between the private and public health care sectors are necessary to ensure that measles does not become the health threat that it once was.

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A Health Survey of Klamath Indian Elders 30 Years After the Loss of Tribal Status

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Synopsis

Federal recognition of the tribal status of the Klamath Indians of Oregon was terminated by Congress in 1954, along with all health, education, and welfare services. In the winter and spring of 1985 a health status and health care needs assessment was conducted among 202 Klamath Indians ages 40 years and older with the use of a shortened version of the Older Americans Resources and Services (OARS) instrument. Twenty percent of the Klamaths surveyed reported having diabetes, and more than 30 percent reported having arthritis, rheumatism, or hypertension, or having had their gallbladder removed.

The data were compared with those of national surveys of Indian and non-Indian elders that also used the OARS instrument. Even though the Klamaths surveyed were younger than the comparison groups, their health status was no better than that of other Indians and was worse than that of the non-Indian population. Moreover, among these Klamath adults, health insurance coverage was lower, and perceived unmet needs for medical care were higher than in either of the comparison groups.

SOURCES OF DATA about the economic, social, and physical well-being of older American Indians and Alaska Natives are few. Valuable information on morbidity is available from Indian Health Service (IHS) data on ambulatory and hospital care utilization in its service population. Records of outpatient visits document the increasing prominence of chronic diseases in the health profile of Indian and Alaska Native adults; diabetes and hypertension are the second and fourth leading diagnoses in visits to IHS clinics (*1*). These clinic data, however, do not reflect the health status and health care needs of Indians who do not live on or near a reservation—approximately 40 percent of the Indian population—or who otherwise do not have access to IHS facilities. Mortality data on all

U.S. Indians are compiled by the National Center for Health Statistics and provide information on leading causes of death. For Indian and Alaska Native adults ages 45 and older, these are heart and vascular diseases, malignant neoplasms, accidents, cirrhosis of the liver, and influenza and pneumonia (*2*).

The only nationwide survey to document the general well-being of older Indian people was conducted by the National Indian Council on Aging (NICOA) in 1980 (*3*). That study used the Older American Resources and Services (OARS) instrument (*4*) developed by the Duke University Center for the Study of Aging and Human Development to examine economic and social resources, physical and mental health, capacity to perform activities of daily living, housing conditions, and need for and use of services. An advantage of this instrument was that it had been used by the Government Accounting Office (GAO) in a study of more than 1,800 noninstitutionalized elderly persons in Cleveland, OH, most of whom were 65 years of age or older (*5*). That survey provided an elderly, non-Indian population, deemed by the GAO to adequately represent the total United States, with which Indian and Alaska Native elders could be compared along similar dimensions.

Of the approximately 700 Indian elders ages 45 years and older interviewed in the NICOA study, three-fourths were drawn from reservations and rural Alaska communities, and one-fourth were drawn from 6 urban centers across the country. Major findings of the NICOA study were (*a*) for virtually every condition that was compared, rural Indians and Alaska Natives ages 60 years and older were worse off than urban Indians and Alaska Natives of the same age, and (*b*) the condition of rural Indians ages 45 years and older and all Indians ages 55 years and older was comparable to that of the older, non-Indian Cleveland sample. That is, the health status of younger Indians was comparable to that of much older non-Indians.

The survey of Oregon Klamath Indian elders reported in this study was designed to document their current health status and health care needs and provide an information base for health planning. In 1954 Federal recognition of the Klamath Tribe was terminated by an act of Congress, along with all health, education, and welfare services. The tribal government was disbanded and the timber-rich reservation land was turned over to the National Forest Service. Tribal members were given the choice of placing their monetary compensation for loss of their reservation lands into a trust or taking their share in cash. Those who placed their money in trust found that the legal and management fees of the trustees consumed much of their settlement. Those who chose to take cash received no financial or investment counseling.

For a number of years the Klamath Tribe has sought restoration of Federal recognition of their tribal status. In August 1986, Congress passed a bill that reinstated Federal recognition of the Klamath Tribe. This recognition makes the tribe eligible to receive medical care through the IHS and to apply for Federal assistance and grants to meet education, housing, and economic development needs.

