

Potential future studies on the nutritional status among indigenous peoples in Alaska and the Russian Far East: preliminary assessment of the Social Transition in the North data set

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ABSTRACT

Objective. The purpose of this assessment is to examine the nutrition-related health data collected during the Social Transitions of the North (STN) study for understanding cultural differences between nations and the impact on nutritional status.

Methods. The nutrition data in the STN study was collected in two regions of Alaska (Northwest Arctic and the Aleutian Islands) and in two regions of the Russian Far East (Kamchatka and Chukotka). The health questionnaire explored several factors that may contribute to identifying the nutritional status of the study populations. These factors were appetite, weight, subsistence food consumption, vitamin or mineral supplements use self-perception of health, special diets, and number of meals consumed with relatives.

Results. US populations were heavier than the Russian population ($p = 0.0001$). Both the Alaskan and Russian populations are frequent users of subsistence foods. The US respondents reported consuming 75% or more of the total protein as subsistence protein more often (40%) than the Russian respondents (25%).

Conclusion. US respondents perceive themselves as healthier than their Russian counterparts. The US respondents consumed greater amounts of subsistence foods in general, and more of their diet over the year is made up of Native protein.

Keywords: nutrition, diet, subsistence, Alaska and Russian Indigenous communities.

INTRODUCTION

The Social Transitions of the North project (STN) investigates the health, population dynamics, and social reproduction of peripheral peoples who are under great stress as they seek sustainable communities. The relationship between health, demographic and domestic factors is an important consideration for examination of resiliency (1). This secondary analysis of the STN data is focused on the nutrition and nutrition-relation health status in Alaskan and Russian Far East communities that are matched along dimensions that permit

controlled comparisons. The purpose of this examination is to describe the nutrition data collected during the STN study, and review the potential of examining the nutrition information from the STN communities in greater detail.

METHODS

The STN materials were archived, indexed and cleaned by the Alaska Native Science Commission and the Institute for Circumpolar Health Studies. These materials were provided to the authors for secondary data analysis of the nutrition and

nutrition-related variables. A complete description of the STN methodology is described earlier (2).

The nutrition data in the STN study was collected from 1993-1995 in two regions of Alaska (Northwest Arctic and the Aleutian Islands) and in two regions of the Russian Far East (Kamchatka and Chukotka). The nutrition data from the first year of collection was the most complete and therefore was selected as the focus for this assessment.

In the survey form, *Section F: Health* contained all the nutrition-related questions. A total of twelve (12) questions were examined in this analysis. Table I lists each question in the order it appeared in the survey. Dietary and nutrition-related health variables from the data set were isolated and examined for missing values. Data were analyzed using SPSS and were considered significant at $p < 0.05$.

Table I. Survey Questions

Survey Code	Question
FI	In general, how would you describe your health? Would you say it is very good, adequate or poor?
F45	What is your height?
F46	What is your weight?
F47	How much has your weight changed over the last year (in pounds or kilograms, plus or minus)?
F48	Is your appetite about the same as it normally is?
F49a	Are you on a special diet?
F49b	If so, is it for your weight, for a health reason (i.e. allergy), or different reasons (religious, etc.)?
F50	Do you take vitamins or minerals?
F57	Was subsistence food (Native food) a large part of any meals you ate yesterday?
F58	How about the day before yesterday? Did you eat any meals in which subsistence foods was a large part of the meal?
F59	In the last two days, how many meals did you eat with a relative who lives in another household?
F60	What percent of all the meat and fish you ate in the last year was Native food?

Table II. Demographics and Summary of Weight and BMI.

	U.S.			Russia		
	Male	Female	Total	Male	Female	Total
N	98	175	273	95	268	363
Age (years)*	41.2±1.6	38.8±1.1	39.6±0.9	35.8±1.2	37.7±0.8	37.2±0.6
Weight (kg)*	78.0±1.5	70.2±1.1	73.0±0.9	70.3±1.1	61.9±0.9	64.0±0.7
BMI*	26±0.48	28±0.50	27±0.36	25±0.32	25±0.66	25±0.50

*Mean ± SEM

RESULTS

Table II presents the mean and standard error of the means for age, weight and BMI of 273 US participants and 363 participants located in the eastern Russian coastal islands. Mean ages were similar, and groups by gender were fairly evenly matched.

