

The Center for Alaska Native Health Research

Summary of Activity

The Center for Alaska Native Health Research (CANHR) has developed an infrastructure and innovative approach to enhancing Alaska's capacity for biomedical and behavioral health research with Alaska Natives (ANs), an underserved population. We are developing unique biomedical knowledge and translating it into research on the prevention and reduction of health disparities. The overall goal of the Center is to achieve a permanent and sustainable research center at the University of Alaska Fairbanks with the primary theme of investigating obesity and chronic disease-related risk, control, and prevention among Alaska Natives.

To build our collaborative research presence in AN communities, three themes guide the CANHR research approach:

1. Prevention and reduction of health disparities. CANHR seeks new knowledge that can ultimately be applied to prevent and reduce health disparities in indigenous communities.
2. Awareness of cultural processes. CANHR studies how cultural variables influence the understanding of disease and risk expression in ANs so that research findings and intervention are valid and culturally acceptable and appropriate.
3. The use of community-based participatory research (CBPR) methods. CANHR collaborates closely with, and takes significant direction from, the indigenous communities. Members of tribal communities become co-researchers; access and relevance are assured. The development of the research capacity of AN agencies and communities is required by the tribal communities.

CANHR currently provides support for several research projects, four of which are funded by NIH/NCRR COBRE grant P20 RR016430 (Gerald V. Mohatt, PI). Additional NIH-funded projects include two by former COBRE investigators: *The Genetics of Obesity in Yup'ik Eskimos* (Bert B. Boyer, PI) and *Health Promotion in a Yup'ik Community: Improving Health Through Collaboration* (Cécile S. Lardon, PI), and four behavioral health projects: *Elluam Tunjinun – Toward Wellness* (James R. Allen, PI), *Ellangneq-Awareness* (Gerald V. Mohatt, PI), *People Awakening Resilience Program* (Gerald V. Mohatt, PI), and *Cuqyun: Predictors of Alaska Native Sobriety and Reasons for Living* (James R. Allen, PI). CANHR also provides support to an NSF IPY project, *Negotiating Pathways to Adulthood* (James R. Allen, PI) and two graduate student projects: *Research Capacity Building through Community-Based Dissemination of Genetics Research Among Yup'ik Eskimos* (Kathleen M. West, MS graduate student) and *Successful Aging through the Eyes of Alaska Natives: The Health and Wellbeing of Alaska Native Elders in Bristol Bay, AK* (Jordan Lewis, PhD graduate student). Several of these research projects are briefly discussed below.

A. COBRE-Funded Projects

Yup'ik Perceptions of Body Weight and Diabetes: Cultural Pathways to Prevention (Andrea Bersamin, project leader). Since diabetes prevention efforts target modifiable lifestyle factors, it is vital to gain an in-depth understanding of local cultural perceptions of diabetes and associated risk factors prior to intervention development and prevention planning. For example, ethnographic data suggest that Yup'ik cultural perceptions of body weight identify overweight and obesity as indicators of a healthy and strong individual, as opposed to a strong risk factor for diabetes. As one Yup'ik elder pithily stated, "a fat wife is a sign of a successful hunter." If such perceptions are culturally prevalent, overweight and obese individuals may feel removed from risk and believe there is no need to monitor diabetes risk or modify health behaviors. Therefore, the overall purpose of this study is to conduct vital formative research to elucidate Yup'ik beliefs about body weight and diabetes in the context of remote village life. We anticipate compelling findings with direct health relevance for creating culturally appropriate and village feasible diabetes prevention programs, health provider training in cultural competency, and improving adherence among diabetics already receiving medical treatment. Data from this project will aid the development of a

community-based participatory research project proposal targeting healthy eating and physical activity among Yup'iks that will be submitted for independent funding.