Method

Study population. The survey was administered to Klamath men and women ages 40 years and older living in the area of the former reservation in south central Oregon and in the cities of western and central Oregon (Portland-Vancouver, Salem, Eugene, Medford, Bend, Klamath Falls). A list of Klamaths ages 40 and older who were thought to be alive was constructed from the 1954 tribal rolls, which yielded the names of 769 persons. However, because the location of the majority of these people was unknown, no attempt was made to draw a random sample of people to be interviewed. Instead, we tried to interview all Klamaths we could contact in the study areas in Oregon. Klamaths from other areas of Oregon and from out of State were interviewed at tribal restoration meetings held around the State.

Less than 5 percent of Klamaths who were contacted refused to participate. The greatest problem was locating people who moved often or did not have a telephone. A few people who resided in nursing homes or suffered from serious illnesses were not interviewed. Estimated proportions of eligible persons who were interviewed ranged from 55 percent in the former reservation area and the nearby city of Klamath Falls, to 70 percent and 76 percent in the Salem and Portland areas, respectively. In all, 202 Klamaths were interviewed—26 percent of the estimated total population of 769 persons ages 40 years and older. Forty-one percent of those interviewed lived in the rural former reservation area, 15 percent lived in Klamath Falls,

Table 1. Klamath Indians who responded to the survey, by age, gender, and location (area of former reservation versus elsewhere in Oregon and out of State)

Age group (years)	Men in former reservation area		Men elsewhere		Women in former reservation area		Women elsewhere		All respondents	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
40–44	4	12	18	35	6	12	21	30	49	24
45–54	16	48	21	41	19	39	26	38	82	41
55–64	10	30	8	16	10	20	15	22	43	21
65 and older	3	9	4	8	14	29	7	10	28	14
Total	33	16	51	25	49	24	69	34	202	100

32 percent lived in the cities of Portland, Salem, and Eugene, and 12 percent lived in other locations in Oregon or out of State.

Instrument. Because of time and resource limitations, a shortened version of the OARS instrument was used. The sections on physical health, illness, and use of medication were included almost in their entirety. The only parts of the social and economic resources questions that were included were living arrangements, employment status, and health insurance coverage. Likewise, only a few questions from the utilization of services section were incorporated. At the same time, questions were added to inquire about conditions that were expected to be particular problems among the Klamaths—diabetes, gallbladder disease, obesity, and dental health.

Data collection and analysis. The interviews were conducted between February and May 1985 by two Klamath tribal members who were trained in interviewing techniques and data recording. Most interviews were held in respondents' homes, although some were conducted in work places or by telephone. The few instances of incomplete or conflicting responses were resolved by recontacting the respondent. Data were coded on the interview schedule, punched to cards, and analyzed with the use of frequencies, cross-tabulations, and analysis of variance.

Comparisons of health status and health care needs with data from the NICOA and Cleveland surveys were restricted to Klamath respondents ages 45 years and older. Nevertheless, the Klamath sample was younger than either the NICOA or Cleveland samples. Fifty-four percent of the NICOA respondents were ages 60 years and older versus only 29 percent of Klamath respondents, and 42 percent of the NICOA sample was 65 years and older versus only 14 percent of the Klamath sample. As mentioned earlier, the Cleveland survey consisted mostly (88 percent) of persons ages 65 years and older. Comparisons with national survey data also were made where possible.

Results

Respondents' characteristics. The age group, gender, and place of residence of the survey respondents are shown in table 1. Almost 60 percent of the respondents were women, and two-thirds of the respondents were between the ages of 45 and 64 years. Forty-one percent of respondents lived in the rural area that had been the reservation, and they were more likely to be older than respondents who lived elsewhere.