Body Mass Index (BMI) was calculated using Quetelet's Index by dividing the weight of the subject in kilograms by the height in meters squared (3). BMI is based on data from the NHANES II and is a frequently used tool to compare the body weight of individuals against standards established for US populations. BMI under < 18.5 are considered to be underweight; BMI between 18.6 and 25.0 are considered to represent a healthy body weight; BMI between 25.1 and 29.9 are considered to be above normal weight; BMI between 30.0 to 34.9 are considered to be overweight and BMI 35.0 are considered to be obese (4).

Mean data from both groups of respondents were found to be in the range of normal weight. For both population groups included in this study, mean weight of males was more than the mean weight of females. The BMI of U.S. males and females fell into the range considered above normal, while Russian gender other group BMI values were within a healthy body weight.

The mean and confidence intervals of body weight for U.S. and Russian respondents are presented in Figure 1. The recorded weights of US populations were heavier than the recorded weights of the Russian population. Independent samples t test indicates that group means are signifi-

cantly different between nations ($p = 0.0001$). The factors relating to body weight could provide important information as to the lifestyle habits that predict body weight. Food insecurity issues should also be explored. Macronutrient contribution may also affect body weight; however, dietary intake data

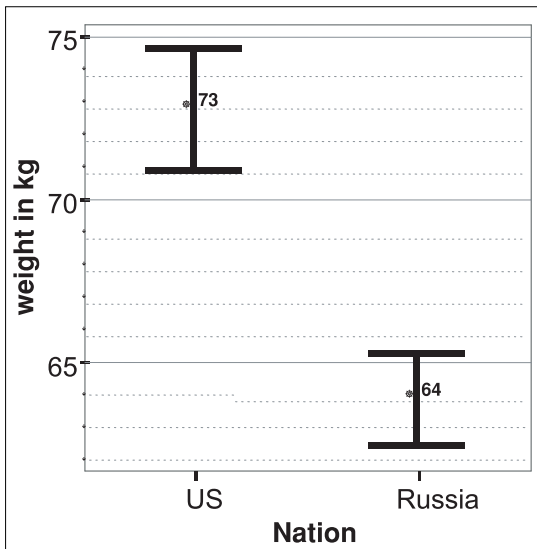


Figure 1. Mean and confidence intervals of body weight for US and Russian respondents. Error Bars show 95.0% CI of Mean.

was not collected during this project.

Figure 2 illustrates the reported appetite by location. Respondents were asked if they felt their appetite was about the same as it normally is. Responses by nation varied dramatically with 82% of the US population reporting that their appetite was normal compared to only 30% of the Russian group reporting a normal appetite. Statistical analysis using Pearson Chi Square indicates highly significant difference between groups ($p = 0.0001$).

Figure 3 indicates that both populations are frequent users of subsistence foods. Pearson chi square analysis reveals that although reported use is similar, the difference between groups was significant ($p = 0.006$). Subsistence foods and the high omega-3 fatty acid content of many arctic foods have been linked to many health benefits (5,6,7). Resulting health status may also be affected in these populations. The authors would encourage the further examination of diet components and nutrient intake resulting from subsistence foods to compare with reported and measured health status. Reported subsistence food consumption prior to the day before the interview show similar results and statistical significance.

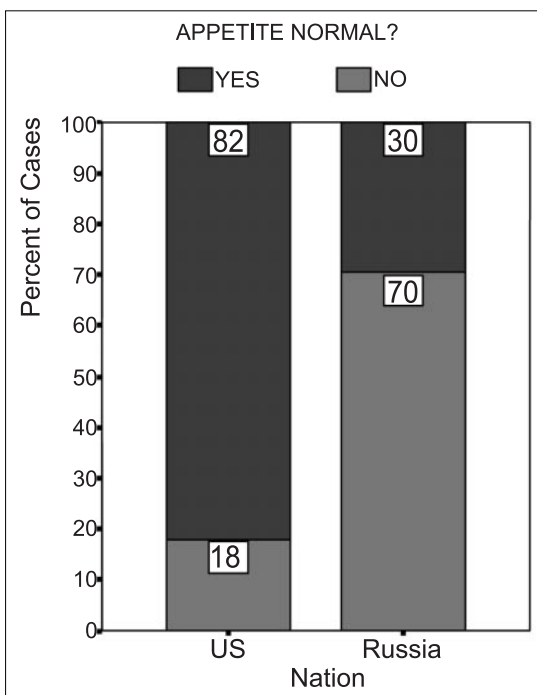


Figure 2. Reported Appetite by location.

