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Asthma Prevalence among American Indian and Alaska Native Children

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S Y N O P S I S

Objectives. Although asthma is the most common chronic childhood illness in the United States, little is known about its prevalence among American Indian and Alaska Native (AI/AN) children. The authors used the latest available household survey data to estimate the prevalence of asthma in this population.

Methods. The authors analyzed data for children ages 1 through 17 years from the 1987 Survey of American Indians and Alaska Natives (SAIAN) and the 1987 National Medical Expenditure Survey (NMES). At least one member of each AI/AN household included in the SAIAN was eligible for services through the Indian Health Service.

Results. The weighted prevalence of parent-reported asthma was 7.06% among 2288 AI/AN children ages 1–17 (95% CI 5.08, 9.04), compared with a US estimate of 8.40% for children ages 1–17 based on the 1987 NMES (95% CI 7.65, 9.15).

The AI/AN sample was too small to yield stable estimates for a comparison between AI/AN children and all US children when the data were stratified according to household income and metropolitan vs non-metropolitan residence. The unadjusted asthma prevalence rates were similar for AI/AN children and for children in the NMES sample.

Conclusions. In 1987, the prevalence of parent-reported asthma was similar for AI/AN children in the SAIAN sample and for children in the NMES sample. More recent data are needed to better understand the current prevalence of asthma among AI/AN children.

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Asthma is the most common chronic childhood illness in the United States.¹ Its prevalence and morbidity continue to increase in a number of countries, including our own.²⁻⁴ Few data are available regarding asthma prevalence in the American Indian and Alaska Native (AI/AN) population. Many asthma prevalence estimates are derived from national surveys, and American Indians/Alaska Natives are frequently not included in numbers sufficient for analysis because they comprise a small proportion of the total population.

The Agency for Health Care Policy and Research has conducted a household survey that relied on adult self-report for demographic information and for information on the health status of children in the household four times under various titles: in 1977 (the National Medical Care Expenditure Survey), in 1980 (the National Medical Care Utilization and Expenditure Survey), in 1987 (the National Medical Expenditure Survey [NMES]), and in 1996 (the Medical Expenditure Panel Survey). The primary goal of these surveys has been to provide national estimates of health insurance coverage and of the use of and expenditures for health services for the US civilian, non-institutionalized population.

For the present study, we used data from the 1987 NMES and the 1987 Survey of American Indians and Alaska Natives (SAIAN), a companion to NMES.

In the 1987 NMES, disproportionate sampling rates were applied for households including members with characteristics of interest: African American or Hispanic ethnic groups, the elderly, those having difficulties with activities of daily living, and the poor. The goal of the SAIAN, which was conducted only in 1987, was to provide estimates comparable to those for the general civilian population for the AI/AN population eligible for care through the Indian Health Service (IHS), using a household survey. The 1996 Medical Expenditure Panel Survey (MEPS), the follow-up to the 1987 NEMS, did not oversample the AI/AN population, and therefore does not include numbers sufficient to assess asthma prevalence in AI/AN children (Personal communication, Steven B. Cohen, PhD, Director, Division of Statistical Research and Methods, Center for Cost and Financing Studies, Agency for Health Care Policy and Research, March 1999).

The 1987 SAIAN included approximately 2000 households representing the population eligible for care through the Indian Health service and living on or near reservations. The one report of chronic disease prevalence resulting from this survey did not address asthma.⁵

The SAIAN is, to our knowledge, the most recent survey to assess health status and health care utilization among the AI/AN population in numbers sufficient to estimate the prevalence of childhood illnesses.

METHODS

Data collection for the NMES and SAIAN consisted of a series of in-person and telephone interviews referencing the year 1987.⁶ The Health Status Questionnaire, used for both NMES and SAIAN, asked detailed questions regarding health conditions and health status and was administered once during the year. Parents provided proxy responses for children ages 1 through 17 years. The questions regarding child health included the following question with regard to asthma: "During the past 12 months has this child had asthma or wheezing? If (s)he did, did (s)he see a doctor about it?" The survey methods are published in detail elsewhere.⁵

Parents' responses to the asthma question were available for 7529 children in the 1987 NMES and 2288 children in the 1987 SAIAN. These children constituted the sample for the present study.

Data analysis. Using 1987 SAIAN data, we calculated the weighted prevalence of parent-reported asthma for the 2288 children ages 1-17 in our AI/AN sample. To estimate the national prevalence of asthma among children ages 1-17, we calculated the weighted prevalence of parent-reported asthma among the 7529 children from 1987 NMES data whose parents answered the asthma question.

To derive unbiased asthma prevalence estimates for the SAIAN and NMES samples, we used appropriate sampling weights that adjusted for nonresponse. To account for the complex sampling design of both surveys, we calculated variance estimates using Stata statistical software's survey commands.⁷

For the SAIAN and NMES samples, we looked at age and income distribution and metropolitan vs non-metropolitan residence. We defined low-income as < 200% of the 1987 federal poverty level, as self-reported for households in both surveys. We considered metropolitan residence as living in a Metropolitan Statistical Areas as defined by the Bureau of the Census.

RESULTS

The age distributions of the children in the AI/AN and NMES samples did not differ, as indicated by overlapping confidence intervals (Table 1). Children in the

Table 1. Selected parent-reported demographic characteristics of children for whom parents answered asthma question, SAIAN and NMES, 1987

Characteristic	AI/AN n = 2288		NMES total n = 7529	
	Number	Percent	Number	Percent
Age category (years)				
0-4	591	25.8	1859	24.7
5-9	737	32.2	2134	28.3
10-14	604	26.4	2128	28.3
15-17	356	15.6	1408	18.7
Residence				
Metropolitan	327	14.3	5438	72.2
Non-metropolitan	1961	85.7	2091	27.8
Income				
< 200% of 1987 federal poverty level	1799	78.6	3338	44.3
≥ 200% of 1987 federal poverty level	489	21.4	4191	55.7

NOTE: Data for AI/AN children were drawn from the 1987 SAIAN.

