THE HEALTH STATUS OF INDIAN CHILDREN: PROBLEMS AND PREVENTION IN EARLY LIFE

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The topic considered here is health for Indian children. By necessity, however, this paper focuses on death and disease patterns of Indian and Alaska Native children. The ages considered are from conception through 14 years. As was necessary in the treatment of this topic in *Health and Behavior: Frontiers of Research in the Biobehavioral Sciences* by the National Academy of Sciences (Hamburg, Elliott, & Parron, 1982), consideration will be given to some adult behaviors and some broader issues which affect the health of children. While limiting the focus to the youthful ages is difficult, in some ways arbitrary, and not a completely accurate representation of reality, it will hopefully serve a heuristic function. It should be particularly useful for the topic of prevention and will allow the health professional to focus far "upstream" to deal with many problems at the source. As will be evident below, a focus on the young is both needed and particularly appropriate for the American Indian population.

Demographic and Epidemiologic Transition

There have been many recent and rapid changes in the population of American Indian and Alaska Natives. Generally these changes are characteristic of those described by the *Theory of Demographic Transition and the Theory of Epidemiologic Transition* (Broudy & May, 1983). A summary of these changes follows.

As detailed in population studies, the process of demographic transition is a change from a traditional society, with high birth rates and high death rates, to a modernized, industrial society with low birth and death rates (Weeks, 1981). In the process of this change, societies go through a period of tremendous population explosion (natural increase) from the rapid lowering of mortality and a much slower reduction in fertility. By many indicators, the American Indian population is in the middle of the demographic transition and is experiencing rapid growth.

The 1980 population (final count) of Indians and Alaska Natives was reported as 1,423,043 which represents 0.6% of the U.S. population (U.S. Bureau of Census, 1984a). The growth from 1970 to 1980 was 72%, which is so high that it could not have been accomplished through natural increase; it therefore must represent some methodological changes and improvements in the census. Nevertheless, the Indian population is growing rapidly. The crude death rate of Indians and Alaska Natives has declined steadily since 1955 from 9.3 to 5.0 per

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1,000 in 1980-82 (Indian Health Service, 1974, 1985), a drop of 46%.[1] The birth rate, however, has dropped little over the same period. From a crude rate of 37.5 per 1,000 in 1955, the rate rose until 1962 and then dropped to 27.9 in 1980-82 (Indian Health Service, 1984a, 1985). Thus, the net decrease in birth rate is 26%, which is one half the mortality drop in the same period. The Indian population is currently experiencing an annual rate of natural increase of 2.4%. A population growing at this rate will double in size every 29 years.

The Theory of Epidemiologic Transition (Omran, 1971) indicates that as societies modernize, the mix of mortality and morbidity changes. The gradual change from high rates of infectious disease to high rates of man-made and degenerative disease characterizes this transition.

The epidemiologic transition is underway with many Indian subpopulations. Overall, the death rates from infectious diseases such as tuberculosis, gastrointestinal disease, influenza, and pneumonia have all declined (Indian Health Service, 1984a; Kunitz, 1983). Death rates from a variety of lifestyle or man-made diseases (e.g., accidents, suicide, etc.) have either remained the same or risen since 1955, a further indicator of epidemiologic change (Broudy and May, 1983; Indian Health Service, 1984a). One exception, though, is that degenerative disease (e.g., ischemic heart disease) has not yet increased or reached high levels among most Indian groups. Life expectancy at birth has risen for U.S. Indians from 51 years in 1939-41 to 71.1 years in 1979-81 (Indian Health Service, 1984b). With such a lowering of death rates and life expectancy this high, it would seem that all is well in Indian country; but several exceptions must be noted.

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Implications of the Transition

First, the above data indicate a group of people undergoing rapid change. In a situation of rapid change, acculturation and general life stress increase. This causes a complex of health problems which result in an increasing rate of behavior-related mortality and morbidity. Studies among Indians show increasing rates of alcohol and drug abuse (Beauvais, Oetting, & Edwards, 1985b; May, 1982), suicide (Van Winkle & May, 1986), homicide (Broudy & May, 1983), motor vehicle accidents (Hackenberg & Gallagher, 1972), child abuse and neglect (Fischler, 1983), and some other behavior-related problems. Therefore, the rapid change results in new types of disease and death which may be more difficult to cure than the older problems.

Second, the above data could easily lead one to a false sense of security about the health status of U.S. Indians and Alaska Natives. Since the above data represent average experience for all Indians, they ignore the fact that within the larger Indian population there are particular subgroups where health problems and needs still exist at an alarmingly high level. Health problems vary in a

number of ways: by tribe, reservation, and acculturation level. Specifically, some tribes, by virtue of their traditional social organization, have higher rates of morbidity and mortality (Levy & Kunitz, 1974). Likewise, particular reservations, by virtue of their history, contemporary level of social organization, and living conditions, have much higher rates of morbidity and mortality (May, 1976, 1982). Such high-risk reservations are obscured in the averaged data, for many Indians have become acculturated and live increasingly in more modern conditions. The 1980 Census indicates that 63% of all U.S. Indians and Alaska Natives now live off the reservation and only 37% live on reservation trust lands, in native villages, or on historical reservation lands in Oklahoma (U.S. Bureau of Census, 1984b). The health gains and positive health status of the more acculturated, then, may mask the needs of the disadvantaged.

