout this report, health disparities are discussed and the candidate themes reflect this. Therefore, this section will focus on two of the many areas of disparity research. These two themes are chosen because they reflect the important nexus between the health of the land and the indigenous people of Alaska.

ENVIRONMENTAL CONTAMINATION/TRANSBOUNDARY POLLUTION

Alaskans, especially those in rural areas, are concerned that potentially harmful contaminants are being found in Alaska’s water, air, and wildlife. The most serious contaminants include manufactured chemicals such as pesticides, PCBs, and dioxins and furans (all known as persistent organic pollutants or POPs), and mercury. These reach Alaska primarily by traveling long distances from lower latitudes to be deposited in the U.S. Arctic. Alaskans increasingly voice concerns that these persistent pollutants are entering the food chain from both global and local sources. Observations from traditional knowledge confirm that unprecedented and unexplained changes are increasingly reported throughout the state.

Alaskans lack adequate information on the current levels or the adverse effects of these chemicals on Alaska’s fish and wildlife and the potential exposure and impact of these chemicals on Alaskans. However, it is known that Native subsistence diets not only provide excellent nutrition, but are also the basis for cultural traditions, values and beliefs. There is no western, scientific evidence to date that indicates these contaminants are having any negative affect on people living in Alaska. However, data on human health and contaminants from Canada and other Arctic countries has fueled concerns by Alaskans about the health of their wild foods.

A coordinated approach is needed to conduct monitoring research, education and other programs to ensure that Alaskans can make informed health choices about wild food sources, including:

- Learning which wild foods and what amounts people are eating from subsistence, commercial and recreational sources;
- Evaluating the comparative risks and benefits of specific Alaskan wild foods;
- Building community educational capacity;
Health Disparities

GLOBAL CLIMATE CHANGE AND THE IMPACT ON HEALTH

Scientists largely agree that the U.S. Arctic is warming, and that the documented environmental changes they are beginning to see are likely to become more pronounced in the coming decades. Arctic climate change can have profound effect on the ecosystem, which in turn, can affect human health.

The extent and thickness of seasonal snow cover, sea ice, permafrost, glaciers and ice sheets are all expected to decrease as the climate warms, affecting the ecosystem and, in turn, human health.

- Detecting and tracking changes over time;
- Identifying any actions needed to reduce unacceptable risks and sources of contaminants; and
- Building community and tribal capacity to participate in research and other programs.

Not enough is known today to accurately predict the degree of global warming or the impacts on humans. But people of the Arctic who live off the land will be the first to observe the changes.

The Arctic Climate Impact Assessment (ACIA), a product of the Arctic Council, will be published in 2004 and will generate continued discussion of climate change impacts in Alaska and across the arctic. The University of Alaska Fairbanks has served as the secretariat for this effort and has accumulated considerable expertise on the subject. Any climate change research agenda should include examination of the social, cultural and human health effects.
Establishing a diversified economy that supports economic growth in Alaska requires a healthy and stable workforce. Alaska’s abundant resources and mixture of diverse people provides an exceptional opportunity to begin expanding economic development and to educate and train a workforce to support such development. Yet, the existence of multiple problems in the daily life of citizens and their communities presents a considerable challenge that hinders the development of a healthy and stable workforce.

One pervasive and complex problem, for example, that significantly impacts individuals and society in Alaska is rooted in abusive alcohol use, alcoholism, and addiction to other drugs. Other problems are the increasing incidence of diabetes among Alaska Natives, high suicide prevalence rates, particularly among Alaska Natives, work-related accidents and deaths, extremely high prevalence levels of Fetal Alcohol Spectrum Disorder (FASD), violence, largely encompassing sexual assaults against women, domestic violence, and homicides. Most incidents of violence recorded in the state are alcohol related.

The specific causes associated with such problems are complex by their very nature and costly in terms of human suffering. To date, no simple explanation for their complexity or their resolution exists in any society. When problems are not simple, the solutions are equally, if not more, complicated. In the search for a rational approach, it seems logical for societies and their governments to seek a scientific basis for identifying and examining the causes, consequences, and management of such
problems, and to also seek effective treatment and prevention of such health and social problems. Thus science is turned to for the best possible solutions or approaches to ameliorate such problems and improve the quality of life. Improvements in quality and effectiveness of care are possible through research that leads to a better understanding of the unique characteristics and needs of the people for whom intervention or treatment is intended. This concept is based on recognition that each person is an individual shaped by interactions between biologically determined heritage and their environment.

Behavioral health represents a conceptual framework for investigating the causes and ways to ameliorate health and social disorders. Broadly defined, a behavioral health approach views health as a function of sociocultural and behavioral/psychological factors and biological systems. The interdependence of these three levels suggests that each is involved in the onset of health-related disorders and that each needs to be addressed in both preventing and treating such disorders. An important dimension of this behavioral health model is that cultural factors play a significant role in preventing and responding to a variety of health problems, such as changing diet or preventing smoking among youth. Within a behavioral health system, people are linked directly with a clinically effective level of care and providers best suited to respond to their needs.

The University of Alaska, in keeping with its mission to conduct and support health related research, is seeking to facilitate communication and interaction among scientists actively engaged in behavioral health research. Findings from productive research can serve as a way of assisting Alaskans to help alleviate problems in the state.

The University also seeks to promote a dialogue among members of the Alaska Native community, researchers, and practitioners to foster development of collaborative efforts that are culturally appropriate and meaningful for Alaska Natives. There is a recognition that people need to be involved in solving problems that affect their community. Consequently a primary goal of the research programs at the University is to bring service providers, researchers, policy makers, and Alaskan Native leaders together. Collaboration allows for existing knowledge to be shared, and to assess what kind of information can be gained from research, what types of research are needed, and how to most appropriately apply knowledge gained to improve the health of Alaska Natives through community-based programs.

**SOCIAL FACTORS THAT CONTRIBUTE TO ILLNESS**

It has been known for a long time that social status is related to health status. Alaska, due to the diverse nature of its population and disparity of income (linked to significant differences in rural and urban environments) has a large underserved rural population that, in many instances, meet federal criteria for poverty. Poverty disproportionately affects ethnic minorities throughout the country, as well as in Alaska. The overall rate of poverty in the U.S. was 12% in 1999, with whites least likely to be poor (8%
poverty), and American Indians and Alaska Natives most likely to live in poverty (26%). In Alaska, Alaska Natives are 2 ½ times more likely to be poorer than the general population; 10% of the overall population lives below the poverty level while 26% of the Alaska Native population lives below the poverty level. Exposure to poverty leads to significantly increased stress levels that compound many conditions or leads to significantly higher risk of developing health problems. Domestic violence, child abuse, smoking, and abuse of inhalants among youth are frequently more prevalent in low-income families. These problems have been found to be disproportionately high among Alaska Natives, and present serious health risks that have contributed to a lessening of their life span.

**THE NATURE OF BEHAVIORAL HEALTH PROBLEMS/DISORDERS IN ALASKA**

One way to gauge behavioral health needs in Alaska has been through the use of the Behavioral Risk Factor Surveillance System (BRFSS). This system is used by the Centers for Disease Control and Prevention (CDC), state health departments, and other health agencies to ascertain health status in the United States. It is the largest ongoing telephone health survey in the world. In 1984 there were 15 participating states and by 1990, 45 states were taking part. Alaska has been part of the survey since 1997. It is conducted jointly by the Department of Health and Social Services, the Division of Public Health, and the Office of Community Health and Emergency Medical Services (CHEMS).

In addition to tracking public health trends, an important element of the BRFSS is that it provides information to monitor risk behaviors related to chronic diseases, injuries, and death. Since the early 1980s, BRFSS data have been used to identify emerging health issues, document health trends, compare health behaviors across states and measure progress towards health goals. The data itself also provides important information for the development of public health programs.

Behaviors linked to health problems are referred to as behavioral risk factors and include smoking, being sedentary, and abusing alcohol and other drugs. These behaviors often play a role in situations where mental health, child abuse, and domestic violence are issues. Behavioral risk factors are directly associated with the ten leading causes of death in the
nation as well as in Alaska. The ten leading causes of death are cancer, heart disease, unintentional injuries, stroke, chronic lower respiratory disease, suicide, diabetes, homicide, pneumonia and flu; and liver disease and cirrhosis.

**DISPARITY IN MENTAL HEALTH TREATMENT AND INSURANCE COVERAGE**

**Insurance Disparity**

The lack of parity in insurance coverage for mental illnesses has become an issue more people are aware of since Congress passed the Mental Health Parity Act in 1996, otherwise known as the Dominici-Wellstone Law. While an improvement over the previous situation, the law did not entirely solve the problem of a lack of adequate insurance coverage for those with mental illness nor did it provide true parity. Parity is clearly an ongoing issue. It is estimated that 90% of insurance companies offer fewer benefits for treatment of mental illness than for physical conditions. About 2.8% of all adult Americans, some 5 million people, suffer from a mental illness, but approximately 40% of those afflicted do not or can not seek treatment, due in part, to a lack of adequate insurance coverage. Of approximately 4 million American children (ages 9-18) experiencing serious emotional disturbance, only a small fraction receive appropriate mental health services.

To date, fifteen states have passed parity legislation: Texas, Maine, New Hampshire, Maryland, Rhode Island, Minnesota, Arkansas, Arizona, Colorado, Connecticut, Indiana, Missouri, South Carolina, and Vermont. In 1997, 34 states considered parity legislation and nine states passed the legislation while additional states passed legislation in one body, but the effort did not become law. The Alaska State Legislature has undertaken a study of mental health parity, but to date no legislation has passed.

**Treatment Disparity**

The National Institute on Alcohol Abuse and Alcoholism (NIAAA) reported that there is an enormous gap between the number of people who report serious alcohol problems and the number of people who actually receive treatment for alcohol problems. Recent research cited by NIAAA suggests that only one in ten individuals who need services for alcohol problems actually have received any form of treatment. This gap may be the result of various factors: barriers to accessing alcohol services including financial, geographic and cultural barriers; denial that treatment is needed; concern about the stigma of alcoholism; or the lack of pressure from family, friends, and employers to seek treatment. A 2000 study sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA) estimates the percentage of Alaskans aged 12 or older that needed, but did not receive treatment for an illicit drug problem in the prior year, at 2.1%. This study places Alaska as the state with the third highest unmet need for substance abuse treatment. This rate is lower than estimates generated by in-state agencies.
RESOURCES FOR FUNDING MENTAL HEALTH IN ALASKA

Alaska is unique in the way it funds behavioral health services. In 1956 Congress granted Alaska one million acres of land with which to generate revenues to fund Alaska’s mental health programs. A lawsuit in the 1980s led to the creation of the Alaska Mental Health Trust Authority (AMHTA) in 1994, whose responsibility is to ensure the creation of a comprehensive, integrated mental health program for Alaska. The Alaska Mental Health Trust Authority uses revenues from trust lands to benefit Alaskans with mental illness, mental retardation, psychosis from chronic alcoholism, and Alzheimer’s disease, or related dementia. These funds are a significant resource for developing the mental health system in Alaska.

SEEKING SOLUTIONS THROUGH RESEARCH

The nature of the problems described above unambiguously conveys that there are substantial health and social problems that have to be addressed to improve the health status of all Alaskans. Behavioral health research can assist in this process by seeking solutions to specified practical problems from which amelioration or improvement of some process or activity or achievement of practical objectives can be achieved. Responding to the behavioral health needs in Alaska, however, will require a coordinated effort among the various agencies and organizations currently providing services, conducting research, or providing administrative services and funding organizations and the state legislature. Some of the Agencies involved in behavioral health research or services in Alaska are:

- The Alaska chapters of the National Alliance for the Mentally Ill (NAMI)
- Office of Community Health and Emergency Medical Services (CHEMS), Department of Health and Social Services, Division of Public Health
- The Department of Public Safety
- Council on Domestic Violence and Sexual Assault (CDVSA)
- The Institute for Circumpolar Health Studies (ICHS)
- The Copper River Native Association
- The Psychology Department at UAF
- The Center for Alcohol and Addiction Studies (CAAS) at UAA
- The Center for Human Development at UAA
- The Alaska Native Health Board
- The Alaska Tobacco Control Alliance
- The Center for Alaska Native Health Research at UAF (CANHR)
- The Mental Health Association in Alaska (MHAA), which is a Division of the National Mental Health Association
The Alaska Mental Health Board
Native American Mental Institute (NAMI)
The National Center for Native American and Native Alaskan Mental Health Research (NCAIANMHR)
The Department of Health and Social Service, Division of Behavioral Health
Behavioral Health Research and Services at UAA
The Alaska Mental Health Trust Authority.

Featured Behavioral Health Research in Alaska

CHRONIC DISEASES

While Alaska has the same types of problems found in all other states, the severity of many of its health problems is greater in Alaska. Some of these problems are obesity, cigarette smoking, high blood pressure, acute and chronic drinking, lack of health care, use of smokeless tobacco and driving while intoxicated. Table 1, below, shows how Alaska compares to the U.S. with respect to four risk factors. As can be observed, we lead in every category.

A shortcoming in the state, with respect to a behavioral health surveillance system, is that the data available are quite limited. Compiling reliable data on behaviors that lead to adverse health effects is essential to formulating effective intervention and prevention strategies. If Alaska could reduce the behavioral risk factors associated with the diseases inherent in the state,

PERCENTAGE OF POPULATION WITH BEHAVIORAL RISK FACTORS, 2001

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Alaska</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overweight</td>
<td>41.2%</td>
<td>37.2%</td>
</tr>
<tr>
<td>Cigarette smoking</td>
<td>26.2%</td>
<td>22.8%</td>
</tr>
<tr>
<td>Acute binge drinking</td>
<td>18.2%</td>
<td>14.7%</td>
</tr>
<tr>
<td>Chronic drinking</td>
<td>5.8%</td>
<td>5.1%</td>
</tr>
</tbody>
</table>
Alaska could achieve a significant increase in its overall health status. Further, knowledge of the full range of behavioral health problems in Alaska would assist in the development of intervention strategies to reduce the severity of such problems, contributing to an improvement in the health status of Alaskans.

**INFECTIOUS DISEASE**

Of course since infectious diseases are something a person becomes infected with, there is a behavioral component to all of them. However, for many infectious diseases the “behavior” that makes someone prone to catching the disease is living in a certain area or being bitten by a bug. When behavioral health professionals speak of infectious diseases that generally refers to sexually transmitted diseases (STD) and HIV/AIDS.

Alaska has rates of many STDs that are higher than the average rate. For example, Alaska has the highest rate of Chlamydia in the nation.

**Featured research:**

- The University of Alaska Anchorage received funding from the National Institute on Drug Abuse to work on HIV prevention efforts. This grant funded the Anchorage site of the Cooperative Agreement for HIV/AIDS Community-Based Outreach/Intervention Research, a multi-site program investigating innovative HIV/AIDS prevention programs for out-of-treatment drug users. These efforts were extended to include an evaluation of the effectiveness of needle exchange programs.

- Behavioral Health Research and Services at the University of Alaska Anchorage received funding from the National Institute on Drug Abuse to investigate the relationship between high-risk sexual and drug-taking behaviors and depression among out-of-treatment drug users.

- Behavioral Health Research and Services at the University of Alaska Anchorage is collaborating with the Medical College of Wisconsin and the University of New Mexico Health Sciences Center to investigate stigma and ethical concerns that emerge in work with rural patients suffering from stigmatizing illnesses, such as HIV/AIDS, STDs, infectious diseases, substance abuse, and mental illness. This project is being implemented in Alaska and New Mexico and has provided invaluable information for treatment providers and policy makers on efforts to improve treatment services and access in rural and frontier communities. This ground-breaking work was featured in the Arctic Research in the United States, published by the National Science Foundation. This work has received additional funding from the National Institute on Drug Abuse to address health disparities experienced by individuals of diverse cultural backgrounds in Alaska and New Mexico.
Behavioral Health Research and Services at the University of Alaska Anchorage will study the pattern of a relationship of coexisting depression and substance abuse to in a longitudinal framework with funding support for the two-year project from the National Institute on Drug Abuse (NIDA). The study will analyze a longitudinal database established through a NIDA funded project implemented in Anchorage. The project seeks to do three things: 1) determine the underlying factor structure of depressive symptomatology among this sample of drug users; 2) assess the relationship between the identified depressive symptomatology factors and high-risk sexual activity, substance use patterns, risky drug-use-related behaviors, and HAV, HBV, and HCV serostatus; and 3) determine whether across time, changes in depressive symptomatology lead to changes in and/or can successfully predict sexual risk behaviors, drug-use-related risk behaviors, substance use patterns, and HAV, HBV, and HCV serostatus.

SUBSTANCE ABUSE

Alcohol abuse, alcoholism and other forms of drug dependence exact a heavy social and economic toll on the state, particularly among Alaska Natives. It is especially essential to reduce the level of Fetal Alcohol Spectrum Disorder (FASD) births in the state. Presently, Alaska has the highest documented FASD rate in the nation. Among non-Natives, the rate is approximately four times higher than that found in other states. Among Alaska Natives, it is over 15 times the national average.

KEY FACTS ABOUT ALASKA NATIVE MORTALITY

| The alcohol-related death rate for Alaska Native adults is over 7 times that of all U.S. adults of all other races. |
| The accidental death rate for Alaska Native adults is almost 5 times that of all U.S. adults of all other races. |
| The suicide death rate for Alaska Native adults is 4 times that of all U.S. adults of all other races. |
| Alaska Native adults’ homicide mortality rate is 2.5 times the rate of all U.S. adults of all other races. |
| The motor vehicle accidental death rate for Alaska Native adults is almost three times that of all U.S. adults of all other races. |

Source: Indian Health Service, www2.his.gov/AlaskaAO/dpehs/Special_Reports/facts/adults.asp
disproportionately over-represented in data collected on human privation and distress due to substance abuse. Their consumption level, crime, and related violence rates, for example, have been shown to be significantly higher than for other groups.

The severity of the “alcohol problem” among Alaska Natives is reflected by a higher proportion of Alaska Natives utilizing substance abuse treatment resources in the state. The table below shows the trend in admissions to state treatment program from 1997 to 2001, and indicates that Alaska Natives have had the highest admission rates over this duration.

Alcohol is also a growing problem among minors in Alaska. Court cases involving minors consuming alcohol increased 131% between 1995 and 1999. The rate in 1995 was 347 cases per 100,000 people, while in 1999 it was 802 cases.

The Center for Alcohol and Addiction Studies (CAAS)

The Center for Alcohol and Addiction Studies (CAAS) at the University of Alaska Anchorage has been vital in helping to research and document the substance abuse problems in the state. Established by the Board of Regents in 1972, the Center has worked to alleviate the problems of alcohol and other drug abuse and their related problems through the development and implementation of educational, research, and public service programs. Early in its development, CAAS concentrated on epidemiological issues and personality research, while later research progressed to more focused studies such as specifically examining drinking among Anchorage’s homeless street population.

CAAS then shifted its emphasis to collaborative studies involving the University of Alaska Fairbanks (UAF), the Alcohol Research Center, Indiana University Medical Center, the Alcohol Research Center, University of Connecticut School of Medicine; and the Institute of Medicine (Novosibirsk, Siberia, Russia), exploring the biobehavioral basis of alcohol-

### ALASKA TREATMENT ADMISSIONS BY RACE

<table>
<thead>
<tr>
<th>Year</th>
<th>Alaska Native</th>
<th>White</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>48.8%</td>
<td>43.0%</td>
<td>8.2%</td>
</tr>
<tr>
<td>1998</td>
<td>51.4%</td>
<td>41.7%</td>
<td>6.9%</td>
</tr>
<tr>
<td>1999</td>
<td>48.4%</td>
<td>43.7%</td>
<td>7.9%</td>
</tr>
<tr>
<td>2000</td>
<td>48.4%</td>
<td>42.0%</td>
<td>9.6%</td>
</tr>
<tr>
<td>2001</td>
<td>48.5%</td>
<td>44.6%</td>
<td>6.9%</td>
</tr>
</tbody>
</table>
ism. This effort resulted in "leading edge" research findings pertaining to the etiology of alcoholism among Alaska Natives.

The “Russian-Siberian connection” provided an international perspective to CAAS’s research. Although the partnership with Novosibirsk researchers ended in the late 1980s, active research collaboration continued with the Alcohol Research Center at the University of Connecticut School of Medicine and the Indiana University Alcohol Research Center. This collaboration culminated in the receipt of a six-year collaborative National Institute on Alcohol Abuse and Alcoholism (NIAAA) research grant with the Alcohol Research Center, University of Connecticut School of Medicine, to investigate factors contributing to alcoholism among Alaska Natives. In the 1990s, CAAS joined with the Institute for Circumpolar Health strengthened its ability to address the State’s needs with respect to substance abuse.

Research within CAAS over the past few years has concentrated on gaining knowledge to help advance substance abuse treatment in the state. An added emphasis has been working with programs serving Alaska Natives to develop culturally oriented treatment approaches that blend traditional Alaska Native ways with western ways to help people heal. Part of this effort involves providing continuing education through workshops for providers in substance abuse treatment programs.

**Featured research:**

- The Integrated Substance Abuse Treatment Needs Assessment for Alaska (ISATNA) comprised the most comprehensive study performed to date to estimate alcohol and drug treatment facility needs, prepared by the North Charles Research and Planning Group. The ISATNA report indicates that there is a shortage of treatment facility beds in Alaska. The study estimated that 1,140 people in Alaska both needed and wanted treatment in 2000, but had not obtained it.

  According to the ISATNA report, the estimated total number of Alaskans in need of treatment for a substance abuse disorder during the past year was 38,790, or 8% of the population. Of the estimated 38,790 people in need, an estimated 5,039 (16%) received treatment for a substance abuse disorder in 2000. The vast majority (84%) of people in need of treatment during the past year (2000) did not receive it. The waitlist for treatment facility slots in July 2001 was 61 women with children and 143 adults seeking residential treatment.

- The People Awakening Project at the University of Alaska Fairbanks: The People Awakening was a research study that sought to develop an understanding on pathways to sobriety among Alaska Natives conducted by the University of Alaska Fairbanks Psychology Department. The research focused on identifying protective and resiliency factors that mitigated against Alaska Natives developing a problem with alcohol or relapsing following treatment. The project was funded
by a research grant from the National Institute of Alcohol Abuse and Alcoholism (NIAAA). It interviewed over 400 Alaska Natives statewide. The study's findings are being made available to state and tribal corporations in order to stimulate reflection on the implication of the results for prevention or treatment of alcohol abuse. The study’s findings have important implications for understanding why some people become vulnerable to dependency on alcohol and what cultural ways will help them obtain and maintain sobriety.

