

# A NEW PARADIGM FOR ARCTIC HEALTH

CHALLENGES AND RESPONSES TO RAPID CLIMATE,  
ENVIRONMENTAL, AND SOCIAL CHANGE

International Workshop Report  
Dartmouth College, Hanover, NH, USA

May 23-24, 2011

**University of the Arctic, Institute for Applied Circumpolar Policy**

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The Dickey Center for International Understanding | The Institute of Arctic Studies  
Dartmouth College, Hanover, NH, USA



## FROM THE CO-CHAIRS

We are pleased to share with the Arctic community the results of an international and interdisciplinary workshop at Dartmouth, May 23-25, 2011, which focused on the major health issues and challenges facing residents of the North. This conference and report is the fourth in a series by the University of the Arctic's Institute for Applied Circumpolar Policy (IACP). IACP is collaboration between Dartmouth, the University of Alaska Fairbanks, and the University of the Arctic. It is our hope that the "New Arctic Health Paradigm" outlined in this report will focus attention on critical health policy issues and promote action to improve and protect the health of all Arctic residents.

The Dickey Center for International Understanding, the workshop host, is Dartmouth's international crossroads, where diverse cultures, knowledge bases and experiences are brought together to advance international understanding. Central to the Dickey Center's mission is the Institute of Arctic Studies and a commitment to collaborating with the global health initiatives of the Geisel School of Medicine at Dartmouth and cooperating with the Dickey Center's War and Peace Studies Program to advance knowledge and understanding of human and environmental interactions at the earth's high latitudes. The inaugural IACP event, The Arctic Climate Change and

Security Conference, was hosted by Dartmouth in 2008. At that conference, the health of Arctic residents and Arctic ecosystems were identified as issues of direct relevance to the future human and political security of the North. This Arctic Health Report is the direct outgrowth and expansion those discussions initiated at Dartmouth.

We extend our sincere thanks to Professor Michael Sfraga, University of Alaska Fairbanks, for help with all aspects of the workshop and to Dartmouth President Jim Yong Kim, Provost Carol L. Folt, and Dr. Albert G. Mulley, Jr., Director of the Dartmouth Center for Health Care Delivery Science, for their comments delivered to the participants and their strong support of Dartmouth's international health initiatives. Special thanks are due to Dickey Center staff members for their skill in making the workshop a success.

The Dickey Center for International Understanding thanks our colleagues for a lively, informed and important debate and discussion, and their contributions to this report.

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# A NEW PARADIGM FOR ARCTIC HEALTH

## EXECUTIVE SUMMARY

An interdisciplinary group of prominent educators, scientists, physicians, policy experts, and indigenous leaders shared their expertise at Dartmouth College on May 23-25, 2011, on the rapidly changing health conditions in the Arctic and their ideas for improving health care delivery and promoting the wellness of individuals and communities. They discussed the complexity of interacting factors—warming temperatures, melting of sea ice and permafrost soils, the effects of colonial legacies on social institutions, the development of resource extraction industries (e.g., oil and gas, mining) and the spread of environmental contaminants (e.g., mercury, persistent organic compounds), and transportation difficulties and geographical remoteness—that have combined to create environmental and social conditions that negatively impact the health of individuals and communities living in the Arctic. Even though the overall health status of Arctic residents has improved over the past sixty years, there are great disparities by country and region, and among specific populations, in life expectancy, infant mortality, self-reported wellbeing, and suicide rates.