A third problem with taking the averaged data literally is methodological. In the 1970s, changes in tribal recognition by the federal government and in tribal enrollment procedure in Oklahoma and several eastern states added a considerable number of highly acculturated, low Indian-blood quantum individuals to the Indian Health Service (IHS) database. In addition, new IHS service policies added large numbers of Indians in several urban areas (i.e., San Francisco, Los Angeles) to the database. The result of these changes is that the higher risk or greater need segments of the Indian population found on western reservations were further masked in the general rates for all U.S. Indians.[2]

A fourth consideration which should be mentioned is that the young age of the Indian population makes crude rates misleading. The median age of U.S. Indians is 22.9 years (U.S. Bureau of Census, 1984b). This indicates a decided age advantage which yields crude mortality and morbidity rates (expressed for people of all ages) that underrepresent the exact death risk and general health conditions.

A fifth and final problem is that the Indian population of the U.S. may be characteristic of what Omran (1971) called the "delayed" model of the epidemiologic transition. That is, the lower death rates of reservation Indians represent only the result of an imposed Western medical model (Broudy & May, 1983; Kunitz, 1983), and there is only a slight change in core cultural values and health-related behaviors to go with the imposed medical model. Thus, without the constant application of advanced medical efforts on reservations, the relatively unchanged social, cultural, and environmental conditions would generally yield much higher rates of death and illness (Kunitz, 1983; Stewart, May, & Muneta, 1980). This is quite unlike many Western societies where the epidemiologic transition was slow and the greatest gains in mortality and morbidity reduction were made by culturally supported prevention measures such as hygiene, changes in environment and lifestyle, and improved nutrition. In other words, European changes were in many ways exclusive of the clinical

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practice of modern medicine (Kunitz, 1986). Certainly the persistent nature of the high birth rate among Indians attests to only small changes in core traditional values among most segments of the reservation Indian population.

Therefore, the significance of the above discussion is that strides have been made by the Indian population towards an epidemiologic transition. The progress, however, has not been quite as dramatic as crude mortality rates for all U.S. Indians indicate; and there remain, within the larger population of Indians and Alaska Natives, a number of high-risk groups which have greater needs.

The Young Indian Population and Other Background Considerations

Studying Indian people under 15 years of age is quite a significant enterprise. The median age of 22.9 compares with 30.3 for the general U.S. population and 31.1 for U.S. Whites (U.S. Bureau of Census, 1984c). A full 32.8% of the Indian and Alaska Native population is under 15 years and 45% is under 20 (Indian Health Service, 1985). On many reservations the median age is even lower. Thus, when one is considering Indian youth, the numbers and impact on the entire Indian population are considerable.

The young age is a consequence of a high fertility rate sustained over a number of years. As seen in Table 1, despite some reduction in this rate over the past 20 years, the U.S. Indian population is still a highly fertile one by any measure. Again, some reservations and Native populations have rates considerably higher than these averages. For example, in 1978 the Navajo reservation rates were considerably higher, with an average of 4.4 children born per mother (Broudy & May, 1983).

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Table 1

Various Birth and Fertility Measures of the U.S. Indian and Alaska Native Population Compared with the U.S.—1980-82

Rate	Indian and Alaska Native 1980-82	U.S. 1981	Ratio of Indian and Native to U.S.
Crude birth rate (CBR)[a]	27.9	15.8	1.8
General fertility rate (GFR)[b]	112.2	67.4	1.4
Total fertility rate (TFR)[c]	2,929	1,815	1.6
Children born per mother	2.9	1.8	

Note. Data are for Indians in 28 reservation states. The statistics are computed from Indian Health Service (1985) and U.S. Bureau of Census (1984c) data.

[a] Birth per 1,000 population.
[b] Births per 1,000 women aged 15-44.
[c] Number of children born to 1,000 women in their entire childbearing experience.

High fertility rates in a society with low mortality create a high dependency situation. That is, the large number of young people create a larger social and economic burden on adult providers. The youth dependency ratio of the Indian

population (0.53) is higher than the U.S. population (0.34).[3] This means that the average Indian adult (15-64 years) works to support one half of a child dependent while in the general U.S. population it is one third.

In the 1980 Census, the Indian population was found to be of lower education and income status than most other populations in the U.S. In Table 2 the data are summarized. In each of these items, Indians rank below all groups except Blacks, the lowest on each item. But Census data also indicate that on selected reservations, each of these variables measures lower. That is, on nine specific reservations the median income and educational achievement is considerably lower than the average of all Indians (U.S. Bureau of Census, 1984b).

Table 2

Selected Census Data for U.S. Indians and Alaska Natives Compared with All U.S. Population—1980

Item	Indians and Natives	U.S. Population
Years of education completed by people 25+		
% completed high school	55.5	66.5
% completed college	7.7	16.2
Median family income ($)	13,869	19,928
Percentage in poverty status	27.5	12.4

Note. From U.S. Bureau of Census (1984b).

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All of the above data, then, sets the stage for the discussion to follow. The American Indian population is one characterized by demographic and epidemiologic transition. While much change has occurred, the general Indian data indicate a population with high rates of birth, dependency, and poverty, and low levels of educational achievement. In addition, acculturation and urbanization are important phenomena in a significant portion of the Indian population. But reservation populations, now less than one half the Indian population, remain lower in socioeconomic status than other Indians; the most outstanding needs in health and public health are found in rural and reservation populations. Less of the demographic and epidemiologic transition has occurred in reservation populations.

Studies on the Health Status of Indian Youth

Detailed consideration of various indicators and studies of mortality and morbidity for young Indians and Alaska Natives will be presented below. The discussion is broken into relevant age groups from conception to 15 years.