- In the Pharmacological Treatment of Alcoholism study, researchers from Yale University, in collaboration with the Southeast Alaska Regional Health Consortium, are examining the effectiveness of two drugs to help reduce alcohol craving. A reduction in craving helps a person in treatment concentrate on receiving help, rather than being preoccupied with the “loss of drinking.” The five-year study, which began in early 2003, will involve 200 Alaska Native adults with alcohol problems. Those people meeting the criteria (having a residence and a minimum four day abstinence) will receive a combination of two drugs, Naltrexone (to reduce alcohol cravings) and Zoloft (an anti-depressant) for 16 weeks in combination with counseling. Researchers plan to follow-up with clients three times to assess their long-term outcomes.

- CAAS has become extensively involved with treatment evaluation and applied research studies. An outcome of this research effort has led to an additional focus on studying the role that historical or intergenerational trauma plays in the onset of alcohol and drug abuse, mental illness, and violence. These studies have been funded by Alaska Native organizations and by the National Institute on Alcohol Abuse and Alcoholism (NIAAA). The results of some of these studies, particularly information on historical trauma, can be found in an early report funded by the Alaska Federation of Natives (AFN) released in 1999, titled, “Alaska Natives Combating Substance Abuse and Related Violence through Self-Healing—A Report to the People.”
The findings from CAAS studies are being used to assist treatment programs to respond more effectively to the needs of Alaska Natives, and others to improve treatment outcome.

- CAAS is or has been specifically involved with the following evaluation projects:
  - Southcentral Foundation, Anchorage; The Pathway Home—A residential program for substance abusing and emotionally troubled adolescents (September 2000–September 2003).
  - Cook Inlet Tribal Council, Anchorage; Family Strengthening Program—A family-based substance abuse intervention project (October 2000–December 2004); The Wisdom Place—A residential substance abuse treatment program for elders (October 2000–September 2001); Ernie Turner Center System of Care—Evaluation of the implementation of a system of care program in the residential treatment program (October 2000–September 2001).
  - Fairbanks Native Association; Life Givers—A residential treatment program for adolescent girls (September 1997–December 2003); Women and Children’s Center for Inner Healing (September 2003–June 2004).
Other studies conducted by the Center have been on identifying effective methods for intervening with homeless Alaska Natives, establishing “best practices” for Alaska Natives in treatment for an addictive disorder, identifying experience of personal violence among homeless Alaska Natives, and on identifying the causes and consequences of alcoholism among Alaska Natives entering treatment for substance abuse. An additional research interest has been on identifying the relationship between historical trauma, cultural identity, and experiences of personal violence. The findings from these undertakings are being used to assist treatment programs to respond more effectively to the needs of Alaska Natives, and others, to improve treatment outcome.

CAAS, in a project funded by NIAAA, is collaborating on a research study with the Alcohol Research Center, University of Connecticut School of Medicine, and entitled “Phenotypes of Alcoholism among Alaskan Natives” (October 1995–September 2001).

NIAAA funded research study that was a collaboration between CAAS and the Alcohol Research Center, University of Connecticut School of Medicine, entitled “Experiences of Personal Violence among Alaska Native Homeless Men and Women” (December 2002–November 2003).

**Drunk Driving**

A serious alcohol-related problem is drunk driving. Data on drunk driving indicates that 45% to 48% of all motor vehicle fatalities in Alaska have alcohol and/or drugs as a major contributing factor. Driving while intoxicated continues to be a major concern in the state and efforts in education and prosecution are ongoing. Alaska has lowered the acceptable blood alcohol content to 0.08, and instituted mandatory driver’s license revocation when a driver’s blood alcohol content is above the acceptable level.

Despite ongoing national and local public awareness efforts to dissuade people from drunk driving, the rate of traffic fatalities involving alcohol does not appear to be declining. According to the National Highway Traffic Safety Administration (NHTSA) FARS database, in 1995 there were 47 traffic fatalities as a result of drunk driving in Alaska, while in 2000 there were 53 fatalities, and in 2001, there were 43. From 1995 through 2001, drunken driving fatalities in Alaska fluctuated a bit in individual years, but continue to hover near the seven-year average of 42.3 deaths per year. During the 1990 to 1998 time period, however, motor vehicle accidents involving an underage drinking driver have seen an overall downward trend, with a significant decrease from a rate of 31.96 per 100,000 people in 1990 to a rate of 19.79 per 100,000 people in 1998. Part of this decrease can be attributed to increased law enforcement efforts, an increase in penalties for DWI and a campaign to reduce DWI in the state.
Tobacco

Another significant drug-related problem in the state is smoking. Nationally, an estimated 65 million people used some sort of tobacco product in 2000, a prevalence rate of almost 29%. The highest rates of tobacco use were in the 18 to 25 age group. Alaska high school students have a smoking prevalence rate of 34%, representing approximately 13,000 teenagers. According to Tobacco Free Kids, an estimated 2,200 kids under the age of 18 become new smokers every year. In 1999, Alaska adults had a smoking prevalence rate of 24%.

Prevalence of smoking in Alaska has remained fairly constant during the last decade. The non-Native population has a prevalence rate hovering around 25%, while the rate for the Alaska Native population is approximately 42%, according to findings reported by the Indian Health Service (IHS). The following table provides a comparison of smoking among Alaskans by ethnic identity between 1991 and 1999.

Approximately 440 Alaskan adults die each year as a result of smoking. Alaska Tobacco Free Kids estimates that 19,500 kids under 18 living in Alaska will ultimately die prematurely from smoking. There are 80 to 140 additional people who die each year as a result of secondhand smoke. Smoking related illness is a huge burden in every state; in Alaska the annual average health care costs directly caused by smoking are $132 million, $60 million of which is covered by state Medicaid.

In 2002, Alaska spent $3.1 million on tobacco prevention and is slated to spend $5 million in 2003. The U.S. Centers for Disease Control and Prevention has recommended that Alaska spend between $8.1 and $16.5 million per year on tobacco prevention. Alaska had $69 million in tobacco-generated revenue in 2002: a combination of a yearly collection on tobacco

### Prevalence of Smoking in Alaska Native and Non-Native People

<table>
<thead>
<tr>
<th>Year</th>
<th>Non-Native</th>
<th>Native</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>25.0%</td>
<td>39.0%</td>
</tr>
<tr>
<td>1995</td>
<td>23.0%</td>
<td>37.0%</td>
</tr>
<tr>
<td>1996</td>
<td>25.0%</td>
<td>47.0%</td>
</tr>
<tr>
<td>1998</td>
<td>40.0%</td>
<td>24.0%</td>
</tr>
<tr>
<td>1999</td>
<td>24.3%</td>
<td>42.1%</td>
</tr>
</tbody>
</table>
settlement payments and tobacco taxes. The tobacco industry spends estimated $21.4 million marketing tobacco products in Alaska each year.

Alaska has raised its tobacco tax twice in the last five years in an effort to reduce tobacco use, particularly among teens. Enforcement against vendors selling tobacco to minors has been strengthened. Preliminary evidence is emerging that teen tobacco use is declining in Alaska.

Featured research:

- The Yukon-Kuskokwim Health Center (YKHC) and the Mayo Clinic Nicotine Dependence Center are working together to reduce the use of iqmkik in the area. Iqmkik, also known as “punk ash,” is a mixture of commercial chewing tobacco and the ash of a fungus that grows on birch trees. The National Institutes of Health supplied $1.5 million in funding for the effort. Research by YKHC revealed that 82% of pregnant women in the region use tobacco; 61% using iqmkik or straight chewing tobacco with the remainder smoking. The project will last ten years and focuses on whether babies whose mothers used iqkim during pregnancy suffer withdrawal at birth and whether there are long term health repercussions for these children. The link between a woman smoking during pregnancy and her child having respiratory infection, SIDS, delayed learning, or mental retardation is well established.

Inhalants

Inhalant abuse, or huffing, involves sniffing the fumes from commercially available products such as gasoline or cleaning products. There are currently 1,400 commercially produced chemicals available for huffing, which makes it difficult to separate children from substances they can sniff. Inhalant use can result in brain damage, gross and fine motor skill impairment; heart, kidney and liver damage; and sudden death. Inhalant abuse by youth in Alaska has emerged as a severe problem, especially among Alaska Native boys and girls. The problem has become especially acute in the Yukon-Kuskokwim region. In a speech given on the senate floor, then Senator (now Governor) Frank Murkowski noted that a recent survey by a rural Alaskan Native health corporation indicated that in two villages, all children ages 3 and up had tried inhalants.

It is clear to many that inhalant abuse in Alaska continues to be a serious problem. In 1993, the Alaska Area Indian Health Service (IHS) began reporting inhalant abuse related services as an unmet need to the IHS headquarters. That same year, IHS in Alaska calculated that a person 19 years old with a history of chronic inhalant abuse, having caused significant brain and/or organ damage, will cost the state an estimated average of $1.4 million over the course of his/her life. These costs will arise from acute and chronic medical needs, substance abuse treatment and rehabilitation, as well as social services; involvement with law enforcement and the court system. In 1995, 22% of Alaska high school students reported having sniffed inhalants.

In 1997, the Alaska Psychiatric Institute reported 53 admissions having
Among the adults in treatment facilities surveyed, 32% had used inhalants—the youngest reported age of use was four and the oldest was 61. Inhalant abusers need two to six weeks of 24-hour, supervised detoxification.

Among the adults in treatment facilities surveyed, 32% had used inhalants—the youngest reported age of use was four and the oldest was 61. Inhalant abusers need two to six weeks of 24-hour, supervised detoxification.

Among the adults (18 years and older) in treatment facilities surveyed, 32% had used inhalants; the youngest reported age of use was four and the oldest was 61. Of those surveyed who were 19 years and younger and in a youth correctional facility, 33% reported having used inhalants, the youngest reported age of use was five, 58% reported having friends who used inhalants, and 29% reported having a friend who was experiencing problems as a result of inhalant abuse. Of respondents in a youth correctional facility, one quarter reported having learned how to use inhalants from a family member, 57% from a friend, and 12% reported having learned through self-experimentation.

- Alaska Native youth in treatment facilities do not respond well to Western treatment approaches.
- Inhalant abusers need two to six weeks of 24-hour, supervised detoxification.
- Inhalant abusers have physically aggressive behavior toward other clients, staff and facility property, poor attending behavior, poor decision making abilities, poor higher thought function, short-term memory problems, and can have physical coordination problems.

**Featured research:**

- The Yukon-Kuskokwim Health Corporation received a grant from the Center for Substance Abuse Treatment (CSAT) to develop a residential treatment program to specifically serve youth who abuse inhalants. The program developed in response to the need to begin...
addressing inhalant abuse in the state. The program was especially needed because there were few families in villages and communities, especially in the Yukon-Kuskokwim (Y-K) region of the state, who had not been directly affected by some form of inhalant-taking behavior among their youth. Y-K’s program was the answer to the people’s wish to protect their youth by having a facility dedicated to helping their children heal from inhalant abuse. The Tundra Swan Program, as it came to be called, thus emerged as a result of a carefully crafted planning process. The process was based on the premise that because the program was to be the first of its kind in Alaska, if not in the nation, it had to be derived by knowing the best practices for working with youth who used inhalants, especially Alaska Native youth.

In the spring of 2003, the TSIP changed its status from a substance abuse treatment facility to a residential psychiatric treatment center. This change allowed the program to more effectively and more comprehensively address the behavioral health needs of the clients, as well as maintaining its emphasis on treating inhalant abuse.

**Fetal Alcohol Spectrum Disorder**

Formerly termed Fetal Alcohol Syndrome (FAS), Fetal Alcohol Spectrum Disorder (FASD) refers to a “constellation of birth defects” caused by exposure to alcohol during gestation. Children with FASD often have behavior and learning disabilities. Alaska has the highest FASD rate in the nation. Among non-Natives, 1.5 cases of FASD per 1,000 live births is approximately four times higher the rates than found in other states; among Alaska Natives, prevalence levels reveal that there are 5.6 per 1,000 live births, which is over 15 times the average recorded rate among all other states. Given an increasing birth rate among Alaska Native women, there is a clear need to provide effective prevention programs to reduce the number of women who drink or use other drugs while pregnant. At this time, there is no estimate of the financial cost to the state of responding to the health and social problems attributable to FASD.

In response to the problem of FASD in the state, the Alaska Mental Health Trust Authority (AMHTA) granted the State Department of Health and Social Services (DHSS) seed money to initiate a statewide program that would focus on reducing FASD. In January 1998, the State DHSS created the Alaska Comprehensive FASD Project (ACFP) with the funds received from AMHTA. In October 2000, ACFP was greatly enhanced with the help of Senator Ted Stevens, who appropriated a five-year $29 million contract through the United States DHHS Substance Abuse and Mental Health Services Administration (SAMHSA) to the State DHSS to further improve ACFP’s efforts. The purpose of this federal grant was “to initiate a statewide comprehensive, integrated approach to FASD prevention and systems improvement.”

The project focused on establishing community-based education and prevention programs; cross-discipline training and educational services;
At present, there is no epidemiological database in Alaska for mental illness among children, adolescents, or adults.

establishing technical assistance and support for communities and public education/media campaigns; and conducting an evaluation study of the project. The outcome of this endeavor will be available in 2005.

**Featured research:**

- The Center for Human Development at the University of Alaska Anchorage is leading an effort to evaluate the State of Alaska’s five-year project to prevent FAS. Four departments at UAA comprise the evaluation team. The evaluation is being funded by the Substance Abuse and Mental Health Services Administration (SAMHSA).

**MENTAL ILLNESS**

The absence of a surveillance system that documents mental health disorders in Alaska inhibits the development of a strategy to identify the extent of the problem and to reduce its prevalence. At present, there is no epidemiological database in Alaska for mental illness among children, adolescents, or adults. The Alaska Mental Health Board has estimated that 6.3% of Alaska’s population has a severe mental illness. Epidemiological data from national surveys yields a higher estimate of 22.9%, even though the age range was smaller (ages 15 to 54). The national survey also estimated that between 9% and 13% of children have severe emotional disturbances (SED). A recently completed study of behavioral health needs in the Copper River region conducted jointly by the Institute for Circumpolar Health Studies (ICHS) at the University of Alaska Anchorage and the Copper River Native Association (CRNA), noted that the estimated rate for Alaska may be lower than the national figure. Lower socioeconomic status of many rural residents is a factor strongly associated with mental illness.

Mental disorders among adults tend to be manifest in the form of depression, post-traumatic stress disorder, mood disorders, anxiety disorders, and severe emotional disorders, such as schizophrenia. Among children,
attention deficit hyperactivity disorder (ADHD), oppositional defiant disorder, conduct disorder, depression, seasonal affective disorder (SAD), and autism are recognized as significant problems.

It has been only within the past 20 to 30 years, following the introduction of medications to treat mild and severe mental conditions, that our society has begun to lessen the stigma associated with mental illness. Due to the massive advertising by pharmaceutical companies to market their products, mental illness has become more accepted in society as a treatable disorder, and such terms as depression, anxiety disorders, and obsessive-compulsive disorder have become part of common language. A result of this change in our society is that many people who were formerly unaware that many mental illnesses are treatable now actively seek medications from their physician to help cope with every stressful aspect of their life.

The drugs available to treat many types of mental illness have improved immensely in the past few years, and understanding of the best methods of other therapies is continually enhanced. Current research indicates that early identification and intervention, a combination of medication with counseling or psychotherapy, and resources for social rehabilitation have the potential to improve the outcome of treatment for mental illnesses. Treatment of mental illness has also become more affordable and more effective. New medications are better at relieving symptoms and avoid many of the unacceptable side effects of earlier drugs. However, it is critical to understand that medications need to be monitored by psychiatrists with significant expertise in psychopharmacology. In many locations in Alaska, there are shortages of psychiatrists, and most medications are being prescribed by health professionals with a lack of any training in psychopharmacology. There are no psychiatrists in Alaska with board certification in psychopharmacology.

Despite the advancement in pharmacological treatment of mental health disorders and changes in the public’s attitude toward such conditions, insurance coverage is typically much lower for mental illness, which precludes people from getting the help they need. Further complicating the situation is that many parents refrain from seeking help for their children who are experiencing behavioral problems because of cost and associated feelings of shame and guilt over their child’s condition. Such parents often wait until it becomes so severe that in many cases, the child is at risk of school suspension and referral for residential treatment. These situations need to be corrected if Alaska is to reduce the incidence of mental illness in the state.

Advancements in the treatment of chronic and persistent mental illness have led the National Alliance for the Mentally Ill and the President's New Freedom Commission to advocate for the recovery and cure for those experiencing psychiatric disorders. Two publications that are excellent resources are Shattered Lives: Results of a National Survey of NAMI Members Living with Mental Illness and their Families and Achieving the Promise: Transforming Mental Health Care in America: Executive Summary of The President's New Freedom Commission on Mental Health.
Featured research:

- The State of Alaska contracted with the Behavioral Health Research and Services program at University of Alaska Anchorage to conduct a program evaluation of the Community Mental Health/Alaska Psychiatric Institute (CMH/API) Replacement Project. The four-year project was federally funded by the Substance Abuse and Mental Health Services Administration (SAMHSA) through a grant to the Alaska Department of Health and Social Services (DHSS).

A project goal was to develop an emergency care system for individuals in the larger Anchorage area with mental health and substance abuse-related crises. Among the project’s goal are: 1) to develop a 24-hour single point of entry into the Anchorage emergency services system to identify appropriate community-based alternatives to hospitalization, provide crisis response services, and streamline placements for consumers in crisis; 2) to enhance crisis respite for stabilization, evaluation, and assessment outside a hospital setting; 3) provide specialized detoxification services and residential treatment services for consumers experiencing a dual diagnosis of mental and substance use disorders; 4) to designate evaluation and treatment beds in secure hospital settings for individuals in crisis and in danger of harming themselves or others; and 5) to enhance extended care with psychiatric back-up as an alternative to long-term hospitalization at API.

- Ch’eghutsen’ is a unique collaboration between the Fairbanks Native Association (FNA), the Tanana Chiefs Conference, and the University of Alaska Fairbanks Psychology Department. Ch’eghutsen’ is an Athabascan word meaning “children are precious.” This program is designed to offer a culturally appropriate mental health service system for Alaska Native children and adolescents in Interior Alaska.

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- The University of Alaska Fairbanks Psychology Department has received funding from the National Institute of Mental Health to conduct a study that will investigate the nature and extent of trauma experienced by Alaska Native children in rural Athabascan communities, and responses of children, families, and communities subsequent to the trauma. The study will explore what types of clinical interventions make the most sense for different Alaska Native social settings, family members, and communities, as well as for varying forms of
trauma and abuse. Investigating these issues will help to achieve the long-term goal of this study.

- Yukon-Kuskokwim Delta Yuut Calirrut Ikaiyuquulluteng/People Working Together Project is being conducted by the Yukon-Kuskokwim Health Corporation (YKHC) with a grant from the Substance Abuse Mental Health Services Administration, Center for Mental Health Services. YKHC has designed a system of care to serve Yup’ik/Cup’ik Eskimo and Athabaskan Indian people who primarily reside in remote villages in the Delta region of southwestern Alaska. Formal partnerships among the categorical and fragmented providers across the Delta have been formed to create a single system of care. Multidisciplinary teams at subregional hub villages provide holistic, culturally competent diagnosis and treatment planning. Families participate at all levels of the system from leadership, policymaking, and program evaluation to advocacy and support for each other. Formal agreements among providers have been developed to allow for single funding streams. A managed-care system for rural Alaska is being developed.

CO-OCCURRING DISORDERS

Co-occurring, or co-morbid disorders, refers to the occurrence of two separate diagnostic disorders in a single person. Concerning drug-taking behavior, co-morbidity typically refers to a substance abuse disorder together with a psychiatric disorder. Mental health and substance abuse programs have faced the growing challenge of treating people with co-occurring substance abuse and mental illness for the last 25 years. The current number of people with co-occurring disorders is high and is increasing. Conservative estimates suggest that, in any given year, as many as 10 million people in this country have a combination of co-occurring mental and substance abuse disorders. It has also been estimated that as many as 80% of people seeking treatment present with some form of co-occurring mental and substance abuse disorders.

Recent research has found that 60% of patients in both inpatient and outpatient mental health facilities have alcohol- or drug-related problems. It has also been shown that 30% of adults who had a mental disorder also had an alcohol and/or drug problem, and that 53% of adults who had a drug abuse problem also had one or more mental disorders. 37% of adults who had been alcohol abusers also had a mental disorder.

In Alaska, Medicaid records indicate that 8% of mental health consumers are also chronic alcoholics. The 1997 Bristol Observatory report estimated that 21% of the people who received services at community
mental health centers also received services from a substance abuse program. Nationally, data suggest that approximately 27% of people with serious chronic mental illness abuse substances and approximately 15% of people with serious non-chronic mental illness abuse substances.

It has also been found that many people with co-occurring disorders receive treatment for only one of their disorders. Even when a person receives treatment for both, it is most often from separate, uncoordinated systems. Therefore, many people with co-occurring disorders are inadequately served—a problem that affects all age groups.

Because people with co-occurring disorders often experience multiple health and social problems, they require treatment that cuts across several systems of care, including substance abuse, mental health, primary health care, and other services. Providing the appropriate types of services (i.e., when and to what degree they are required) presents formidable challenges to treatment programs. These challenges are intensified when coupled with the numerous barriers that often limit coordination and integration efforts.

Further research has found that dual diagnosis patients—those exhibiting symptoms of psychiatric illness and an addictive disorder—have often been misdiagnosed and mistreated. This finding has important implications for mental health and alcohol and drug treatment programs. If dual diagnosed cases are not identified, this oversight offers an explanation for why some treatments may not be working.

Although an alcoholic or drug user may complete treatment and achieve sobriety, failure to recognize an underlying disorder, such as depression, is likely to increase chances for relapse. Conversely, if treatment is provided while a person is actively experiencing a mental or mood disorder while drinking or using drugs, a successful outcome is unlikely.

Alaska is clearly in need of more dual-diagnosis treatment capacity for people with mental illness and substance abuse. Many people with untreated mental illness turn to available legal and illegal substances as a way to self-medicate in an effort to cope with their illness. The Alaska Department of Corrections reports that up to 120 people per year are discharged still in need of dual-diagnosis treatment residential care.

Alaska’s criminal justice statistics provide a clear picture that substance abuse and mental health disorders are often an underlying cause for criminal activity, both for adult and juvenile offenders. According to data from the Bureau of Justice Statistics in 2000, nationally one in every eight state prisoners was receiving some mental health therapy or counseling services with close to 10% receiving psychotropic drugs. Alaska reported that 9% of its prisoners were receiving psychotropic drugs in 2000. Approximately one third of inmates diagnosed with a mental illness were also diagnosed with an alcohol or drug dependency. The Department of Corrections acts as the single largest provider of inpatient psychiatric treatment.

