

# Alaska Native Traditional Food and Harvesting Activity Patterns over 10 Years of Follow-Up

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## ABSTRACT

**Background:** Alaska Native (AN) traditional foods and associated harvesting activities are beneficial to human health.

**Objective:** This study assessed longitudinal self-reported traditional food use and harvesting activities among Alaska Native and American Indian (AN/AI) participants in the Alaska Education and Research Towards Health (EARTH) study.

**Methods:** In 2004–2006, southcentral Alaska EARTH study participants ( $n = 1320$ ) completed diet and activity questionnaires which were repeated in 2015–2017; results were compared between participants who completed both questionnaires ( $n = 388$ ).

**Results:** In the follow-up questionnaire, >93% of participants reported eating  $\geq 1$  traditional food in the past year. The top 3 traditional foods were fish (75%), moose (42%), and shellfish (41%). Women were more likely than men to consume traditional foods, especially fish, gathered berries, shellfish, and seal oil ( $P < 0.05$ ). Participants aged  $\geq 60$  y in the original cohort were significantly more likely to consume fish and shellfish at follow-up, whereas those aged 40–59 y were the most likely of the 3 age groups to consume seal oil ( $P < 0.05$ ). Between the original cohort and follow-up, there was a significant decline in the mean number of traditional foods eaten from 6.3 to 5.5, as well as reduced consumption of multiple traditional foods ( $P < 0.001$ ). Over 59% of participants reported  $\geq 1$  traditional harvesting activity in the past year; this proportion did not significantly change between baseline and follow-up. Picking berries/greens (44%), cutting/smoking fish or meat (33%), and fishing (30%) were the most common activities. Participation in traditional harvesting activities was greater among women than men ( $P < 0.05$ ), but did not differ by age.

**Conclusions:** Longitudinal follow-up demonstrated that AN/AI people maintained participation in traditional harvesting activities, but the variety of traditional foods declined significantly among both men and women. Promotion of traditional foods and harvesting activities that serve as protective factors against chronic diseases may benefit this population. *Curr Dev Nutr* 2019;3:nzz114.

## Introduction

Alaska Native (AN) traditional foods and the harvesting activities required to obtain them are beneficial to human health (1–10). Historically AN people harvested and subsisted upon foods from the local environment. However, since Western contact there has been a decline in the reliance on traditional foods and harvesting activities in the AN lifestyle and an increase in the use of commercial, processed or store-bought foods (7, 11–18). Simultaneously, AN people have experienced an increase in the prevalence of chronic diseases, including obesity, diabetes, cardiovascular diseases, and cancers, which are often associated with the Western diet (1, 19–28).



**Keywords:** Alaska Native, American Indian, traditional food use, physical activity, harvesting activity, diet measurement, dietary intake

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Manuscript received February 28, 2019. Initial review completed September 20, 2019. Revision accepted October 7, 2019. Published online October 9, 2019. Supported in part by Indian Health Service/National Institute of General Medical Sciences (IHS/NIGMS) of the NIH Native American Research Centers for Health grant U261IHS0084 (to KRK) and by NIGMS grant S06GM123545 (to KRK).

The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH or IHS.

Data described in the article will be made available upon request pending tribal review and approval by tribal health organizations participating in the study.

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Abbreviations used: AI, American Indian; AN, Alaska Native; DHQ, Diet History Questionnaire; EARTH, Education and Research Towards Health.