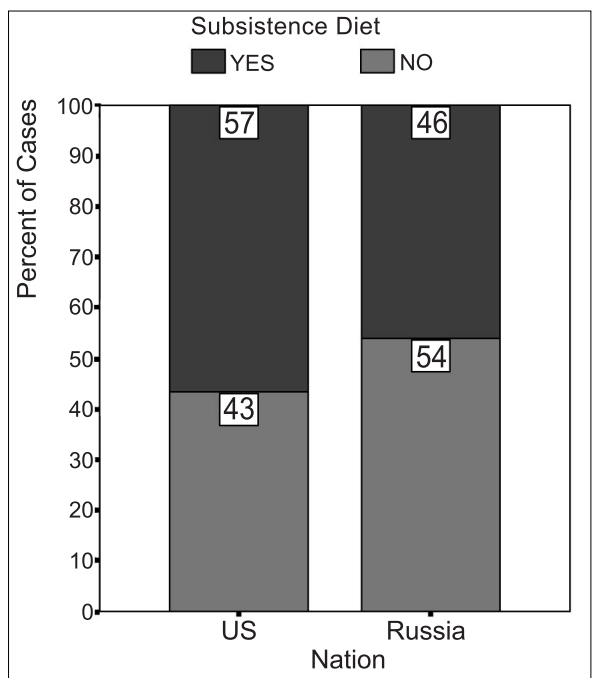


Figure 3. Reported use of subsistence foods by location on day before interview.

Figure 4 illustrates the percent of subsistence protein consumed in the past year by the US and Russian communities. The US respondents reported consuming 75% or more of the total protein as subsistence protein more often (40%) than the Russian respondents (25%). Only three percent of the US respondents reported eating no subsistence protein, compared to 18% of the Russian respondents. The other categories showed similar responses for both nations. Statistical analysis reveals significant differences between groups ($p < 0.05$).

Respondents were asked how they would describe their health and were given a choice of three answers: very good, adequate and poor. Approximately half (46.3%) of the US participants responded that their health was very good, compared with only 4.4% of the Russian participants. Seventy-five percent (75%) of the Russian respondents perceived their health as adequate and 20.5% reported poor health.

Few respondents from both nations reported being on a special diet, 5.4% and 7.3% for US and Russia respectively. Of those that were on a special diet in the US, the reasons were evenly divided between dieting for health reasons and for weight loss/gain. Those on a special diet in Russia reported dieting for weight loss/gain more frequently than for health reasons.

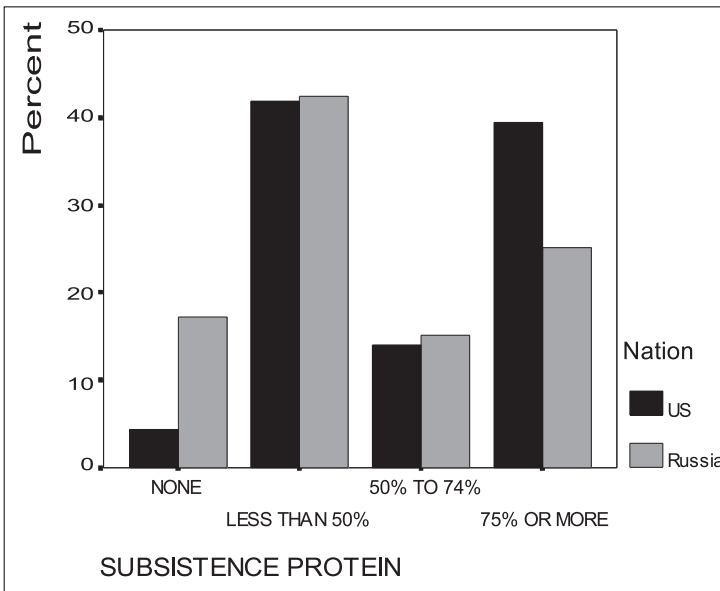


Figure 4 Percent of Subsistence Protein Consumed in Past Year.

The use of vitamin and mineral supplements was similar for both nations. Thirty-two percent (32%) of the U.S. respondents and 35% of the Russian respondents reported taking vitamin supplements. Pearson Chi-square analysis showed no statistical significance between groups.

