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Prevalence of chronic diseases: a summary of data from the survey of American Indians and Alaska Natives.

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Agency for Health Care Policy and Research

Center for General Health Services Intramural Research

National Medical Expenditure Survey

**Prevalence of Chronic Diseases:
A Summary of Data From the
Survey of American Indians
and Alaska Natives**

Data Summary 3



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Health Care Policy and Research

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Background

This report from the Division of Medical Expenditure Studies presents results from the 1987 National Medical Expenditure Survey (NMES). The survey provides extensive information on health expenditures by or on behalf of American families and individuals, the financing of these expenditures, and each person's use of services. The National Medical Expenditure Survey is a research project of the Center for General Health Services Intramural Research, Agency for Health Care Policy and Research.

Since the 1970s the intramural research program has given particular emphasis to studies of the use and financing of health services. The first series of studies (NMES I) employed data collected in the 1977 National Medical Care Expenditure Survey. These studies produced information on a broad range of issues such as the number and characteristics of the uninsured and the underinsured, the tax implications of excluding employer-paid premiums for health insurance from employee income, and the differences among socioeconomic and demographic groups with respect to the use of health services.

A new series of studies (NMES II) was initiated in the 1980s. These studies also involve a major data collection effort—the 1987 National Medical Expenditure Survey. Like its predecessor, NMES II provides information about the noninstitutionalized population. In addition and in contrast to the earlier studies, NMES II also provides extensive information on the population residing in or admitted to nursing homes and facilities for the mentally retarded.

The NMES II Household Survey is based on a national probability sample of the civilian, noninstitutionalized population living in the community. The sample is designed to provide a larger representation of population groups of special policy interest to the Federal Government than would have been obtained from a random sample. These groups include poor and low income families, the elderly, the functionally impaired, and black and Hispanic minorities. A Survey of American Indians and Alaska Natives

(SAIAN) includes a separate sample of American Indians and Alaska Natives living on or near Federal reservations and eligible to receive care provided or supported by the Indian Health Service. The Institutional Population Component includes a sample of persons residing in or admitted to nursing and personal care homes and facilities for the mentally retarded during 1987. A separate Medicare Records Component provides claims data on all Medicare beneficiaries included in the household and institutional samples.

Together, the major components of NMES II contain information to make national estimates of health status, use of health services, insurance coverage, expenditures, and sources of payment for the civilian population of the United States during the period from January 1 to December 31, 1987. Oversampling of population groups of special interest makes possible in-depth studies of these groups. The data base can also be used to assess the implications of recent or proposed changes in public or private health care benefits, methods of financing both health care and insurance coverage, various public and private subsidies for health care, and employee compensator arrangements.

Household Survey

Each family in the Household Survey was interviewed four times over a period of 16 months to obtain information about the family's health and health care during calendar year 1987. Baseline data on household composition, employment and insurance were updated at each interview, and information was obtained on illnesses, use of health services, and health expenditures for each family member. A fifth round of interviews was conducted in the spring of 1988 to obtain information on the tax filing status and medical deductions of each household. A long-term care supplement was administered during the first and fourth rounds of interviewing to permit estimates of persons with functional disabilities and their use of formal services or long-term care provided by family or friends.

In order to verify and supplement the information provided by household re

July 1991

AHCPR Pub. No. 91-0031

spondents, the household component of NMES II included two additional surveys. A Medical Provider Survey obtained information from the physicians, hospitals, outpatient clinics, emergency rooms, and home health agencies used by the household sample during 1987. A Health Insurance Plan Survey obtained information on the private insurance of persons in the household sample, including premiums paid by all sources and the provisions of coverage.

Survey of American Indians and Alaska Natives

This survey was conducted with the same data collection instruments and interview procedures as the Household Survey and covered the same reference period — calendar year 1987. SAIAN also included followup surveys to medical providers and health insurers. Consequently, the data can be used to make comparisons between American Indians and Alaska Natives eligible for care from the Indian Health Service and the general U.S. population with regard to issues such as health status, use of health services, and access to care. Information was obtained on services provided outside the Indian Health Service and on other sources of health care financing available for persons eligible for IHS care.