The Education and Research Towards Health (EARTH) Study is a multicenter cohort study designed to investigate risk and protective factors for chronic disease among Alaska Native and American Indian (AN/AI) people. Participants were recruited in 2004–2006 from 3 regions in Alaska (southcentral, southeast, and southwest). A main focus area of this study was diet and physical activity, which included traditional AN wild-harvested foods and harvesting activities. In the original cohort analysis in the 3 regions, >92% of participants reported eating  $\geq 1$  traditional food in the past year with the top traditional foods reported being fish, moose, and *agutaaq* (a mixture of berries and fat). Use of traditional foods varied by region, with the southwest region reporting the most traditional foods consumed, and also by age, with older participants (aged  $\geq 55$  y) reporting more use of traditional foods than younger participants. Reported participation in traditional harvesting activities was high in the original 3-region cohort, with almost 70% of participants participating in  $\geq 1$  traditional harvesting activity. Picking berries or greens, cutting/smoking fish or meat, and fishing were the most common activities. Similarly to traditional food consumption, participation in traditional harvesting activities was highest in southwest Alaska. Traditional harvesting activities were significantly higher among men than among women in the original 3-region cohort, but did not differ by age. The original cohort study also found that respondents who reported greater use of traditional food and harvesting activity also reported significantly greater tribal self-identification and were more likely to speak a Native language at home, use traditional remedies, or participate in or attend traditional events (29).

Although several studies have presented cross-sectional data showing a decrease in traditional food use and physical activities by AN people since the 1950s (2, 4, 8, 14, 15), as far as we know no studies to date have examined time trends in a defined cohort of AN people. From 2015–2017 a subset of the original Alaska EARTH study participants recruited in 2004–2006 from the southcentral Alaska region participated in a follow-up study visit (Figure 1). Here we describe changes in traditional food use and physical activities associated with harvesting traditional foods (hereafter referred to as harvesting activities) reported by southcentral region EARTH study participants at follow-up.

## Methods

### Study population

The study design, survey methods, and measurement instruments for the original EARTH study cohort (2004–2006) have been reported previously, including the methods used to collect dietary and physical activity data (29–33). Briefly, the original Alaska EARTH study cohort was comprised of participants from 26 communities in 3 regions of Alaska. Enrollment criteria included AN/AI race and eligible for health care through the Indian Health Service;  $\geq 18$  y of age; physically and mentally able to give informed consent and complete study activities; not currently pregnant; and not currently receiving chemotherapy. Deferred enrollment was offered to participants who were pregnant (until 3 mo postpartum) or actively undergoing cancer treatment (until 1 y after completion of cancer treatment).

The follow-up cohort (2015–2017) included only AN/AI people from the southcentral region, who live in or around Alaska's largest urban area (Anchorage/Matanuska-Susitna Valley, total population  $\sim 380,000$ ; AI/AN population  $\sim 57,500$  or  $\sim 35\%$  of the statewide AI/AN population) (34). Because this area is an employment and education center for the state, numerous tribal groups were represented in the follow-up cohort, including Yup'ik, Inupiaq, Athabascan, Unangan (Aleut), and Tlingit/Haida/Tsimshian, as well as AI people from the contiguous United States. Contact information provided at the original cohort study visit as well as electronic medical record data were used for follow-up recruitment, which included multiple contact methods: telephone, postal and electronic mail, and in-person encounters. Members of the AN community worked as study members, and data were collected at AN community health locations. As in the original cohort study, participants were provided incentives for participation, including a health risk assessment at the conclusion of the study visit. Deceased participants, identified using state vital statistics records, were excluded from recruitment efforts (35).

### Ethics

This study was approved by the Alaska Area Institutional Review Board and the Tribal research review and approval entities for the Alaska Native Tribal Health Consortium and Southcentral Foundation. All participants provided informed consent. This study was not a clinical trial and therefore did not need to be registered.