In summary, there is a strong need to begin addressing the needs of dual diagnosis clients who seek treatment. Historically, such individuals received treatment for only one of their diagnoses. Which problem was treated depended on which type of institution the client found first, with the
other diagnosis general remaining totally untreated, or at best a referral was provided. This treatment approach was fostered by the historical differences in views between the fields of mental health and substance abuse as to how to establish and sustain successful treatment programs for people with co-occurring disorders.

Today, researchers, providers, and systems administrators have come together to minimize, sidestep, and/or overcome historical obstacles. The Alaska Department of Health and Social Services’ Behavioral Health Division has implemented an integrated behavioral health approach that mandates that all chemical dependency programs in the state be co-occurring capable. This requirement will entail evaluation research studies that will report on how well the state’s integrated behavioral treatment approach is serving the needs of Alaska’s people.

**Featured research:**

- Behavioral Health Research and Services (BHRS) at the University of Alaska Anchorage has conducted extensive research in the area of co-occurring mental and substance use disorders. This work included BHRS’s evaluation of a SAMHSA-funded project, the Anchorage Comorbidity Services (also known as the Community Mental Health/Alaska Psychiatric Institute 2000 Project and Community Mental Health/Alaska Psychiatric Institute Replacement Project). This project’s main goal was the implementation of community-wide systemic changes to create an integrated, seamless system of care for individuals with co-occurring disorders. One major finding of BHRS’s research is that the presence of co-occurring disorders is the rule, rather than the exception, at mental health and substance abuse treatment facilities in Alaska. This research has resulted in many publications in peer-reviewed journals and most recently was featured in Alaska Medicine.

**HOMELESSNESS**

Most of the homeless are found in the state’s three largest cities: Anchorage, Fairbanks, and Juneau, and many of them are chronic drinkers. The problem of homelessness has become a major concern in these population centers. As in other cities in the United States, the homeless are in dire need of food, shelter, and health care. Those “on the streets” frequently tend to be loners, yet cluster in groups to support each other and to pool resources to buy liquor and food. They also tend to reside in campsites together. It has also become clear that many are mentally
ill, usually with serious psychiatric problems. Their mental health condition is also frequently accompanied by an addiction to alcohol, which presents a complicated clinical picture. Anchorage, Fairbanks and Juneau, with their diverse populations, shifting seasonal economies, and in-migration from rural communities, among many other factors, contribute to make these locations the repository of the state’s most serious homelessness problems.

**Featured research:**

- In Anchorage, under the auspices of its Safe City Program, a Pathways to Sobriety project was implemented to reduce homelessness. This is a multifaceted project aimed at improving the well being of individuals exhibiting chronic public inebriation in Anchorage. One aspect of this project includes providing case management at the Transfer Station, which essentially provides “sleep-off services” to facilitate movement of individuals with histories of public inebriation into treatment services, housing, and employment. The program is seeking to gain funds to initiate a community-based detoxification treatment program, and to purchase and staff an additional van to transport homeless individuals with histories of public inebriation to the Transfer Station. This project is being evaluated by the Behavioral Health Research and Services (BHRS).

**SUICIDE**

Suicide is a serious problem of epidemic proportions in Alaska. In 2000, Alaska had an overall suicide rate that was twice the national average. Nationally, the suicide rate is 10.7 suicides per 100,000 people, while Alaska’s suicide rate is 22.0 per 100,000 people. The Alaska Native suicide mortality rate is 4.2 times higher than the rate for the U.S. general population, and almost twice the rate for the Alaska general population. The Alaska Native suicide by firearm rate is 4.9 times higher than the rate for the U.S. general population. Firearms were the most common means used in completed suicides, while poisoning was the most common method of suicide attempt. The most common substance for overdose suicide attempts was acetaminophen (Tylenol), which was used 26% of the time.

In a report issued in 1989, the Alaska Federation of Natives indicated that the suicide rate for Alaska Natives had increased over 500% between 1964 and 1989. It remains high, although there is evidence of a downward trend. The suicide rate in Anchorage has increased since 1990 from 11.0 to 16.1 per 100,000 people and is 39% higher than the national average of 11.6. Alaska Natives constitute a large proportion of these suicides. The suicide rates in Alaska correspond to a period of rapid growth and acculturation. The AFN has reported the following with respect to suicide among Alaska Natives:

- There is a suicide in the Native community every 8 days.
- 69% of all suicides by Alaska Natives were committed by persons younger than age 30.
The rates of suicide are highest among young men (73% males vs. 23% females).

Suicide among Alaska Natives is 117% higher than any other American Indian group.

The teen suicide rate in Alaska has decreased by over 23% from a 1993–95 three-year average of 43.1 per 100,000 to an average of 33.0 per 100,000 for the 1997-99 time period. Even with this reduction, the Alaska teen suicide rate remains four times higher than the national average for 1999. Alaska Native teenage males have a suicide rate for the 1997-99 time period of 197.5 per 100,000. This rate is 5.4 times higher than the 1999 rate for American Indian teen males—the group that has the highest nationwide suicide rate, giving Alaska Native males the highest nationwide suicide rate. According to the Indian Health Service, the suicide attempt rates for Alaska Native teens, by age groups and gender, range from three to six times higher than attempt rates for the same-age, same-gender group of their non-Native peers. During the five-year period from 1994 to 1998, suicide was the leading cause of death for Alaskan youth: a loss of 85 lives. During those years, there were 685 children and adolescents hospitalized after suicide attempts.

The chart below demonstrates the regional variation in the teen suicide rates for the 1990 to 1999 time period. Alaska’s suicide rates vary dramatically by geographic regions as well by ethnicity, gender, and age. Alaska Natives, however, are more likely to commit suicide than non-Native people, teenagers are more likely to attempt than adults, and males are more likely than females to complete. These data plainly identify a behavioral health domain that requires a major effort at saving lives by reducing suicide attempts. Research is needed that can begin to identify contributing factors that place people at risk; such information can then be used to begin developing more effective prevention programs.

**ALASKA TEEN SUICIDE RATES BY REGION, 1990-1999**
(Suicides per 100,000 people)

<table>
<thead>
<tr>
<th>Region</th>
<th>Rate (Suicides per 100,000)</th>
</tr>
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<tbody>
<tr>
<td>Northern</td>
<td>208</td>
</tr>
<tr>
<td>Southwest</td>
<td>108</td>
</tr>
<tr>
<td>Interior</td>
<td>37</td>
</tr>
<tr>
<td>Gulf Coast/Southeast</td>
<td>25</td>
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<tr>
<td>Anchorage/MatSu</td>
<td>20</td>
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</tbody>
</table>

During the five-year period from 1994 to 1998, suicide was the leading cause of death for Alaskan youth.
**Featured research:**

- The Alaska Suicide Follow-back Study, is underway, conducted by the Alaska Injury Prevention Center with funding from the Department of Health and Social Services obtained by the Alaska Suicide Prevention Council. Follow-back studies are used to characterize those who complete suicide by identifying risk and protective factors associated with each death. Suicide risk, protective factors and their interactions form the empirical base for suicide prevention. Data for each suicide will be compiled from the state medical examiner’s office, law enforcement, medical facilities, schools, military, mental health facilities, and next of kin interviews. This project should have a report in 2005.

**INTERGENERATIONAL/HISTORICAL TRAUMA**

Historical (or Intergenerational) Trauma is a phenomena that is gaining increased recognition as a factor involved in the health and welfare of Alaska Natives, and other Native Americans. Historical Trauma (HT) is defined as “the cumulative emotional and psychological wounding across generations, including the current lifespan, resulting from massive trauma.” HT is a form of shock, a gradual realization on the part of already numb people that their community no longer exists as an effective source of support, and that an important part of their world has silently disappeared. Traumatized individuals tend to believe that they are isolated and alone, and live in a kind of social wasteland with no one to turn to. They have lost the solace that comes from being in fellowship with one’s kind. They have lost both the physical and the spiritual health that comes from being in communion with kinsmen and neighbors who can be counted on to care, as was inherent among their ancestors. Stated in terms of Alaska Native views, HT is the pain and harm created in individuals and in communities as a result of life having changed from being in balance and in harmony with nature to disharmony and an imbalance with nature.

Experiencing HT, especially when linked with experiences of personal violence, can result in extreme stress disorders. The clinical picture manifested generally consists of symptoms of anxiety, autonomic hyperarousal, avoidance behaviors, and persistent reexperiencing of traumatic events, all of which are consistent with a DSM-IV diagnosis of Post Traumatic Stress Disorder (PTSD). Persons diagnosed with PTSD frequently manifest deficits in short-term memory of verbal information, impaired monitoring and regulation of memory information, and difficulty in recalling trauma-specific memories. These deficits can interfere with treatment effectiveness because such cognitive-impaired clients may be unresponsive to verbal processes. Research is needed to identify the extent to which HT is related to specific psychopathology and to substance abuse among Alaska Natives. The knowledge gained from such research will contribute to helping develop a basis for understanding how HT develops and impacts lives and how to help people heal.

Stated in terms of Alaska Native views, Historical Trauma is the pain and harm created in individuals and in communities when life changes from being in balance and in harmony with nature to disharmony and an imbalance with nature.
Featured research:

- A recently completed research project in the form of a dissertation study linked to historical trauma issues investigated resiliency factors among Alaska Native men. The study found that Alaska Native men are adapting to social and environmental transitions and collective emotional and psychological injury. They are challenged, however, by the redefinition of their position within the family and community. The study’s findings suggested that reliance upon cultural values such as subsistence, responsibility to the tribe, respect for the land, honoring elders and reliance upon Christian values can help them adapt and minimize effects of chronic social problems. The results may help providers to understand the importance of improving resilience by helping cultures maintain their uniqueness and integrity.

DOMESTIC VIOLENCE

Domestic violence is a problem that plagues Alaska, especially members of Alaska’s Native communities. Research has demonstrated a strong relationship between drinking and use of other drugs, such as cocaine, and various types of sexual and physical violence, homicides and suicide. Alcohol is specifically linked to domestic violence incidents. Researchers have suggested that alcohol contributes to aggression by increasing sensitivity to pain and frustration. In addition, alcohol may impair problem-solving ability through its effects on the brain’s frontal lobes. Further, intoxicated persons exposed to a frustrating event have been found to experience stronger frustration and react with more aggression than sober people exposed to the same event.

Childhood is an especially dangerous time to experience or witness domestic violence. For infants and children, survival is dependent upon adults, most typically the nuclear family. It is in the family setting that the child is fed, clothed, sheltered, nurtured, and educated. Unfortunately, it is in the familial environment that children are most frequently manipulated, coerced, degraded, inoculated with destructive beliefs, and exposed to violence. In Alaska, child abuse is the second leading cause of injuries requiring hospitalization and of injury deaths among children under one. Alaska Native children who experience harm and are involved with child protective services at rates far higher than their non-Native counterparts in the general population.

In the U.S., the home has been found to be the place where violence occurs most frequently. In 1995, the FBI reported that 27% of all violent crime involves family on family violence, 48% involved acquaintances with the violence often occurring in the home. Children are often the witnesses to, or victims of, these violent crimes. The Council on Domestic Violence and Sexual Assault (CDVSA) annual report for fiscal year 2000 cites a study of more than 900 children at battered women’s shelters that reported that nearly 70% of the children had been physically abused or neglected. Nearly half of the children had been physically or sexually abused; five
percent had been hospitalized due to the abuse. However, only 20% had been identified and served by Child Protective Services prior to coming to the shelter.

Violent crime statistics grossly underestimate the prevalence of violence in the home. It is likely that less than 5% of all domestic violence results in a criminal report. Intra-familial abuse and domestic battery account for the majority of physical and emotional violence suffered by children in this country. This violence takes many forms. The child may witness the assault of her mother by father or boyfriend. The child may be the direct victim of violence—physical or emotional—from father, mother, or even older siblings. It has been estimated that over 29 million children commit an act of violence against a sibling each year. The child may become the direct victim of the adult male if he or she tries to intervene and protect mother or sibling. While these all cause physical violence, an additional destructive element of this intra-familial toxicity is emotional violence—humiliation, coercion, degradation, and threat of abandonment or physical assault.

In Alaska, lack of comprehensive statewide data on domestic violence precludes estimating the full extent of the problem. Statewide crime data is reported by the Department of Public Safety using the Uniform Crime Reporting (UCR) system. UCR is a system developed by the International Association of Chiefs of Police (IACP) and that uses eight categories of crime identified by the Federal Bureau of Investigation in the 1920s. The categories include four crimes against people and four crimes against property. Incidents of domestic violence are not tracked separately in UCR system, but are collected with others as aggravated assault or forcible rape incidents, as appropriate. UCR numbers are aggregated at the statewide level. Individual police departments within the state track domestic violence calls, but these figures are not entered into a single database.

Traditionally, services for women who are victims of domestic violence have not been well coordinated with services for abused children, despite the high rate of co-occurrence of domestic violence and child abuse. More than half of the female victims of domestic violence live in households with children under the age of 12. A 1998 research survey reported that more than 50% of men who frequently abused their spouse also frequently abused their children. Only one study regarding domestic violence has used controlled population groups. It found that 40-60% of mothers of abused children were also abused, compared to 13% of mothers of children with no record of having been abused. A survey by National Family Violence found that the most chronically abusive husbands had nearly 100% probability of also abusing their male children. It is estimated that some 3.3 million children nationally are witness to domestic violence in their homes.

**Featured research:**

- To assess the mental health and substance abuse treatment of children and youth in Alaska, the Department of Health and Social Services (DHSS) contracted with UAA Behavioral Health Research and
Services to conduct a needs assessment. The Children and Youth Needs Assessment (CAYNA) was to collect comprehensive data about all aspects of care delivery to help the Alaska DHSS and its relevant Divisions refine and expand existing services to care more optimally for children and youth in need of mental health or substance abuse treatment. CAYNA became a comprehensive and far-reaching effort assessing perceived, normative, expressed, and relative needs for children and youth services statewide.

- Researchers at the Department of Health and Social Services, Division of Public Health, Office of Community Health, and EMS (CHEMS) reviewed data from 1994 to 2000 to determine the incidence of infant physical abuse in Alaska. Data were reviewed from birth certificates, child protective services administrative records, the Alaska Trauma Registry, and the Alaska Infant Mortality review.

- The Child Welfare Evaluation Program (CWEP) is a partnership between four entities: the Alaska Office of Children’s Services, the Tribal-State Collaboration Group, the Casey Family Programs, and the University of Alaska Anchorage (UAA) School of Social Work (SSW) and the Family Training Academy. CWEP was formed in 2003 to formulate a research agenda for child welfare in Alaska. Funding for the program is through a grant to UAA SSW from the Administration for Children and Families, DHHS. Research is focused on family preservation and support, parental substance abuse programs; the status of Alaskan foster care alumni ages 19-23, and independent living skills for youth (age 15-18) in care.

- The Alaska version of Kids Count has been conducted each year since 1996. The data book reports on the well-being of Alaska’s children as assessed through 15 measures, making comparisons among regions and with national averages.
Social Transitions of the North (STN) was a comparative study of social and economic change in two regions of Alaska and two regions of Russian Far East as reflected in health and family relationship characteristics, as well as by indicators of individual or collective well-being. In September 1995, following the Year 3 summer field research, a tragic boat accident claimed the lives of project personnel Steven McNabb, William Richards, Alexander Pika, and Richard Condon. At the request of the funding agency (NSF) and the principal investigator families, the Alaska Native Science Commission took over the administration of the project.

ICHIS was part of a larger STN work group with the specific mission of conducting a preliminary assessment of the STN data set. The papers were presented by ICHS researchers at the 50th Arctic Science Conference.

ELDER ABUSE

A growing problem nationally, and in Alaska, is elder abuse. Abuse of elders occurs in many forms: physical, sexual, emotional, and financial. Research, cited by SAMHAS, indicates that in 90% of elder abuse and neglect incidents, the perpetrator was a family member. Two-thirds of the perpetrators were adult children or spouses. Studies have also shown that people of all socioeconomic, ethnic, and religious backgrounds are vulnerable to abuse, but the typical abuser of the elderly in domestic settings has specific characteristics. Risk factors for abuse include a history of mental illness, a family history of violence, poor health or cognitive impairment; substance abuse problems, and lack of financial resources.

Currently, the extent of elder abuse in Alaska is unknown. There is a distinct need to begin to institute surveillance procedures to gain recognition of the nature and extent of the problem, and to use such information to help plan effective intervention measures and to help plan how to care for the elderly.
Featured research:

- The National Administration on Aging (NOA) established The National Resource Center for American Indians, Alaska Natives and Native Hawaiian Elders at the University of Alaska Anchorage. The project is designed to incorporate Native communities in the planning process by “listening to the voices of our elders” to obtain their wishes and expectations for services and care that are consistent with traditional community heritages, Tribal values and customs, and to provide technical information to promote culturally sensitive and functionally appropriate services to maintain social well being of Alaska Native based on “best, promising, and emerging practices.”

SEASONAL AFFECTIVE DISORDER

Seasonal affective disorder (SAD), also known as “cabin fever” or “winter blues,” is seasonal depression brought on by the lack of daylight exposure available during the winter months. Alaska has a large share of SAD cases because northern latitudes receive less sunlight than more southern latitudes during late fall, winter, and early spring. A leading expert in the diagnosis and treatment of SAD estimates that one in every five people who live in Alaska may be affected by SAD. Some experts believe that the only major population at northern latitudes that is not affected by SAD is Icelanders. Evidence is not clear yet, but having snow cover seems to lessen symptoms, perhaps due to the reflective properties of snow.

Symptoms of SAD include sleeping more hours, lethargy, difficulty waking, craving carbohydrates, and withdrawing socially. The symptoms tend to start around September each year, lasting until April, but are at their worst in the darkest months. Standard estimates are that around 2% of people suffer severely, with 10% experiencing milder symptoms. Worldwide, the incidence increases with distance from the equator. More women than men are diagnosed as having SAD; children and adolescents are also vulnerable.

Featured research:

- With funding from the National Science Foundation through the Experimental Program to Stimulate Competitive Research (EPSCOR) program, a research study examined the relationship between photoperiod, hormone cycle, and seasonal behavior to the spontaneous eye blink rates of people living at high latitude. The project was prompted by NIH research, which observed that people with SAD experienced a change in blink rate, particularly among premenopausal women. The EPSCOR-funded research found no difference in spontaneous eye blink rates between men and women, and it found a very weak relationship between photoperiod and eye blinking.
Candidate Themes for Behavioral Health Research Priority in Alaska

The pervasiveness of behavioral health-related problems in the state necessitates that efforts be undertaken to reduce their prevalence. Many of these issues are made even more pressing because of their impact, either directly or indirectly, on children. Research can help find ways to reduce the severity of the problems that impact the state.

There are, however, two basic ways to approach behavioral health research in Alaska. One method would utilize theories that have been developed for “mainstream USA,” and then apply them to Alaska—such theories are then modified to account for the conditions and cultures of our state. The problem with this scheme is that most of the behavioral health research promulgated in the United States is based on implicit assumptions derived chiefly from the cultural and value systems espoused by western culture. This approach to research in Alaska does not accommodate the extremely diverse cultures in the state; nor does it account for the vast geographical or extreme climatic aspects encountered in Alaska.

The unique approach involves undertaking innovative research based on an understanding of the physical, social and economic conditions as well as the various Alaska Native cultures of the state. This method involves the development of innovative theories that are responsive to the needs of the people of the state, which leads to novel methodologies that result in findings relevant to the populations studied. Research, within this second context, can proceed to examine behavioral health issues that are specific to Alaska Native and non-Native groups, and which are common to both these populations. Some interrelated questions, appropriate to conducting health research areas that apply to Alaska Natives and other minority groups follow:

- What are the processes a given cultural group goes through when it is being impacted by the larger, dominant culture, and what health-related problems emerge?
- How do subgroups resist the negative aspects of this impact? What are life factors or personal attributes that contribute to resiliency?
- From the minority cultural worldview, what are the perceived roles of substance use and abuse in the processes of cultural change?
- To what extent is the substance abuse behavior of the minority culture based on what they learned from their introduction to drinking and drug use by the dominant culture?
- How has substance abuse related violence come to be associated with acculturation stress?
- Does drug-taking behavior have different meanings and serve diverse functions within different cultural groups? Is there a pattern of drug-
taking behavior that is more specific to minority members of a cultural group that differs from drug-taking behavior among the majority group?

- What are the dynamic protective forces operating within the minority group that are disrupted or affected by the larger or dominant culture and to what extent are drinking and drug-taking behaviors related to an attempt to cope with this disruption and its effects?

Two behavioral health research questions applicable to Alaska in general follow:

- What are the health and social problems related to a “boom–bust” economy and to changing demographics linked with people who seek their future in Alaska?

- Are there unique health and social problems among “Newcomers” to Alaska?

The pursuit of answers to these questions, and to investigations encompassing other areas of interest, involves a coordinated research strategy. Three research needs that involve a coordinated effort are listed below:

- Basic epidemiological research to determine the prevalence of various disorders among Alaskans to chart what type of service systems are needed within the state and to track change as a result of efforts to reduce the problems.

- Ongoing evaluation research of treatment programs to identify “best practices” that can be adopted within the state, particularly approaches that are responsive to Alaska Natives.

- The effectiveness of prevention programs directed at reducing behavioral health problems. Little is known about their impact, and less is known about what constitutes an effective prevention program.

In addition to these three research domains, research is also needed to reduce the severity of the following behavioral health problems.

**CO-OCCURRING SUBSTANCE ABUSE AND MENTAL HEALTH DISORDERS**

The extensive substance abuse problem in the state requires a better understanding be obtained about the nature and extent of co-occurring disorders in order to strengthen treatment approaches.

**CHRONIC AND PERSISTENT MENTAL ILLNESS**

There is a need for research to better identify individuals in need of service, particularly children and adolescents, and to understand what types of services are required to serve their needs. Research is also needed to evaluate innovative practices that serve mentally ill individuals. Of particular importance is the necessity for research on how to integrate individuals
with chronic and persistent mental illness into communities, prevent them from entering the justice system, and to ascertain how medication monitoring and compliance can be most effectively maintained in rural areas. Additionally, the introduction of telepsychiatry in the state requires that its effectiveness be evaluated.