It is important that recent data be covered here for two reasons. First, there are few general papers on the health status of Indian youth. While there are a number of papers which deal with specific problems among Indian youth, there

have been very few which undertake any comprehensive review of overall health status. Second, the last extensive review was published by Wallace in 1973 using data through 1971 (Wallace, 1973a, 1973b). Other, more limited works were published by Coulehan (1978) for the Navajo; Maynard and Hammes (1970) for the Eskimo; Adams, Brown, Iba, and Niswander (1970) for the Papago; and Evers and Rand (1983) for Canadian Indian 2-year-olds. Thus the data and discussion which follow are vital for a current and topical consideration of both the health needs and prevention possibilities for Indian youth.

Conception Through Year 1

In the previous material, the high fertility rate of American Indians was documented. High fertility increases the risk for various complications of pregnancy, childbirth, and infancy which might result in problems for the infant (Slocumb, Ordoff & Kunitz, 1975). One specific factor is birth weight. Women who have short intervals between pregnancies are more likely to have babies with low birth weight. Younger women (under 20 years) and older women are more likely to have smaller babies. Low birth weight is associated with a variety of risks to the children from higher mortality, birth defects, and birth injury.

Birth weight. The information on fertility and birth weight presented in Table 3 is by the age of the mother. Age-specific fertility rates indicate that Indians have higher rates of birth at all ages than the U.S. population; but this is especially true in the younger (20 years and younger) and older ages (40+ years). Birth weight data indicate that Indian babies are no more likely to be of low birth weight than the U.S. population in most age groups. More low birth weight Indian infants are found in only the middle ages, and the difference is small. In addition, the average birth weight of Indians is actually higher than U.S. averages (by 36 grams or approximately 1.2 oz) and only slightly lower than U.S. Whites (by 50 grams or 1.6 oz). In fact, Indians not only have fewer babies under 2,500 grams (6.3%) but they also have fewer under 2,000 grams (2.2%): the highest risk babies.

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Table 3

Age-Specific Fertility Rates and Birth Weights for Indians and Alaska Natives—1980-82 and U.S. Population—1981

	Fertility Rate[a]			% Low Birth Weight[b]	
Age of Mother	Indians/ Natives	U.S. Rate	Ratio	Indians/ Natives	U.S. Population
10-14	1.9	1.7	1.7	9.7	14.0
15-19	102.7	52.7	1.9	6.5	9.4
20-24	199.6	111.8	1.8	5.9	6.9
25-29	151.9	112.0	1.4	6.0	5.8
30-34	84.3	61.4	1.4	6.5	5.8
35-39	35.9	20.0	1.8	7.5	7.1
40-44	8.9	3.8	2.3	10.8	8.3
45-49	0.5	0.2	2.5	2.4	11.0
		Total < 2,500 grams		6.3	6.8
		Total < 2,000 grams		2.2	2.5

Median Weight: U.S. = 3,360 grams; Indian and Native = 3,396 grams.

Note. From Indian Health Service (1985) and National Center for Health Statistics (1983).

[a] Rates per 1,000.
[b] Low birth weight is defined as babies weighing less than 2,500 grams (5 lb, 8 oz).

Previous articles have documented the tendency of Indians to have large babies (Adams & Niswander, 1968, 1973). Particularly Plains Indian tribes have larger babies on average than do other tribes. The issue of birth weight is not a simple one, however, for the issue is complicated by the high incidence of diabetes in some tribes such as the Pima and the Papago. Diabetic mothers, who tend to have both larger babies and a higher risk for birth defects, are of major medical concern in some tribes (Bennett, Rushforth, & Miller, 1976; Knowler, Bennett, Hamman, & Miller, 1978; Knowler, Pettitt, Bennett, & Williams, 1983; Pettitt, Baird, Aleck, Bennett, & Knowler, 1983; Pettitt, Knowler, Baird, & Bennett, 1980). With the above exception and with particular birth defects mentioned below, birth weight does not pose any greater risk for Indians than in the general population. It is considerably less of a problem than for Blacks.

Infant mortality. Turning now to infant mortality, Table 4 summarizes data from 1955 through 1982. The infant mortality rate of Indians and Alaska Natives has declined from 2.4 times higher than the U.S. rate in 1955 to essentially equal in 1980-82. This equalization of rates should not reduce the scrutiny of health professionals, however. While it is a dream come true to have reached this point, given the similarity in birth weights between Indians and Whites, the Indian rate could be even lower and closer to that of Whites. Again, the reader is reminded that the infant mortality rate is considerably higher than these averages on some reservations (Broudy & May, 1983), and among Alaska Natives.

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Table 4

Infant Mortality Rates For U.S. Indians and Alaska Natives and U.S. Population—1955-1981[a]

Year	Indians/U.S. Natives[b]	Population	Ratio	U.S. Whites	Ratio of Indians/Natives to U.S. Whites
1955	62.7	26.4	2.4	--	--
1965	38.5	24.7	1.6	21.5	1.8
1975	18.7	16.1	1.2	14.2	1.3
1978	15.5	13.8	1.1	12.0	1.3
1981	12.0	11.9	1.0	10.5	1.1

Note. From Indian Health Service (1984a), Indian Health Service (1985), and National Center for Health Statistics (1984).

[a] Rates per 1,000 births.
[b] Year averages centered on the year indicated in table.

Examining the exact period of infant death (Table 5), it is evident that Indian infants have had consistently lower rates of neonatal death and higher rates of post-neonatal death. Therefore, Indian children are born relatively mature and have a high survival rate for the first month. In the post-neonatal period, however, environmental risk, social, behavioral, and other factors take a higher toll on Indian babies (Broudy & May, 1983).

Table 5

Neonatal and Post-Neonatal Mortality Rates For U.S. Indians/Alaska Natives and U.S. Population[a].