Social and economic resources. Unemployment was high among nonretired, nondisabled Klamath men and women in the former reservation area and elsewhere. Among the women in the former reservation area and elsewhere and the men in the former reservation area, one-third were unemployed and looking for work, as were 24 percent of men who lived elsewhere. Only 41 percent of Klamath men in the former reservation area and 44 percent of Klamath men elsewhere were employed full time. The majority of Klamath respondents had transportation available whenever they wanted or needed it, but about 10 percent had to make special arrangements for transportation, and another 10 percent had transportation only in emergencies or not at all. Although only 71 percent of Klamaths ages 65 years and older had transportation whenever they wanted or needed it, the remainder were able to make special arrangements, and none reported having no transportation at all. Access to a telephone was a greater problem. More than half (56 percent) of the Klamaths in the former reservation area and 35 percent of the Klamaths elsewhere did not have a

Table 2. Percent of respondents reporting insurance, health care needs, and medical conditions in the Klamath Indian, National Indian Council on Aging (NICOA), and Cleveland surveys

Category	Klamath respondents ages 45 and older	NICOA respondents ages 45 and older	Klamath respondents ages 60 and older	NICOA respondents ages 60 and older	Cleveland respondents
Medical insurance, care					
Have health, medical insurance	48.0	61.4	61.0	67.2	98.1
Need medical care	37.0	25.0	30.0	25.4	10.9
Medical conditions					
Arthritis, rheumatism	39.0	46.2	43.0	56.6	55.5
Taking medication	14.6	28.1	11.4	34.8	21.3
Heart trouble	11.0	18.5	18.0	24.0	23.3
Taking nitroglycerine	5.3	7.5	2.3	8.9	6.2
Taking digitalis	1.3	9.0	2.3	11.7	14.6
Eyesight:					
Excellent	10.0	7.6	7.0	5.0	9.0
Good	47.0	37.3	39.0	32.1	50.7
Fair	32.0	31.9	43.0	34.6	26.0
Poor	11.0	21.7	11.0	26.3	13.5
Emphysema, chronic bronchitis	9.0	6.2	11.0	7.2	5.5
High blood pressure	31.0	27.7	43.0	33.1	33.2
Taking blood pressure medicine	22.9	25.6	34.1	31.2	29.4
Taking water or salt pills	6.5	14.2	15.9	17.7	20.4
Circulation problems	24.0	23.5	32.0	29.3	28.5
Taking anticoagulants	3.3	5.4	4.5	7.8	2.7
Taking other circulation medicines	1.3	7.9	2.3	11.7	8.0
Ulcers	5.0	5.4	0.0	4.5	4.3
Taking medicine for ulcers	2.0	3.7	NA	3.9	2.6
Stomach, intestinal, or gallbladder problems	10.0	9.2	13.6	10.9	6.3
Liver problems	7.0	2.1	9.0	2.0	0.7
Kidney problems	7.0	9.6	9.0	10.3	2.4
Diabetes	15.0	16.3	20.0	21.6	8.8
Taking insulin	3.4	7.0	4.5	8.0	2.1
Taking oral hypoglycemics	6.5	8.8	6.8	12.2	5.1
Thyroid problems	6.0	4.5	4.5	4.7	2.0
Taking thyroid medicine	4.6	3.0	4.5	1.9	2.1
Physical disability	10.0	10.0	10.0	9.7	7.1

NOTE: NA = not applicable.

telephone in their home. Some people had access to a neighbor's phone or could make arrangements for messages, but almost 25 percent were without any access to a telephone. Nationwide, less than 10 percent of homes in the total U.S. population and about 30 percent of Indian homes are without a telephone (*6*). Finally, living arrangements varied substantially by gender and age. Men were more likely than women to live alone (17 percent versus 7 percent) in the less than 65 years age group. Among those 65 and older, 29 percent of men and 33 percent of women lived alone.

Health care needs. Fewer Klamaths ages 45 years and older had health or medical insurance compared with the subjects in the NICOA survey (table 2). Compared with national estimates, 59 percent of Klamaths ages 45–64 years had no medical insurance versus less than 15 percent of the total U.S. population in this age group (*7,8*). Among Klamaths ages 65 years and older, 33 percent of women and 14 percent of men had no insurance coverage, whereas only 1–2 percent of the U.S. population in this age group had no insurance.