**BEHAVIORAL RISK FACTORS IN CHRONIC DISEASES**

The increasing incidence in deaths related to cancer, diabetes, and cardiovascular disease, especially among Alaska natives, necessitates research that begins to identify promising and innovative ways to treat such cases and to prevent such deaths.

**VIOLENCE, SUICIDE, AND TRAUMA**

As noted above, violence is a problem in the state. Alaska’s extremely high rates, make suicide the most pressing mental health issue in the state. The need for more effective suicide prevention is imperative. Given the substantial disparity in suicide rates by geographic region, research can help determine what contributes to this discrepancy. Many communities experience no suicides, while their neighbor communities have high rates. What leads to the resiliency of some communities to suicide over others? Research is also needed to identify the most effective suicide prevention programs for Alaska Natives, particularly teenage boys because their suicide rates are higher than other populations. The Alaska Suicide Followback Study needs to be extended for additional years.

**Child Abuse and Neglect**

Services for abused children need to be strengthened. Research is needed to analyze the gaps in access to children’s mental health services, and to learn what services are most effective in responding to their needs, particularly community-based services.

**Domestic Violence**

There is minimal information available on the scope of domestic violence in Alaska. Because the UCR data does not separate domestic violence from other cases of aggregated assault, statewide rates are not available. While some local police departments track incidents of domestic violence in their jurisdictions, it is unclear if all departments are tracking these cases.
Basic research on the prevalence of this problem, the scope of the current tracking system among local police departments, and an investigation of the difficulty of collating local reports into statewide figures is necessary.

**HEALTH ASPECTS OF LIVING IN AN ARCTIC AND SUB-ARCTIC CLIMATES**

Research to identify the ways in which darkness and light, as well as a harsh winter climate, affect behavior is another area in need of study to help researchers gain an understanding of how living under such conditions affects health.

**CONCLUSION**

From a behavioral health perspective, Alaska has a myriad of problems to address if its people are to live healthier lives. Rapid development and the associated boom-bust economy, in-migration of diverse cultures, dramatic changes in the lives of its indigenous people, and continuously emerging value systems all provide stresses to the population. Many of these changes mirror the processes the rest of the Western United States experienced during and following the gold rush. Oil and other large resource development continue to put stressors on our social fabric. Darkness and cold effect our behavioral health.

Given this situation, the opportunity exists to learn from our experiences, to begin studying events as they are occurring, and to use such observations to plan ways to reduce, treat, and prevent behavioral health-related disorders.

Achieving gains in the status of behavioral health among Alaskans also requires an investment of resources, involving people (and their organizations) and dollars. Without an investment in preparing trained people to work in behavioral health fields, and without adequate financial support for research and innovative treatment approaches, the problems currently inherent in the state will progress. Ultimately costing considerably more with respect to the health, economic and social costs to the state and the increased expenditure involved in attempting to counter the problems affecting the health and welfare of Alaska’s people.

Achieving gains in this area also necessitates a vigorous research and evaluation agenda. This chapter covers a broad number of areas. More strategic thinking is needed to narrow the focus on each area. More resources are needed to support researchers working in this area.
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The health services research aspiration is to conduct research that will inform the development of policies and programs to improve health and health care delivery for all people in Alaska.

**SITUATION AND EXPERTISE IN ALASKA**

Alaska is the largest state in the Union, and one of the least populated. Alaska has approximately one person per square mile (1.1) while the U.S. average is 79.6 people per square mile. Despite the low population density, 7 out of 10 people in Alaska live in communities of over 2,500 people. Thirty percent of Alaskans live in rural communities or outside any community.

Regions of the state have dramatically different topography and climate and many communities are not on the road system. These issues make it difficult to obtain health care in many areas of the state. In Southeast Alaska for instance, boat travel is possible all year, while in the Arctic it is only possible a few months of the year. In many cases, expensive air travel is the only way to move patients to routine and emergency care.

Alaska has developed innovative solutions to overcome distance, provider isolation, and the cost problems that come from delivering services to few people. These unique programs could benefit from review and evaluation for efficacy and potential improvements.

Alaska’s health care financing system is complex for a small population. Federally financed care to military personnel, veterans, Medicaid beneficiaries and Alaska Natives make up an unusually large percentage of those...
with health care coverage in Alaska. A high percentage of people work in small businesses, seasonally or part-time, and in dangerous occupations, such as fishing and resource extraction. Each health care system has its own rules, practices, and capabilities. Small community hospitals and providers often find it difficult to bridge between systems.

Many Alaskans are uninsured or underinsured and lack physical access to health care services, yet very little formalized study has been done of Alaska’s unique situation and what is working and what remains to be addressed.

**Featured Health Services Research in Alaska**

**SHORTAGE OF HEALTH CARE PROFESSIONALS, ESPECIALLY IN RURAL AREAS**

Alaska is not alone in suffering from shortages of health care professionals, although the severity of the shortage in some areas is very acute. Most states and frontier areas have trouble recruiting health care workers in rural areas, and Alaska is primarily a rural state. Professional isolation, unusual living conditions, and the vast geography of Alaska contribute to making recruiting and retaining health care professionals a challenge. Adding to that challenge is the absence of professional schools to train some health care workers in-state.

Many areas of the state suffer from severe shortages of behavioral health care providers. The state is especially lacking in clinicians with graduate level training. There are shortages of clinicians with master’s degrees and those with doctoral degrees are rare. In a recent study by the University of Alaska, virtually the entire state is a mental health professional shortage area. The Alaska Department of Labor projects a 47% increase in need behavioral health professionals by the end of the decade.

As with the rest of the country, health care facilities in Alaska are currently experiencing a critical shortage of RNs. In response to this situation, the University/Industry Alaska Nursing Education Task Force formed and issued a report in April 2002. The main recommendation of the task force was to double the number of nursing graduates per year from 110 to 220. The University of Alaska Anchorage School of Nursing has been striving to make this goal a reality by the target date of 2006. This effort has received a considerable amount of support, both financial and clinical from local hospitals. The University of Alaska has expanded its nursing program and will meet the doubling goal by 2006.

Major expansions of programs to education in the allied health fields are underway at the University of Alaska.

**Featured research:**

- The Alaska Center for Rural Health, UAA, received funding from HRSA’s Office of Rural Health Policy for two studies. The first was an integrated literature review of the program and the second was an
assessment of retention factors for their practitioners. The Community Health Aide Program (CHAP) is a unique program employing local, indigenous peoples as primary care non-physician providers in extremely remote, frontier, tribal Alaskan communities.

- Published articles regarding the CHAP program from 1968-present were identified and analyzed into an integrative literature review. Key informant interviews were used to update aspects of the program that had changed since previous publications. The literature review found 27 citations of published materials related to the CHAP program. Well-documented program features in the literature include: program history; Community Health Aide/Practitioner (CHA/P) roles and responsibilities; training; supervision; liability; roles of the IHS, native corporations, village, and state; and existing outcome data. New aspects of the program documented through key informant interviews include: certification, reimbursement, and the Alaska dental health aide program. The CHAP program could benefit from studies on outcomes, the impact of technology, decentralization and workforce issues.

- With attrition rates up to 20%, recommendations for improving retention are necessary to maintain access to primary care services in rural communities. Key informant interviews were conducted with 41 community health aides/practitioners (CHA/Ps) in 15 villages statewide. Efforts were made to ensure the sample included a mix of villages with high retention of health aides and villages with lower retention. Geographic and ethnic diversity were also considered. Transcripts were coded using NUD*IST software and data analyzed for differences between high retention and low retention villages, and between more experienced and less experienced CHA/Ps. Five fundamental needs of health aides were identified as critical for retention of personnel. These needs include strong co-worker support, access to basic training, a fully staffed clinic, good community support, and supportive families.

The Community Health Aide Program employs local, indigenous people as primary care, non-physician providers in remote Alaska communities.
Physicians are a critical and expensive component of the health care delivery system. An adequate number of physicians are required to represent the needs of generalists and specialists. In fall 2002, the Institute for Circumpolar Health Studies collaborated with the Providence Health System Alaska to better understand current and future physician needs for the Anchorage community. Provider rolls, interviews with practice managers, and interviews with senior physician leaders were compiled to project the number of physicians needed by specialty per 100,000 people. These data were compared with national benchmarks to better identify the needs for physicians in different specialty areas.

The information highlighted the need for extensive recruitment efforts for new physicians in Anchorage to help address shortage areas in identified specialties and to replace aging physicians as they near retirement and reduce the amount of hours they practice.

The Alaska Department of Health and Social Services, Primary Care and Rural Health Unit, contracted with the Alaska Center for Rural Health, University of Alaska Anchorage, to conduct a statewide assessment of rural recruitment resources, strategies and costs. The Primary Care and Rural Health Unit initiated the project partially in response to expectations of their Alaska Primary Care Office, Alaska Office of Rural Health, and Rural Hospital Flexibility programs. ACRH conducted telephone surveys to collect data on strategies used by 76 small hospitals, rural clinics, and rural mental health centers (henceforth “rural health care facilities”) to recruit physical, behavioral, and oral health providers. ACRH also documented the costs associated with recruiting these professionals. The analyzed information will allow the State of Alaska and other Alaskan entities to identify strategies for better coordination and integration of rural recruitment practices.

ESCALATING HEALTH CARE COSTS, THE UNINSURED AND UNDERINSURED

Many reports in the popular press have made people aware that health care costs are rising faster than inflation. Nationwide, health care costs have risen 15% per year for several years. Insurers pass on these increased costs through higher insurance premiums and larger co-payments by patients. The national trend of health care cost increasingly outpacing the increase in other expenses is also true in Alaska. In fact, the increase in health care costs is happening more rapidly in Alaska than in the rest of the nation. For the six years from 1995 to 2000, the Consumer Price Index in Anchorage increased 27% for medical care services while the index for all goods only increased 9%. In 2001, an analysis by the Division of Medical Assistance revealed that overall medical costs in Alaska are 25% higher than the rest of the nation. Higher costs mean fewer residents have health coverage. Esti-
mates are that 17-20% of Alaskans are totally uninsured. Very little information exists regarding trends in health care financing in Alaska.

TELEMEDICINE

Telemedicine is the process of using technology to enable a health care worker, typically a physician or specialist, in another physical location to consult on a case or conduct a clinical visit. The consulting parties share data, visual images, and voice transmissions. Telemedicine has substantial promise for Alaska as a state with a very low population density, a vast geographic area, and a lack of road access to many communities.

The most significant effort to develop a telemedicine system in Alaska in the past decade was focused on people receiving health care funded by the federal government. Congress allocated $30 million over five-years for a project to link 235 sites to a statewide network. The network is operated under the auspices of the Alaska Federal Health Care Partnership (AFHCP). Partners include the Department of Defense (47,000 beneficiaries at 9 sites), the Indian Health Service and 37 tribal entities (97,000 beneficiaries at 195 sites), the Veterans Administration (65,000 beneficiaries at one site), the U.S. Coast Guard (3,000 beneficiaries at 4 sites), and the managing partner, the Alaska Native Tribal Health Consortium (ANTHC). The Alaska Department of Public Health Nursing also has 26 sites. The network, called the Alaska Federal Health Care Access Network (AFHCAN), aims to bring better health care to Alaskans in rural areas using telemedicine technologies. It is thought to be the largest operating telemedicine system in the U.S., and one of the largest in the world. The system primarily uses store-and-forward technology.

Making use of the groundwork laid by AFHCAN, the telecommunications company GCI is launching ConnectMD, a private telemedicine network for Alaska, which will be the most unified telemedicine system any state possesses. The AFHCAN network focused on federal medical providers, while ConnectMD will be available to any medical provider who wants it and can afford to pay for access. The cost of the service depends on how many people are using a connection and the amount of data they may transfer. In an effort to make the service more affordable, ConnectMD has secured agreements with several of the primary providers of continuing medical education in Seattle. Physicians will be able to stay abreast of current knowledge and meet licensing requirements without having to travel.

Featured research:

- The Center for Human Development at the University of Alaska Anchorage is in the process of completing an evaluation of the AFHCAN telemedicine project. The evaluation has several goals:
  - Documenting the history of the AFHCAN project
  - Assessing the AFHCAN project’s impact on health care delivery in Alaska in the areas of access, quality outcomes, and provider skills
• Assessing the impact of AFHCAN from a rural provider prospective, a technological perspective, and sustainability perspective

- The Efficacy Project was conducted by the Alaska Telehealth Advisory Council (ATAC) to build a business case for a reimbursement methodology when using store-and-forward telehealth applications to:
  • Identify if telehealth services could provide medical benefits comparable to traditional health care
  • To determine if this technology has a place in Alaska’s medical community
  • Determine if it would be assimilated into the participants’ medical practices (assimilation of telehealth services was projected to be dependent on the ease of use).

An additional objective of the project was to validate the proposal to increase reimbursement for telehealth consultations in comparison with face-to-face medical consultations.

- The Alaska Medical Informatics Initiative (AMII) is a project, funded by the Department of Defense that examines the viability of enhancing medical communications during a medical transport using low-band with communications. The project, a partnership between YKHC and the Institute of Circumpolar Health Studies at the University of Alaska Anchorage, seeks to develop a prototype system, to transfer important medical information as soon after an accident or other traumatic event as possible. Medical data would continue to be transmitted to providers through the arrival of a patient at the final referral facility. The expected goal is to measure the improvements in patient outcomes that are related to the enhanced medical information available to providers.

- Alaska suffers from a high prevalence of mental health diseases. There are too few behavioral health professionals to treat these diseases, especially in frontier locations. With funding from the Alaska Science and Technology Foundation and the Alaska Telehealth Advisory Council, the Alaska Center for Rural Health, UAA evaluated a demonstration child telepsychiatry project in Ketchikan and Metlakatla, Alaska, in partnership with the Ketchikan Gateway Mental Health Center. Conducted between February 2002 and July 2003, the project’s purpose was to improve access and quality of mental health services in two remote communities.

Sixteen qualitative interviews were conducted in Ketchikan and Metlakatla with 16 patients’ parents/guardians and 22 clinic staff members. The telepsychiatrist completed clinical quality surveys for 22 telepsychiatry consults that occurred between December 2002 and June 2003.
The study found that improved access to mental health services was the biggest advantage to telepsychiatry, especially in extremely remote Metlakatla where no psychiatric services had previously been available. Some quality concerns were expressed, especially in Ketchikan, which had experience with itinerant child psychiatry services. Quality concerns were less pronounced in Metlakatla, where the introduction of psychiatric service in the community was viewed as overwhelmingly beneficial.

Overall, telepsychiatry was perceived as providing generally high-quality mental health services, although many staff, parents/guardians, and psychiatrists still voiced a preference for face-to-face visits over distant medicine. Successful telepsychiatry programs will require ongoing support and training for clinic staff.

**ACCESS TO PRIMARY AND ACUTE CARE SERVICES**

Access to primary care has been dramatically improved in the state in recent years. A decade ago Alaska had one federally funded community health center in Anchorage. Today, a system of over 20 health centers at over 60 sites provide needed services to thousands of Alaskans who are uninsured or underinsured.

Alaska has 24 hospitals and over 300 communities. Most urban communities outside of Anchorage have only one hospital. Sole community hospitals have been greatly assisted in providing acute care by federal initiatives to support critical access hospitals.

One of the most pressing health care issues in rural Alaska is the issue of non-reimbursed extended stay primary care. Because of unavoidable weather, terrain, and transportation issues, many primary care clinics are

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The Nastasia Evans Memorial Clinic is in Newtok, Alaska. Because of unavoidable weather, terrain, and transportation issues, many primary care clinics are providing extended services to patients who under normal clinic circumstances would go to a tertiary care provider.
Health Services

providing extended services to patients who under “normal” clinic circumstances would be transferred to a tertiary care provider. Without recognition as a provider type that is permitted to offer extended stay services, many Alaska clinics are not adequately compensated for these necessary services. Consequently, they frequently find it necessary to care for patients without needed staff or well-defined quality standards.

In 2003, Congress authorized the Centers for Medicare and Medicaid Services (CMS) to conduct a budget-neutral demonstration project to look at this new provider type. Eligible frontier clinics are 75 miles from a hospital or inaccessible by public road. Concurrently, HRSA’s Office of Rural Health Policy is supporting a project to identify and test FESC services and protocols. The HRSA effort precedes commencement of the CMS project and is separate from it.

**Featured research:**

- The Frontier Extended Stay Clinic (FESC) Demonstration Project is the result of the successful efforts of a consortium of Alaska agencies to compete for a HRSA cooperative agreement. The Alaska FESC Consortium involves four health care organizations representing diverse regions of the state and a variety of organization types and target populations. These organizations are SouthEast Alaska Regional Health Consortium (SEARHC); Iliuliuk Family and Health Services, Inc. (IFHS); Cross Road Medical Center (CRMC); and The Native Village of Eyak (EYAK). A fifth Consortium partner, Alaska Center for Rural Health (ACRH) at UAA will provide evaluation services to the Consortium.

The Alaska FESC Project will work to demonstrate the viability and sustainability of the FESC provider type and service in Alaska and ensure that FESC patients receive high quality services consistent with their medical conditions.

**LACK OF ACCESS TO ORAL HEALTH CARE, ESPECIALLY IN RURAL COMMUNITIES**

The National Oral Health Surveillance System run by the Centers for Disease Control and Prevention reports that 70.2% of Alaskans visited the dentist or dental clinic within the past year and that 65.3% of the population had their teeth cleaned by a dentist or dental hygienist within the past year. Much of Alaska’s population is not on a public water system, but among those that are, 55.2% have fluoridated water. About one quarter (24.2%) of the population 65 and older have lost all of their teeth. There are nearly 70,000 children enrolled in Medicaid and another 21,000 enrolled in the Children’s Health Insurance Program (CHIP). CHIP is a comprehensive health insurance program for children whose families make too much money for Medicaid, but cannot afford private insurance on their own. The vast majority (79%) of dentists are enrolled in Medicaid and in CHIP.
In the state, there are only four community-based low-income dental clinics and no school-based health centers with an oral health component. The ANTHC has 11 dental clinics in rural communities; all of them can serve Alaska Native and non-Natives. The ANTHC Dental Coordinator is a fully trained dentist, with a Masters in Public Health in Public Health Dentistry. Only one local health department has a dental program. The state dental director is not a full time job. The Alaska State Dental Program funds, conducts, or otherwise facilitates activities related to access to care, dental screening, early childhood caries/baby bottle tooth decay prevention, provision of fluoride (community water supplies, supplements, or varnish), and oral health education.

The University of Washington School of Dentistry operates the Northwest/Alaska Center to Reduce Oral Health Disparities (NACROHD), one of six centers funded nationally. NACROHD, and the other five national Centers to Reduce Oral Health Disparities, were created in 2002 by joint grants from the National Institute of Dental and Craniofacial Research (NIDCR) and the National Center on Minority Health and Health Disparities (NCMHD).

The creation of these centers was the single largest expenditure in the history of the NIDCR. NACROHD emphasizes novel approaches to reducing oral health disparities among children in segments of the Pacific Northwest population that maintain high levels of oral disease, specifically poor, minority, and rural children. This Center’s core research projects cover underserved populations in Washington, Oregon, and Alaska, with outreach extending to Idaho and Montana. This project is a collaborative effort of the UW School of Dentistry, the School of Medicine, Heritage College, the Alaska Native Tribal Health Consortium, the Yukon-Koskokwim Native Health Corporation, the Yakima Valley Farm Workers Clinic, the Northwest Portland Area Indian Health Board, the Northwest Tribal Epidemiology Center, Washington Dental Service Foundation and the Medical Assistance Administration.

Alaska Native children are disproportionately affected by early childhood caries, compared to all U.S. children.
**Featured research:**

- The Caries Transmission Prevention in Alaska Native Infants project is a project sponsored by the National Institute of Dental and Craniofacial Research (NIDCR). The project, administered by the University of Washington, is examining the impact of xylitol gum with pregnant women.

  Alaska Native children are disproportionately affected by early childhood caries, compared to all U.S children. Dental care needs for adults and children in rural Alaska far exceed the acute care and prevention resources available. As a result, there is a high level of dental morbidity present among adults that likely contributes to early transmission of mutans streptococci (MS) from adult caregivers to infants in the household. Furthermore, the cultural practice of premastication of solid food for infant feeding amplifies the transmission of oral secretions from adult to child. The prevention of early MS acquisition and subsequent caries in infants and toddlers requires efforts starting at birth.

  Since Alaska Natives are a rural population at high risk for caries, interruption of vertical transmission of MS using a combination of improved oral hygiene practices, and topical antimicrobials and bacteriostatic agents may be an ideal prevention strategy for childhood caries. Chlorhexidine and xylitol are two agents that have been shown to reduce dental decay and MS counts.

  The specific aim of the Caries Transmission Prevention in Alaska Native Infants project is to conduct a community-based, randomized blinded trial to determine if the serial use of chlorhexidine and xylitol will reduce the vertical transmission of caries between Alaska Native mothers and infants. The project is sponsored by the National Institute of Dental and Craniofacial Research (NIDCR) and is being conducted by the University of Washington.

**Candidate Themes for Health Services Research Priority in Alaska**

The overall goal of applied health services research is to improve the effectiveness of prevention, treatment, and other interventions in addressing health problems. In Alaska, many health services are based on models developed for non-Alaskan population groups. Many of these programs are brought to Alaska without having been tested in arctic and sub-arctic environments. Applied health services research can help Alaskans improve the effectiveness of service delivery models and better tailor them to the unique needs and environments of Alaskans.

Health services research is fundamental to the improvement of health service delivery in Alaska. It is difficult to improve the appropriateness or
quality of health services without the constant monitoring of effectiveness of health service delivery and its impact on target populations.

Applied health services research can also help determine the nature and extent of health problems and change among specific populations. It also allows the measurement of the impact of health services on the status of the health and welfare of affected populations.

Applied health services research can also address barriers to the receipt of needed services. Impediments to the receipt of available services include travel, geography, weather, and ability to pay. Another barrier to the receipt of needed health services is the cultural acceptability of the services. The effectiveness and accessibility of services can be greatly enhanced through a better understanding of the barriers to effective provision of services to those in need.

**SHORTAGE OF HEALTH PROFESSIONALS**

While strong efforts are being made to address the health care professional shortage, research and evaluation are needed to assess the impact of the physician shortage on the stability of rural hospitals. The quality of care can fluctuate with physician presence or absence, and a lack of continuity contributes to a lower quality of care. Surveying physicians, dentists, pharmacists, and other health professionals who currently work in rural settings about conditions and what challenges they face may help recruit new physicians and retain those currently in rural practice.

Even types of workers who are not in short supply now will be affected by the aging of the health care work force. A good inventory of the numbers and age of current health care workers is necessary in order to plan for the aging general population, which will require more care, and the aging of the health care work force.