	Neonatal			Post-Neonatal		
Year	Indians/ Natives[b]	U.S. Population	Ratio	Indians/ Natives[b]	U.S. Population	Ratio
1966	16.1	17.2	0.9	20.7	6.5	3.2
1970	12.2	15.1	0.8	12.2	4.9	2.5
1975	9.2	11.6	0.8	9.5	4.5	2.1
1978	7.8	9.5	0.8	7.6	4.3	1.8
1981	5.5[c]	8.0	0.7	6.5	3.9	1.7

Note. From Indian Health Service (1984a), Indian Health Service (1985), U.S. Bureau of Census (1984c), and National Center for Health Statistics (1984).

[a] Rates per 1,000 births.
[b] Rates are 3-year averages.
[c] Of the neonatal deaths, 50% are in the first days, 29% days 1-6, and 21% days 7-27 day.

Table 6 lists the nine major causes of infant mortality for the period 1980-82. As predicted from other studies and U.S. data, conditions originating in the perinatal period and congenital anomalies are leading causes even though neither are as common among Indians. Ill-defined symptoms, especially Sudden Infant Death Syndrome (SIDS), accidents, influenza and pneumonia, meningitis, gastrointestinal disease, and child abuse are all recorded as causes more frequently than in general U.S. statistics. Because of differences in classification over the years, it is difficult to compare these causes with previous studies (e.g.,

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Wallace, 1973a). In previous studies, however, infectious and gastrointestinal diseases are consistently found to be major causes of infant death on reservations. Indications are that these problems are improving, but major environmental and lifestyle changes are still necessary to further affect the problem. Hopefully, the days of major diarrhea epidemics among children on most reservations (a tremendous problem as recently as the past decade) will soon be history (Horwitz, Pollard, Merson, & Martin, 1971; Hughes, Rouse, Barada, & Guerrant, 1980; Runkle et al., 1983; Sack et al., 1975).

Table 6

Nine Leading Categories of Infant Mortality of U.S. Indians and Alaska Natives (1980-82) and U.S. All Races (1981): Number, Percent, and Rates per 100,000 Births

	U.S. Indian/Alaska Native				U.S.	
Category	#	Percent	Percent Neonatal	Rate	Rate	Ratio Indian/ Native to U.S.
1. Certain conditions originating in perinatal period	421	33.0	94.3	394.6	592.7	0.7
2. Symptoms, signs, and ill-defined conditions	313	24.5	7.3	293.3	164.1	1.8
(SIDS)	(268)	(21.0)	(3.7)	(251.2)	(145.9)	(1.7)
3. Congenital anomalies	209	16.4	63.7	195.9	245.6	0.8
4. All other causes	64	5.0	17.2	59.9	48.7	1.2
5. Accidents and adverse effects	59	4.6	8.5	55.3	27.0	2.0
6. Influenza and pneumonia	56	4.4	14.3	52.5	22.3	2.4
7. Meningitis	28	2.2	14.3	26.2	11.6	2.3
8. Gastritis, duodenitis, non-infective enteritis and colitis	17	1.3	5.9	15.9	4.2	3.8
9. Child battering and mistreatment	10	7.8	10.0	9.4	6.0	1.6
All other	98	7.7				
Total	1,275	99.9	45.9	1,194.9	1,193.2	1.0

Note. Indian rates computed from IHS vital statistics data (IHS, 1985); U.S. rates from National Center for Health Statistics (1984).

Sudden infant death. The fact that Sudden Infant Death Syndrome (SIDS) is the second most common cause of infant death among Indians (1.7 times the U.S. population) deserves a great deal of future attention. There are only a handful of studies which have looked at SIDS among Indians. Among Oklahoma Indians, Kaplan, Bauman, and Kraus (1984) report that the SIDS rate is lower (2.3 per 1,000 births) than in the U.S. (1.5 to 3.0). Fleshman and Peterson (1977) found a SIDS rate among Alaska Natives of 3.1 to 4.5 per 1,000 births. Kraus, Franti and Borham (1972), in an etiological study, found that Indian infants in California were high risk for SIDS. Many of these factors were social and economic. Finally, a recent study in Alaska found the Native rate of SIDS to be 6.3 per 1,000 for 1976-80, 2.9 times higher than Whites, yet following a pattern similar to Whites (Adams, 1985). Nevertheless, no studies have succeeded in isolating any particular pattern or etiology for SIDS among

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Indians. Certainly this is an area worthy of major investigation in the future (Arsenault, 1980). It is particularly important that these studies be in-depth, multivariate works which utilize autopsies on all suspicious infant deaths. Most of the above are not autopsy based.

Birth defects. Studies on congenital malformations in American Indians seem to be few. As documented by Niswander, Barrow, and Bingle (1975), Indians have a lower incidence of clubfoot and central nervous system anomalies (e.g., spina bifida). On the other hand, there is evidence that they have a higher rate of cleft lip (with and without cleft palate) and polydactyly (extra fingers and toes). These findings are in keeping with other Mongoloid populations and the other articles on anomalies and Indians (Bingle & Niswander, 1975; Niswander & Adams, 1967; Weit, 1979). Overall, the data from Indian birth certificates indicate that 3.3% of Indian newborns are born with a recognizable anomaly (Indian Health Service, 1985). This is comparable to U.S. averages.

Of recent concern is the suspicion of teratogenic (environmentally induced) birth defects and adverse health affects among Indian population. Low-level radiation and other consequences of uranium mining and milling have been suspected as being teratogenic for the Navajo, Laguna Pueblo, Sioux, and others who live near mining operations. But evidence is negative, inconclusive, or still forthcoming from several studies in Shiprock and the Grants mineral belt in New Mexico (Goodman, 1984; Norwood, 1985). At the very least, these studies show an altered sex ratio and low birth weights in the Grants area and some evidence of birth defects in the Shiprock area during the late 1960s and the 1970s.