Developing a Novel Set of Diet Pattern Biomarkers, Based on Stable Isotope Ratios (Diane O'Brien, project leader). This project is developing and validating a novel approach to dietary assessment. Methods of dietary assessment based on self-reporting are problematic due to bias, cost, and the time investment and compliance required of participants. This research aims to develop practical, unbiased diet pattern biomarkers, based on naturally-occurring isotopic differences in the elemental composition of foods. These isotopic signatures ($^{13}\text{C}/^{12}\text{C}$, $^{15}\text{N}/^{14}\text{N}$, $^{18}\text{O}/^{16}\text{O}$, D/H, and $^{34}\text{S}/^{33}\text{S}$) are incorporated into human tissues, and reflect diet at the time the tissue was formed. Unique isotopic signatures distinguish marine from terrestrial foods ($^{15}\text{N}/^{14}\text{N}$, $^{34}\text{S}/^{33}\text{S}$), foods deriving from higher and lower latitudes ($^{18}\text{O}/^{16}\text{O}$, D/H), foods containing corn or sugar cane ($^{13}\text{C}/^{12}\text{C}$), and foods deriving from different trophic levels ($^{15}\text{N}/^{14}\text{N}$). Stable isotope ratios are gaining attention for their potential as dietary biomarkers in nutritional studies. Our research will make a significant contribution to this growing field: it will be the most comprehensive assessment of isotopic variation in humans and their diets yet conducted, and it will be the only study to develop a multi-isotopic approach for dietary pattern assessment. Because Yup'ik Eskimos are a high-latitude population which relies on a mix of local marine and terrestrial subsistence and market foods, they present an ideal population for a validity study of isotopic dietary biomarkers.

Contaminants and Nutrients in Alaskan Subsistence Foods: Striking a Balance (Todd M. O'Hara, project leader). Diet and physical activity are key factors in the etiology of chronic disease. In particular, a shift from a subsistence-based lifestyle to a more Western one has been implicated in increasing the burden of chronic disease among indigenous populations around the world; this phenomenon is hypothesized to be occurring among Alaska Natives as well. Although several benefits are known to be associated with consumption of traditional foods, an increased concern for environmental contaminants may threaten their intake. Changes to traditional diets for Alaska Natives result from both local and global factors. Local choices are significantly altered by the availability of store-bought foods, which are often less nutritious than subsistence alternatives. Global factors are "contaminating" the food chain (e.g., pesticides, heavy metals). While some studies address one or the other of these issues, the unique aspect of this study is that it measures nutrients and contaminants in an integrated fashion, utilizing the actual food products consumed; we will evaluate changes in the composition of foods as a result of different preparation methods. This research is necessary to provide balanced information regarding contaminants and nutrients and to provide the information needed to develop an integrated, quantitative model that public health officials will be able to utilize for effective interventions. The overall aim of this research project is to evaluate the nutrient composition and contaminant load of several key subsistence foods. We hypothesize that the nutritive value of subsistence foods outweighs the potential harm of consuming these foods. In order to test the specific aims below, we ask the following basic question: Do current contaminants and nutrients data on subsistence use species, based on raw tissue sampling, accurately reflect human intake?

Yup'ik Experiences of Stress and Coping: Intervention via Cultural Understanding (Inna Rivkin, project leader). A substantial body of research demonstrates that chronic psychosocial stress significantly undermines physical, mental, and behavioral health. Life in many American Indian and Alaska Native (AI/AN) communities is shaped by a disproportionately high stress load, due in part to historical trauma and rapid cultural change. The experience of acculturative and socio-cultural change stressors among AI/ANs is associated with increased substance abuse and a higher incidence of depressive and anxiety-related disorders (including post-traumatic stress disorder). Such mental and behavioral states have, in turn, been shown to have direct detrimental effects on physiology relevant to obesity, diabetes, and cardiovascular disease. This research project will provide an in-depth analysis of stress and coping in two Yup'ik Eskimo villages in the Yukon Kuskokwim Delta of Southwest Alaska. A focus on stress and coping in this population is well justified given preliminary data indicating a widespread concern in Yup'ik communities about the negative health consequences of frequently experiencing difficult and traumatic life events. The goal of this research project is to collect and analyze the data necessary for the future planning and implementation of an effective stress management intervention, in accordance with a Community-Based Participatory Research (CBPR) model.