More Klamaths ages 45 years and older (37 percent) also felt they needed medical care or treatment beyond what they were receiving than was reported by either the NICOA (25 percent) or Cleveland (11 percent) samples. The difference between the Klamath and NICOA samples in perceived need for care was greater in the 45 years and older (37 percent versus 25 percent) than the 60 and older (30 percent versus 25 percent) age groups, probably because of the availability of Medicare in the older age group. Perceived unmet need for medical care was strongly associated with the lack of medical insurance: only 19 percent of the Klamaths with insurance said they needed medical care beyond what they were receiving,

Table 3. Percent of respondents reporting use of medical services, days sick, and self-rated health status

Variables	Klamath respondents ages 45 and older	NICOA respondents ages 45 and older	Klamath respondents ages 60 and older	NICOA respondents ages 60 and older	Cleveland respondents
Visits to physician in previous 6 months					
0	47.0	31.3	41.0	27.2	28.0
1–2	26.0	33.2	29.0	32.1	32.0
3–4	11.0	14.5	14.0	16.0	17.0
5 or more	16.0	21.0	16.0	24.7	23.0
Days in hospital previous 6 months					
0	89.0	81.7	86.0	78.3	87.0
1–7	7.0	10.3	7.0	11.9	5.0
8 or more	4.0	8.0	7.0	9.8	8.0
Days sick in previous 6 months					
0	61.0	53.8	68.2	52.4	71.8
1–7	16.0	24.0	2.3	20.4	10.7
less than 1 month	13.0	12.9	18.2	16.1	8.2
1–6 months	10.0	9.4	11.4	11.0	6.8
Overall health status (self-rated)					
Excellent	16.0	7.0	16.0	5.0	11.0
Good	51.0	41.3	41.0	37.6	45.8
Fair	28.0	39.6	36.0	43.4	36.0
Poor	5.0	12.1	7.0	14.1	7.3

versus 49 percent of Klamaths without insurance (chi-square (df 1) = 19.5, $P < .01$). Thirty percent of Klamaths in both age groups reported that in the 6 months before the interview there had been at least one time when they needed to see a physician but did not. Worry about cost was cited by two-thirds of respondents as a reason for not going to the physician. Among Klamaths ages 60 years and older, frequently cited reasons were bad weather (24 percent), no transportation (19 percent), and that they attributed their ailments to old age (19 percent).

Health problems and medical conditions. Given the younger age of the Klamaths surveyed, one would expect them to report fewer health problems and better health status compared with the NICOA or Cleveland samples. Table 2 shows that some conditions (arthritis and rheumatism, heart trouble, and problems with eyesight) were reported with lower frequency by the Klamaths. However, contrary to expectation, the majority of problems were reported with similar frequency by Klamath and NICOA respondents in both the 45 years and older and 60 years and older age groups. The prevalence of reported medical conditions among Klamath and NICOA respondents also was similar to Cleveland respondents for the most part, even though the Cleveland respondents were older. A few conditions were reported more often by both of the Indian samples than the Cleveland sample, including stomach, intestinal and gallbladder, liver, and kidney problems, and diabetes. Finally, a consistent pattern is that, for most conditions where medication might be indicated, a smaller proportion of Klamaths with the problem reported taking medication. This is especially apparent for arthritis and rheumatism, heart trouble, high blood pressure, and diabetes.

Sick days, health status, and utilization. Despite the similar frequency of reported medical conditions, Klamath repondents reported fewer visits to physicians and days of hospitalization than the NICOA sample (table 3). More Klamaths reported 0 days sick and fewer reported 1 to 7 days sick. However, the same proportions in both samples reported more than 7 days sick. Self-ratings of health by the Klamaths indicated better heath than the self-ratings of respondents in the NICOA sample in both age groups and were similar to those of the Cleveland sample. However, the Klamaths rated themselves as being in worse health than the respondents to the 1985 National Health Interview Survey (NHIS) (*9*) of the U.S. population, in which only 32 percent of respondents ages 65 years and older rated their health as fair or poor, compared with 43 percent of Klamaths ages 60 years and older.

Mental health. The reported frequency of drinking problems was similar for the Klamath and NICOA respondents ages 45 years and older, and was higher than that of Cleveland respondents (table

Table 4. Percent of respondents reporting mental health problems

Kind of problem or treatment	Ages 45 and older		Ages 60 and older		
	Klamath	NICOA	Klamath	NICOA	Cleveland
Drinking problem	5.0	6.3	0.0	5.9	1.6
Treatment for personal or emotional problems	5.0	5.9	4.5	6.2	2.1
Prescription medicine for nerves, depression	5.0	10.1	4.5	10.3	19.5
Tranquilizers	1.3	6.7	0.0	6.4	17.1
Sleeping pills	0.7	4.3	0.0	4.7	6.3

4). In contrast to the NICOA respondents, no Klamaths ages 60 years and older reported having a problem with drinking. Frequency of treatment or counseling for personal or emotional problems also was similar for the Klamath and NICOA respondents in both age groups and was somewhat higher than that reported by the Cleveland respondents. However, the reported frequency of use of prescription medicine for nerves or depression, tranquilizers, and sleeping pills was substantially lower among the Klamaths in both age groups than that reported by the NICOA or Cleveland samples.