### Data collection

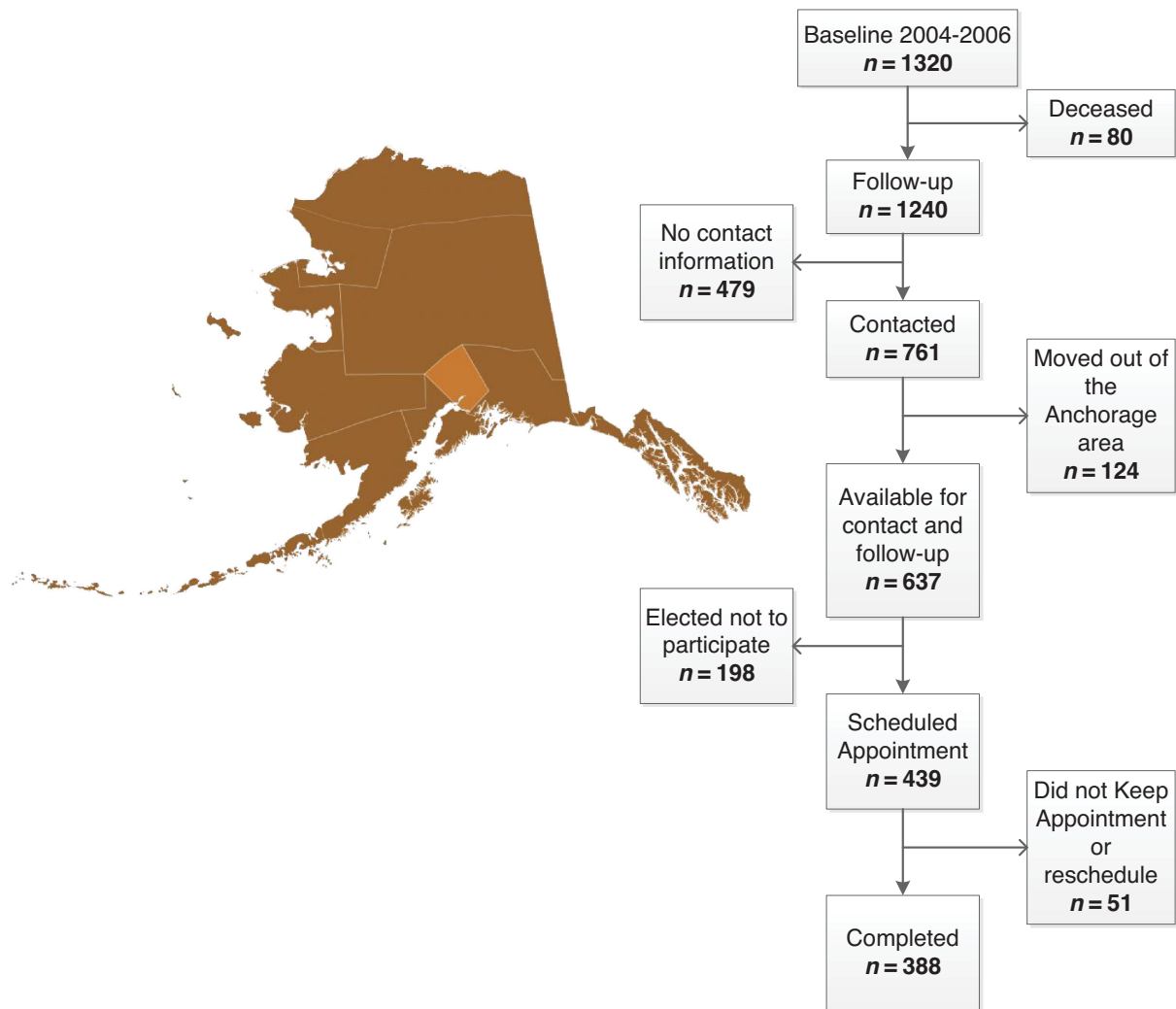
Participants completed diet and physical activity questionnaires by using computer-assisted self-interview on touch-screen panels while listening to an audio version of the questionnaire (36). Self-reported demographic data were also collected.