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Alcohol, however, is now a widely recognized teratogen, and Fetal Alcohol Syndrome (FAS) has been studied extensively among the Navajo, Pueblo, and Plains Indians of the Southwest (May & Hymbaugh, 1983). The incidence over the years 1968-82 was found to be 1.8 per 1,000 births with variations from 1.4 for the Navajo to 9.8 for the Plains culture groups. When FAS cases are combined with Fetal Alcohol Effect (FAE) cases (a milder form of prenatal alcohol damage) the incidence of the two was found to range from 2.2 to 17.9 per 1,000 in these same groups. The overall Southwestern Indian average rate of FAS and FAE was 2.8 (May, Hymbaugh, Aase, & Samet, 1983). In general the 15-year rates of FAS and FAE among the majority of Southwestern Indians were similar to that found in Sweden (FAS=1.6) and France (FAS=1.5) (Abel & Sokol, 1987).

Unfortunately, two facts about FAS and Indians seem outstanding. First, those rates found in the Southwestern Plains culture tribes were substantially higher than reported elsewhere for any other group. When Southwestern Plains incidence rates are projected to similar Indian cultures elsewhere in the U.S. with similar alcohol-related death indexes, the incidence of FAS and FAE may be expected to be high among a number of other Indian groups (May & Hymbaugh,

1983). Secondly, as seen in Table 7, the prevalence of both FAS and FAE was found to be 3 to 4 times higher in the youngest age groups (0-4 years). This may be an artifact of the screening procedures, but it is also quite probable that fetal alcohol anomalies are actually increasing at a substantial rate (May et al., 1983).

Table 7

Prevalence of Fetal Alcohol Syndrome and Fetal Alcohol Effect (by age groups) Among American Indians of the Southwestern U.S.—1982[a]

	Fetal Alcohol Syndrome		Fetal Alcohol Syndrome and Fetal Alcohol Effect	
	Age Group			
Culture Group	0-4	5-14	0-4	5-14
Navajo	3.7	0.5	5.2	1.0
Pueblo	4.7	1.1	5.7	1.3
Southwest Plains	11.7	10.2	17.5	20.5
Total	4.2	1.0	5.7	1.8
Adjusted rate[b]	(1/238)	(1/1,000)	(1/175)	(1/556)

Note. From "Epidemioogy of Fetal Alcohol Syndrome Among American Indians of the Sourthwest" by P.A. May et al., 1983. *Social Biology, 30(4)*, pp. 374-387.

[a] Rates per 1,000 population.
[b] Adjusted by the direct method to the proportion of each culture in the entire Southwest study area.

In summary, fetal alcohol syndrome was found to be the leading major birth defect among Indians of the Southwest. Further work needs to be done to survey other groups, both Indian and non-Indian, to further delineate incidence and also for further insight into maternal alcohol abuse. Prevention can be undertaken now, but intervention with problem-drinking mothers has been found to be difficult. Fortunately, in most tribes FAS and FAE children are born to a small number of women (6 per 1,000 women of childbearing age), but they are an extremely difficult group to reach (May et al., 1983). Approaches to effect either a cessation of (a) drinking or (b) childbearing in these women need to be explored and refined. Otherwise more and more dollars will have to be spent to deal with the variety of medical problems and developmental disabilities which are typical of FAS and FAE children (Abel & Sokol, 1987; Fischler & Fleshman, 1985).

Morbidity statistics. Turning now to a final health issue for Indian infants, available morbidity statistics will be considered. In Table 8, both outpatient workload data and inpatient discharge data are summarized. The 10 leading clinical impressions for all outpatient visits are listed. From a prevention perspective it is exciting to see that the most frequent outpatient visit was for "well child care" and "other prevention" was fourth. This will warm the heart of any public health professional. However, the other eight reasons deserve a different type of consideration.

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Table 8

Outpatient Visits and Inpatient Discharges for Indian and Alaska Native Infants (Age - Birth to 1 Year) By Clinical Impression and Discharge Diagnosis, Fiscal Year 1984

Outpatient			Inpatient		
Clinical Impression	Number	Percent	Diagnosis at Discharge	Number	Percent
1. Well child care	58,515	22.9	1. Pneumonia	1,422	15.0
2. Otitis media-acute	51,009	19.9	2. Healthy Infant, and chronic child care	971	10.2
3. Upper respiratory infection	32,861	12.8	3. Gastroenteritis and colitis	607	6.4
4. Other preventive health services	15,480	6.1	4. Bronchitis and Bronchiolitis-Acute	542	5.7
5. Gastroeteritis, diarrhea	12,405	4.8	5. Otitis media	519	5.5
6. Conjunctivitis	6,267	2.4	6. Intestinal infection diseases	366	3.9
7. Pneumonia	5,636	2.2	7. Misc. for contract health care systems	204	2.1
8. Acute bronchitis, Bronchiolitis	4,981	2.0	8. Ill-defined condition	196	2.1
9. Fungal diseases	3,538	1.4	9. Meningitis	161	1.7
10. Eczema, urticaria, skin allergy	2,965	1.2	10. Convulsions	128	1.3
All others	62,161	24.3	All others	4,088	43.0
Total	255,805	100.0	Total	9,504	100.0

Note. From Indian Health Service Ambulatory Patient Care Data and Indian Health Science Inpatient (Direct and Contract) Data.