B. Independent Investigator Grants at the Center for Alaska Native Health Research

Genetics of Obesity in Yup'ik Eskimos, NIH/NIDDK R01 DK074842 (Bert B. Boyer, PI). Summary of Activity: Obesity is one of the most common preventable causes of morbidity and mortality, and ethnic minorities are disproportionately affected. There is considerable evidence supporting that a combination of genetic and environmental components leads to the development of obesity. In particular, diet and physical activity are important contributors, yet we know little about the molecular mechanisms of how gene-by-environment interactions trigger fat accumulation. The overall objective of this research application is to identify the contribution of selected candidate genes, diet factors, and physical activity, in the development of obesity in Yup'ik Eskimos, an "at risk" and underserved population in Southwest Alaska. We have recruited over 1,000 Yup'ik Eskimos into our study, and collected DNA and plasma, as well as dietary, anthropometric, and psychosocial data on each participant. Excess central body fat is common, while the prevalence of type 2 diabetes (<3%) and metabolic syndrome (10%) remain low. We hypothesize that polymorphic variants in a selected subset of biologically plausible candidate genes for obesity modify the association between energy expenditure and/or PUFA intake and obesity in Yup'ik Eskimos and place this population at risk for the development of obesity related comorbidities such as diabetes and cardiovascular disease.

Health Promotion in a Yup'ik Community: Improving Health Through Collaboration, NIH/NHLBI and OBSSR R21 HL083862 (Cécile S. Lardon, PI). Summary of Activity: The goal of this research project is to develop and evaluate the effectiveness of a community-based health promotion project (*Piciryaratggun Calritllerkaq*, or Healthy Living through a Healthy Lifestyle) targeted at increasing behaviors related to cardiovascular health in a Yup'ik Eskimo village: physical activity, nutrition, and stress reduction. *Piciryaratggun Calritllerkaq* has been developed in collaboration with the host community and the regional Tribal Health Corporation. The project examines the specific ways in which this approach to cardiovascular health can develop a local infrastructure, knowledge base, and process to encourage and maintain lasting lifestyle improvements. The long-term goal of this research is to develop this project into a model for conducting health promotion in the region. We hypothesize that a culturally-based community-development approach to health promotion will increase physical activity, increase consumption of subsistence foods and/or healthy substitutes, and decrease stress levels. Eventually, changes in these behaviors and participants' sense of well-being are expected to be related to an increase in protective blood lipid factors, healthy weight, and healthy blood pressure.

People Awakening Resilience Program, NIH/NIAAA R21 AA015541 (Gerald V. Mohatt, PI), *Ellangneq (Awareness)*, NIH/NCMHHD R24 MD001626 (Gerald V. Mohatt, PI), and *Cuqyun: Predictors of Alaska Native Adolescent Sobriety and Reasons for Living*, NIH/NIAAA R21 AA016098 (James R. Allen, PI). Summary of Activities: There is no greater source of health disparity in American Indian and Alaska Native communities than that involving alcohol use disorders and suicide, and no greater necessity in addressing this disparity than the development of sustained, trusting, collaborative, and non-exploitive research relationships with those who historically experienced forced acculturation and exploitation. The University of Alaska Fairbanks with the Yukon- Kuskokwim Health Corporation has worked with communities and individuals in the Yukon Kuskokwim (YK) region of Southwest Alaska to address these two issues. Suicide and alcohol abuse are closely linked in this population; our research group views them as co-occurring processes.

For the past 15 years, we have engaged communities using community-based participatory research (CBPR) methods to discover what protects tribal members in Alaska from ever developing a problem with alcohol, or if they did develop an alcohol problem, how they recovered, and stayed sober and healthy. The People Awakening Project, funded by the National Institute of Alcohol Abuse and Alcoholism and the National Center for Minority Health Disparities through RO1 AA 11446, identified strengths that participants told us had protected them. Out of this work we developed the People Awakening Protective Factors model. We heard about individual strengths that developed during youth, and led people to believe they could solve problems and meet challenges. We heard about ways that families supported and helped youth to develop strengths to resist drinking and chose healthy living. Finally, we heard about ways communities provided safety, support, opportunities, and role models to build strong youth. We called these protective factors, and organized them into individual, family, and community characteristics.

Because these protective factors first emerged in youth, tribal communities next asked if we could use this knowledge to develop programs for youth to give back to communities, and to expand our focus to address risk both for alcohol abuse and suicide.

Over the past three years, we have worked with two YK communities to plan cultural and bicultural activities to build these individual, family, and community protective factors. *People Awakening Resilience Program* developed an intervention based upon the People Awakening Protective Factors model and studied its feasibility through a pilot test in one community using CBPR methods. A companion CBPR project, *Ellangneq* “Awareness” provided similar pilot work in one other community, and both projects mutually informed the other. *Cuqyun: Predictors of Alaska Native Sobriety and Reasons for Living* developed and refined the intermediate and ultimate outcome measures for both these pilot intervention projects, and provided an empirical test of important elements of the protective factors model developed out of the People Awakening qualitative work.