Institutional Population Component

The Institutional Population Component of NMES II included persons resident in or admitted to nursing and personal care homes and facilities for the mentally retarded at any time in calendar year 1987. This survey provides information on the functional status, use of services, and health expenditures of the institutionalized population. A Survey in Institutions collected data from facility administrators and designated staff on the characteristics of facilities and charges. A Survey of Next of Kin obtained data from the respondent's next of kin or other knowledgeable persons in the community on the financial status, insurance coverage, and personal history of the institutionalized person.

Survey Samples

All survey components were designed to provide statistically unbiased estimates. The Household Survey sample is representative of the civilian noninstitutionalized population of the United States in 1987. It is a stratified multistage area probability design with a total sample of roughly 35,000 individuals in 14,000 households who completed all rounds of data collection. Oversampling of the population subgroups of special policy interest was based on a separate screening interview conducted in the fall of 1986 with a sample of 36,000 addresses.

The Survey of American Indians and Alaska Natives adopted a multistage area probability sample design. It used an IHS constructed frame of counties with individuals eligible for services provided or supported by the Indian Health Service and living on or near federally recognized reservations or in Alaska. An initial screening interview was completed in approximately 13,700 dwelling units to identify the eligible sample, yielding 1990 responding households in round 1. Approximately 6,500 SAIAN respondents responded for their entire period of eligibility in 1987.

The institutional population sample was based on a three-stage probability design. The first two stages were used to select facilities; the final stage sampled facility residents as of January 1, 1987. These facilities were also used to obtain a sample of admissions between January 1, 1987, and December 31, 1987. Based on sampling specifications, the Institutional Population Component includes a total of 1,500 facilities, comprising 800 nursing homes and 700 facilities for the mentally retarded. Counting both residents and new admissions, this sample yielded approximately 10,100 persons, of whom 5,700 were in nursing homes and 4,400 were in facilities for the mentally retarded. The sample frame for facilities was derived from the 1986 Inventory of Long-Term Care Places.

Taken in conjunction, the NMES II surveys yield comprehensive, population-based information that will support studies of most population groups of

policy interest, including those presently outside the scope of various public and private financing mechanisms. In contrast to information obtained from program or provider statistics, NMES II data can be used to analyze all public and private sources of coverage for health care services and out-of-pocket payments by individuals and families.

The Agency for Health Care Policy and Research sponsored the NMES II data collection activities. A substantial part of the support for the Survey of American Indians and Alaska Natives was provided by the Indian Health Service. The Health Care Financing Administration, the National Center for Health Statistics, and the Office of the Assistant Secretary for Planning and Evaluation provided extensive technical assistance during the development of the survey design and instruments. Interviews were conducted by the primary contractor, Westat, Inc., Rockville, MD and by NORC, University of Chicago; the Council of Energy Resource Tribes, Denver, CO; and Stephen R. Braund and Associates, Anchorage, AK. Data processing during the analysis stage of the project is being provided by Social & Scientific Systems, Inc., Bethesda, MD.

The data were collected under the authorities of the Public Health Service Act and are being edited and published in accordance with the confidentiality provisions of that act and those of the Privacy Act. Public use tapes from NMES II are being released on a continuous basis to ensure timely access to the data.

Additional information on NMES II is available from Daniel C. Walden, Ph.D., Director of the Division of Medical Expenditure Studies; Center for General Health Services Intramural Research, Agency for Health Care Policy and Research; Room 18-A-55, Parklawn Building; 5600 Fishers Lane; Rockville, MD 20857 (301/443-4836).

Prevalence of Chronic Diseases: A Summary of Data From the Survey of American Indians and Alaska Natives

Ayah E. Johnson and Amy K. Taylor

This summary report from the 1987 Survey of American Indians and Alaska Natives (SAIAN) presents estimates of selected chronic conditions in the noninstitutionalized population ages 19 and older and eligible for services provided or supported by the Indian Health Service (IHS).¹ These estimates are compared to similar estimates for the total civilian noninstitutionalized U.S. population obtained in the Household Survey of the National Medical Expenditure Survey (NMES). The SAIAN and the Household Survey were designed to yield comparable estimates of health status, health services use, and expenditures. The 1987 NMES offers a unique opportunity to assess and compare the prevalence of selected chronic diseases in the two populations and avoid the bias inherent in comparing results from different surveys.