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Problems of great concern are found in this list. Otitis media, so common among Indian children, accounts for 19.9% of all visits, while upper respiratory infections (12.8%), gastroenteritis (4.8%), conjunctivitis (2.4%), pneumonia (2.2%), and bronchial infections (2.0%) are all common reasons for visits. Many of these problems have been around for years on reservations, but most are causing fewer problems than before. Nevertheless, the more serious disabilities created by these diseases will have to be addressed for years to come (Fischler & Fleshman, 1985).

Inpatient discharge data tell a similar story in that a number of infectious diseases are still serious morbidity problems. Pneumonia is the leading cause for hospitalization (15%) among infants, followed by gastroenteritis, bronchial infections, otitis media, and other infectious diseases such as meningitis.

The above morbidity data indicate that infectious and parasitic diseases are still of concern among Indian infants. Detailed discussion of some of these problems will follow in the next section.

Ages 1 - 14 Years

In Table 9, the mortality of Indian children aged 1 through 14 years is summarized. Throughout these ages, accidents are the leading cause of death with other accidents leading motor vehicle deaths in all categories. The second

leading cause, all other diseases, is a residual classification of little use to understanding or prevention. Congenital anomalies are the third leading cause in ages 1-4 followed by heart disease (other forms), homicide, ill-defined conditions, pneumonia, cancer, meningitis, bronchitis, and other infectious and parasitic diseases. In the 5-9 age group, heart disease, meningitis, and bronchitis disappear from the problem list which still includes anomalies, ill-defined conditions, homicide, cancer, and pneumonia. Among ages 10-14, cancer and homicide become more important along with the addition of suicide. As the bottom of the table indicates, the percentage of male death increases in each age group. By ages 10-14, two thirds (67%) of all deaths are male. Another way of expressing this is that the sex ratio at death goes from 122 males per 100 females in ages 1-4, to 175 in ages 5-9, to 204 in ages 10-14. This higher toll among Indian males continues throughout the middle years of life to age 65 (Carr & Lee, 1978; Kunitz, 1983; Kunitz & Slocumb, 1976).

Table 9

Age-Specific Mortality by Cause, Ages 1-14, 1980-82 for All Indians and Alaska Natives

	Age Group								
	1 - 4			5 - 9			10 - 14		
Cause of Death	N	%	Rank	N	%	Rank	N	%	Rank
Accidents & adverse effects	147	49.0	1	90	64.3	1	91	57.6	1
Motor vehicle	(64)	(21.3)		(41)	(29.3)		(44)	(27.8)	
Other	(83)	(27.7)		(49)	(35.0)		(47)	(29.7)	
All other diseases	41	13.7	2	16	11.4	2	16	10.1	2
Congenital anomalies	21	7.0	3	2	1.4	8	2	1.3	10
Ill-defined conditions	13	4.3	5	11	7.8	3	8	5.1	5
Homicide	13	4.3	5	3	2.1	7	9	5.7	4
Heart disease - other forms	14	4.7	4	0	0.0	-	4	2.5	8
Pneumonia	11	3.7	7	4	2.9	5	5	3.2	7
Cancer—all forms	8	2.7	8	5	3.6	4	10	6.3	3
Meningitis	6	2.0	9	0	0.0	-	0	0.0	-
Bronchitis	6	2.0	9	0	0.0	-	0	0.0	-
All other infectious/parasitic diseases	6	2.0	9	4	2.9	5	3	1.9	9
Suicide	0	-	-	0	-	-	6	3.8	6
Subtotal	(28.6)	(95.9)		(13.5)	(96.4)		(15.4)	(97.5)	
Other than above causes	14	4.6		5	3.6		4	2.5	
Total	300	100		140	100		158	100	
Sex:									
Male	165	(55)		89	(64)		106	(67)	
Female	135	(45)		51	(36)		52	(33)	
Sex Ratio[a]	122.2			174.5			203.8		

Note. Indian Health Service, 1985

[a] Male deaths per 100 female deaths.

In Table 10, the death rates for these ages are compared to those of the general U.S. population. Overall, the Indian death rate in ages 1-4 is 1.5 times the U.S. rate. Of particular concern are the rates of death from accidents, pneumonia,

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infectious diseases such as meningitis and other infectious diseases, bronchitis, other forms of heart disease, and homicide. This is also true in ages 5-14. In this age group the overall rate is 1.2 times the U.S. rate and accidents continue to be higher than the U.S. average, as are infectious and parasitic diseases, pneumonia, ill-defined conditions, homicide, and suicide.

Table 10

Age-Specific Rates of Death, Ages 1-14 for U.S. Indians and Alaska Natives (1980-82) and the U.S. Population (1981)[a]

	Age Group					
	1-4			5-14		
Cause of Death	Indians and Natives	U.S.	Ratio Indians/Natives to U.S.	Indians and Natives	U.S.	Ratio Indians/Natives to U.S.
Accidents and adverse effects	45.1	23.6	1.9	21.5	14.2	1.5
Motor vehicle	(19.7)	(7.8)	(2.5)	(10.1)	(7.5)	(1.4)
Other	(25.5)	(15.8)	(1.6)	(11.4)	(6.7)	(1.7)
All other diseases	12.6	8.0	1.6	3.8	3.4	1.1
Congenital anomalies	6.4	7.6	0.8	0.5	1.6	0.3
Heart disease—other forms	4.3	2.4	1.8	0.5	0.7	0.7
Symptoms, signs and ill-defined conditions	4.0	2.1	1.9	2.3	0.5	4.5
Homicide	4.0	2.6	1.5	1.4	1.3	1.1
Pneumonia	3.4	1.7	2.0	1.1	0.4	2.7
Cancer—all forms	2.5	4.9	0.5	1.8	4.1	0.4
Meningitis	1.8	1.2	1.5	--	0.1	--
Bronchitis	1.8	0.1	18.0	--	0.0	--
Other infections/parasitic diseases	1.8	--	--	0.8	--	--
Suicide	--	--	--	0.7	0.5	1.4
All Causes	92.1	60.2	1.5	35.5	29.4	1.2

Note. Indian Health Service (1985) and National Center for Health Statistics (1984) data; (--)indicates no deaths in this category.