Through open and straightforward discussion, participants identified disciplinary intersections, opportunities for synthesis, and policy recommendations. The dialog focused on four interrelated subjects:

1. Climate change, globalization, and the emergence of new diseases and disease patterns
2. The impact of environmental contaminants and dietary change on human health
3. Research considerations in partnerships with Arctic communities
4. Institutional and community capacity building to improve health care delivery

Current research, local observation, and traditional knowledge chronicle a complex set of interacting conditions challenging the quality of human health in the North. Studies of soil and water contamination from industrial activity show increased mercury contamination of food and an array of other contaminants in water sources, creating uncertainty about what is safe to eat and drink. Epidemiological evidence clearly points to infectious diseases and vectors, previously only seen in warmer climates, moving north, with serious negative health effects on people and wildlife. A concurrent decline in the consumption of traditional food sources, such as walrus, whale, and seal, and regulations discouraging the harvesting and trade of traditional food sources are resulting in the substitution of less nutritious and more expensive high caloric “western” market foods. This has led to an increase in chronic diseases, such as diabetes and heart disease, which are linked to obesity. The combined influences of climate change and diet shift as reported by indigenous leaders and social scientists coincide with an increased need for mental health and addiction services, particularly among young men. The local capacity of current health programs to meet the physical and mental health needs of individuals and the community is highly strained.

Despite these serious challenges, Arctic communities have proven resilient in adapting to environmental and social change. However, large challenges remain and new partnerships between scientists, medical professionals, funders, and communities are essential to increasing local capacity, participation and control over health care and wellness programs.



## KEY FINDINGS

1. The emergence of *new diseases and disease patterns in the Arctic region* is an immediate challenge for the epidemiological and health care communities. These patterns are linked with climate and ecosystem change and the movement of people and disease vectors as the Arctic develops and joins in a globalized economy.
2. The *movement of environmental contaminants* into the Arctic from industrial activities in the south and the release of heavy metals and other pollutants from mining and energy extraction in the North pose significant health risks to Arctic residents and wildlife. Arctic residents need more and better information on contaminants in subsistence foods and on the health consequences of a western diet to make informed choices on diet and health.
3. New opportunities for improved health care information and delivery capacity in the North require *innovation in research methods and more effective partnering* between researchers and practitioners and the communities they study and serve. Health care innovations and successes must be shared among communities, states, and international organizations and intergovernmental forums (e.g., Arctic Council). Health care research and delivery can be improved by supporting networks of researchers, practitioners, and communities at local, national and international scales using established models of community-based participatory research and local-based research frameworks.
4. The physical isolation of many Arctic communities poses special challenges for *improving local health care delivery*. Current models rely on transport to regional centers. Creating a more holistic view of the individual within his or her cultural, environmental, and economic circumstances is an essential step in sustaining community and individual wellbeing.

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Above all, what is needed is a **New Paradigm for Arctic Health**, one that shifts the view of community health issues in the Arctic region from one solely based on problems and deficits to one that builds on examples of community resilience, promotes capacity building, and disseminates successful outcomes.

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## INTRODUCTION AND WORKSHOP OBJECTIVES

An Arctic policy workshop was held at Dartmouth College, Hanover, New Hampshire, USA, on May 23-25, 2011, under the auspices of the University of the Arctic's Institute for Applied Circumpolar Policy (IACP). The Institute was founded in 2008 to foster interdisciplinary analysis of critical issues facing Arctic peoples. IACP is co-directed by Dartmouth's Dickey Center for International Understanding (Kenneth Yalowitz at the time of the conference and now Ross Virginia) and the University of Alaska Fairbanks (Michael Sfraga). This partnership brings to bear the expertise of these institutions, each with long histories of Arctic research, with the extensive research and education networks of the University of the Arctic. IACP meetings bring together representatives of governments, the academy, non-governmental groups, and indigenous peoples to discuss aspects of climate change that require policy attention, identify and prioritize policy-related research requirements, and help develop governmental and legislative agendas that address pressing national and international policy issues related to the Arctic.

IACP conferences are held under the Chatham House Rule to encourage open, frank discussion and information sharing: "When a meeting, or part thereof, is held under the Chatham House Rule, participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed." All attendees agreed to be listed as participants in the meeting.