This work resulted in a book, the *Qungasvik*, or ‘Toolbox.’ The *Qungasvik* is composed of 36 cultural and bicultural intervention activities designed to build the People Awakening Protective Factors. The *Qungasvik* activities increase reasons for life and sobriety in youth. The *Qungasvik* is not an intervention manual, but instead a community development process approach to local adaptation of prevention activities. Communities select from activities presented in the manual. The *Qungasvik* provides directions and suggestions on doing these activities from the Community Planning Groups and our staff. However, the activities for youth, families, parents, and the community require the community to flesh out the activity, which both contextualizes the activity to local community customs and settings, which vary enormously, and facilitates community ownership.

Elluam Tunjiinun – Toward Wellness, NIH/NCMHHD R24 MD001626 (James R. Allen, PI). Summary of Activity: This five-year CBPR intervention research project extends the work of the *Ellangneq*, *People Awakening Resilience Program*, and *Cuqyun* projects. It will offer and evaluate the intervention program previously developed and produced in the *Qungasvik* to three new communities, and provide technical assistance to sustain the interventions in the two pilot communities. Its goal is to more conclusively demonstrate if the program is effective, and determine under what conditions it works best. If the program proves to be effective, we will then share the *Qungasvik* model and outcome results more widely with other YK communities, the Yukon-Kuskokwim Health Corporation, and other interested Native communities, groups, and health corporations. We are also discussing with the Native leadership how to create a center for training and dissemination of this powerful tool for change.

C. Graduate student projects at the Center for Alaska Native Health Research

Research Capacity Building through Community-Based Dissemination of Genetics Research among Yup'ik Eskimos (Bert B. Boyer, PI; Kathleen M. West, MS graduate student). Using a CBPR approach to disseminate progress and results of multifactorial disease genetics studies is yet unprecedented. There are no guidelines, such as the Belmont Report, developed to inform genetics dissemination in communities. We aim to develop culturally appropriate strategies to convey our genetics research progress to all community partners. This project will result in two main products. First, we will conduct a literature review and summary paper discussing the ethical basis for disseminating genetics research to communities. This piece will provide a context for others contemplating CBPR projects, and offer an alternative approach for other genetics researchers to consider using. Secondly, we plan to work with community members in interviews, focus groups and field observations to develop an understanding of how knowledge is transferred in the community that will be applied to a dissemination strategy for CANHR genetics progress, building upon community strengths. Learning what the community knows about CANHR's work, genetics research, as well as their own health priorities will shape future research undertaken by CANHR. This program will also provide educational and training opportunities for community members that may help to reduce health disparities among Yup'ik Eskimos.

Successful Aging through the Eyes of Alaska Natives: The Health and Wellbeing of Alaska Native elders in Bristol Bay, Alaska. Funding from NSF ARC-0823120, Andrew W. Mellon Foundation Dissertation Fellowship, EPSCoR Graduate Research fellowship, and ANTHC. (Jordan Lewis, PhD graduate student).

There is very little research on ethnic minority elders and how they subjectively define a successful older age; nor is there a well-accepted definition or explanatory model of successful aging for ethnic minorities. The lack of a minority definition of successful aging means that there is a risk of labeling their aging as less successful than their non-minority counterparts. This qualitative research project with Alaska Native elders will establish a conceptual understanding of successful aging among the different Alaska Native cultural groups and the role the elders play in their communities. This research will advance the gerontology and cultural anthropology literature, as well as the successful aging literature. This dissertation study will involve a purposive sample of fifty (N = 50) Alaska Native elders in the Bristol Bay region, living in either Dillingham or a neighboring village (4 villages plus Dillingham). Participants will be recruited through word of mouth as well as nominated with the assistance of the Bristol Bay Area Health Corporation (BBAHC) and the village tribal councils.

Contact:

Gerald V. Mohatt, EdD

Center for Alaska Native Health Research

Institute of Arctic Biology

PO Box 757000

University of Alaska Fairbanks

Fairbanks, AK 99775-7000

Tel: (907) 474-7927

Fax: (907) 474-5700

Email: ffgvm@uaf.edu