Consuming meals with relatives appeared to be more common among Russian respondents. Twenty (20%) percent of the Russian respondents reported eating 4 to 7 meals with relatives, 40% ate 1 to 3 meals and 27% ate no meals each week with relatives. Conversely, 8% of the US respondents reported eating 4 to 7 meals, 39% ate 1 to 3 meals and 44% ate no meals each week with relatives. Analysis of variance revealed significant ($p < 0.01$) differences between groups, with the greatest differences occurring for "no meals" and "4 to 7 meals".

DISCUSSION

The primary finding in this assessment was that US respondents perceive themselves as healthier than their Russian counterparts. The US respondents consumed greater amounts of subsistence foods in general, and more of their diet over the year is made up of Native protein. Both male and female respondents from the US weighed more and had greater BMI's than the Russian respondents, and appetite was reported as normal significantly more among US respondents. All of these findings may be related to food availability, both subsistence and store bought.

The thinner body weights of the Russian cohort combined with the low percentage of normal appetite and reported poor health and high use of subsistence foods may suggest high levels of food insecurity in this population. The definition of food insecurity established by Campbell is "access to all people at all times to enough food for an active, healthy life and at a minimum includes the following, 1) the ready availability of nutritionally adequate and safe foods, and 2) the as-

sured ability to acquire personally acceptable foods in socially acceptable ways" (8). Using this definition it appears that arctic populations may face challenges unique to regional cultural practices of securing and harvesting foods. With the majority of food insecurity literature based in urban cash economies, the dynamics of food insecurity in non-cash subsistence economies is not well understood and deserves further examination.

While BMI is a very commonly used tool to estimate excess fat in the general US population, use of BMI has been cited to be problematic with the First Nation peoples in the Canadian Arctic (9). Similar problems in the use of this tool for a once-in-time assessment may exist in this study as well. BMI may be most appropriate to evaluate the same population over many points in time.

In addition to providing descriptive information and comparison of nutrition responses among groups, the STN data was reviewed to determine the potential of answering two preliminary nutrition questions. First, what medical, social and dietary indicators predict self-perception of good health? Second, what health indicators are correlated with subsistence food consumption? The authors believe that both of these questions can be answered with further analysis of the existing data. The STN survey included several health questions that were not explored in this analysis. These include medications taken, visits to the dentist, exercise, number of times admitted to the hospital, and number of times seen by a health care practitioner. In addition, individuals were asked if they had been diagnosed with a list of chronic diseases that included diabetes, heart disease, liver disease, etc. The frequency of these medical health indicators should be examined in detail for differences between nations. It is possible that these indicators can be examined for significant correlations with self-perception of good health, subsistence food consumption and appetite. Although the questions were mostly yes/no or forced answer, the breadth of health questions explored in the total survey has potential for correlating overall health to nutrition status in these communities. In addition, future analysis could investigate differ-

ences in subsistence food consumption, self-perception of good health and appetite by age and gender groups. Data collected in years 2 and 3 should be reviewed to determine potential changes in subsistence food consumption and other nutrition variables over time.

CONCLUSION

An important area of recent research in Alaska and other circumpolar nations concerns the safety of consuming subsistence foods. The information from the STN communities can be used in connection with contaminant identification projects to estimate the importance of subsistence foods and consumption of native protein sources in participating communities. Data are presented in this analysis by nation; however, given the large data set available, it would be possible to conduct the same analysis by region and by individual community. Data by region or community can be used as a baseline and needs assessment to justify more detailed dietary intake studies to help prioritize foods for contaminant analysis.

There are limitations of the nutrition data in the STN data set that should be addressed before future analyses are initiated. First, all responses were self-reported, and no dietary intake data was collected. The authors recognize that dietary intake was not the focus of the STN study, however, food consumption data would help with future analysis of the responses given.

Second, most of the nutrition questions solicited yes/no answers and did not have follow-up questions that probed for details. The qualitative data obtained by questions such as "Is your appetite normal" should be reviewed to understand the full context of the responses within the context of equality of thought through translation from one language to the other. For example, it is unclear what the original researchers meant when they asked about appetite. Appetite is a complex construct that can be defined as hunger, need to eat, desire for food, craving, taste or all of these. A follow-up food security question would be helpful to understand the yes/no answer provided. Translation issues may have also contributed to some differences in the interpretation of these results.

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