The authors of this conference report take full responsibility for the summation of remarks and discussion. When making recommendations, they, in all cases, sought to discern the consensus opinion of the group. This report is a synopsis of the meeting and is intended to highlight key points, findings, and recommendations for the policy community. As such, a review of Arctic environmental change and human health literatures are not included.

We anticipate that the recommendations and findings from this meeting will be useful for Arctic nations and indigenous organizations, the Arctic Council and its working groups, and the research and health care communities and their funders. Our intent is to advance the status and knowledge of Arctic health issues of most concern to these stakeholders.



## ARCTIC HEALTH ISSUES: AN OVERVIEW

There are presently some four million people living in the Arctic region, about half in Russia. Approximately ten percent are members of indigenous groups. While their overall health status has improved over the past sixty years, great disparities remain between northern communities and others, and among disparate regional populations, in life expectancy, suicide rates, and infant mortality.

The impacts of climate change and globalization on northern communities are growing and obvious to residents. These include an increase in environmental pollutants originating from outside the North; the appearance of new disease vectors, such as insects and problems of water borne microorganisms; increased industrial, energy, shipping and tourism activity; the degradation of water supplies and sanitation; a change from subsistence-based diets to diets rich in imported and processed foods; and significant increases in suicide, drug abuse, and mental health disorders, especially among young men, due in part to social dislocation.

Climate change and globalization combine to provide new and interconnected pathways for current and new diseases to become more prevalent in the Arctic. These changes are complex and nuanced. Small variations in the seasonality of events critical to subsistence activities (e.g., access to sea ice, hunting, plant gathering) have had amplified impacts on communities and the individual sense of wellbeing. The thawing of permafrost soils and the loss of sea ice have led to dramatic increases in coastal and riverbank erosion, which can impact water quality through damage to water intake sources and storage and waste water treatment facilities. The risks associated with deteriorating water systems are the spread of water borne diseases and skin infections from lack of sanitation.

Climate warming and the consequent increased movement of people and goods into the Arctic also are facilitating the northward movement of disease organisms and their insect and tick vectors, increasing the potential for new disease outbreaks. In addition, there are many climate sensitive human zoonotic and parasitic diseases and organisms infecting wildlife consumed by people. The traditional interconnections between people and animals are sensitive to climate and disease, and the negative consequences touch entire communities.