All estimates are based on responses to a household questionnaire relating to health status and health behaviors (see Edwards and Berlin, 1989, for the Household Survey and SAIAN instruments). They reflect reports of conditions previously identified by a physician. Overall prevalence estimates for the SAIAN population are age/sex adjusted to the total U.S. population; estimates of prevalence by sex are age adjusted.² These adjustments were made to account for the fact that the SAIAN population is younger than the U.S. population; over 50 percent of persons are under 25 years of age and

only 6 percent are aged 65 and over, compared to less than 38 percent and almost 12 percent, respectively, in the U.S. population.

The technical appendix to this report explains how these estimates were derived. The appendix also describes the sample and presents standard error information required to assess the statistical significance of comparisons between the estimates.

Age/Sex-Adjusted Estimates

In 1987, 505,000 American Indians and Alaska Natives ages 19 or older lived on or near reservations and were eligible for care provided or supported by the Indian Health Service. Just over 40 percent in this population had one or more of the following chronic conditions: cardiovascular disease, cancer, emphysema, gallbladder disease, hypertension, rheumatism, arthritis, and diabetes. In the U.S. population as a whole, 39.4 percent had at least one of these conditions. The age/sex-adjusted prevalence of chronic conditions for the adult SAIAN population was 42.2 percent overall (Table 1); this rate is not statistically different from the estimate for the total U.S. population.

For individual conditions, the main difference between the two populations was a lower prevalence of cancer among American Indians and Alaska Natives in the SAIAN and a higher prevalence of both diabetes and gallbladder disease than found for the general population. There was no difference between the two populations in the rates for cardiovascular disease, emphysema, hypertension, rheumatism, and arthritis.

The difference in the age/sex-adjusted rate for diabetes was over twofold (12.2 percent in the SAIAN versus 5.2 percent in the general population); it was less pronounced for gallbladder disease (7.4 percent versus 5.4 percent). The difference in the age/sex-adjusted cancer rates was in the reverse direction (3 percent in the SAIAN versus 4.7 percent in the U.S. population).

In the SAIAN population, age-adjusted rates of chronic conditions for males and females were similar except for cardiovascular and gallbladder disease (Table 1).

¹The American Indian and Alaska Native population included in the NMES is a subset of the total U.S. population of American Indians and Alaska Natives. The target population for the Survey of American Indians and Alaska Natives lived on or near federally recognized Indian reservations or in Alaska tribal areas and was eligible for services provided or supported by the Indian Health Service. Thus, while the SAIAN population is in many ways similar to the total American Indian and Alaska Native population, the populations may differ in factors relevant to this report. In particular, many American Indians and Alaska Natives not included in this study were not eligible for the Indian Health Service, lived in areas farther away from a federally recognized reservation, or lived in more urban areas than was the case for the SAIAN population.

²The prevalence of chronic disease for the SAIAN population was sex and age adjusted to the U.S. population using the direct method of standardization (Fleiss, 1976) to allow for prevalence comparisons.

Table 1. Selected chronic conditions among adults: Age/sex-adjusted percent and age-adjusted percent for males and females with at least one condition in the SAIAN and in the general U.S. population, United States, 1987

Condition	SAIAN population			U.S. population		
	Total	Male	Female	Total	Male	Female
Total (in thousands)	505	240	265	169,054	79,900	89,154
	Percent (SE)					
At least one	42.2 (2.0)	39.8 (2.3)	44.4 (2.0)	39.4 (0.6)	36.9 (0.7)	41.7 (0.6)
Cardiovascular disease	9.8 (1.3)	12.1 (1.9)	7.8 (0.9)	10.0 (0.3)	10.5 (0.4)	9.6 (0.3)
Cancer	3.0 (0.6)	2.6 (0.9)	3.4 (0.6)	4.7 (0.2)	4.0 (0.2)	5.3 (0.2)
Emphysema	1.8 (0.5)	2.4 (0.8)	1.4 (0.4)	2.5 (0.2)	2.7 (0.2)	2.3 (0.2)
Gallbladder disease	7.4 (0.8)	3.8 (0.5)	10.7 (1.2)	5.4 (0.2)	3.2 (0.2)	7.4 (0.3)
Hypertension	22.7 (1.4)	23.2 (1.6)	22.2 (1.7)	22.8 (0.4)	22.2 (0.6)	23.4 (0.4)
Rheumatism	4.5 (1.0)	5.3 (0.8)	4.0 (1.2)	4.8 (0.2)	4.2 (0.2)	5.4 (0.3)
Arthritis	19.7 (1.2)	18.0 (2.2)	21.3 (1.2)	20.4 (0.5)	16.8 (0.5)	23.6 (0.6)
Diabetes	12.2 (1.2)	11.0 (1.0)	13.2 (1.6)	5.2 (0.2)	4.8 (0.2)	5.6 (0.2)