[a] Rates per 100,000 population.

The fact that motor vehicle accidents and other accident deaths are higher among Indians is not a surprise to anyone who lives and works with reservation Indians, but one usually thinks of older persons when considering accidents. Of the limited number of studies on accidents and Indians, few consider young children at all (Boyd, Maynard, & Holmes, 1968; Brown, Gurunanjappa, Hawk, & Bitsuie, 1970; Hackenberg & Gallagher, 1972; Katz & May, 1979; May, 1976; Omran & Laughlin, 1972; Schmidt, Hole, & Barclay, 1966; Stull, 1972, 1977; Wills, 1969). Of obvious concern from Table 10 is that children aged 1-4 are dying over 2 times more frequently from motor vehicle accidents. Protective devices such as infant and youth seats could prevent this (Berger, 1981; Sleet, 1984). In addition, a high-risk lifestyle or environment may be quite influential in the high rate of other accidents (Brown et al., 1970). More on prevention of accidents will follow.

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As with the infant data, a high-risk environment for infectious and contagious diseases is again shown by the statistics on Indian youth. Certainly the higher rates of death from these diseases indicate that improvements in the sanitation conditions of housing, water supplies, and other key areas (Maynard & Twiss, 1970; Stewart et al., 1980), will not only benefit infants, but also other youth. Also, early detection and treatment of these illnesses would certainly lower the death rate from infectious, and parasitic and related diseases. In this light, one might question the trend of cutbacks and/or no expansion in Public Health Nursing and Community Health Representative Services.

In Table 11, the inpatient and outpatient data for Indian youth aged 1-14 years are documented. The clinical impressions for outpatient visits are listed by percentage of all visits. Leading the list for children aged 1-4 are otitis media, upper respiratory infection, and gastroenteritis. Again, as with infants, preventive services (well child care, other preventive services, and physical exams) are quite important in these data. In ages 5-9, the data are similar, but strep throat, lacerations, and allergies begin to emerge as problems. Finally, in ages 10-14, the patterns of outpatient visits are quite similar to those of 5-9 year olds.

Table 11

Ten Leading Outpatient Visits and Inpatient Discharges (%) for Indian Youth (Age 1 through 14 Years) by Clinical Impression and Discharge Diagnosis, Fiscal Year 1984

	Age Group		
Clinical Impression (%)	1-4	5-9	10-14
Acute and chronic otitis media	17.8	8.2	3.5
Upper respiratory infection	14.0	11.7	8.3
Well child care	10.8	2.9	--
Other preventive health services	6.9	4.5	4.9
Gastroenteritis, diarrhea	2.4	--	--
Physical examination	2.3	5.0	5.4
Pharyngitis and tonsilitis (non-strep)	2.2	5.0	5.4
Pneumonia	2.1	--	--
Impetigo	2.1	--	--
Conjunctivitis	1.9	--	--
Strep throat	--	3.7	3.4
Laceration/open wound	--	3.6	3.0
Respiratory allergy	--	2.7	--
Dislocation, sprain, strain	--	--	3.3
Superficial contusion	--	--	3.0
Refractive error	--	3.2	5.2
All others	37.5	52.3	54.8
Total (number)	429,306	235,455	225,151

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Table 11 (continued)

Discharge Diagnosis (%)	Age Group 1-4	5-9	10-14
Pneumonia	18.5	5.3	2.9
Otitis media	9.4	7.6	3.4
Intestinal infectious diseases	4.6	2.2	1.3
Gastroenteritis and colitus	4.0	2.8	--
Convulsions	3.7	1.5	1.5
Asthma	3.4	3.5	3.0
Fractures	3.2	9.2	8.7
Bronchitis, bronchiolitis, acute	3.0	--	--
Cellulitus and abcess, except digit	2.4	2.6	--
Acute laryngitis and tracheitis	1.6	--	--
Open wounds	--	2.3	2.6
Inguinal hernia	--	1.5	--
Deliveries	--	--	2.5
Diabetes	--	--	2.2
Larcerations	--	--	1.4
All others	46.0	61.5	70.0
Total (number)	5,245	2,632	2,722

Inpatient data in Table 11 show that pneumonia, otitis media, intestinal disease and gastroenteritis lead the list for ages 1-4. In the later age groups, the infectious diseases become less important while wounds, fractures, lacerations, diabetes, and deliveries become more important.