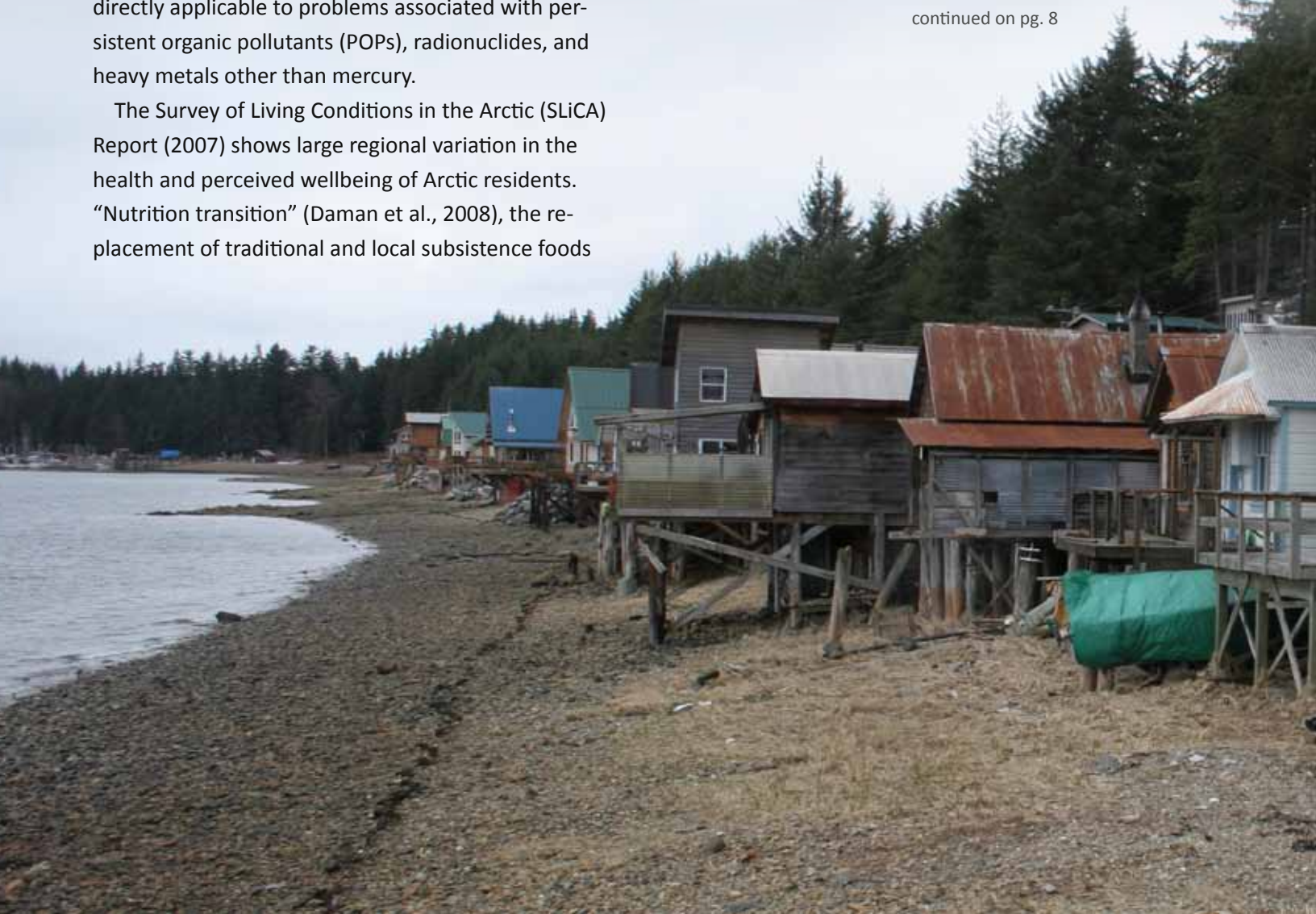
The Arctic Council and individual Arctic countries have moved individual and community health needs to a high priority. For example, the scientific and policy communities are urgently seeking ways to reduce mercury (Hg) contamination of Arctic ecosystems and the exposure and risk accrued by humans from consumption of fish and marine mammals (Johansen et al., 2007). The Arctic Monitoring and Assessment Programme report (AMAP, 2011) to the Arctic Council Ministerial Meeting in Nuuk, Greenland, provides the scientific assessment and policy recommendations that would significantly reduce mercury exposure. This information and its policy implications are also directly applicable to problems associated with persistent organic pollutants (POPs), radionuclides, and heavy metals other than mercury.

The Survey of Living Conditions in the Arctic (SLiCA) Report (2007) shows large regional variation in the health and perceived wellbeing of Arctic residents. “Nutrition transition” (Daman et al., 2008), the replacement of traditional and local subsistence foods

with commercially available western products that often have higher caloric content and lower amounts of vitamins and beneficial fatty acids, has been associated with increases in obesity and related health challenges, including heart disease and diabetes. These combine to create new health care needs, especially in small, remote communities where facilities may be lacking.

Dietary problems, when combined with substance abuse and a more sedentary lifestyle may also contribute to mental health problems. Attention also is needed to improving public knowledge of health risks such as botulism and toxoplasmosis coming from the

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## OVERVIEW CONT.

consumption of improperly processed and stored local foods. Increasing temperatures and humidity create health risks from the consumption of foods stored below ground at now unsafe temperatures, and the air-drying of fish and animal products, which may not cure properly. Communities share an urgent need for scientific and traditional information on what local foods to eat and how to build a healthy lifestyle and assure food security based on local resources. This necessarily includes efforts by schools to teach children and young people how to obtain, prepare and cook traditional foods.