Note: Age and sex adjustment is to the total civilian noninstitutionalized U.S. population.

Source: Agency for Health Care Policy and Research. National Medical Expenditure Survey—Survey of American Indians and Alaska Natives and Household Survey, 1987.

The prevalence of cardiovascular disease in men was 1.6 times that for women (12.1 percent versus 7.8 percent); for gallbladder disease, the difference was almost threefold and in the opposite direction (3.8 percent for men and 10.7 percent for women). In the U.S. population, women had a higher prevalence of cancer, gallbladder disease, rheumatism, arthritis, and diabetes than men.

Diabetes was the only chronic condition where the prevalence for men differed substantially between the SAIAN and the total U.S. population. This difference was twofold—11.0 percent versus 4.8 percent, respectively.

Women in the SAIAN population were also more likely to have diabetes and gallbladder disease than U.S. women in general (13.2 percent compared to 5.6 percent for diabetes and 10.7 percent compared to 7.4 percent for gallbladder disease). There was no difference in the estimates for hypertension, rheumatism, and arthritis for

American Indian and Alaska Native women in SAIAN and U.S. women in general. The prevalence of cancer and emphysema was lower for SAIAN women than for U.S. women (3.4 and 1.4 percent, respectively, in the SAIAN, compared to 5.3 and 2.3 percent in the U.S. population).

Differences by Age and Sex

SAIAN. The prevalence of chronic conditions among American Indians and Alaska Natives in the SAIAN increased with age, as expected (Table 2). Men and women had comparable prevalence rates for emphysema, hypertension, rheumatism, arthritis, and diabetes across the three age groups. Differences between men and women within age groups existed for cardiovascular disease, cancer, and gallbladder disease.

Women ages 45 to 64 had substantially lower rates of cardiovascular disease than men (10.1 percent com-

Table 2. Selected chronic conditions among adult males and females: Percent in the SAIAN and general U.S. population with at least one condition by age and sex, United States, 1987

Condition and age in years	SAIAN population			U.S. population		
	Total	Male	Female	Total	Male	Female
Number (in thousands)	505	240	265	169,054	79,900	89,154
	Percent					
Cardiovascular disease						
19-44	2.1	*1.9	*2.3	2.0	1.9	2.0
45-64	14.8	20.5	10.1	13.4	16.2	10.8
65 or older	28.7	34.7	23.8	35.0	38.0	32.9
Cancer						
19-44	1.5	*0.5	*2.5	1.6	1.1	2.2
45-64	3.0	*1.9	4.0	7.4	5.6	9.1
65 or older	8.2	*11.3	5.6	13.6	13.5	13.7
Emphysema						
19-44	0.3	*0.2	*0.4	0.5	0.6	0.4
45-64	2.6	2.7	*2.5	4.0	4.8	3.3
65 or older	6.0	*9.4	*3.2	7.6	10.8	5.3
Gallbladder disease						
19-44	4.1	0.9	7.1	2.2	0.4	3.9
45-64	9.2	5.1	12.6	8.6	4.5	12.2
65 or older	16.7	12.4	20.4	14.3	8.7	18.2
Hypertension						
19-44	11.6	12.6	10.6	12.6	13.2	12.0
45-64	37.8	38.1	37.5	36.1	35.2	36.9
65 or older	36.7	35.6	37.6	49.3	44.2	52.9
Rheumatism						
19-44	*0.8	*0.6	*1.0	0.9	0.7	1.1
45-64	5.9	6.9	*5.1	7.0	6.3	7.6
65 or older	*16.3	19.5	*13.6	16.3	15.4	17.0
Arthritis						
19-44	6.4	5.4	7.3	7.0	5.6	8.4
45-64	31.5	28.5	34.0	33.8	26.5	40.4
65 or older	48.6	44.3	52.2	55.1	46.3	61.4
Diabetes						
19-44	3.7	3.2	4.2	1.9	1.3	2.5
45-64	21.5	21.2	21.8	8.1	7.9	8.2
65 or older	27.4	22.2	31.8	14.2	15.2	13.5