Dental health. Dental health information was compared with NHIS data (*10*). Table 5 shows that the frequency of visits to a dentist declines with age among both the Klamath and U.S. populations, but that Klamaths were much less likely to have gone to a dentist in the previous year. The frequency of edentulism increased with age in both surveys, but rates were much higher among the Klamaths. More than two-thirds of Klamaths ages 45 years and older had full or partial dentures. Furthermore, half of Klamath respondents who had dentures reported they needed to be refitted or replaced, and 10 percent of respondents did not have dentures but thought they needed them. Despite the apparent frequency of problems with their dentures, Klamath respondents who had dentures were much less likely to have visited a dentist in the previous 4 years.

Obesity. Self-reported weight and height were used to estimate the prevalence of obesity among respondents and its association with other conditions. Klamath women were, on average, heavier than men (table 6). Klamath men were slightly heavier compared with men in the National Health and Nutrition Examination Survey (NHANES) sample of the U.S. population, and Klamath women were much heavier (*11*). Obesity also was associated with the prevalence of some medical

Table 5. Percent reporting dental visits and dentures, Klamath Indians and the U.S. population

Category	Ages 40–45	Ages 45–64		Ages 65 and over	
	Klamath	Klamath	U.S.[1]	Klamath	U.S.[1]
Last dental visit:					
Within previous year	40	21	49	3	33
2–3 years ago	32	33	...	18	...
4 or more years ago	28	46	...	79	...
Have full dentures or edentulous[2]	27	55	23	79	51
Have full or partial dentures	53	70	...	86	...

[1]Reference *10*.
[2]Klamath respondents were asked about having dentures, not about edentulism per se.
NOTE: ... means the data were not collected in NHIS.

conditions and self-ratings of health status. Respondents with diabetes and respondents whose gallbladders had been removed were heavier than the other respondents. These differences were statistically significant among women, but not among men. Self-rating of health was significantly negatively associated with the body mass index among men (F (df 2,80) = 3.85, $P < .03$), but not among women.

Gender differences. Women were more likely than men to report arthritis or rheumatism (43.2 percent versus 23.8 percent), gallbladder removal (33.1 percent versus 6.0 percent), kidney problems (11.0 percent versus 2.4 percent), thyroid problems (9.3 percent versus 0.0 percent), diabetes (16.1 percent versus 9.8 percent), high blood pressure (31.4 percent versus 23.8 percent), and dentures (75.2 percent versus 53.6 percent). No men of any age rated their health as poor, and men were more likely than women to report excellent or good health (77.3 percent versus 61.9 percent). More men than women smoked (47.6 percent versus 33.1 percent) in every age group but 65 years and older, in which only 14 percent of men and women

Table 6. Mean body mass index (BMI) for the Klamath Indians and the U.S. population

Age (years)	Number	Mean BMI	SD
	Klamath men		
40–44	22	27.99	3.25
45–54	37	29.96	6.40
55–64	18	26.38	3.60
65 and older	7	28.14	5.10
	Klamath women		
40–44	27	30.72	6.68
45–54	44	32.10	6.67
55–64	25	31.06	5.76
65 and older	20	29.14	6.43
	U.S. men (NHANES II sample)[1]		
40–49	. . .	26.40	3.93
50–62	. . .	26.20	3.91
	U.S. women (NHANES II sample)[1]		
40–49	. . .	25.70	6.07
50–62	. . .	26.50	5.56

[1]Reference *11*.
NOTE: SD = standard deviation; NHANES II = National Health and Nutrition Examination Survey, 1976–80; . . . means not reported.

smoked. The highest frequency of smoking (63.6 percent) was reported by men ages 40–44 years. Smokeless tobacco use was reported by 6.0 percent of men, and only by those less than 65 years.