The public health situation in the Russian north is particularly concerning. Rising temperatures have brought an increase in tick borne disease and tularemia. The degradation of permafrost is not just destroying roads and other infrastructure; it is creating climate refugees and an increased risk of anthrax as animal burial grounds are exposed. This complex interaction calls for close collaboration between medical doctors and veterinarians to identify contaminated sites and to provide preventive information and treatment, if needed.

The spread of PCBs and other persistent organic pollutants into the Arctic region is exacerbated by climate change and makes predictions of future contaminant levels difficult. Special emphasis must be placed on identifying local “hot spots” of environmental contamination from mining, oil and gas extraction, and other industrial activities. Personal health risk from local contaminants often far exceeds those from materials transported over long distances by air or water to the site.

As the Arctic experiences globalization, changing demographics is an important issue. For people

wishing to sustain traditional lifestyles, migration from smaller communities to urban areas poses a multitude of challenges. In some areas, such as the North Slope of Alaska, entire villages face relocation inland in response to accelerating rates of coastal erosion. In many places, chronic housing shortages contribute to overcrowding and increased infectious disease risk. Cities in the Russian north are steadily losing population and their economic base. A quality health care system, with its infrastructure and human capital requirements, needs a sustainable local economy.

The high rate of suicide in Arctic communities and among indigenous residents is of special concern, as is domestic violence and children’s wellbeing. These issues are found in all communities, but in the Arctic they pose additional challenges. A colonial legacy of distrust in central governance, remoteness, and the general lack of community-based health care facilities and health professionals with local language skills combine to create a health care system that too often must rely on removing individuals to distant regional service centers for treatment. This results in significantly higher health care costs and social disruption as a result of separating patients from family and community.

New insights and progress in developing solutions to Arctic health challenges require innovation by health professionals and a focus on communication to improve sharing of knowledge among community members and researchers. The use of research frameworks that emphasize partnerships between communities and researchers, such as community-based participatory research (CBPR), are receiving wide attention in Arctic health. CBPR projects are

designed through the iterative and reciprocal exchange of ideas between health experts and the community, beginning with problem formulation, and moving to research design and method selection, the research itself, analysis and interpretation, and the dissemination of findings. CBPR programs and related place-based approaches to developing local guidelines and policies for managing environmental risks and food security are gaining favor in the Arctic and more generally where western scientists and indigenous communities interact to improve community health and sustainability.

Climate change effects on human health should not be considered gender neutral. Special attention is needed to bring gender perspectives into research and policy plans for meeting the specific and differential health needs of women and men as affected by climate change (Preet et al. 2010). For example, women and men may have different perceptions of health risks from contaminants in food and water and different strategies for response and adaptation. Gendered power relationships may limit women's access to decision-making roles in setting health priorities in areas important to their wellbeing (e.g., reproductive health). Changes in traditional societal roles for men, seen in many communities as declining opportunities for subsistence activities, are associated with loss of self-esteem and a range of psycho-social disorders. New multi-disciplinary research is needed to focus specifically on the climate, health and gender interaction.

Arctic health must have as its foundation healthy communities and efficient national health care systems. Researchers and practitioners have created a number of organizations and societies to evaluate the relevant health issues and propose solutions that apply across the circumpolar Arctic region. The Arctic Council has taken a leadership role in health assessment studies, and there are other international, national, and indigenous organizations that focus on health, among them the International Network for Circumpolar Research, the International Union for Circumpolar Health and its national affiliates, the Arctic Health Research Network (Canada), the Alaska Native Health Board, the Inuit Circumpolar Council, the

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## OVERVIEW CONT.

Institute for Circumpolar Health Studies (Alaska), and others. However, these organizations often struggle to secure adequate funding just to meet their own specific missions, let alone to develop the professional networks and information products demanded by the scope and scale of Arctic health issues.