See notes at end of table.

pared to 20.5 percent). Women ages 19 to 44 had a higher cancer rate than men (2.5 percent as opposed to 0.5 percent.) The most striking difference between SAIAN men and SAIAN women was found for gallbladder disease, where rates for women were higher than for men across all three age groups.

U.S. population. For the U.S. population in general, sex differences within the age groups were more notable but patterns were similar to the SAIAN. Men ages 45 years or older had a higher prevalence of cardiovascular disease and emphysema than women. Women had higher rates of gallbladder disease and arthritis across the

Table 2. Selected chronic conditions among adult males and females: Percent in the SAIAN and general U.S. population with at least one condition by age and sex, United States, 1987 (continued)

Condition and age in years	SAIAN population			U.S. population		
	Total	Male	Female	Total	Male	Female
	Standard errors					
Cardiovascular disease						
19-44	0.7	0.6	1.0	0.1	0.2	0.2
45-64	1.3	3.3	1.3	0.5	0.8	0.6
65 or older	5.4	7.6	4.0	0.7	1.0	1.0
Cancer						
19-44	0.3	0.3	0.6	0.1	0.2	0.2
45-64	0.7	1.2	1.0	0.4	0.5	0.6
65 or older	3.7	6.2	2.7	0.6	0.9	0.7
Emphysema						
19-44	0.1	0.1	0.2	0.1	0.1	0.1
45-64	0.7	0.8	0.7	0.3	0.6	0.3
65 or older	2.7	4.4	2.1	0.4	0.7	0.5
Gallbladder disease						
19-44	0.8	0.3	1.3	0.2	0.1	0.3
45-64	1.2	1.3	1.9	0.3	0.4	0.5
65 or older	2.2	2.5	2.7	0.5	0.6	0.8
Hypertension						
19-44	1.0	1.6	1.3	0.3	0.4	0.4
45-64	2.5	3.0	3.6	0.8	1.0	1.0
65 or older	4.3	5.5	4.8	0.8	1.1	1.1
Rheumatism						
19-44	0.3	0.5	0.4	0.1	0.1	0.1
45-64	1.4	1.5	2.1	0.5	0.5	0.6
65 or older	5.0	4.0	5.9	0.7	1.0	0.9
Arthritis						
19-44	0.7	1.2	1.2	0.2	0.4	0.4
45-64	2.6	3.7	2.2	0.8	1.0	1.1
65 or older	3.2	4.3	4.0	0.9	1.2	1.1
Diabetes						
19-44	0.6	0.8	0.7	0.2	0.2	0.2
45-64	2.6	2.4	3.9	0.4	0.6	0.6
65 or older	3.3	3.8	3.5	0.5	0.8	0.8

*Relative standard error is equal to or greater than 30 percent.

Source: Agency for Health Care Policy and Research. National Medical Expenditure Survey—Survey of American Indians and Alaska Natives and Household Survey, 1987

three age groups. Women ages 19 to 44 had a higher prevalence of cancer than men, while for the groups ages 65 or older the rates were comparable. Rheumatism and diabetes were more prevalent among women ages 19 to 44 than among men. The prevalence of hypertension was higher among women ages 65 or older than among men in the same age group.

SAIAN/U.S. differences. The prevalence of diabetes was higher among the SAIAN than the U.S. population for both sexes and uniformly across the three age groups. In general, however, the five most prevalent chronic diseases reported by the U.S. population were the same as those reported by the SAIAN population: Hypertension, arthritis, diabetes, cardiovascular dis-

ease, and gallbladder disease, in that order (see Table 2). Rank order varied with age and sex. For males and females in both populations, the two most prevalent chronic conditions among all age groups were hypertension and arthritis. Rheumatism was the only chronic disease with a comparable prevalence rate for the two populations. Women ages 19 to 44 in the SAIAN had a higher prevalence of gallbladder disease than U.S. women of the same age. The prevalence of cardiovascular disease for those ages 19 to 64 was comparable in the two populations, but for women ages 65 or older the prevalence in the U.S. population was higher.