### Diet measurement.

The EARTH Diet History Questionnaire (DHQ) has been previously described (32). The questionnaire includes foods commonly eaten by the general US population as well as an AN traditional foods list based on Tribal leadership and local AN expert knowledge. Traditional foods were defined as foods locally hunted, harvested, fished, and gathered in Alaska, including seafood, game meat, marine mammals and their fats, berries, greens, and wild birds and bird eggs. There were 27 traditional foods incorporated into the EARTH DHQ: smoked or dried fish; hooligan or herring; other fish such as halibut or char (not smoked or dried); herring eggs; canned or jarred salmon; shellfish; muskox; caribou; deer; moose; reindeer; buffalo; beaver; rabbit or squirrel; heart or tongue; kidney; intestines or stomach; seal or walrus; *muktuk* (whale blubber and skin); seal oil; gathered berries; *agutaaq* (a mixture of berries and fat); beach asparagus; seaweed or kelp; wild or gathered greens; wild birds; and bird eggs. Participants reported if they ate each food at least once a month or  $\geq 12$  times in the past year to assess both frequency as well as the variety of foods consumed. The EARTH DHQ was validated using repeated 24-h diet recalls and found to have acceptable relative validity for use in epidemiologic studies (31).

### Physical activity measurement.

Harvesting activity was defined as activity related to traditional food procurement or harvesting. Harvesting activities included berry



**FIGURE 1** Participant flowchart outlining the formation of the follow-up Education and Research Towards Health subset from the baseline cohort.

picking, fishing by hand or with a set net, hunting marine mammals, hunting big or small game, trapping, butchering game, cutting and/or smoking fish or meat, and working on animal skins or tanning hides. The EARTH study physical activity questions were adapted from the Multi-Ethnic Study of Atherosclerosis and the Taylor physical activity questionnaires (37, 38).

### Statistical analysis

Summary statistics were calculated to provide an overview of the demographic characteristics of the Alaska southcentral EARTH study follow-up participants as compared with the original southcentral cohort at baseline. Among follow-up participants, the percentages of respondents reporting any mention of each of the 10 most common traditional foods (i.e., fish, moose meat, *agutaq*, gathered berries, herring eggs, shellfish, caribou, seal oil, seal/walrus meat, and wild birds) were calculated and compared with the respondents' reports at baseline. McNemar's test was used to determine significant changes

in the consumption of each food. The percentages of respondents mentioning consumption of  $\geq 1$ ,  $\geq 7$ , and  $\geq 10$  of 27 traditional foods were also calculated and McNemar's test was used to determine significant changes in traditional food consumption between baseline and follow-up. Finally, the mean number of the 27 traditional foods mentioned by respondents at baseline was compared with the mean at follow-up. A paired *t* test was used to test for significant change. Analyses were stratified by age (18–39, 40–59,  $\geq 60$  y) and sex, based on age at baseline.

The proportion of respondents who reported traditional harvesting activities was also assessed. Percentages of respondents participating in the original cohort were compared with those at follow-up using McNemar's test. The proportions of participants reporting consumption of traditional foods and participation in harvesting activities at baseline and follow-up were compared among men and women and between age groups. Chi-square tests were used to determine whether differences were statistically significant. All analyses were conducted using SAS 9.4

**TABLE 1** Comparison of participant characteristics of the southcentral Alaska Education and Research Towards Health study baseline and follow-up cohorts

	Baseline cohort <i>n</i> (%)	Follow-up cohort <i>n</i> (%)	<i>P</i> value <sup>1</sup>
All participants	1320 (100)	388 (29.4)	
Sex			
Female	878 (66.5)	280 (72.2)	0.005
Age, y			
18–39	647 (49.0)	177 (45.6)	0.2033
40–59	593 (44.9)	189 (48.7)	
≥60	80 (6.1)	22 (5.7)	
Household size <sup>2</sup> (mean ± SD)	3.5 (2.2)	3.4 (2.1)	0.225
Education level			
Greater than high school	712 (53.9)	253 (65.2)	<0.0001
Employment status			
Currently employed or self-employed	618 (46.8)	213 (54.9)	0.0001
Annual income			
>\$15,000 <sup>3</sup>	758 (64.6)	273 (74.8)	<0.0001
Length of time in residence, y			
>5 <sup>4</sup>	514 (39.6)	150 (39.3)	0.86
Marital status			
Married/living as married	511 (38.7)	178 (45.9)	0.0006
Language spoken at home			
English <sup>5</sup>	1058 (80.3)	332 (85.8)	0.009
Self-reported health status			
Excellent/very good/good <sup>6</sup>	1015 (77.0)	322 (83.2)	0.0005

<sup>1</sup>Chi-square *P* value for differences in proportions between southcentral cohort respondents followed up and those unable to be followed up.