**FRONTIER MODELS OF HEALTH DELIVERY**

How are frontier models of health delivery working to improve health status? These delivery models include federally funded community health centers that are tribally managed and serve all in the community, small critical access hospitals and now frontier extended stay clinics.

**TELEMEDICINE**

Telemedicine usage continues to grow in the state. Research examining the impact of telemedicine on the delivery of health care in Alaska is necessary. Reviewing the effect of technology (especially telemedicine) on the clinical practice, patients’ satisfaction with telemedicine is important. Finally, the beginning use of telepsychiatry needs to be carefully examined. Studies may show that telepsychiatry is appropriate for some conditions and not others.

**ORAL HEALTH CARE**

Research continues to find new links between oral health and overall health. For this reason, it would be highly appropriate to conduct an analy-
ysis of the accessibility of dental care in Alaska, including such factors as what is driving dental costs, who receives care, and what are the payment sources. An evaluation of the effectiveness of the new dental technicians in rural Alaska is also needed.

**TRIBAL OWNERSHIP AND MANAGEMENT OF CLINICS AND HOSPITALS**

Under tribal self-governance, the Alaska Native Medical Center primary care system has been completely redesigned over the past 5 years. The new health care delivery system is customer centered and designed to meet the needs of the entire Native community. The result has received highly positive reviews from the Native customers and has been featured on the front page of the New York Times, in the British Medical Journal, the Family Medicine Management Journal, and in numerous other publications. Health services research is needed to define and measure the impact that the change in health services delivery has had on the health of Alaska Natives in the Anchorage area.

**COMPLEMENTARY MEDICINE INTEGRATION**

Research is needed on the use and integration of complementary medicine with traditional Western medicine to cost effectively treat and/or prevent chronic diseases among Alaska Natives and non-Natives, who use these modalities with increasing frequency.
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The disability research aspiration is to support, coordinate, and conduct research to improve the lives of all people with physical, emotional, and mental disabilities.

**SITUATION AND EXPERTISE IN ALASKA**

According to the National Institute on Disability and Rehabilitation Research, one in five Americans has some type of disability. The Institute defines a disability as creating limitations to functional activities, creating limitations to instrumental and other daily living activities, creating limitations on the ability to work, or necessitating the use of special aids. The Institute reports the variations shown below in the percentage of people with a disability among different races and genders. There are more disabled women than men because people are more likely to become disabled with age, and women typically live longer than men do. Certain disabilities are more prevalent among one gender or the other; e.g., autism is more common among men.

According to the 2000 Census, 6.9% of Alaska’s population age 5 to 20 years has a disability, 15.6% of the population age 21 to 64 has a disability and 46.2% of Alaskans age 65+ experience a disability. Not surprisingly, older age groups have higher rates of disabilities. The 2000 Census defines a disability as “a long-lasting physical, mental or emotional condition. This condition can make it difficult for a person to do activities such as walking, climbing stairs, dressing, bathing, learning or remembering. This condition can also impede a person from being able to go outside the home alone or
One in five Americans has some type of disability.

to work at a job or business.” Less than 1% of adults with disabilities own their homes compared to 63% of the general adult population.

Many of the figures available regarding disabilities focus on either those disabilities that prevent people from being fully employed or those that necessitate special education services among children. The focus on work disabilities and special education issues tends to not express the huge range of conditions covered by the disability umbrella. This umbrella includes, but is not limited to well over a dozen medical conditions that result in physical disabilities or cognitive deficits such as cystic fibrosis, cerebral palsy, asthma, Down syndrome, and other less well-known conditions.

Other disabilities include cognitive, emotional and sensory disorders; a few examples of such disabilities include autism, fetal alcohol spectrum disorder (FASD), a range of visual and hearing impairments, and a number of other conditions. Finally, there are mental health related disabilities; for example attention deficit disorder (ADD), attention deficit hyperactivity disorder (ADHD), anxiety related disorders, and other disabilities. Even with the issues mentioned, many other specific disabilities have not been mentioned.

The Social Security Administration lists 42 conditions that qualify people as disabled for Supplemental Security Income (SSI). It is important to understand that there is a continuum of severity for disabilities, and a variety of responses are needed. Different disabilities fall in diverse places on the continuum; for example, attention deficit disorder and cerebral palsy are not on the same place on the disability continuum. Even within one
specific disability, such as autism, there is a continuum of severity between less severe and more severe cases.

The disability community in Alaska includes many agencies working to provide better services and understanding for those with disabilities. Some of the groups working in this arena include:

- Governor’s Council on Disabilities and Special Education
- Parents, Inc.
- Special Education Service Agency (SESA)
- AK Info
- Anchorage School District, Special Education Parents Resource Center
- Disability Law Center of Alaska
- Department of Health and Social Services, Office of Fetal Alcohol Syndrome
- Norton Sound Health Corporation
- Centers for Disease Control and Prevention
- Alaska Division of Vocational Rehabilitation
- Center for Human Development at the University of Alaska Anchorage
- Alaska Mental Health Trust Authority
- Division of Seniors Services and Disability Services (DSDS)
- State Independent Living Council (SILC)

34 community organizations that receive grants from DSDS and provide services to over 3,550 Alaskans with developmental disabilities in nearly 100 different cities, towns, and villages across the state.

Many of the organizations listed above work primarily with the developmental disabilities community. There are scores of agencies providing services to and advocating for people with other types of disabilities. It is difficult to know where to draw the line in listing organizations, as there are so many. Of course, there are other dozens more agencies working on these issues that are too numerous to list.

**Featured Disability Research in Alaska**

**FETAL ALCOHOL SPECTRUM DISORDERS**

Fetal Alcohol Syndrome (FAS) is characterized by abnormal facial features and growth and central nervous system problems. People with FAS may have problems with learning, memory, attention span, communication, vision, and/or hearing. These problems often lead to difficulties in school and problems getting along with others. FAS is a permanent condition that is caused by prenatal exposure to alcohol and is entirely preventable. It was first identified in 1973, and has been a long-standing concern in...
Alaska. Use of alcohol during pregnancy is the leading cause of mental retardation in Alaska.

Fetal Alcohol Spectrum Disorders (FASD) is the new term used to describe the wide variety of disorders associated with prenatal exposure to alcohol such as FAS, Fetal Alcohol Effect (FAE), Alcohol Related Neurodevelopmental Disorders (ARND), and Alcohol Related Birth Defects (ARBD). Beginning in June of 2000, work began to establish FASD diagnostic teams throughout the state; work is ongoing to establish diagnostic teams in more communities in Alaska.

According to the U.S. Department of Health and Human Services, Indian Health Services, the percentage of Alaska Native women who drank during pregnancy was 12.3%, compared to 1.5% of all women nationally who drank during pregnancy. From 1995 to 1998, an average of 14 infants were born in Alaska every year with Fetal Alcohol Syndrome, which is an FAS rate of 1.4 cases per 1,000 live births. The incidence of FAS among Alaska Natives infants was 4.8 cases per 1,000 live births. There were 55 infants born between 1995 and 1998 who are confirmed cases of FAS; 84% were Alaska Native and 9% were white. There is some indication that the increasing rate of reported FASD may be a result of increased awareness of the disease as well as a firmer clinical understanding of the symptoms. Between 1977 and 1992, a rate of 0.8 FAS cases per 1,000 live births was reported for Alaska.

**Featured research:**

- The Centers for Disease Control and Prevention, National Center on Birth Defects and Developmental Disabilities implemented the Fetal Alcohol Syndrome Surveillance Network (FASSNet) to monitor the occurrence of FAS in five states. FASSNet is a collaborative data gathering effort in Alaska, Arizona, Colorado, New York, and Wisconsin. There was only minor variation in the reported rates of FAS in the other four states. Those states had FAS rates of 0.3 to 0.4 cases per 1,000 live births. For the same time period, Alaska had an FAS rate of 1.4 cases per 1,000 live births overall and 4.8 cases per 1,000 live births among the Alaska Native population. The Alaska FAS Surveillance Project tracks children who have been identified at birth as being at risk for FAS until they are age 6. This tracking system is important because many children with FASD do not show any symptoms until between ages 3 and 5. The Alaska FAS Surveillance Project receives all potential FAS cases from the Alaska Birth Defects Registry.

- Alaska’s Comprehensive FAS Project began in January 1998 and is funded through September 2005 with $29 million ($5.8 million per year) from DHHS, Substance Abuse and Mental Health Services Administration to develop a comprehensive, integrated approach to FAS prevention and systems improvement. A portion of the project funding is devoted to evaluation.
The rate of employment for people with a disability is much lower than the overall rate of employment among the same age groups. The national employment rate for adults without a disability is 82%. Nationally, 77% of people who experience a non-severe disability are employed, as are 26% of those with a severe disability. In Alaska, approximately 34% of people with substantial disabilities are employed, compared to the 95% employment rate among the general population. Among Alaskans age 21 to 64 years old, people with a disability are more than a third less likely to be working than people without a disability (See chart below). According to the Division of Vocational Rehabilitation, nearly all (95%) people with substantial disabilities who are employed are underemployed, typically working only part-time. Many people with disabilities will not work more than part-time for fear of becoming ineligible for government health care and other benefits.

According to the Disability Statistics Center at the University of California, San Francisco, in 1980, the U.S. rate of people with a work disability was 85.2 per 1,000 people, while Alaska’s rate that same year was much lower at 54.0 per 1,000 people. This was the lowest rate of people with a disability among all 50 states and Washington, D.C. In 1990, Alaska was still well below the national rate of disabilities with 66.3 disabilities per 1,000 people versus 81.5 per 1,000 people for the nation. However, between 1980 and 1990 Alaska had the largest percentage increase of any state or Washington, D.C. in its rate of disabilities. Alaska experienced a 22.8% increase in the rate of people with disabilities during that period. The majority of Alaska’s increase in disabilities was among non-severe work disabilities, where again, the rate of increase was the largest in the nation with a 20.8% increase. Alaska’s increase in severe work disabilities during that time was only the third largest increase in the nation. The rate of severe work disabilities in Alaska increased 26.7% between 1980 and 1990. Alaska

<table>
<thead>
<tr>
<th>DISABILITY STATUS OF THE CIVILIAN NON-INSTITUTIONALIZED POPULATION</th>
<th>Population</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total population age 5–20 years old</td>
<td>165,698</td>
<td>100.0%</td>
</tr>
<tr>
<td>Population age 5–20 years old with a disability</td>
<td>11,406</td>
<td>6.9%</td>
</tr>
<tr>
<td>Total population age 21-64 years old</td>
<td>357,706</td>
<td>100.0%</td>
</tr>
<tr>
<td>Population age 21-64 years old with a disability</td>
<td>55,956</td>
<td>15.6%</td>
</tr>
<tr>
<td>Population age 21-64 years old w/disability who are employed</td>
<td></td>
<td>55.3%</td>
</tr>
<tr>
<td>Population age 21-64 years old without a disability</td>
<td>301,741</td>
<td>84.4%</td>
</tr>
<tr>
<td>Population age 21-64 years old w/o a disability who are employed</td>
<td>245,785</td>
<td>79.7%</td>
</tr>
<tr>
<td>Total population age 65 or older</td>
<td>34,301</td>
<td>100.0%</td>
</tr>
<tr>
<td>Population age 65 or older with a disability</td>
<td>15,849</td>
<td>46.2%</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau
remained below the national rate of people with work disabilities in all
categories except the rate of non-severe work disabilities in 1990. That year,
the national rate was 39.6 disabilities per 1,000 people, while Alaska had
43.2 disabilities per 1,000 people.

In 2001, 7,860 disabled workers received social security payments in
Alaska, receiving an average monthly cash benefit of $796. Supplemental
Security Income (SSI) was made available for 7,460 disabled and blind
people with an average monthly payment of $382. The Division of Public
Assistance Adult Public Assistance (APA) program is another source of
monthly cash benefits for people who experience a disability or who are
elderly; the maximum APA benefit is $362 per month. For the last decade,
the APA disabled caseload has grown an average of 10% per year. The
percentage of growth in the overall caseload during this period has aver-
aged 7.2%.

AUTISM

According to the National Institutes of Health, National Institute of Child
Health and Human Development (NICHD), 1 in 500 people have some
form of autism. The autism spectrum includes “classic” autism, Pervasive
Developmental Disorders/Not Otherwise Specified (PDD/NOS), and
Asperger’s syndrome. This rate is the current, commonly accepted incident
rate for autism in America. Ten years ago, the commonly accepted rate for
autism was between 5 and 10 cases per 10,000 individuals. Using the
current rate, it is estimated that there are 1,240 people with some type of
autism in Alaska. Nationally, there is a marked increase in the numbers of
students being served in special education programs who are diagnosed
with autism. In the 1991-92 school year, there were 5,000 autistic students
receiving special education services, by the 1998-99 school year that
number had increased over 1,200% to 67,000 children.

AUTISM STUDENTS RECEIVING SPECIAL EDUCATION SERVICES IN
ALASKA, 1993-2002
Alaska mirrors the national trend, also showing a substantial increase in the number of autistic students receiving special education services according to the Department of Education and Early Development. The Autism Autoimmunity Project reports that Alaska has seen an increase from 1992-1993 to 2000-2001 from an incidence rate of 8 to 195, an increase of over 2300%. The graph below shows the dramatic increase, over 660%, in the number of students receiving special education services in Alaska.

AGING OF THE DEVELOPMENTAL DISABILITY POPULATION

The aging of the developmental disability population has only recently become a problem. In the past, it was unlikely that a person with a developmental disability would outlive their parents, but that is no longer the case. Just like the general population, people with developmental disabilities continue to see improvements in their general health status as medicine and treatments improve. According to the Governor’s Council on Special Education, people with developmental disabilities are expected to live as long as the general population. Advances in technology have also contributed to the overall growth of the disabled population as children who are born with complex medical conditions survive at a much higher rate than they did even 10 years ago. These factors have contributed to the situation where people with disabilities outlive their caregivers and need ongoing services. Most of the developmental disability population needs lifelong services.

Services for people with developmental disabilities in Alaska are provided in community settings by local agencies. Alaska no longer has any persons with developmental disabilities living in an institution. Despite increased appropriation over the past decade, funding is currently insufficient to meet the demand for services, so Alaska has a centralized state waiting list. People are given priority on the waiting list by level of need and length of time on the list. This system was implemented to avoid only serving people once their need for services has become a crisis, although 80% of people receive some service while they are in the list.

The waitlist only represents those individuals who have been deemed eligible for and requested developmental disability services. Therefore, the waitlist does not represent all of the people who may need services. There is
Alaska has a centralized state waiting list for services for people with developmental disabilities. Average time on the waitlist in 2003 was 5.25 years.

There is no definite number as to the number of Alaskans with disabilities. If people have other methods to pay for services they may not be known to the state. Applying the same prevalence rate for developmental disabilities in Alaska as in the nation (1.8%) yields an estimate of 12,000 to 13,000 Alaskans with developmental disabilities. Currently, only about 3,500 people receive community developmental disability services funded by the legislature. People interested in the waitlist should consult the Division of Senior and Disabilities Services November 2003 report available on their web site.

The number of individuals who seek services is lower than the prevalence rate would predict. Some individuals and families do not seek publicly funded services. Others who may be eligible for services may be satisfied with the level of assistance and support they receive from the state’s Infant Learning Program (for ages 0–3) or Special Education (ages 3–22). In fiscal year 2003, the Infant Learning Program providers served 1,721 infants and toddlers with developmental disabilities up to age 3 and there were 2,421 children ages 3–22 that were enrolled in Special Education in fiscal year 2003. There were 18,116 individuals ages 3-21 in Special Education. In 1998, there were an estimated 423 people in Alaska with developmental disabilities who were being cared for by someone 60+ years old. In 2002, 17 people on the waitlist for services were 50 years old or older. Average time on the waitlist in 2003 was 5.25 years. Prior to 2001, the average length of time on the waitlist had been declining. The number of people on the waitlist during that time was actually decreasing by a couple hundred people a year. Due to budget cuts, the average time on the waitlist has increased two years (from 3.25 year in 2001 to 5.25 years in 2003) in the past two years.

**Featured research:**

- An analysis of the impacts of Medicaid Waiver structure and requirements in terms of meeting clients needs will be conducted by the Alaska Mental Health Trust Authority.
SCOPe OF Problem

Several ongoing research projects are primarily aimed at defining the scope of one portion of the problem. This is a vital step in the process of improving services.

Featured research:

- The Municipality of Anchorage is working to identify the frail elderly.
- A national survey of the number of children with special needs is being conducted by the U.S. Department of Health and Human Services, Health Resources and Services Administration (HRSA), and the Maternal and Child Health Bureau. Data will be available by state.
- Native American Research Center for Health Grant (NARCH) is a project of The Office of Alaska Native Health Research (OANHR) in the Division of Community Health Services at the Alaska Native Tribal Health Consortium. NARCH is a National Institutes of Health and an Indian Health Service funded project that has multiple locations throughout the country. The Alaska NARCH conducts a variety of projects, each directed toward specific concerns of Alaska Natives. One project of the Alaska NARCH is a retrospective epidemiological study of the prevalence of disabilities among Alaskan Native children in the years 1984-89 in order to address prevention, early identification of disabling conditions, and early intervention to maximize rehabilitation.

Candidate Themes for Disability Research Priority in Alaska

As revealed in the section above, there is a dearth of disability research currently being conducted in Alaska. Regarding some specific disability areas, there are not reliable figures available about the extent of the problem. There is a great deal of research needed to answer some pressing questions about developmental disabilities in Alaska.

Unemployment and Underemployment Among People With Developmental Disabilities

Research is needed to determine the unemployment rates for Alaskans with disabilities. Once a reliable figure is available, an analysis of what services would be needed to enable people with disabilities to achieve full employment should be undertaken. For those people with disabilities who have the capacity for employment, being employed can contribute to their financial, social, and emotional well-being.

Aging of Disabled Population

The impact of aging among the developmental disability population needs to be assessed; analysis of the degree and type of additional services that may be required is essential. Just as the general population is skewing
toward the older end of the curve, so is the disability population. Surveys to get accurate rates of people who will need long-term developmental disability services are indispensable to plan for the future. Included in planning for future disability service provision should be an evaluation of the cost effectiveness of the Medicaid program, specifically the Medicaid MRDD Waiver program.

EFFECT OF DISABILITIES ON CHILDREN

Just as the disabilities discussed last a lifetime, so can effective services provided to children. Therapy for children with autism and FASD can imprint positive behaviors and instill improved coping skills that provide a lifetime of help for both those affected and their caregivers. Other research projects can help clarify topics surrounding other disability issues impacting children. Research is needed to determine the effectiveness of family and community support for medically fragile children. The effect of classroom segregation of students with complex disabilities is unknown and an analysis of the impact of this typical policy is desirable to determine if the practice is helpful or harmful. Additionally, an examination of what happens after students leave or age-out of special education would help inform planning for future demand for services. An evaluation of which FASD prevention messages are effective and an analysis of the cultural appropriateness of those messages is desirable. Finally, a study of the incidence of autism in Alaska, with a primary eye toward disparities in urban and rural prevalence rates would be beneficial.

SERVICES FOR CHILDREN WITH DISABILITIES IN FOSTER CARE

Given the compounded vulnerability of disabled children in foster care, there are a number of issues requiring more data.

Given the compounded vulnerability of disabled children in foster care, there are a number of issues requiring more data. Highly appropriate for immediate funding is basic research to determine the incidence of children with disabilities in foster care. Once the incidence of children with disabilities in foster care is known, an analysis of the services those children receive while in foster care would be an excellent next step. Finally, an analysis of what happens after children with disabilities age-out of foster care is necessary.

RURAL ISSUES

With such a large percentage of the state being rural, paying specific attention to the use and provision of services in rural areas is imperative. An evaluation of service delivery models in rural areas should be undertaken. The identification of barriers to the development and use of rural services is also needed.

GENERAL RESEARCH

Research is needed to determine the level of health care access (including access to dental care) available to people with disabilities. The relationship between consumer satisfaction and cost of services needs to be investigated.
Acknowledgments

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Mark Johnson, University of Alaska Anchorage
Eileen Lally, Family Training Academy, University of Alaska Anchorage
Gwen Lee, Association for Retarded Citizens of Anchorage
Steve Lesko, Hope cottages
David Maltman, Department of Health and Social Services, Division of Mental Health and Developmental Disabilities
Karen Martinek, Infant Learning Program
Maureen McGlone, Stone Soup
Jesse Owens, University of Alaska Anchorage
Karl Pfeiffer, University of Alaska Anchorage
Chris Robinson, Special Education Service Agency
Rosellen Rosich, Geriatric Education Center, University of Alaska Anchorage
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Angela Salerno, Adult Public Assistance
Jon Sherwood, Medicaid
Lizette Stiehr, Focus
Diana Strzok, ASSETS
Amy Swango-Wilson, University of Alaska Anchorage
Bob Taylor, Commission on Aging
Karen Ward, Center for Human Development, University of Alaska Anchorage
The gerontology research aspiration is to support and coordinate research aimed at understanding and improving the health, social networks, social supports, and social roles of individuals in later adulthood, especially as Alaska’s population of seniors expands.

**SITUATION AND EXPERTISE IN ALASKA**

In 2000, life expectancy at birth was 76.9 years. According to the Federal Interagency Forum on Aging-Related Statistics, life expectancies at ages 65 and 85 have increased. Under current mortality conditions, people who survive to age 65 can expect to live an average of nearly 18 more years, more than five years longer than people living to age 65 in 1900 could expect. The life expectancy of people who survive to age 85 today is about 7 years for women and 6 years for men. Given the increases in life expectancy, by the year 2050 it is projected that one in five Americans will be elderly. With the gains in life expectancy, more people are living long enough to need assistance with activities of daily living. Only 4-5% of today’s elderly live in nursing homes, yet almost 25% need assistance with their activities of daily living.

The Alaska Commission on Aging reports that while the overall population of Alaska is projected to increase by one-third between 2000 and 2025, the number of Alaskans over age 60 will more than triple during that same time period. Seniors are projected to comprise a larger percentage of Alaska’s population; in 2000 they comprised 8% (50,600) of the population and by 2025 they are projected to be 20% (165,000) of the population.
The growth rate in Alaska’s senior population far exceeds the growth rate among seniors nationally. From 1990 to the projected 2025 population, the percentage of seniors nationally will increase 41%, while during the same time period Alaska’s percentage of seniors will increase 230%.