Discussion

A modified version of the OARS instrument was administered to 202 Klamath Indians ages 40 years and older. The manner by which subjects were included in the survey probably led to a conservative estimate of health care needs and morbidity among the Klamaths in Oregon. For the most part, those who were not interviewed did not have telephones, moved frequently, or were preoccupied with family or health crises at the time of the survey. Had they been included in the sample, the estimates of unmet health care needs and poor health status might have been higher.

As in other Indian populations, unemployment was high and many respondents had problems with access to transportation and a telephone. Approximately one-third of men and women ages 65 years and older lived alone. This finding contradicts the stereotype that ethnic elders uniformly reside with their families, but it is in accord with another survey that found that Indian elders prefer to live independently (*12*). However, Indian elders who live alone have been found to have greater service needs and lower awareness of available services (*13*).

Klamath elders had substantial unmet health care needs, even in the age group 65 years and older. Many men, and even more women, in this older age group found that their employment history did not qualify them for Medicare, but they were not sufficiently destitute to qualify for Medicaid. Perceived need for additional medical care was strongly associated with lack of medical insurance, and cost was the most often cited reason for not going to a physician when needed.

Even though Klamath respondents were younger than the Indian and non-Indian comparison groups, the majority of conditions were reported with equal rather than lower frequency. Nevertheless, Klamath older adults were consistently less likely to report taking medication for their conditions, and they reported fewer physician and hospital visits and better self-rated health than the NICOA sample.

These findings are difficult to interpret. Klamaths' self-reported health status may have been better than that of the Cleveland and NICOA respondents because the Klamath respondents were younger, and perhaps their conditions were less severe or disabling and less likely to require medication. Although the lower frequency of physician visits and hospitalizations may reflect fewer Klamaths reporting any days sick, equal proportions in both Indian samples reported 8 or more days sick. Moreover, 30 percent of Klamaths reported they needed to see a physician in the previous 6 months, but they had not gone. It is therefore equally plausible that the greater frequency of visits to physicians and use of medication in the NICOA and Cleveland samples reflects more access to and availability of care—not greater illness burden. The majority of the NICOA sample had access to free medical care from the IHS, and virtually all of the Cleveland sample had medical insurance coverage.

Although the frequency of counseling for personal and emotional problems and perceived need for such help was similar in the Klamath and NICOA surveys, the reported frequency of use of prescription medication for nerves or depression, tranquilizers, and sleeping pills was much lower among the Klamaths than among respondents in the NICOA or Cleveland samples. Again, these observations may be indicative of differences in

the availability of services, help-seeking behavior and expectations, or provider prescribing patterns rather than actual need. In both the NICOA and Cleveland samples, the reported frequency of prescription medication for nerves or depression was higher than the frequency of counseling for personal or emotional problems.

The Klamaths' dental health also was worse than that of the general U.S. population. Recency of last dental visit declined with age, dental visits were less frequent among respondents with dentures, and a large proportion of those with dentures had problems with them. This situation has a number of health implications. The low frequency of dentist visits increases the likelihood that oral lesions and cancers will not be detected, and people who wear full or partial dentures find many foods difficult to eat (*14*).

The high prevalence of obesity, especially among women, may contribute to their reporting a higher frequency of arthritis, diabetes, and gallbladder problems. These findings are consistent with patterns observed in other American Indian populations (*15*). Although men were less likely to be obese and reported better health status, the high prevalence of smoking among men less than 65 years of age compromises their future health outlook.

Summary

Thirty years after their Federal recognition as a tribe was terminated by Congress, the health status of older Klamath Indians is no better than that of other Indians nationwide and is worse than that of the non-Indian population. Furthermore, health insurance coverage is lower, and perceived needs for medical care are higher than among other Indians or the general U.S. population. With the recent restoration of the tribe's Federal recognition, Klamaths are eligible for IHS care. This will alleviate some of the problems of access to medical care, but the IHS will have to cope with the increasing burden of chronic diseases attributable to lifestyles that are apparent among the Klamaths, as in other Indian populations. It is hoped that the determination and resourcefulness marshalled by the Klamaths in their struggle for Federal recognition can be brought to bear on efforts to improve their health status.

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