There was no difference in the prevalence of cancer for ages 19 to 44, while for those ages 45 to 64, estimates were higher for both men and women in the U.S. population. In the oldest age group (65 or older), U.S. women in general had higher cancer rates than their counterparts in the SAIAN population. Men in the general U.S. population ages 19 to 64 had a higher prevalence of emphysema than their SAIAN counterparts. For hypertension, the most common of the eight conditions for which estimates are presented, U.S. women ages 65 or older had a higher prevalence than women in the SAIAN. For U.S. women ages 45 or older arthritis was the most frequently reported condition. It ranked second for SAIAN women ages 45 to 64 and first for women 65 or older. Despite a comparable ranking, U.S. women ages 45 or older had a higher rate of arthritis than their SAIAN counterparts.

Implications

While infectious disease and resulting mortality have decreased substantially for American Indians and Alaska Natives over the last decade, their burden of chronic disease is rising. These estimates from the 1987 NMES offer a summary of prevalence rates of selected chronic conditions for the population in the Survey of American Indians and Alaska Natives as well as rates for the general population.

In 1987, the age-adjusted prevalence rate of diabetes and gallbladder disease was higher among SAIAN men and women than in the U.S. population. In turn, the general U.S. population had a higher prevalence of cancer, cardiovascular disease, and emphysema than the SAIAN population. Hypertension was the most common disease in both groups, and the rates of persons reporting rheumatism and arthritis were comparable.

American Indians and Alaska Natives are considered a low-risk population for cancer (Sievers and Fisher, 1981). At 3.0 percent, the age/sex-adjusted prevalence

of cancer in the SAIAN population is less than two-thirds that of the U.S. population. On the other hand, the prevalence of gallbladder disease among American Indians and Alaska Natives was 1.4 times that of the U.S. population in general.

An important finding is that diabetes was also much more prevalent in the SAIAN than in the general U.S. population. Sievers and Fisher (1981) have reported that diabetes had attained epidemic proportions in some tribes such as the Pima Indians, although prevalence in other tribal groups such as the Athapaskan tribes and the Eskimos had increased less markedly. They also note that the diabetes-related death rate for U.S. Indians was 2.3 times that of the general population. According to the NMES data, which do not allow for tribal comparisons, the prevalence of diabetes among the SAIAN population was more than twice that of the total U.S. population.

The age-adjusted difference in gallbladder disease between SAIAN women and men (10.7 percent compared to 3.8 percent) exceeded that for the general U.S. population (7.4 percent compared to 3.2 percent). This relatively high prevalence of female gallbladder disease is consistent with previous findings in American Indian populations (Joos and Ewart, 1988).

A lower prevalence of chronic disease among American Indians and Alaska Natives in the past is documented (Kunitz and Levy; 1981, Rhoades, 1987). Thus, comparable or higher rates than for the U.S. population in 1987 may indicate a relative rise in the prevalence of chronic diseases among the SAIAN population.

In all, the data presented here confirm other studies of chronic illness in the Indian population and provide further evidence that the level of chronic diseases among American Indians and Alaska Natives now may approach that of the U.S. population. Two chronic illnesses were noted which are particularly prevalent in the SAIAN population: diabetes and gallbladder disease. This information can further contribute to a better understanding of the health status of the population eligible for services from the Indian Health Services and thus can be useful in planning health care services in IHS facilities.

Technical Appendix

Data Sources and Methods of Estimation

The data in this report come from the health status questionnaire administered in round 3 of the Survey of American Indians and Alaska Natives and in round 2 of the Household Survey of the 1987 National Medical Ex-

penditure Survey. The SAIAN is comprised of a representative sample of American Indian and Alaska Native households on or near reservations and containing at least one person eligible to receive medical care from the Indian Health Service. The findings in this report refer to persons responding to round 1 of the SAIAN.