Several factors are contributing to Alaska’s increasing senior population; increased life expectancy is part of the equation, another part is more seniors are staying in the state. In 1999, Alaskans age 60 and over were surveyed and 90% intend to remain in state. Among those seniors who predicted they would not stay in the state, primary reasons for leaving were better climate, proximity to relatives, and lower cost of living. Not surprisingly, the markets for services to seniors will similarly increase as nearly all seniors plan to remain in Alaska indefinitely. Seniors will need three times or more the current levels of social and recreational opportunities, medical and personal care, appropriate housing, transportation, nutrition, and other services.

It should be noted that projections about how many seniors will remain in the state may be impacted by recent cuts to such things as the Longevity Bonus Program, actual or proposed changes to property tax breaks for seniors, threatened cuts to the Permanent Fund, and the seeming tightening of eligibility requirements for the Medicaid Waiver Program/Medicaid Nursing Home Admission criteria (regarding which there is currently a class action suit against the state). The recent changes in the state’s economy and services as they impact seniors may result in more seniors leaving the state. However, it would be desirable to keep seniors in the state. Even if only a portion of the state’s seniors chose to leave, there will still be enough of an increase in the senior population to necessitate increasing service capacity.

The shortage of qualified health care providers to meet the special needs of Alaska’s burgeoning elderly population will be alleviated to some degree through the new Geriatric Education Center (GEC) at the University of Alaska Anchorage. The U.S. Department of Health and Human Services (HHS), Health Resources and Service Administration gave UAA the $2.3 million, five year grant to establish the GEC, which will have its main location at UAA and satellite locations at UAF and UAS Sitka. The GEC
will be operated by a consortium of the three universities. In an effort to cope with the needs of the expanding elderly population, the federal government has mandated that every state have at least one GEC to facilitate training of health professions faculty and practitioners in the prevention, diagnosis, and treatment of disease and disability, and other problems of the elderly. The University of Alaska Anchorage has also received a grant from HHS, Administration on Aging to establish a National Resource Center for American Indians, Alaska Natives, and Native Hawaiian Elders. This center will work closely with the AKGEC.

Many of the needs of seniors are the same as the needs of other age groups or populations, but seniors’ need for services are more intensive. Other needs of seniors are more specific to their population such as services related to Alzheimer’s disease, or related dementia. Given the wide variety of services seniors need, there are many groups involved in providing those services and advocating for seniors’ rights. Some groups involved include:

- Alaska Department of Labor and Workforce Development
- Alaska Commission on Aging
- Federal Interagency Forum of Aging-Related Statistics
- Department of Health and Social Services
- Division of Senior and Disability Services (formerly the Department of Administration)
- Division of Senior Services
- Robert Wood Johnson Foundation
- Older Persons Action Group, Inc.
- University of Alaska Anchorage Center for Human Development

**Featured Gerontology Research in Alaska**

**HIGH COST OF MEDICAL CARE**

More than one quarter of Medicaid recipients report they lack sufficient resources to buy food or pay for housing or utilities. According to an Administration on Aging study completed in 1999, the nationwide population age 65 and older spends 12% of their total income on health care.

Due to advances in medicine, seniors are living longer, which contributes to the rising cost of living. Seniors are also affected by increasing medical and housing costs. In Alaska, 93% of people age 65 and over partially fund their retirement with social security. Seniors are likely to own their own homes and have few debts; however, as seniors age, they are likely to spend down savings and assets to cover medical bills and specialized housing.

Researchers have found that seniors are more likely to be poor than the non-senior general population. While seniors aged 85 and older generally
need the most care, they also are the poorest group in the population. According to the 2000 U.S. Census, 14% of seniors age 65 and over fell below the poverty line. Research also shows that among seniors, women outnumber men, especially in Alaska, in part because women typically live longer than men. However, women fare poorly when it comes to income during their senior years. Women made up 54% of the people age 65 who were below the poverty line. The difference in poverty status increases with age between men and women.

The rising cost of health services is a barrier for seniors using any sort of medical coverage. Health-care costs are continually rising at 15% per year nationwide. These rising costs, in turn, cause insurance costs to rise accordingly. Health care costs continue to increase much more rapidly than other costs in Alaska. They are also increasing more rapidly in Alaska than nationwide. The U.S. Department of Labor statistics reports that for 1995-2000, the Consumer Price Index for all items in Anchorage increased by 8.9%, while the cost for medical care services increased by 27.4%.

**Featured research:**

- In 2001, the Division of Medical Assistance conducted the Health Care Cost Analysis Project to document that medical care in Alaska is more expensive than it is in the rest of the nation. The project began as a response to the federal Children’s Health Insurance Program (SCHIP) that only allotted Alaska a geographic cost differential of 3.9%, which was less than a number of other states with lower health care costs. Medical care costs for the 50 most common dental procedures and the 250 most common medical procedures in Alaska were compared by procedure code between Alaska and the entire country.

  The analysis revealed that overall medical costs in Alaska are 25% higher than the rest of the nation. Over three-quarters (78%) of the procedures were more expensive than the average national cost, 7% were the same as the average national cost, and 15% of procedures were less expensive in Alaska than the national average. Among those procedures that cost more in Alaska, 40% were 25% more expensive here. The result of this analysis shows that medical procedures cost Alaskans 25% more than the national average for those same procedures.
**HIGH COST OF PRESCRIPTION DRUGS**

Prescription drug prices have skyrocketed. In 2001, they rose 25% and they are projected to nearly double in price again by 2007. During the past ten years, studies have shown that the cost of prescription drugs has risen as much as 48%. The prices of the 50 most-prescribed drugs for older Americans climbed an average of three times the rate of inflation last year, according to a Families USA report. A study by the Kaiser Family Foundation said Alaska has the fastest-growing prescription drug prices in the nation. While prices rose 17.3% on average around the country, Alaska’s prices rose 25.2%, the study said. Meanwhile, many of Alaska’s seniors have no prescription drug coverage and must pay drug costs out-of-pocket.

**LACK OF MENTAL HEALTH COVERAGE**

There is a striking lack of parity between the physical health and mental health coverage provided by Medicare. Traditional Medicare coverage is insufficient for seniors with mental illness. Patients are responsible for 50% of the Medicare-approved amounts for most outpatient mental health care, in comparison to clients being responsible for just 20% of other medical services. Medicare also imposes a 190-day cap on inpatient psychiatric care, while there is no cap on general hospital care.

**Featured research:**

- The Council on Aging and the Alaska Mental Health Board are conducting a study to determine the prevalence of mental health problems, including Alzheimer’s and dementia, among seniors.

**MEDICARE BARRIERS**

Some seniors have insurance in addition to Medicare to help cover costs that Medicare will not cover. Urban seniors were more likely than rural seniors (77% versus 55%, respectively) to have health insurance other than Medicare. Seniors need other insurance because Medicare does not provide adequate coverage from many things and has barriers to service. There are a number of small barriers in Medicare that accumulate into a large barrier, preventing seniors from getting the care they need. For example, Medicare will not cover nursing home costs unless the patient first spends time in the hospital for the ailment causing them to enter the nursing home. Seventy-two percent of seniors surveyed had health insurance other than Medicare and about 25% of those with additional insurance had long-term care coverage.

**LACK OF LONG TERM CARE IN RURAL AREAS**

Seniors in Alaska face unique challenges. A large percentage of seniors live in rural making it more challenging for seniors who need help with activities of daily living to remain in their homes, even to remain in their communities. Additionally, the unique transportation challenges in Alaska make it more difficult for seniors who leave their communities for care to
The National Resource Center for American Indians, Alaska Native and Native Hawaiian Elders promotes culturally sensitive and functionally appropriate services to maintain the social well being of Alaska Natives.

stay connected. Several programs in the state are addressing these issues and working to help seniors remain in their communities.

The Department of Health and Social Services, Division of Senior and Disability Services (formerly the Alaska Department of Administration, Division of Senior Services) manages the Personal Care Attendant (PCA) Program that served more than 1,300 Alaskan seniors in 125 communities statewide. By providing help with activities of daily living, the program allows Alaskans to live in their home or community, instead of being placed in a more costly and restrictive long-term care institution in one of the larger communities.

**Featured research:**

- The Robert Wood Johnson Foundation (RWJF) has supported the Coming Home Program, which focuses on providing affordable assisted living care for seniors. Alaska is participating in this six year, $6.5-million national program created in 1992. RWJF worked with the NCB Development Corporation (NCBDC), a community development bank that works with rural communities to develop affordable assisted-living residences that integrate and coordinate health, social, and personal care services and housing for seniors who are frail or chronically ill. A goal of the program is to enable seniors to live as independently as possible and avoid unnecessary placement in a nursing home. Assisted living helps seniors with activities of daily living they cannot perform for themselves such as grooming, dressing, cleaning, and food preparation. Since this program focuses on providing affordable assisted living, seniors must have incomes that are at or below 80% of the area’s median income. This program began in response to the fact that most rural areas currently have little in the way of assisted living services and no affordable assisted living options.

- The National Resource Center for American Indians, Alaska Native and Native Hawaiian Elders is a grant from the national Administration on Aging designed to 1) incorporate Native communities in the planning process by “listening to the voices of our elders” to obtain their wishes and expectations for services and care that are consistent with traditional community heritages, tribal values and customs, and

A nursing intern talks with an elder at the Alaska Native Medical Clinic. “Listening to the voices of our elders” to obtain their wishes and expectations for services and care is a goal of a new grant program at UAA.
2) to provide technical information to promote culturally sensitive and functionally appropriate services to maintain social well being of Alaska Natives based on “best, promising, and emerging practices.”

The grant will focus on Alaska Native communities and the processes to assess the needs of communities and the Elders in providing culture-based Elder care. There will be conferences and papers resulting from the grant.

**Candidate Themes for Gerontology Research in Alaska**

Seniors should be able to remain in Alaska with their family and friends, in their communities and their homes if they choose to do so. Alaska needs to provide the services and supports to help make that an option for any senior who wants it. In addition to all the social capital brought to society by seniors, they add to the state with their wisdom and experience. In 1999, senior income was responsible for at least $2.4 billion of Alaska’s total $17.7 billion of personal income. The $2.4 billion that seniors contribute to the economy is more than the estimated impacts of employment created by most of the state’s leading industries. These include the petroleum industry ($2 billion), the seafood industry ($1.2 billion), and the tourism, mining and forest-products industries combined ($1.6 billion). In order to enable seniors to remain in Alaska and lead fulfilling lives further research on certain topics is necessary to determine which supports and services are needed.

**ALASKA SPECIFIC RESEARCH**

Alaska has some unique issues impacting its seniors and therefore any research on those issues must be conducted in the state. A list of potential topics needing more research follows.

- There is a need for basic research studying the impact of fluctuating light levels on seniors.
- Surveillance activities on the effects of the Alaskan environment on injuries in old age (in particular the role of weather and ice in falls) are needed.
- Alaska needs more information about how members of the state’s diverse population understand age, aging, care giving, mental health and illness among the elderly. This information becomes even more necessary as the Alaska Geriatric Education Center begins training people to care for elderly Alaskans.
- Research is needed on the impact on Alaska Native seniors having their culturally related activities, foods, traditional healing, and opportunities for spiritual expression absent in health care settings.
- An examination of the differences in access to health care between rural and urban communities is needed.
Also needed is research to examine how law enforcement responds to forms of elder abuse or endangerment.

Finally, an assessment of the cultural values in Alaska regarding aging would help inform the debate about policies for seniors. Research specifically examining how dementia, frailty, and the nature and world of care giving are viewed and understood by Alaskans would be very helpful.

**HEALTH CARE RELATED RESEARCH**

Medicare is central to the health care of many seniors, yet several related questions remain:

- It would be helpful to look at the percentages and locations of practitioners who could are reimbursed by Medicare for services, but who choose not to take Medicare patients.

- Applied research to determine the ratio of Medicare providers to service need would enlighten planning for future need as the Baby Boom generation ages, as well as informing current recruiting strategies.

- Additional research to identify what lay people, para-professionals, and professionals need to know in order to provide appropriate and effective services to seniors would enable efforts to made to provide that knowledge.

- Knowing what geriatric health personnel requirements are across health care settings would also help plan future recruiting and training of workers.

- An analysis of the barriers to medical care for elders (including Medicare, Medicaid, cultural issues) is needed. These data would allow changes to be made which would make sure all seniors are able to access the care they need.

**POLICY RESEARCH AND PILOT STUDIES**

The field of gerontology is ever evolving, and new thinking will be needed to deal with the challenges as the number of seniors increases dramatically. It would be highly appropriate to fund applied research analyzing aging policy in the State of Alaska. In the spirit of keeping a fresh perspective on the field, applied research on the effectiveness of pilot programs would be appropriate.

**QUALITY IMPROVEMENT/BEST PRACTICES**

In addition to efforts to make sure the state is ready for future needs and has the most current information about the need for geriatric health care providers it is also important to be sure that the current services being provided are high quality and the best practice known. An analysis of “best practices” related to senior care in rural areas is needed.
Acknowledgments

The following people and organizations contributed significantly to this process. Contributions of their time, thoughts, and expertise are greatly appreciated.

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Darci Nevzuroff, Southcentral Foundation
Bill O’Connor, Anchorage Pioneers’ Home
Nancy Overpeck, University of Alaska Anchorage
Karen Perdue, University of Alaska
Michael Price, Salvation Army
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Midge Stafford, Providence
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Ken Takakuwa, Senior Citizens Advisory Commission, Anchorage
Beverly Tallman, University of Alaska Anchorage, Center for Human Development
Bob Taylor, Alaska Commission on Aging
Don Thibedeau, Denali Center
Suzanne Tryck, University of Washington Medical School
Lee Vanderbrink, Alaska Regional Medical Center
Timothy Wallstrom, University of Alaska Anchorage
Karen Ward, University of Alaska Anchorage
Larry Weiss, University of Alaska Anchorage
Lillian Wilder, Department of Health and Social Services, Division of Senior Services
The maternal, child, and family health research aspiration is to understand the environmental, physical and social factors that affect the health and well-being of women, children, and families and to determine the strategies that most effectively reduce short and long-term negative impacts.

**SITUATION AND EXPERTISE IN ALASKA**

Maternal, child, and family health focuses on the cycle of reproduction and child development, and encompasses issues such as prenatal care, infant mortality, low-birth weight, and a broad range of issues that impact maternal, child, and family health. When compared to the national average for most of these health measures Alaska is doing better. Prenatal care is the only health outcome, among those listed below relating to newborn health, on which Alaska lags behind the nation. The percentage of Alaskan women receiving adequate prenatal care and the percentage of Alaskan women receiving prenatal care in their first trimester is below the national average. The rates of prenatal care receipt are lowest among teens and Alaska Natives.

Even though there was an increase in the percentage of low birth weight babies, Alaska has a lower rate than any other state. Over the same period, the state’s infant mortality rate dropped from 10.5 deaths per 1,000 births to
6.8 deaths. Alaska traditionally had a very high rate infant mortality. The formation of the Maternal-Infant Mortality Review process contributed to the sizable drop in rates to where they are today.

In 1996-1997, the Pregnancy Risk Assessment Monitoring System (PRAMS) reported that 10% of women were abused either during the 12 months before or during pregnancy. As with pre-natal care, teens and Native Alaskans fare worse on this indicator. Nearly one-fifth (19%) of Native Alaskan women reported abuse during these periods in contrast with 7% of non-Native women reporting abuse. Over one-fifth (22%) of teens reported abuse in the 12 months prior to or during pregnancy versus 10% of older women reporting abuse during the same time periods. PRAMS also found that 40% of pregnancies in Alaska are unintended.

Prenatal substance use appears to be declining. Reported rates of alcohol, marijuana, and cocaine use among pregnant women have all declined. Prenatal substance use appears to be declining. Reported rates of alcohol, marijuana, and cocaine use among pregnant women have all declined.

**PRENATAL SUBSTANCE ABUSE**

![Graph of prenatal substance abuse from 1991 to 2000](image-url)

**1999 MATERNAL AND INFANT HEALTH INDICATORS FOR ALASKA AND U.S.**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Alaska</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teen birth rate per 1,000 women age 15-19</td>
<td>48</td>
<td>50</td>
</tr>
<tr>
<td>Young teen birth rate per 1,000 women age 15-17</td>
<td>27</td>
<td>29</td>
</tr>
<tr>
<td>Women receiving first trimester prenatal care</td>
<td>78%</td>
<td>83%</td>
</tr>
<tr>
<td>Women receiving adequate prenatal care (9+ visits/begins 1st tri.)</td>
<td>67%</td>
<td>75%</td>
</tr>
<tr>
<td>Pre-term deliveries (less than 37 weeks)</td>
<td>11%</td>
<td>12%</td>
</tr>
<tr>
<td>Low birth weight deliveries (less than 5.5 pounds)</td>
<td>6%</td>
<td>8%</td>
</tr>
<tr>
<td>Infant mortality rate (deaths &lt;1 year old per 1,000 live births)</td>
<td>5.5</td>
<td>7.1</td>
</tr>
<tr>
<td>Infant deaths</td>
<td>55</td>
<td>27,937</td>
</tr>
</tbody>
</table>
PRAMS reports that breastfeeding initiation rates in Alaska increased between 1991 and 2000 from 79.1% to 88.8%, respectively. This gives Alaska one of the highest breastfeeding initiation rates in the nation. In 2000, 90% of women had initiated breastfeeding with their infants and when the infant was 1 month old, 79% were still breastfeeding. However, by 6 months breastfeeding rates had decreased to 32% of infants reportedly being breastfed. The average length of breast-feeding in Alaska is 3.3 months; a minimum of 6 months of breastfeeding is recommended by medical associations and one year is considered optimal.

Rates of Sudden Infant Death Syndrome (SIDS) have been improved in many areas by the “Back to Sleep” campaign urging caregivers to put infants to sleep on their backs. Placing infants on their backs to sleep is the best position to reduce risk of SIDS. In Alaska, the percentage of mothers of newborns who put their infants to sleep on their backs has increased dramatically. In 1996, 41% of Alaskan newborns were placed on their backs for sleeping and by 2000, that percentage had increased to 67%, a 63% increase.

Older children are at risk of accidental death as well as infants. The childhood mortality rate, deaths among children 1 to 4 years old, is 3.5 times higher for Native Alaskans than for non-Natives. Death rates among children and teens due to accidents, homicides, and suicides have fallen in both Alaska and the nation. Alaska’s rates have historically been higher than comparable national rates. The Alaska child death rate decreased from 41 deaths per 100,000 children ages 1-14 in 1990 to 23 deaths in 1999. Nationally, the rate fell from 31 to 24. The rate of teen deaths by accidents, homicide, and suicide in Alaska increased from 97 deaths per 100,000 teens aged 15-19 in 1990 to 128 deaths in 2000. During the same time period, the national rate dropped from 71 deaths per 100,000 teens aged 15-19 in 1990 to 51 deaths per 100,000 in 2000. (Suicide is discussed in detail in the behavioral health chapter.)

As with many of the other sections of this health research plan, a wide range of agencies are involved. The state Section of Maternal and Child Health was disbanded during the recent reorganization of state agencies. Most of the services provided by that agency are now being offered through several other agencies. However, the Maternal-Infant Mortality Review process has been defunded. It remains to be seen whether the current organization of maternal and child health activities will result in the same high levels of health families in Alaska have enjoyed.
Agencies working to study and improve the outcomes for pregnant women and their children include

Department of Health and Social Services, Division of Public Health;
Alaska Native Epidemiology Center (EpiCenter) within the Alaska Native Health Board (ANHB)
Alaska Injury Prevention Center;
University of Alaska Anchorage,
College of Health and Social Welfare, Institute for Circumpolar Health Studies;
Alaska Center for Rural Health (ACRH) at the University of Alaska Anchorage
Environmental Protection Agency
Alaska Native Tribal Health Consortium (ANTHC
Center for Disease Control and Prevention, Arctic Investigations Program
Indian Health Service, Alaska Area Native Health Service
National Center for Environmental Health
North Slope Borough
Arctic Slope Native Association
Yukon Kuskokwim Health Corporation (YKHC).

**Featured Maternal, Child, & Family Health Research in Alaska**

**NUTRITION**

Nutrition plays an enormous role in maintaining good health. Like the rest of the country, Alaskans do not eat enough produce and eat too many fatty foods. Proper nutrition is vital to healthy development for pregnant women, children, and adolescents. In addition to the typical unhealthy diets consumed by most Americans, there are nutritional issues of specific concern to Alaskans. There are several studies being conducted focusing on specific nutrients.

**Featured research:**

- In 1998, health care providers in Hooper Bay, Alaska reported that hemoglobin data from a local Head Start program indicated that 31% of the children aged 2-4 years had anemia. This proportion was substantially higher than the estimated prevalence in the United States of 8% among children aged 1-5 years. The Department of Health and Social Services and the Yukon Kuskokwim Health Corporation are
conducted a study, the Yukon Kuskokwim Delta Anemia Study, examining the occurrence of iron deficient anemia in the population.

- The Department of Health and Social Services conducted a study about Vitamin D. Vitamin D is a crucial mineral in bone development. Insufficient vitamin D can cause bones to be thin, brittle, soft, or misshapen. Vitamin D prevents rickets in children and osteomalacia in adults, which are skeletal diseases. Vitamin D deficiency can be a larger problem in Alaska because the body produces vitamin D in response to exposure to sunlight. Certain foods, primarily milk, are fortified with vitamin D.

From January 2001 through May 2002, children age 6 through 23 months were recruited from one of seven Alaska WIC programs. At enrollment, WIC staff collected 1 to 2 cc of blood and administered a questionnaire regarding breastfeeding and vitamin supplementation. During the study period, vitamin D supplementation was available to children free of charge but required a prescription. (WIC no longer has funding to provide vitamin D to clients at WIC offices.) A high prevalence of vitamin D deficiency was found among these children. The primary risk factor for low vitamin D level was breastfeeding in the absence of adequate vitamin D supplementation. In Alaska, the contribution of breastfeeding to vitamin D deficiency has likely increased in recent years, with an increase in the proportion of women who breastfeed longer than 6 months from 28% of infants during 1990 to 50% during 2000.

**DENTAL CARE**

When the Indian Health Service (IHS) conducted an oral health survey in 1991, 50% of Alaska Native children and adolescents found to have untreated cavities. Nearly all 15 year olds participating in the survey had at least one cavity in a permanent tooth. Protective sealants applied to teeth protect teeth from decay. The IHS survey did find that 70% of 15 year olds had gotten protective sealant applied on at least one occasion to their permanent molars. Additionally, many rural and Native villages do not have effective levels of fluoride in their water systems.

Over one quarter (26%) of Alaska Native children less than five years of age had evidence of baby bottle tooth decay. Among non-Native children, the rate of baby bottle tooth decay was 4%.