<sup>2</sup>Missing household size values for 10 baseline and 1 follow-up participants.

<sup>3</sup>Missing income values for 147 baseline and 23 follow-up participants.

<sup>4</sup>Missing residence values for 23 baseline and 6 follow-up participants.

<sup>5</sup>Missing language value for 2 baseline and 1 follow-up participants.

<sup>6</sup>Missing health status value for 1 baseline and 1 follow-up participant.

(SAS Institute, Cary, NC); *P* values ≤0.05 were considered statistically significant. All analyses used predeclared primary endpoints and no post hoc or exploratory analyses were conducted.

## Results

### Demographic characteristics

Demographic characteristics for the southcentral Alaska EARTH study original cohort (*n* = 1320) and follow-up participants (*n* = 388, 29.4% of the original cohort) are shown in [Table 1](#). Women predominated in the follow-up cohort (72%). Over half (55%) of follow-up participants were employed and 75% reported household incomes >\$15,000/y. The majority (65%) had a high school education or higher. About 46% were currently married or living as married, and ~14% spoke their AN/AI language at home. More than 83% believed their health to be good to excellent. Statistically significant demographic differences between the baseline and the follow-up cohorts included a larger proportion of women, higher educational attainment, a larger proportion married, currently employed, with income >\$15,000, and speaking English at home in the follow-up cohort than in the baseline cohort (29).

### Traditional food use

[Table 2](#) shows the top 10 traditional foods reported in the EARTH follow-up study (*n* = 385). Self-reported traditional foods consumed by the same individuals are compared at both time points (baseline

and follow-up). Fish was the most frequently reported traditional food (75%), followed by moose (42%), shellfish (41%), gathered berries (39%), and caribou (27%). Among follow-up participants, women were more likely than men to report eating shellfish, gathered berries, fish, and seal oil (*P* < 0.05). Older participants (age ≥60 y) were more likely to report eating fish and shellfish than were the other 2 age groups, whereas those aged 40–59 y were the most likely of the 3 age groups to report eating seal oil (*P* < 0.05). Of the total follow-up study population, 93% reported eating ≥1 traditional food in the past year, 31% reported eating ≥7 different foods, and 16% reported eating ≥10 foods.

At the original southcentral region baseline, the top 3 foods reported were fish, shellfish, and gathered berries. At follow-up, the top 3 foods were fish, moose, and shellfish ([Table 2](#)). There was an overall significant decline between baseline and follow-up in the consumption of seal or walrus (23% compared with 10%, *P* < 0.001) but a significant increase in the reported consumption of moose meat (36% compared with 42%, *P* = 0.02). There was no statistically significant change in the consumption of the other traditional foods reported. There was also a significant decline in the mean number of traditional food sources eaten from 6.3 to 5.5 (*P* < 0.001), as well as a reduction in the consumption of multiple traditional foods, with fewer participants reporting eating ≥7 traditional foods (31% compared with 41%, *P* < 0.001) or ≥10 traditional foods (16% compared with 23%, *P* = 0.001) at follow-up than at baseline. This trend held for both men and women and there were no significant differences across age groups.