Questionnaires were similar for both the general U.S. and the SAIAN survey components, except for the addition of certain questions which were relevant only to the population served by the Indian Health Service. The reference period for both surveys was from January 1, 1987, to December 31, 1987. However, the Household Survey involved four rounds of data collection at approximately 4-month intervals, with a fifth short interview at the end, while the field operations of the SAIAN component consisted of three core interviews conducted with sampled households at 5- to 6-month intervals over a period of 15 months. Complete documentation on questionnaires and data collection methods is presented in Edwards and Berlin (1989).

Derivation of chronic disease estimates. Computation and analysis of the prevalence of chronic diseases in both populations used responses to a questionnaire on health status and health behavior. Several questionnaire items elicited previous physician diagnoses of chronic conditions, specifically cancer, emphysema, hypertension, rheumatism, arthritis, diabetes, cardiovascular disease, and gallbladder disease. (In this report, the cardiovascular category includes stroke, heart attack, hardening of the arteries, and heart disease.) The prevalence of chronic diseases in the SAIAN population and the U.S. population was estimated from the answers to these questions. The prevalence of chronic disease in the SAIAN population was sex and age adjusted to the U.S. population using the direct method of standardization (Fleiss, 1976) to allow for prevalence comparisons.

Item nonresponse. Among persons responding to the health status questionnaire, the item nonresponse rate for specific conditions was less than 10 percent. The missing cases were assumed not to have the chronic condition.

Sample Design and Standard Error Estimates

SAIAN. The 1987 Survey of American Indians and Alaska Natives was designed to produce statistically unbiased estimates that are representative of the civilian noninstitutionalized population eligible for the Indian Health Service. The survey adopted a multistage area probability sample design using an IHS-constructed frame of counties with individuals eligible for IHS serv-

ices and living on or near reservations. The sampling frame initially consisted of 482 counties in the United States served by the Indian Health Service, with an estimated population of 1,013,000 projected for 1987. For reasons of cost efficiency, the frame was truncated to exclude counties with fewer than 400 American Indians or Alaska Natives. The truncated frame included 97.2 percent of the population of interest.

Twenty-four eligible counties were paired with larger neighboring counties, yielding 274 primary sampling units (PSUs) for sample selection. Within each sample PSU, SAIAN area segments were created. Segments were defined as 1980 census enumeration districts or individual blocks or block combinations. Again, for cost efficiency, the SAIAN sample frame was further restricted by excluding segments with less than 0.5 percent population representation of American Indians and Alaska Natives. Approximately 95 percent of the American Indian and Alaska Native population remained eligible for sample selection when the effects of PSU and segment frame truncation were considered jointly.

In early 1987, an initial screening interview was completed in approximately 13,700 dwelling units to facilitate identification of the eligible sample. Data were obtained for about 87.5 percent of eligible households in the first round of data collection. The joint core questionnaire/health status questionnaire response rate was 76 percent. For a detailed description of the survey design, sampling, estimation, and weight adjustments, see Cohen, DiGaetano, and Waksberg (1988).

Household Survey. The NMES Household Survey was designed to produce statistically unbiased national estimates that are representative of the civilian noninstitutionalized population of the United States. To this end, the Household Survey used the national multistage area samples of Westat, Inc. and NORC.

An initial screening interview was conducted in the fall of 1986 to facilitate oversampling of population subgroups of particular policy concern (blacks, Hispanics, the elderly, the poor and near poor, and those with difficulties in activities of daily living). Screening interviews were completed in approximately 28,700 dwelling units. Sampling specifications required the selection of about 17,500 households for the first core household interview. Data were obtained for about 85.4 percent of eligible households in the first interview. Approximately 6 percent of all survey participants provided data for only some of the time in which they were eligible to respond. In the Household Survey, the joint core questionnaire/health status questionnaire response rate was 73 percent. For a detailed description of the survey design

and of sampling, estimation, and adjustment methods, including weighting for nonresponse and poststratification, see Cohen, DiGaetano, and Waksberg (in process).

Standard errors. Tests of statistical significance were used to determine whether differences between estimates exist at specified levels of confidence or whether they simply occurred by chance. Differences were tested using Z-scores having asymptotic normal properties, based on the rounded figures at the 0.05 level of significance. Unless otherwise noted, only statistically significant differences between estimates are discussed in the text.

Direct standard error estimates computed using SESUDAAN (Shah, 1981) are provided for each estimate on Tables 1 and 2. The estimates presented in these tables have been rounded to the nearest 0.1 percent.

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