**Featured research:**

- The Alaska Native Tribal Health Consortium (ANTHC) is conducting a dental needs assessment.

- The federal portion of the health care system for Alaska Native people is administered by the Alaska Area Native Health Service (AANHS), which is part of the Indian Health Service (IHS). AANHS has conducted a third survey about the oral health of Alaska Natives.
IMPACT OF MATERNAL EDUCATION ON CHILDREN’S HEALTH

An important factor impacting the health status of women and children is the educational attainment of the mother. Women who had less than a high school education were more likely to smoke during pregnancy and have a child die before the first birthday. In addition, only half of this group received adequate prenatal care. There is a clear relationship between educational attainment and better health outcomes for women and their children.

Participation in preschool or group childcare has been shown to be beneficial for children’s social development. Additionally, institutional settings often screen children for disabilities, many of which are more responsive to treatment when caught earlier. In 1999, approximately two-thirds of children between the ages of three and five years old in Alaska and the nation were enrolled in nursery school or kindergarten. Just above one quarter of children under age six attend paid childcare. This percentage was similar for Alaskan children (28%) and children nationally (26%).

ENVIRONMENTAL CONTAMINATION

Environmental contamination is an issue for all people’s health, but may present a larger risk for Alaska Natives living a subsistence lifestyle. The status of environmental contamination can be monitored using cord blood. A wide range of negative health outcomes are tied to contamination; one being studied is breast cancer.

Using cord blood samples to monitor levels of environmental contamination has been done a number of times in Alaska. In 1996, the Community Health Service of the Alaska Area Native Health Service, studied maternal, cord blood samples from North Slope Borough residents in Barrow, and cord blood samples from the Yukon-Kuskokwim Delta were analyzed for levels of pesticides.

The Center for Disease Control and Prevention, Arctic Investigations Program has research nutritional and environmental contamination using cord blood. The Arctic Monitoring and Assessment Programme (AMAP) is an international organization established in 1991 to implement components of the Arctic Environmental Protection Strategy. One monitoring tool used by AMAP to gauge levels of Arctic pollution is by using cord blood.
Featured research:

- With funding provided by the Environmental Protection Agency (EPA), the Alaska Native Tribal Health Consortium (ANTHC) is conducting the Maternal and Umbilical Cord Blood Monitoring Study. This study has a one year funding cycle, with the expectation that other federal sources will be secured to provide this service for more mothers throughout the Alaskan Arctic as well as statewide.

  This study aims to provide surveillance to pregnant women and infants until age one for contaminant levels, diet, reproductive success, and immune system strength. This project will also help to establish a locally based system to engage community members in the regular assessment of environmental health concerns.

- The Breast Cancer and Persistent Organic Pollutants project has been conducted in two phases and has been done in collaboration with the Center for Environmental Health at the Centers for Disease Control and Prevention. The first phase was a retrospective study of levels of persistent organic pollutants (POPs) in banked serum from cases and controls. Levels in cases and controls did not differ significantly, and levels in cases and controls combined did not exceed those of the general U.S. population.

- The Institute for Circumpolar Health Studies, in cooperation with the University of Alaska Anchorage and the Harvard School of Public Health, was contracted to evaluate the relationship between the incidence of asthma in young children and their proximity to traffic.

  This study is based on kindergarten and first grade children (1600+ students) in twelve neighborhood schools in Anchorage. The primary assessment involved a survey of the parents of the kindergarten and first-grade students in the same neighborhood schools to assess asthma symptoms of the children, family risk factors, in-home factors related to individual risk of asthma, socioeconomic status, racial/ethnic identity, and the length of time the child has lived at this address.

  Traffic exposure was divided into low, medium, and high exposure. Logistic regression models had doctor-diagnosed asthma as the dependent variable and traffic exposure, parental asthma, smoker in the house, family income, and gender as independent variables. This study indicated that living close to high traffic areas in an area with no other air pollution sources was a risk factor for childhood asthma.

- The aim of the Alaska Traditional Diet Survey was to document the intake of subsistence food among residents of villages in rural Alaska. The motivation for this study was to provide evidence of quantities and types of food eaten so that the safety of such a diet could be
The CDC Division of Environmental Health Effects continues to study the relationships between exposure to environmental organochlorines and breast cancer in Alaska Native women.

determined, given what is known about contaminant levels in subsistence foods. After documenting subsistence diets, the study recommended that additional species from a variety of locations around the state need to be tested for contaminants. Another recommendation was that all tissues of animals that are typically consumed should be tested both raw and cooked. Given that large quantities of many plants are consumed, the study also recommended that plants need to be included in the testing.

The Centers for Disease Control and Prevention, National Center for Environmental Health, Division of Environmental Health Effects continues to study the relationships between exposure to environmental organochlorines and development of breast cancer in Alaska Native women. The relationship will be assessed through the collection of biological samples from Alaska Native women undergoing breast biopsy or surgery at the Alaska Native Medical Center. Participants are asked to complete a questionnaire and provide a blood, urine, and breast fat tissue sample. Enrollment and specimen collection of approximately 200 women is complete, and samples are currently being analyzed at CDC for endocrine disrupting chemicals.

RACIAL AND ETHNIC DISPARITIES IN MATERNAL, CHILD, AND FAMILY HEALTH OUTCOMES

Overall, the health and well being of Alaska’s women, children, and families has improved over the past 10 years. Some of the improved outcomes include a decrease in the infant mortality rate, fewer teenagers having children, and reduced substance abuse during pregnancy. However, there are still significant disparities in well being between racial and ethnic groups.

The Alaska Department of Health and Social Services, Section of Maternal, Child and Family Health collected information on maternal and child health on an annual basis (before the reorganization of HSS restructured the agency). Much of the data it collected was presented by race/ethnicity,
gender, educational attainment, and age of mother. As shown in the table below, behavior and outcomes can vary significantly by race or ethnicity. Alaska Natives are more likely to smoke during pregnancy, receive inadequate prenatal care, and have children who die between the ages of 1 and 4 years old. Blacks are most likely to have low birth weight babies and have a child die before its first birthday.

Minority families are more likely to be living below the poverty line. According to the 2000 census, only 8.1% of non-Hispanic Whites nationwide lived below the poverty line, in comparison with 12.8% of Asians, 22.6% of Hispanics, and 24.9% of Blacks. Unfortunately, the census does not provide figures for American Indians and Alaska Natives. In 1999, the median family income for families with children in Alaska was $51,700; the national median income was $47,900. That same year, 4% of Alaskan children lived in extreme poverty (income below 50% of poverty level); fewer than the 7% of children nationally were living in similar conditions. Nationally, and in Alaska, approximately one quarter (27% and 28% respectively) of families with children lived in households headed by a single parent in 1999.

### Featured research:

- The Department of Health and Social Services, Division of Public Health conducted a two-year study examining the racial, ethnic, and geographic disparities in maternal and child health outcomes. The study analyzed innovative models to address the disparities in these health outcomes.

### SERVICES TO MOTHERS, CHILDREN AND FAMILIES

The Department of Health and Social Services provides a variety of services to pregnant women, infants, children, and families to support healthy development and growth. Two of those programs that have some aspect of them being researched are listed below. The Department also has programs targeting family planning, infant screening and testing; and genetic testing.

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#### MCH INDICATORS BY MOTHERS’ RACE/ETHNICITY

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Alaska Native/American Indian</th>
<th>Asian/Pacific Islander</th>
<th>Black/African American</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnant women (15-44 yrs.) smoking</td>
<td>32.4%</td>
<td>6.9%</td>
<td>10.0%</td>
<td>15.0%</td>
</tr>
<tr>
<td>Pregnant women receiving adequate prenatal care</td>
<td>48.5%</td>
<td>65.2%</td>
<td>74.4%</td>
<td>75.3%</td>
</tr>
<tr>
<td>Births that are low birth weight (less than 5.5 pounds)</td>
<td>4.5%</td>
<td>5.6%</td>
<td>8.6%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Infant (&lt;1 yr.) deaths per 1,000 births</td>
<td>10.7</td>
<td>9.2</td>
<td>11.4</td>
<td>5.8</td>
</tr>
<tr>
<td>Deaths of children (1-4 years old) per 100,000 children</td>
<td>109.0</td>
<td>26.6</td>
<td>18.8</td>
<td>34.5</td>
</tr>
</tbody>
</table>

Data are five year averages 1994-1998.
Featured research:

- The Department of Health and Social Services, Office of Children’s Services operates the Healthy Families Program. This program gives grants to enable home visits with expectant parents and parents of newborns who are under stress that places their infant (and other children) at risk of child abuse or neglect. Visits are weekly during the first nine months of services and then decrease in frequency, but may continue until the child is five. An evaluation of the project is occurring to determine if the goals of promoting healthy childhood growth and development, positive parent-child relationships, and enhanced family functioning are being met.

- The Southcentral Foundation’s Nutaqsiivik Program is a nurse home visiting program initiated in 1993 to reduce infant mortality among Alaska Natives. A standardized risk list was created to identify clients at high social risk during their pregnancies. Three full-time community health nurses case manage and home visit more than 40 high social risk families each. Visits occur at least once a month for the first 12 months of the infant’s life. An evaluation of the program in 2000, utilizing a “days between deaths” run chart, showed a fifty percent reduction in infant mortality.

- Denali Kid Care is Alaska’s program to ensure that children and teens of both working and non-working families can have the health insurance they need. Denali Kid Care provides excellent health insurance coverage for children and teens through age 18, and for pregnant women who meet income guidelines. The goal of the program is to reduce the costs associated with poor health care assess. Denali Kid Care is operated by the Department of Health and Social Services, Division of Health Care Services. A consumer satisfaction study of the Denali Kid Care program is underway.
Candidate Themes for Maternal, Child, & Family Health Research Priority in Alaska

Of all the areas examined in this report, maternal, child, and family health may have the largest impact on the future of Alaska. With improved health and developmental outcomes for infants and children, they will have a greater chance to grow into dynamic, responsible, healthy Alaskans of the future. All pregnant women need the education and services to enable them to provide their baby a healthy start at life and the best odds of growing up healthy. All children and families in Alaska need the services and supports that will enable them to reach their full potential. While there is still significant work to be done, this is one of Alaska’s better health areas. Even though the state lags in a few specific areas, overall, many of the outcomes are better than the national average. The following areas need more research to further assure that every Alaskan has a chance to be their healthiest and best.

The strong, positive outcomes achieved in maternal and child health are especially impressive given that the state does not have the institutions that typically conduct research in these areas. In many states, a medical school or school of public health is instrumental in guiding research in this area. In the past, some Alaskan research has been conducted in conjunction with researchers from Johns Hopkins University or the University of California Los Angeles. The Alaska Department of Health and Social Services has worked on specific research projects. While the location for the drive behind the research is unique, the state has achieved good results with this situation.

ADOLESCENT HEALTH

In reviewing the ongoing research, indeed even in thinking about maternal and child health, many people do not extend that category to include adolescents. Programs and research aimed at younger children may not meet the needs of adolescents or be appropriate for older children and teens. Yet, this arena should be examining potential negative outcomes of teens having sex, such as pregnancy and sexually transmitted diseases. Given the very negative impacts of teenage pregnancy on the teens and their children, evaluations of interventions aimed at decreasing teen pregnancies are needed. Teen pregnancies lead to poor educational outcomes, which in turn, are associated with adverse outcomes for children. Further research is needed to determine which other issues are important to Alaskan teens and are impacting their current health status.

PEDIATRIC ANEMIA

Further research is needed regarding pediatric iron deficiency anemia. Since the state has extremely high rates of iron deficiency anemia among children, this area is a high priority. Iron deficiency anemia is the most common form of anemia. Babies are born with about 500mg of iron in their bodies. By the time they reach adulthood, they need to have accumulated...
about 5000mg. Children need to absorb an average of 1mg per day of iron to keep up with the needs of their growing bodies. Children only absorb about 10% of the iron they eat, so most children need to ingest 8-10mg per day of iron. Breast-fed babies need less, because iron is absorbed 3 times better when it is in breast milk. Drinking too much cow’s milk is a classic cause of iron deficiency in young children.

A common time for iron deficiency is between 9 and 24 months of age. The adolescent growth spurt is another high-risk period. Iron deficiency (even when not enough to cause anemia) is an important cause of decreased attention span, alertness, and learning—both in young children and in adolescents. Iron deficiency anemia measurably worsens school performance. Further research on this subject is needed.

ASTHMA SURVEILLANCE PROGRAM

A recent study determined asthma prevalence among Alaska Medicaid enrollees younger than 20 years old, with an emphasis on Alaska Natives. A master database was obtained that included all children enrolled in Medicaid during 12 months in 1998-99. Physician, pharmacy, and hospital claims files for the ICD codes for asthma were linked to this master database. Asthma was defined as any asthma-related care or medication claim. Asthma prevalence among the study population was 6.9%. Alaska Natives had lower asthma prevalence than non-Natives, but among the subgroup of children residing in the state’s major urban center, Alaska Natives had a higher prevalence. Overall, 0.22% of the study population experienced an asthma-related hospitalization, with Alaska Natives having a higher risk of hospitalization than non-natives. Among hospitalized children, Alaska Natives were less likely to have received a long-term control medication. Compared with non-Natives, Alaska Natives have a lower risk of asthma, but only among non-urban residents. The increased risk of hospitalization among Alaska Natives may be related to underuse of long-term control medications.

This study was the first on asthma rates in Alaska. Further work is needed to establish a baseline for asthma rates. Work is also needed to address the differences in medication use between Alaska Natives and non-natives.

PRENATAL CARE

Adequate prenatal care, defined as having a minimum of nine prenatal medical check-ups with at least one occurring during the first trimester, is very important for healthy outcomes. Many infants are fine although their mother received no prenatal care. Prenatal care, however, provides the opportunity for good outcomes when everything would not be fine without medical intervention. It also encourages improved outcomes by providing pregnant women with information about nutrition, infant care and breastfeeding; and proper expectations. Alaska does poorly compared to the U.S. average on the number of women seeking and receiving prenatal care in the first trimester. Applied research analyzing reasons why women do not seek timely prenatal care is needed. Research regarding what
barriers exist for women who desire prenatal care, but do not receive adequate care would also be beneficial. Evaluations of efforts to increase prenatal care use would be helpful to better target these efforts.

**DRINKING AND SMOKING DURING PREGNANCY AND DURING CHILDHOOD**

Preventing prenatal substance abuse would be a huge contribution to the health of Alaskans. Evaluation and implementation of measures to prevent prenatal substance use, primarily focused on alcohol and tobacco are needed. While alcohol use among pregnant women has declined in general, binge drinking among the highest risk women has not. Research on what will keep Alaska Native youth from smoking, since the rate of tobacco use among Alaska Native youth is among the highest in the country. Prevention programs need to start in elementary school, because tobacco use begins early.

**LONGITUDINAL STUDY OF CHILDREN**

Adult diseases begin during childhood. NIH is currently planning a National Children’s Study, authorized by the Children’s Health Act of 2000. The study will enroll about 100,000 pregnant women and follow the children from before birth to about 20 years. The study’s intent is to learn about environmental influences (including physical, chemical, biological, and psychosocial) on children’s health and development. An important opportunity will be missed if the study does not include Alaskan children.

**OBESITY PREVENTION**

Research is needed on the effectiveness of a comprehensive community-based program to prevent obesity among Alaska Native and non-Native youth (starting in infancy) that is sustainable. It is important to learn why and how children develop healthy habits. These habits persist throughout life and are key to preventing heart disease and diabetes. Research would provide an understanding of how to successfully promote exercise, good nutrition, and stress reduction to decrease the risk of heart disease and diabetes in later life.
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Students, space for faculty, equipment and connectivity are key ingredients to a vital research program. In each of these areas, organized research programs in Alaska face substantial challenges.

In the last five years, there has been dramatic growth in research dollars at the University of Alaska. Total research revenue grew from $77 million in FY 98 to $133 million in FY03. Growth of health research dollars, particularly from NIH capacity building programs, have fueled a portion of that growth and health research has been the fastest growing sector. Dozens of new faculty have been recruited and hired at the Fairbanks and Anchorage campus. Space and support for these faculty has been provided, and more will be needed.

Physical Infrastructure

FACILITIES

Demand for science instruction is increasing, and the University of Alaska is attracting major new researchers in the areas of human health, biology and biotechnology. Existing classroom and laboratory facilities cannot meet today’s demand, much less allow for growth in science programs expected in the next decade and for the increased sophistication
Infrastructure to Support Health Research

The new Biological Research and Diagnostics Facility will incorporate program components and facilities for laboratory animal holding and care.

needed to do science in the 21st century. With a desire to increase the research capacity of the University, UA embarked on an ambitious plan to construct five new science buildings and to efficiently renovate several existing outdated facilities. Two of these facilities have been completed and one more is approved to begin construction in the fall of 2004.

The full cost of these badly-needed new facilities is currently estimated at $200 million, with state funding requests totaling $150 million. The projects will be phase funded and built using a combination of university, federal and state funding. Voters approved bonds to cover the initial state funding increment of $45 million in a statewide vote two years ago.

**West Ridge Research Building at University of Alaska Fairbanks**

The West Ridge Research Building (WRRB) is a new 59,000 square foot multistory facility designed to house biological research laboratories and the Arctic Region Supercomputing Center and the Remote Sensing Group of the Geophysical Institute.

The WRRB is on the West Ridge, the center of science and research activities for the UAF campus. Located in an existing parking area, the WRRB is connected to Elvey Building Geophysical Institute and is in close proximity to the major research buildings for biology and other life sciences. The $15.2 million project was started in April 2003 and was fully occupied in August 2004.

The new Biological Research and Diagnostics Facility will incorporate program components and facilities for laboratory animal holding and care, multiple procedure rooms, accommodation for a future barrier within the facility, necropsy, veterinary diagnostic laboratories, an aseptic surgical suite with support rooms and imaging, onsite biological waste handling, animal care administration, and support space. The facility as currently programmed will be 41,000 gross square feet on two levels with a mechanical penthouse. Total project cost will be $23.0 million, and will be complete by July of 2006.
Ecosystem Biomedical Laboratory at University of Alaska Anchorage

The Ecosystem Biomedical Laboratory (EBL) is a new 14,500 square foot single story facility designed to give a new home to UAA researchers engaged in biological and biomedical research. The building will provide research laboratory space for physiology, systems ecology, plant ecology, wetland ecology, cell biology, integrative physiology, and related research.

The project is tied to a number of UA and campus initiatives. Addressing interim science program needs is key to recruitment and retention of students and quality science faculty. Approximately 30% of the UA scholars attending the Anchorage campus who have declared majors have elected to major in the sciences. Adequate facilities are essential to meet their educational requirements. The project also addressed the faculty and space commitments associated with Federally funded research programs.

The facilities will be shared between ecosystems and biomedical programs, providing space for experimental learning and training where students receive instruction and work side-by-side with faculty, participating together in instructional research. The project goals are to: 1) support UAA’s expanding graduate, undergraduate and faculty research and training activities; 2) provide research and teaching spaces that will match modern curriculum delivery and facilitate recruitment and retention of high caliber faculty and students; 3) create a safe and modern laboratory environment for scholarship, teaching and research; and 4) create additional instructional research space in the UAA Science Building by relocating Ecosystem and Biomedical programs to the new facility.

The Integrated Science Facilities at University of Alaska Anchorage

As of the writing of this report, the Integrated Science Facilities is excepted to be a project that will consist of two distinct pieces. First, the of construction of an approximately 40,000 gross square foot facility, envisioned to be three stories tall. The facility will provide instructional classrooms and laboratories, offices, research laboratories and animal facilities. The design of the building is intended to foster interaction between the scientific disciplines creating a collaborative community of science. The building is to be designed in a modular style with as high a level of physical
efficiency as possible, yet provide flexibility for future modifications in instructional and research programs. The science programs that will be served in the new facility are biochemistry, biological sciences, and chemistry. Current science program needs exceed the initial 40,000 square foot project and will be accommodated in future phases.

This project is very necessary because currently there is not adequate space allocated to science labs and instructional classrooms to meet student demand. The Alaska Scholars Program and program initiatives have increased the number of full time students requiring coursework in the sciences at UAA. Existing science space has not been upgraded at UAA in the last 30 years. In order to attract and retain students and quality faculty, this deficiency must be corrected. The science faculty has collaborated significantly on the planning of an innovative integrated sciences approach.

**BANDWIDTH, CONNECTIVITY, AND WEB-PRESENCE**

The University of Alaska, in partnership with six rural western states, received a $10 million grant to provide a high-speed telecommunications network for biomedical researchers in those states and to bridge to the regional biomedical hub at the University of Washington School of Medicine. This networking project, known as the Western INBRE InfoNet, will enable scientists and educators in Alaska, Hawaii, Idaho, Montana, Nevada, and Wyoming to create collaborations and to share among these states access to research resources in this region. In addition, these states will be able to access major research universities elsewhere for real-time simulation modeling, analyses of complex biological images, and remote operation of state-of-the-art instruments many thousands of miles away. Alaska will use its portion of the grant to establish an Internet 2 broad-band link with the University to the CDC Arctic Investigations Program in Anchorage, the Alaska Native Medical Center, the State of Alaska Public Health Laboratories, and other partners.

**Existing network infrastructure**

The network infrastructure currently available in Alaska is usually adequate for day to day commodity internet needs, but for occasional large computing projects, the bandwidth is limiting. Future growth in image analysis, simulation modeling, and other new approaches will be stymied by the lack of larger, faster fiber and switches. Some investments have already been made to create this critical infrastructure. The University also has a good system-wide network architecture linking the campuses together and to a satellite Pacific NorthWest Gigapop (PNWGP) hub at the Fairbanks campus (which is located in the Alaska Regional Supercomputing Center facility). The University also has scalable broad-band network connectivity via two modern submarine fiber cable operations from the system network hub to the Pacific NorthWest Gigapop’s main hub in Seattle. Capacity between PNWGP-Seattle and Alaska is driven and funded from a complex set of partners, including those of the Alaska Regional Supercomputing Center in Fairbanks.
Alaska has made considerable progress in the past six years with an innovative statewide telehealth network; however, that network is not now part of the research network in the state or to the larger health research networks outside Alaska. This lack of smooth connectivity often makes ongoing research, education, and collaboration a struggle and some appealing projects are impossible.

The hub of the telehealth delivery network is in Anchorage, with services provided by several Alaskan providers (AT&T Alascom, GCI, and ACS). There are low speed (T1) peering arrangements between the University network and GCI and ACS, which accommodate some faster routing of traffic and H.323 video conferencing; however, there is no high speed capability between the networks. This has disenfranchised the research scientists from outside the University from access to advanced research networks available through the UA (Internet 2 and other networks accessed through the PNWGP).