During the conference we experienced a significant shift in dialog away from a discussion of specific topics focused on the health of individuals, communities, and the ecosystems that support societies, to one centered on acknowledging and understanding the resilience and capacity of northern and indigenous communities to respond to their increasing health challenges. Participants then identified key elements in a “new Arctic health paradigm,” a term that attempts to identify targeted innovations in the behavior and activities of the research community, health care profession, and the health delivery industry to solve local health problems in the Arctic. Such a paradigm must also recognize the fundamental role of colonial legacies in shaping current health challenges in the Arctic and the underutilized resource of indigenous and local knowledge in providing new solutions and effective policies for health goals. New ways of conceptualizing the critical issues of Arctic health and new models of community success and resilience are needed to shape new best practices for communities and modify national policies to better serve Arctic residents. Innovation in community health care delivery needs to be based on the level of community involvement and local determination of health care benchmarks. This involves reframing health research from a problems-and-deficits model to one seeking to understand what protects community health. This approach necessarily draws upon traditional knowledge, culture, spirituality, language and local resources to define community-based solutions to health challenges. Health care solutions to problems in the North





will require practices and solutions designed by people of the North in collaboration with “outside” expertise.

The implementation of new Arctic health policies, programs and their funding requires continued leadership from Arctic nation governments, universities, the Arctic Council and its Sustainable Development Working Group, which is engaged in a series of assessments and activities to: examine the role of governance and organization in reaching desired outcomes in different regions; serve as a source for health research, education and outreach information; and develop international disease surveillance networks of health agencies, hospitals, and laboratories. The Arctic Council is the primary agent linking nations, indigenous peoples organizations, and the leading NGOs focused on health and sustainability in the Arctic. A valuable academic partner in this collaboration is the University of the Arctic and its network of educational institutions, programs and thematic research networks.

During a period of declining governmental and private funding for health programs, new relationships between funders and health researchers and practitioners are needed. In particular, funding agencies should place more priority on local, community-based research and providing opportunities for researchers and communities to sustain personal relationships and information exchange. These interactions should be subject to ethical review procedures (e.g., Institutional or Tribal Review Boards) designed by the stakeholders working on the problem.

The challenge of improving the health of Arctic residents and communities provides a set of issues around which the major Arctic powers can work together to directly benefit their citizens and economies. A productive health dialog among Arctic nations could advance peaceful cooperation on other major issues such as resource extraction, environmental protection, shipping, and security.

# THE NEW ARCTIC HEALTH PARADIGM

Conference participants identified the following critical elements of a New Arctic Health Paradigm, recognizing the important work recently completed by the Arctic Council in their “The Arctic Health Declaration” prepared for the Arctic Council 2011 Ministerial Meeting in Nuuk, Greenland (The Arctic Health Declaration, 2011).

## I. DESIGN FEATURES AND GUIDING PRINCIPLES

- Arctic peoples have a specific worldview shaped by environment, history, and colonial legacies. The community and its members are knowledgeable in fashioning healthy living approaches when information on food and diet, lifestyle choices, and other health matters are shared with researchers and health professionals. They must be full partners in this endeavor.
- The measurement and assessment of community health program outcomes needs to rely on models and metrics defined by the community working closely with researchers and practitioners. The frame of reference should be wellbeing rather than disease intervention. The focus should be on health practices that protect and sustain people rather than solely on health problems and deficits in health care.
- Researchers need to form authentic partnerships with local communities, at all stages of research design, implementation and analysis, to produce tangible benefits as defined by the community. A key goal is social-ecological restoration as a key measure of community health.
- Health education, programs and services must be placed into a holistic framework of personhood that links personal responsibilities for health with social obligations to family, neighbor, and community.
- Investment in capacity building should integrate the local and traditional knowledge that flows from the community into health practices and policies.
- Gender must be an important factor in defining health research priorities and the construction of health care programs. Women and men are not affected equally by climate change impacts on health and wellbeing.