**TABLE 2** Top 10 traditional foods reported consumed by southcentral Alaska Education and Research Towards Health study participants in the past year at baseline and follow-up by sex and age<sup>1</sup>

	All (n = 382)			Men (n = 105)			Women (n = 277)			18-39 y (n = 176)			40-59 y (n = 185)			≥60 y (n = 21)													
	Baseline		Follow-up	Baseline		Follow-up	Baseline		Follow-up	Baseline		Follow-up	Baseline		Follow-up	Baseline		Follow-up											
	n	%	n	n	%	P value	n	%	n	%	P value	n	%	n	%	n	%	n	%	P value									
Fish <sup>†</sup>	284	74	286	75	77	71	70	67	209	75	216	78	122	69	126	71	146	77	139	74	18	86	21	100					
Moose	138	36	160	42	41	38	40	38	97	35	120	43	55	31	68	38	0.052	76	40	84	44	7	33	8	38				
Agutaq	80	21	70	18	24	22	20	19	56	20	50	18	34	19	31	18		42	22	36	19	4	19	3	14				
Gathered berries	149	39	150	39	33	31	27	26	116	42	123	44	63	36	65	37		78	41	79	42	8	38	6	29				
Herring eggs	90	24	85	22	24	22	21	20	66	24	63	23	33	19	32	18		52	28	46	24	5	24	7	33				
Shellfish	173	45	158	41	42	39	34	32	131	47	124	45	77	44	73	41		84	44	69	37	0.052	12	57	16	76			
Caribou	109	29	104	27	32	30	24	23	77	28	80	29	42	24	38	21		61	32	60	32	6	29	6	29				
Seal oil	69	18	65	17	18	17	11	10	51	18	54	19	25	14	21	12		40	21	42	22	4	19	2	10				
Wild birds	56	15	43	11	18	17	12	11	38	14	31	11	24	14	21	12		31	16	21	11	0.059	1	5	1	5			
Seal or walrus	89	23	39	10	23	21	9	9	0.001*	66	24	30	11	<0.001*	34	19	14	8	0.003*	52	28	25	13	<0.001*	3	14	0	0	
Consumption of multiple traditional foods																													
≥1 foods	347	91	357	93	91	87	95	90	0.240	256	92	262	95	0.240	154	88	159	90	0.275	172	93	177	96	0.225	21	100	21	100	
≥7 foods	157	41	119	31	0.0002*	37	35	26	25	0.020*	120	43	93	34	0.002*	60	34	50	28	0.123	88	48	63	34	0.0007	9	43	6	29
≥10 foods	89	23	61	16	0.001*	24	23	14	13	0.020*	65	23	47	17	0.016*	35	20	27	15	0.182	49	26	31	17	0.002	5	24	3	14

Mean ± SD traditional foods eaten 6.3 ± 5.1 5.5 ± 4.4 <0.001\* 5.9 ± 5.2 4.7 ± 4.4 0.005\* 6.5 ± 5.0 5.8 ± 4.4 0.002\* 5.6 ± 4.6 5.1 ± 4.2 0.100 7.1 ± 5.5 5.9 ± 4.7 0.0001\* 6.5 ± 3.8 5.3 ± 3.2 0.071

<sup>†</sup>Fish includes smoked or dried fish (any kind), salmon/hooligan/herring, other fish like halibut or char, canned or jarred salmon, and fish soup. Follow-up sex comparisons: women were more likely than men to consume fish (P = 0.023), gathered berries (P = 0.0008), shellfish (P = 0.03), and seal oil (P = 0.04). Follow-up age group comparisons: participants aged ≥60 y were more likely to consume fish (P = 0.018) and shellfish (P = 0.003), whereas those aged 40-59 y were most likely to consume seal oil (P = 0.02). \*P < 0.05.