SAIAN = Survey of American Indians and Alaska Natives
 NMES = National Medical Expenditure Survey
 AI/AN = American Indian and Alaska Native

AI/AN sample were more likely to live in non-metropolitan areas and to live in households with incomes below 200% of the 1987 federal poverty level.

More than 85% of AI/AN children lived in non-metropolitan areas. According to parent self-report, 78.6% of AI/AN children resided in low-income households (< 200% of the 1987 federal poverty level).

The weighted prevalence of parent-reported asthma was 7.06% among 2288 AI/AN children ages 1-17 (95% CI 5.08, 9.04), compared with a US estimate of 8.40% for children ages 1-17 based on the 1987 NMES (95% CI 7.65, 9.15). (See Table 2.)

DISCUSSION

Our findings indicate that, at the time of this survey, AI/AN children had an overall prevalence of parent-reported asthma or wheezing comparable to that found in a national sample of children. The AI/AN sample was too small to yield stable estimates for a comparison between AI/AN children and all US children when the data were stratified according to household income and metropolitan vs non-metropolitan status.

The findings of the present study have several limitations. First, the small sample size limited our ability to fully explore associations demonstrated elsewhere between asthma prevalence, income, and residential location.⁸⁻¹⁵ Second, the SAIAN and NMES surveys were administered in 1987, and childhood asthma has increased in prevalence and severity over the last decade.⁴ Third, the SAIAN sampling frame was restricted to IHS-eligible American Indians and Alaska Natives living on or near reservations, a primarily rural population, which does not represent the distribution of the entire AI/AN population. In Washington State, for example, 56% of people self-identified on the 1990 Census as American Indians or Alaska Natives lived in urban areas.¹⁶ Because it undercounts urban residents, who are frequently not IHS-eligible, the SAIAN sampling framework limits the generalizability of our prevalence estimate.

Fourth, the pooled prevalence estimate reported here may mask regional differences in the prevalence of childhood asthma among AI/AN populations and, perhaps, in the quality of and access to asthma health services. There are large and well-documented differences in lifestyle and environment between AI/AN populations across the

Table 2. Weighted prevalence of parent-reported asthma in children for whom parents answered asthma question, SAIAN and NMES, 1987

Age category (years)	AI/AN n = 2288		NMES n = 7529	
	Percent	95% CI	Percent	95% CI
1-4	8.13	5.73, 10.52	10.30	8.74, 11.87
5-9	6.24	3.50, 8.98	7.07	5.85, 8.29
10-14	7.91	1.69, 14.13	8.48	7.08, 9.88
15-17	5.76	2.12, 9.40	7.79	6.24, 9.35
Total	7.06	5.08, 9.04	8.40	7.65, 9.15

NOTE: The presence of asthma is defined as parent-reported asthma or wheezing in the previous 12 months. Data for AI/AN children were drawn from the 1987 SAIAN.

SAIAN = Survey of American Indians and Alaska Natives

NMES = National Medical Expenditure Survey

AI/AN = American Indian and Alaska Native

CI = confidence interval

contiguous US and Alaska. Kunitz also recently reported as large as four-fold differences in per capita IHS health resource allocations across the 12 national IHS service areas.¹⁷ There is a marked disparity in the quality of health care received by poor and non-poor children, and this disparity is believed to contribute to the higher asthma morbidity found in poor children.¹⁸

While we found no other reports of asthma prevalence among AI/AN children, one study examined hospitalization for asthma as a proxy for severe illness among AI/AN children.¹⁹ This analysis, which employed IHS hospital discharge records, concluded that AI/AN children had asthma hospitalization rates similar to those of white children despite rates of poverty that were more similar to those of African American children. While this finding resembles our own with regard to asthma prevalence among AI/AN children, it must also be interpreted cautiously. The authors hypothesized that the AI/AN children receiving services from the IHS had better access to health care than other low-income groups. The study was limited by the inability to include admissions to hospitals outside of the IHS system, the frequency of which varies greatly among IHS service areas.¹⁷ This bias would lead to underestimating the true incidence of asthma hospitalizations among AI/AN children.

As shown in previous studies, asthma prevalence varies greatly according to the clinical definition used.²⁰ Using data from the second National Health and Nutri-

tion Examination Survey (NHANES II), Gergen and colleagues reported an asthma prevalence of 8.9% (standard error [SE] \pm 0.62) among white children and 13.1% (SE \pm 0.15) among African American children for either a diagnosis of asthma or perceived wheezing.⁷ When just a history of wheezing was considered, they found a prevalence of only 5.0 (SE \pm 0.45) for white children and 7.3 (SE \pm 1.0) for African American children.⁸ Using data from the Child Health Supplement to the 1988 National Health Interview Survey (NHIS), Weitzman and colleagues reported a prevalence of 4.1% for white children and 5.1% for African American children.⁹ The definition used in the NHIS was a positive parent report that the child had had asthma within the previous 12 months. Self-reports (or parental reports) of medical diagnoses are influenced by patterns of contact with medical care and by providers' diagnostic practices. Wording the question to include "asthma or wheezing" should attenuate the influence of these variations.

Given the limitations of the present study and the lack of corroborating evidence, further investigation is needed of asthma prevalence and morbidity among AI/AN children.

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