**Upgrades to infrastructure planned with the Western INBRE InfoNet Grant**

Infrastructure will be put in place to provide high-speed (OC-3 or better) connections between the University and three major research partners, including the Alaska Native Medical Center, the State of Alaska Public Health Section of Epidemiology and Laboratories, and the Centers for Disease Control in Anchorage. The hardware will be located to provide the broadest coverage and ability for future growth.

To make the effort effective, the University of Alaska’s capability at the Anchorage, Juneau, and Fairbanks campuses must also be selectively upgraded to bring Gigabit Ethernet capability across each campus and among the three major campuses. This will put in place the high-speed connections and related infrastructure for building out to the health community in each location (with the Anchorage build-out put in place first by the INBRE Western InfoNet project). The ready access to broad-band will allow expansion of state-of-the-art projects, creation of larger research partnerships across the state.

Implementing these INBRE and telehealth-related network infrastructure upgrades will provide a high-speed bridge between university and health networks in Alaska, particularly Alaska Native health services.

**Web-presence**

The Arctic Health website is sponsored by the National Library of Medicine’s Division of Specialized Information Services and maintained by the University of Alaska Anchorage’s Health Sciences Information Service. Its aim is to provide a central source of information on diverse aspects of the Arctic environment and the health of Northern peoples. It
provides access to evaluated health information from hundreds of local, state, national, and international agencies, as well as from professional societies and universities.

The National Library of Medicine Arctic Health (NLM/AH) was created based on a recommendation from the international Arctic Monitoring and Assessment Programme (AMAP) Biomarkers Program. While there are other NLM sites, the Arctic Health site is the first in the nation to focus on health disparities for a group; in this case Alaska Natives.

**Human Resources for Health**

**DOCTORAL EDUCATION**

**Relationship of doctoral education and research**

The quality and quantity of research that can and does occur in Alaska is primarily dependent on the quality and quantity of researchers in the state. It is a better situation for Alaska if research regarding state needs is conducted by researchers located here. Alaska offers unique research opportunities to study a number of issues and to guide research agendas, rather than solely depending on outside researchers to become interested in state problems.

In addition to producing high quality and valid research, distinguished researchers contribute to the amount of research being conducted in the state since researchers with excellent credentials and experience are more likely to receive research grants. Having top talent in the state yields an ongoing supply of high quality researchers; bright up-and-coming researchers want to work with big names in their field. Alaska needs more researchers to study all the unique situations here and to work on challenges the state faces. As with personnel shortages in other fields, the best way to get more researchers for Alaska is to train Alaskans. In order to begin to do this, Alaska needs additional doctoral education opportunities, particularly in the humanities and the social sciences. Finally, having doctoral students in this area would assist in recruiting research oriented faculty.

A Ph.D. candidate works in the organic chemistry lab in UAF’s Natural Sciences Facility. UAF is the only University of Alaska location that confers doctoral degrees.
**Current doctoral education**

The University of Alaska Fairbanks is the only UA location that confers doctoral degrees. Twelve disciplines offer doctoral degrees; there are none in the humanities and only one in a social science (anthropology). Research infrastructure at UA has been built largely within several semi-autonomous organized research institutes; e.g., Geophysics, Marine Sciences, and Arctic Biology. These research institutes grew in parallel with the establishment of doctoral programs in academic departments, notably those in the College of Science, Engineering and Mathematics and the School of Fisheries and Marine Sciences.

The Institute of Arctic Biology (IAB) was founded in the 1960s with an emphasis on environmental physiology of humans and other mammals. The Institute of Marine Science (IMS), which includes research in physiology and microbiology, was established in the same period. The corresponding doctoral programs were sited in the Department of Biology and Wildlife, and the School of Fisheries and Ocean Sciences and involve IAB and IMS faculty. An interdepartmental doctoral program is administered by the Department of Chemistry and Biochemistry. Since there is no medical, dental, or veterinary school in Alaska, these two Institutes house almost all of the biomedical researchers at UAF. In the 1980s and early 1990s, research programs in reductionist biology and biomedical science in IAB were largely eclipsed by rapid growth in wildlife biology, ecology and marine sciences. Biomedical research became something of an academic orphan at UA for many years. The infusion of funding for new facilities and personnel has changed the climate at UA.

**Need for a doctoral program in psychology**

Both the student and the University must make a substantial investment of time and money for students to complete all required work to receive a doctoral degree. Before that commitment can even occur, the University must also make a long-term commitment, complete a lengthy course of work, and make a sizable investment to start a doctoral degree program in a new discipline. The next step in advancing the University’s commitment to addressing the needs of the state is to begin a Ph.D. program in psychology. Much of the initial groundwork on this project has already been done. The need is well documented: many of the challenges the state faces will be addressed by researchers with training in the humanities. Currently, to achieve this level of training a person must leave the state.

Faculty from the Psychology Departments at UAA and UAF worked to collaboratively develop a UA Consortium Ph.D. program in psychology. The program would be offered jointly by UAA and UAF faculty who would pool training resources for psychology doctoral students who would take courses at both campuses. To assist in planning for the program, and to document need, the UAA and UAF departments collaborated on a needs assessment conducted during 2002. If the Board of Regents approves the Consortium Ph.D., it will be the first Ph.D. program offered at UAA.
Doctoral level psychologists work in a variety of settings, including direct services, businesses, government agencies, educational settings, and correctional facilities. The trend in the past decade in the U.S. is that of an expanded role for psychologists in health and behavioral health care, community and organizational development, and applied research. Alaska needs additional Ph.D. psychologists in all of these roles.

The state could use more psychologists to provide clinical and health interventions—psychologists can work in a variety of settings with individuals. Doctoral level psychologists can also work on community and organizational development, such as health prevention work, evaluating community programs, facilitating organizational change, advocating for policy changes, and promoting healthy changes in lifestyles and policies.

Finally, and most importantly for this effort, psychologists can conduct applied research, evaluate programs, research policies, write grants, and manage programs, just to name a few options. Psychology is a versatile degree that would be an excellent first entry into humanities Ph.D. programs for the University. Having students graduating in state with this degree would provide the research personnel to meet many of Alaska’s needs.

**STUDENTS IN HEALTH PROFESSIONS**

Demand for health care workers is expected to grow faster than any other employment sector over the next decade. Approximately 15% of Alaska’s workforce will be employed in the health care sector by 2010. Ten of the 15 fastest growing occupations in Alaska are in health. Alaska has serious needs today for skilled workers in health occupations. Hospitals and clinics report high vacancy rates for nurses and many other professions. Trained workers in radiology, pharmacy, laboratory, dental, and medical office occupations are in high demand.

There are thousands of health care jobs in rural Alaska, where unemployment is very high. To fill these positions, health organizations are currently spending millions of dollars importing “locum tenens” or temporary workers. Rural employers, therefore, are increasingly focused on spending money to train and educate local residents for these jobs. This

In rural Alaska, there are thousands of health care jobs, but the state needs more psychologists to help meet these needs.
Grow Our Own approach will improve continuity of care as well as provide an economic boost in regions where unemployment is high.

The University of Alaska is committed to the education of students and the pursuit of research in the sciences and in health-related areas. Expansion of health related programs has been a top priority for the President of the University and the Board of Regents. UA has invested over $5 million in new resources in the last four years to develop programs to meet this need in nursing, social work, allied health, human services, early childhood, and health care management.

More people are being trained to meet the state’s health-related needs. Those newly trained workers will provide much needed services and, their employment is a positive situation for their communities. Alaska is well-positioned for the future and the health care situation is very promising.
The aim of this report is to document the current state of Alaska’s health as well as its current capacity for and the ongoing state of biomedical and health-related research. In the course of noting where the state stands, it also becomes clear where there is a need for additional investments and a need to strengthen and improve Alaska’s research efforts. While each chapter documents specific needs, we believe this report has made the case for why the following five overarching focus areas are vital to improving the health of Alaskans.

Why should Alaskans care about research? In addition to its role in learning and knowledge, research has great practical importance in two other ways.

First, it is an economically significant industry in its own right. Today the University of Alaska conducts over $133 million worth of sponsored research annually, leveraging state funds invested in university research by a ratio of 7:1. Today, over a thousand jobs can be directly tied to research. Growth of the health research enterprise means attracting talent from around the world to the state, an improved ability to “grow our own” and to keep Alaska’s best and brightest in the state.

Secondly, research can enhance the way we do business and can improve the health status of our citizens.

The research enterprise in Alaska depends on federal and state support. While federal funders demand scientific excellence, state leaders have a slightly different focus. In order to justify state investments in research, leaders need to understand how research is addressing real problems facing
Recommendations

its citizenry. Currently, the state of Alaska invests very little in health research. It is incumbent on the health research community to communicate with state leaders about the value of current and new research.

As the research community gains the ability to better articulate how research meets state needs, it might also attract foundations and other private support.

THE CONDUCT OF RESEARCH

With good reason, human subjects research is highly regulated. Moreover, Alaska-based researchers have a responsibility to go beyond the basic federal requirements when conducting research. An extremely important partner in health research is the Alaska Native community. Many, if not all, tribal organizations have instituted their own institutional review and intellectual property procedures. The U.S. Interagency Arctic Research Policy Committee approved a set of “Principles for the Conduct of Research in the Arctic” in 1990 and there exists the recent “Code of Research Ethics” drafted by the Alaska Native Science Commission.

It is essential for researchers working with this population to understand and embrace these guidelines in order to create a climate of trust for researchers to develop and flourish. It is equally essential for sponsors of research to understand that the pace of research may be necessarily slowed by adhering to these principles.

PARTNERSHIPS

A successful state research enterprise depends on the pooling of expertise and approaches across many projects addressing applied and basic scientific questions. With limited resources in a state with a small population, it makes sense for members of the research community to be mutually supportive. For instance, while the University of Alaska does not have its own medical school\(^1\) with clinical departments which deliver medical services, it has expertise in many areas such as genomics, biochemistry, molecular biology, physiology, and bioinformatics. The Alaska Tribal Health Consortium and tribal health organizations have research and clinical expertise. The Arctic Investigations Program of the Centers for Disease Control and the relevant state departments have the ability to surveil and assess for diseases and conditions and to analyze that information. The National Institute for Occupational Safety and Health (NIOSH) and other agencies have expertise in injury control.

Universities across the world are being funded to do research with Alaska’s people and its resources and this will always be the case. This is a

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\(^1\) Since 1971, the University of Alaska has been a partner in the WWAMI program, a multi-state educational effort to offer the first year of medical school to students at Washington State, University of Wyoming, University of Alaska, Montana State University, and University of Idaho. Largely because of the establishment of WWAMI, the number of Alaskans accepted into the University of Washington Medical School increased nine-fold between 1971 and 1988.
desirable situation when it adds to a body of knowledge and the research is performed responsibly. But it is also desirable to build a core research capacity that is in-state and that can guide sponsors in the development of relevant research agendas. Reliance on mostly an “import” model of research has led to a fragmented approach at best to unique problems in Alaska.

Throughout this document there are examples of growing research partnerships that are Alaska-based. Networks which connect research institutions are being deployed.

Scientific workshops which delve into areas of study or discuss research findings should be encouraged, especially when they draw on the talents of academic experts, traditional or local knowledge, and develop Alaska-based expertise.

RESEARCH INFRASTRUCTURE

Health and biomedical research in the 21st century requires biochemistry, genetics, genomics, proteonomics, molecular biology, systems biology, bioinformatics and the applications of these disciplines to basic science areas like physiology, microbiology, and immunology. For both basic and clinical research, Alaska requires sophisticated instrumentation, properly serviced laboratories, large computational capacity, and broad-band connectivity between sites in Alaska and to the rest of the world.

Modern laboratory space is at a premium in Alaska. Between 1985 and 2004, no new biomedical research laboratory buildings were constructed at the University of Alaska. The need was partially addressed in 2004 by the addition of two modest laboratory buildings, the West Ridge Research Building (WRRB) in Fairbanks and the Ecosystems Biomedical Laboratory (EBL) in Anchorage, partially financed by state supported bond issues. Over $4 million from federal infrastructure grants provided instruments for these laboratories, and now many of the recently recruited scientists are able to pursue genetic and biomedical research with the latest techniques for molecular and cellular biology. The facility in Fairbanks houses not only wet bench biological space but also the Arctic Region Supercomputing Center and thus proximity favors expansion of partnerships between biologists and computational scientists. The hardware for broad-band connectivity for the university and between the university and the native health-CDC campus in Anchorage has been augmented with additional federal funding. However, much is left to be done. The immediate needs include:

- Modern animal quarters for physiology, biochemistry, pharmacological and behavioral research in Fairbanks and Anchorage. The next stage of construction in Fairbanks will alleviate some of these needs, but provision of a comparable facility in Anchorage is much needed and programmed for well in the future.

- Containment laboratories for research on infectious agents such as West Nile virus, influenza virus and others is being planned at the UAF campus, adjacent to the new animal facility. It may be that a new state virology public health laboratory will be constructed so that state
Recommendations

diagnostic activities and university microbiology research can stimu-
late and complement one another.

- Student training at the undergraduate and graduate level requires exposure to research and involvement in research projects. The proposed Integrated Science Facilities at UAA and the Biological and Computational Science building at UAF are planned to provide classrooms and teaching laboratories close to research laboratories and thus will facilitate the involvement of students in the discovery of new knowledge at the same time and in the same site when and where they take coursework in the fundamentals of science.

- Broad-band connectivity and fast internet switches and other hard-

ware advances spiral upward each year. Without repeated invest-
ments, year after year, in information technology hardware, software, and staff support, Alaska will run the risk of falling behind and missing out on opportunities to be at the forefront of biomedical research. The connectivity already present within the University needs to be extended to the rest of the health research community in Alaska and these research networks must be coupled efficiently with Alaska’s telemedicine infrastructure and with the national grid.

Expansion of the doctoral level biomedical research at UAF, parallel growth of research activities at UAA, and growth of research in the health delivery organizations will require federal competitive grants for support of the many basic science and clinical projects, and state funding for local applications of research technologies. The synergies of federal, state, and foundation support should allow us to keep begin to catch up with the need. With Alaska’s increases in its research capacity and the removal of its barriers to conducting research, comes enhanced competitiveness for merit reviewed grants. As Alaska’s health and biomedical research community grows in stature, it will continually become more self-sustaining. But unless we marshal local resources to jump start the priority health research capac-
ity, we cannot regularly win federal grants.

**ADVANCED GRADUATE AND PROFESSIONAL EDUCATION PROGRAM**

It is critical for Alaskans that we have an in-state capacity to educate and train our citizens for health research and health delivery. We should build this educational enterprise with tight coordination to the research enterprise. Our premier research scientists will often also be our lead educators for graduate education and for training of the next generations of health researchers and health delivery professionals. It is important that we choose carefully our areas for advanced training and instruction so that they are appropriate for local talent and needs and are appropriate for a predomi-
nately rural state with a population of scarcely 600,000 people.

Since our resources are finite, we must restrict major investments to those sites where intellectual critical mass can be built. In turn, the critical
mass of researchers must have the ability to become self-sustaining through repeated successful awards from federal competitive, merit-based grants. Since an intellectual community of sufficient size and an academic community with a fairly mature research culture are prerequisites, we believe that the development of advanced graduate programs at the doctoral level should emphasize leadership from the doctoral university campus in Fairbanks and include significant involvement of talented faculty and students at the urban campus in Anchorage. Representative themes and programs which should be priorities for further investments in graduate education include the following:

- **Biochemistry and molecular biology:** A doctoral program exists at UAF and its members include faculty from UAA.

- **Psychology:** A doctoral program which involves faculty participation from UAF and UAA has been proposed and its planning is proceeding.

- **Physiology:** The doctoral program at UAF, which is almost a half-century old, has recently undergone marked expansion and has strong collaborating faculty at UAA.

- **Bioinformatics and systems biology:** This program will involve faculty from biochemistry, biology, and computational sciences and could utilize the facilities at the Arctic Region Supercomputing Center in Fairbanks.

- **Environmental biomedicine:** Toxicology, epidemiology, and infectious disease research are expanding in Fairbanks and Anchorage and the intellectual community to sustain this thrust includes personnel from the health delivery organizations, state agencies, and the federal CDC facility in Anchorage. Furthermore, these themes build upon the well-developed ecology research and databases present in the University and elsewhere in Alaska.

- **Public health:** Full time faculty have been hired to deliver an academically strong Masters in Public Health to mid career students.

- **Nursing:** UA has collaborated with Oregon Health Sciences University to create doctoral education offerings for Alaskan students.

**THE NIH ROADMAP AND THE ALASKA RESEARCH**

The U.S. National Institutes of Health (NIH) has embarked on an innovative program to accelerate biomedical research and its application to treatment of disease. Alaska is engaged in a parallel effort.
state and among the many health-related institutions, and encouraging the applications of research to the unique context in Alaska and the needs of all Alaskans.

The NIH Roadmap originated from broad consultations with scientists, health care providers, and the public. The vision developed by identifying today’s scientific challenges, roadblocks to progress, and investments to overcome roadblocks. Priority areas were identified and refined in further inclusive discussions. As specific initiatives for actions were conceived, working groups were created for systematic planning and these led to implementation groups and the investment of resources.

By convergence rather than imitation, Alaska’s health planning which grew out of Senate Joint Resolution 44 has paralleled elements of the NIH process. Like NIH, Alaska has identified scientific themes, technologies, and other resources to allow new discovery. Alaskans have accelerated the creation of partnerships among the stakeholders, with emphasis upon government agencies (state, federal, and local), the university, the health providers, and non-profit entities. As new initiatives and partnerships develop, researchers remain mindful of encouraging wide community participation in continuing planning and in the implementation of the plan so that the enterprise develops knowledge and also translates it into Alaskan applications. Finally, Alaska is striving to fit our state priorities into national ones so that Alaska’s research community can be a full partner in the major health research programs supported by the National Institutes of Health.
Appendix A

Explanation of Senate Joint Resolution 44

SJR 44: THE BIG PICTURE

The mandate for this document began with the Alaska State Legislature in the spring of 2002. The Alaska State Legislature passed Senate Joint Resolution 44 which requested that a coordinated research and development plan be constructed with input from the Legislature to help expand and diversify Alaska’s economy. The result of the resolution should enable the Legislature to provide input and direction to the tens of millions of government dollars directed toward research and development in Alaska.

Senate Joint Resolution 44 mandates the creation of a research and development plan by the representatives of the state and federal organizations. The goals of the plan are to expand and diversify Alaska’s economy while helping strengthen and maintain the health of state research institutions and protecting the health of Alaskans and the environment of Alaska. In part, the way the plan seeks to achieve these goals is by working to ensure that the state and federal governments work together in identifying and assessing high economic potential from resource development and tourism of federal and state lands, waters, and airspace. The initial timeline ambitiously called for this information to be presented in a little over six months to the first regular session of the 23rd legislature.

An overall Organizing Group was identified in the resolution comprised of representatives from the University of Alaska (UA), the Alaska Science and Technology Foundation (ASTF), the North Pacific Research Board (NPRB), the Arctic Research Commission (ARC), and the Interagency Arctic Research Policy Committee (IARPC). The Organizing Group suggested that six working groups comprised of topical task forces simultaneously address issues of importance to the state, the nation, and the scientific enterprise. Those six topic areas are:

- Alaska’s innovation resources
- Physical infrastructure
- Social and economic needs of Alaskans
- Environment
- Technical and operating management capabilities
- Alaska industry, including alternative use and value added opportunities

The resolution also calls for a Study Coordinating Committee, comprised of the Organizing Group plus Working Group Chairs. The Study
Appendices

Coordinating Committee is responsible for assembling the output of the six topical Working Groups into a unified research and development plan in a timely fashion.

Leaders of each Working Group and supporting Task Force are asked to organize their efforts in consonance with common organizing principles, approaches, and measures, including common terminology, to provide meaningful and coherent recommendations. Seven organizing principles were laid out at the beginning of the project:

1. The study should seek to identify research and development directions and associated resource requirements to meet well-defined needs of the state. Each group’s principal aim was to recommend to both sponsors and researchers the critical scientific issues and questions where Alaskans – by virtue of their unique location, culture, and environment – can help provide answers. The study should outline the most important lines of investigation by, in, and for Alaska, as well as the human, physical, and fiscal resources needed to pursue them.

2. Recommendations must stress the importance of economic and cultural sustainability. The study should highlight plans for sustainable use while protecting natural and human dimensions of Alaska’s environment in both rural and urban settings.

3. Research and development programs should emphasize interdisciplinary integration and breakdown of the barriers between basic research and application to meet society’s needs. A holistic approach to the research and development enterprise, with an emphasis on human dimensions, should be central to all deliberations.

4. Working Groups should understand, and account for, the potential impact of climate change upon Alaska and other Arctic regions.

5. The study should consider the degree to which research and development directions proposed for Alaska, and their potential outcomes, are extensible to other states and nations.

6. The study must also consider, as a topic of interest to the Legislature, how to enhance the state’s research capability and its capacity to create wealth. The study should detail how investment in research and development contributes to supporting Alaska’s training and research capabilities and other public services.

7. Each topical Task Force should seek broad representations including federal, state, local, Native, academic, industrial, and non-governmental organizations, as appropriate. The Working Groups and Task Forces should develop recommendations in consonance with the visions and evolving goals of Alaska 20/20.
The six topical Working Groups divided their areas into subject areas to yield manageable topic scopes; the average was seven subject areas, but figures range from five to eleven. The Social and Economic Needs of Alaskans was divided into eight subject areas:

- Diversity of culture, language, history
- Subsistence activities
- Education, training, and workforce development
- Health and biomedicine
- Disaster preparedness and mitigation
- Social and welfare services
- Law enforcement and justice
- Rural economic development

For more information about SJR 44, see the Alaska Research and Development web site at www.arad.alaska.edu/infoMission.html.
There are entities mandated by federal law to develop research plans for the arctic. The United States Arctic Research Plan is mandated by the Arctic Research and Policy Act of 1984 and is prepared by the Interagency Arctic Research Policy Committee (IARPC). The plan is a consensus document that reflects the views of the twelve federal agencies. It responds to recommendations of the U.S. Arctic Research Commission and to the recommendations of scientists who provide advice to the IARPC agencies. The report is submitted to the President, who submits it to Congress.

The plan is written with the guidance of the United States Arctic Research Commission. Among its duties are the promotion of Arctic research and to recommend Arctic research policy and to communicate those priorities to the President and the Congress. The seven member Commission has prioritized arctic health research in its planning. It is hoped that this document will be of use to the Commission.