## Traditional harvesting activities

**Table 3** shows the number (percentage) of follow-up participants reporting traditional harvesting activities ( $n = 376$ ). The top harvesting activities were picking berries or greens (44%), cutting and smoking fish or meat (33%), and fishing (30%). Women reported significantly greater levels of participation than men in picking berries or gathering greens, whereas men were more likely to report game and marine mammal hunting ( $P < 0.05$ ). This was consistent with findings from the original cohort study sample. There was no significant difference between age groups in participation in traditional harvesting activities. Of the total follow-up study population, 59% reported participating in  $\geq 1$  harvesting activity in the past year, 37% reported participating in  $\geq 2$  harvesting activities, and 19% reported participating in  $\geq 3$  harvesting activities. Although a slight increase in the proportion of respondents reporting participation in multiple traditional activities was noted, it was not statistically significant ( $P > 0.05$ ). We observed a significant increase in participation in picking berries or greens (44% compared with 37%,  $P < 0.001$ ) and cutting/smoking fish or meat (33% compared with 27%,  $P < 0.05$ ). These increases were primarily driven by increases in reported harvesting activities among women and younger age groups. There was no statistically significant change in participation in fishing (except for an increase among those aged  $\geq 60$  y), game hunting, tanning hides, marine mammal hunting, or trapping during the decade between the baseline and follow-up cohorts.

## Discussion

A number of studies have noted a decline in traditional food use among AN people since the 1950s (2, 4, 8, 14, 15), but no studies to date, to our knowledge, have examined time trends in a longitudinal cohort of AN people. Furthermore, traditional harvesting activity patterns over time have been understudied in this population. This study demonstrates changing patterns of traditional food use and harvesting activity among AN people over a 10-y period. The study found that participants maintained involvement in traditional harvesting activities, with a significant increase in picking berries or greens and cutting/smoking fish and meat. In contrast, there was a significant decline in the consumption of multiple traditional foods among both men and women. There were also differences in the types of traditional foods consumed reported by the southcentral cohort over the follow-up period, including an increase in the consumption of moose and a decline in the consumption of seal or walrus.

Several factors might be involved in the changes observed, including social influences, such as sharing food among families or within communities and teaching traditional food harvest and preparation skills to younger generations, or environmental influences (18, 39, 40). These might be important factors that contribute to the decline in traditional food use reported at follow-up. The high cost and amount of time needed for hunting, harvesting, and processing traditional food may also play a role. Additional factors are changing patterns in the abundance of game over the 10 y of follow-up, as well as state and federal regulations governing use of subsistence foods, which may restrict access to traditional harvest locations or species (41). A further possible determinant is that the effects of climate change in the Arctic, including the appearance of new disease species, increasing water temperatures,

**TABLE 3** Number and percentage of southcentral Alaska Education and Research Towards Health study participants reporting traditional harvesting activities at baseline and follow-up by sex and age<sup>1</sup>