## II. SPECIFIC PATHWAYS FOR ACTION

- Increase investment in training and development of human capital to address the shortage of Inuit public health professionals with local language skills and provide for the specific training needs of those already working in the field.
- Strengthen disease diagnostics and surveillance systems at the local level, link them across borders and join veterinary and human systems surveillance and reporting networks. Standardize surveillance and reporting methodologies and stress sharing of health outcomes data by explaining reasons for successes locally, not just delivering information from outside agencies and institutions.
- Improve geospatial data and mapping of environmental contamination “hot spots,” particularly in Russia and industrial areas, small settlements and other affected locales.
- Enhance comparative learning across the Arctic on how to set up models, measures and metrics of effective community-based health care. Policy lessons learned from local communities, as well as at national and regional levels, should be broadly exchanged.
- Assess international regulations, such as EU policies on harvest and trade of marine mammals, for their impact on subsistence activities and diet. Improve public access to information on contaminants in food and the importance of diet on health.
- End confusion and concern among Arctic residents about what is safe or not safe to eat and drink by establishing an Arctic-focused, international definition of food and water security. Expand and support circumpolar data repositories on contaminants in Arctic environments and foods.

### III. ACTION STEPS FOR STAKEHOLDERS

- Enhance support for the Arctic Council as the focal organization for the development of dietary and other health guidelines and identify Arctic health priorities in the context of international health policy as set by agencies such as the UNEP. Highlight ongoing integrated health assessments (such as AMAP) of contaminant exposure and health risks in the Arctic by region.
- Develop new graduate and medical training programs that instill a better understanding of research ethics and responsibilities when working with communities, and promote an appreciation of the values of traditional knowledge in forming research and relationships with communities. Increase the number of professional health staff, particularly indigenous people, with native language skills.
- Work with funding agencies to recognize the need for a new health paradigm by improving their understanding of the health issues facing communities and the need to directly support community engagement in research design and implementation, and in disseminating findings to all relevant stakeholders.
- Support circumpolar health education initiatives such as the University of the Arctic health programs and Greenland's medical specialist training program.
- Support Arctic health as a leading-edge issue to improve cooperation between the US, Canada, Russia and Europe on environmental and human security issues.



Increasingly, the Arctic is a critical stakeholder in discussions of global issues, especially climate change and resource development. In promoting our vision for Arctic health, boldly presented in this report as a “new paradigm,” we wish to emphasize the significant interconnectedness of climate change, globalization, and the future health of the Arctic and its peoples. The Arctic policy community has a special opportunity to support public education on the links between climate, environment, and health by bringing knowledge of the North and from the North to the global arena.

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## CREDITS

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### **DARTMOUTH COLLEGE**

Since its founding in 1769, as a school for Native Americans, Dartmouth College has maintained a long commitment to the Arctic and its peoples. The Institute of Arctic Studies at the Dickey Center for International Understanding is a founding member of the UArctic Institute for Applied Circumpolar Policy, and a crossroads for Arctic research at Dartmouth.

<http://dartmouth.edu>  
<http://dickey.dartmouth.edu>



### **UNIVERSITY OF ALASKA FAIRBANKS**

Located just 200 miles south of the Arctic Circle, the University Alaska Fairbanks is part of the University of Alaska System and encompasses seven rural and urban campuses in addition to the main campus in Fairbanks. With Dartmouth College, it is a founding member of the UArctic Institute for Applied Circumpolar Policy.

<http://www.uaf.edu>



### **UNIVERSITY OF THE ARCTIC**

The University of the Arctic (UArctic) is an international cooperative network of universities, colleges, and other organizations dedicated to education, research and the promotion of indigenous and local capacities and sustainable development in the circumpolar North. There are over 130 member institutions and organizations.

<http://uarctic.org>

**Institute for Applied Circumpolar Policy**  
<http://iacp.dartmouth.edu>