	All ( $n = 376$ )			Men ( $n = 102$ )			Women ( $n = 274$ )			18–39 y ( $n = 173$ )			40–59 y ( $n = 182$ )			$\geq 60$ y ( $n = 21$ )			P value																				
	Baseline n	%	Follow-up n	Baseline n	%	Follow-up n	Baseline n	%	Follow-up n	Baseline n	%	Follow-up n	Baseline n	%	Follow-up n	Baseline n	%	Follow-up n																					
Picking berries or greens	139	37	167	44	0.008*	23	32	31	0.083	116	42	135	49	0.039*	58	34	72	42	0.066	70	38	89	49	0.004*	11	52	6	29	0.132										
Cutting/smoking fish/meat	103	27	124	33	0.040*	30	29	28	0.835	73	27	95	35	0.013*	35	20	52	30	0.008*	62	34	66	36	0.579	6	29	6	29	1.000										
Fishing	120	32	114	30	0.581	42	41	30	0.093	78	28	83	30	0.564	49	28	54	31	0.500	68	37	53	29	0.050*	3	14	7	33	0.046*										
Game hunting	37	10	38	10	0.869	19	19	20	0.782	18	7	18	7	1.000	14	8	18	10	0.394	22	12	20	11	0.593	1	5	0	0	0										
Tanning hides	6	2	7	2	0.760	1	1	0	0.655	5	2	7	3	0.527	2	1	3	2	0.655	4	2	4	2	1.000	0	0	0	0	0										
Marine mammal hunting	5	1	3	1	0.410	4	4	3	0.655	1	0	0	0	0.527	2	1	0	0	0.655	3	2	3	2	1.000	0	0	0	0	0										
Trapping	1	0.3	1	0.3	0	0	1	1	0.655	1	0	0	0	0.527	2	1	1	1	1.000	3	2	3	2	1.000	0	0	0	0	0										
Participation in multiple traditional activities	202	54	222	59	0.06	50	49	55	0.369	152	55	167	61	0.099	87	50	104	60	0.027*	103	57	108	59	0.466	12	57	10	48	0.479										
$\geq 1$ activity	125	33	139	37	0.17	36	35	33	0.590	89	32	106	39	0.047*	49	28	59	34	0.157	68	37	73	40	0.466	8	38	7	33	0.706										
$\geq 2$ activities	66	18	72	19	0.47	22	22	19	0.467	44	16	53	19	0.216	22	13	29	17	0.237	42	23	41	23	0.858	2	10	2	10	1.000										
Mean $\pm$ SD traditional activities	1.1 $\pm$ 1.3			1.2 $\pm$ 1.3			1.0 $\pm$ 1.3			1.2 $\pm$ 1.4			1.2 $\pm$ 1.2			0.95 $\pm$ 1.2			1.2 $\pm$ 1.2			1.3 $\pm$ 1.4			1.3 $\pm$ 1.3			0.800			1.1 $\pm$ 1.2			0.9 $\pm$ 1.1			0.529		

<sup>1</sup>Follow-up sex comparisons: women were more likely than men to pick berries or greens ( $P = 0.002$ ), whereas men were more likely to hunt game ( $P = 0.0002$ ) and marine mammals ( $P = 0.0195$ ). \*  $P < 0.05$ .

and decreased sea ice, all affect available species traditionally eaten by AN people, including potentially reducing harvesting success (42–49).

This study has significant strengths. It is the only longitudinal source of data on traditional food use and harvesting activities in this population, to our knowledge. Its maintenance of ascertainment methods provides confidence in the observed changes. These findings have important implications for AN health because traditional foods are nutrient dense and tend to be significantly healthier than alternative commercially available foods (7, 50). Intervention programs are needed that can promote diet quality and physical activity among AN people (51).

This study has several limitations. Only 29% of the original southcentral study participants completed the 10-y study follow-up. Follow-up study participants were of similar age but more likely to be female, educated, employed, and have a higher income than nonrespondents, which may be a threat to the internal validity of estimates derived from this study (52, 53). For example, people who are working may have less time to prepare traditional foods for consumption, or more disposable income to purchase foods or eat away from the home. In addition, only participants from the southcentral region were rerecruited for the follow-up cohort, so results reported here may not be generalizable to the entire Alaska EARTH study population, nor the AN population as a whole. In addition, data were collected by self-report, which is prone to previously noted random and systematic errors (54, 55). Finally, the current report does not include quantification of the amounts of traditional foods eaten.

In conclusion, traditional harvesting activities and foods in Alaska continue to be an important component of AN/AI food intake and physical activity, which speaks to the resilience of AN people. However, during the 10-y follow-up period the mean number and the variety of traditional foods consumed by participants declined. Promotion of and increased support for traditional food harvest and consumption may help maintain the health benefits associated with traditional food use and reduce the risk of chronic diseases among AN people.

## Acknowledgments

We acknowledge the contributions and support of the Alaska Native Tribal Health Consortium Board of Directors and the Southcentral Foundation Board of Directors. The authors' responsibilities were as follows—KRK and VYH: designed the research; VYH and JAB: conducted the research; GMD: analyzed the data and performed the statistical analysis; DGR and GMD: wrote the paper; SHN: contributed editorial content; DGR: had primary responsibility for the final content; and all authors: contributed additional comments and edits and read and approved the final manuscript. The authors report no conflicts of interest.

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