Accidents and trauma. From the above data it might be said that for young Indians (ages 1-14), accidents are the single most important, and possibly ignored, issue. The toll of death from accidents in the U.S. is quite high in and of itself—43.9 per 100,000—(National Center for Health Statistics, 1984), but for Indians it is much higher. Certainly there are many reasons such as rurality, the young median age of the Indian population, alcohol laws, and acculturation stress to account for this disparity (Hackenberg & Gallagher, 1972; Katz & May, 1979), but the higher rates of motor vehicle accident deaths may be quite preventable. For instance, the incidence among those under 5 years could certainly be lessened through the use of infant seats and child restraints (Berger, 1981; Sleet, 1984). Not just in eastern urban states, but even in the wide open and individualistic western states, laws and programs to facilitate the use of car seats have proven effective. In New Mexico a law requiring the use of child protective seats reduced the accident death rate 33%. In the first 15 months after its enactment, the rate of death for children under 5 years of age dropped from 20.4 per 10,000 vehicle accidents to 13.7 (Restraint Law, Albuquerque Journal, 1985). Another health problem related to motor vehicles was recently mentioned in the literature. On a number of reservations some children have died from carbon monoxide (CO) poisoning in motor vehicles. When a check of a sample of Navajo-owned vehicles was made, 19% were found to have levels of CO exceeding the Environmental Protection Agency (EPA) 8-hour standards while

2.6% were found to have levels which exceeded the highly serious 1-hour standard (Williams, 1985). Parents can certainly have an effect on accident trauma and mortality.

A final consideration regarding accidents is that disability from trauma is high among Indians. The disability rate in the general Indian population is believed to be higher in many categories than the general U.S. For example, Levy (1981) found significantly higher rates of epilepsy and seizure disorders among several southwestern tribes than in non-Indian comparison communities. Most of the difference in rates was caused by accident trauma; much of it was alcohol related. Injury and accidental death exclusive of motor vehicles is a very complex issue and will be considered in detail in the Prevention section of this chapter, for major environmental changes will have to be undertaken.

Infectious diseases. The reduction of incidence for many infectious diseases has been quite successful among Indians over the past 30 years, but the data here indicate that more gains need to be made in some areas. In order to lower the incidence rates of meningitis, bronchitis, strep, and rheumatic fever, advances need to be made in the environment (e.g., housing and sanitation), lifestyle, and public education. Some focused screening programs in school and head start programs can also prove to be effective (Coulehan, Bracke, Welty, & Goldtooth, 1982). Also new vaccines may be found which are effective for these problems. Early detection will also decrease the death toll and seriousness of the diseases. An example of these possibilities is found with meningitis and haemophilus B influenza. This influenza is 4 to 6 times higher among the Navajo and some Alaska Natives than in the general U.S., and it usually strikes those under 2 years of age. A majority of all meningitis cases among the Navajo (60%) and Eskimos are caused by haemophilus B (Coulehan et al. 1984; Ward, Lum, Margolis, Fraser, & Bender, 1981). Another 20% of Navajo meningitis cases are caused by streptococcus pneumonia. Even when meningitis does not cause death, the neurological sequelae may include developmental disabilities such as motor defects, seizures, paralysis, and hydrocephalus. Thus, it is a serious disease which should be attacked on various fronts. Aside from the obvious need for a more hygienic environment and better housing and living conditions, (Maynard & Twiss, 1970; Stewart et al., 1980), a new vaccine is being tested for use in early infancy which may help protect young Indians from hemophilus B infections, and therefore meningitis (Coulehan, Hirsch et al., 1983).

With the above diseases, as with rheumatic fever and otitis media, the debate continues regarding the causation role of genetic and environmental variables. This debate may persist forever; but evidence exists for either view. Many Indian children do live in environments with higher risk for these diseases, and thus one would expect the higher rates found for Indians in the lower 48 states,

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Alaska, and Canada. But in several studies of otitis media, rates of disease were found to be higher even for Indian youth living in much improved environments (Longstaffe, Postl, Kao, Nicolle, & Ferguson, 1982; Nelson & Berry, 1984; Spivey & Hirschhorn, 1977; Weit, 1979). It may be that otitis media is more common to Indian children because of a structural difference in the eustachian tube. Likewise, rheumatic fever is also believed to have a major genetic component, but one recent central study in Manitoba, Canada, points more towards environmental conditions (poverty and overcrowding) than to other factors (Longstaffe et al., 1982).

Breast feeding. Regardless of the etiology of a variety of infectious diseases, breast feeding in infancy has been found in numerous studies to prevent or protect children from otitis media, diarrheal diseases, and a number of other infectious diseases (Ellestad-Sayed, Cooden, Drilling, & Hayworth, 1979; Forman et al., 1984; French, 1967; Jason, Nieburg, & Marks, 1984). In these studies, Indian children who were exclusively breast fed the first 6 months were virtually free of otitis media and a number of infectious diseases. Studies focusing on infants 6 months and older also show that breast milk is protective and that whole milk, as opposed to low fat or skim, is up to 5 times more protective for diarrheal diseases (Koopman, Turkish, Monto, Thompson, & Isaacson, 1984). Not only is the prevention of otitis media and other diseases an important consideration for the Indian child's physical health, it is also of grave importance to the child's psychological and social development (McShane, 1982).

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Other Issues

There are several issues not addressed in the above data which deserve attention here: dental needs and nursing bottle caries, inhalants, tobacco and drug use, and child abuse and neglect.

Nursing Bottle Caries and Dental Issues

The baby bottle syndrome (or nursing bottle caries) is caused by extended contact between an infant or young child's teeth with liquids from a feeder bottle. Of particular concern is the "propping" of a bottle filled with various types of sugar-containing drinks (e.g., pop, artifically sweetened and natural fruit drinks, sugar water, and even milk) in the mouth of the child for extended periods. The toll taken by nursing bottle caries among a number of Indian groups is a major problem. In ages 0-4 only 18% of Indian children are caries-free while 40% have 7 or more decayed or filled teeth. As much as 50%

of the Indian preschool children examined suffered from nursing bottle caries (Dental Branch, IHS, 1985). Baby bottle syndrome children suffer 4 times the caries attack rate than do children without the nursing bottle problem. In addition, as Table 12 indicates, the decayed, missing, and filled teeth index (DMFT) is considerably higher among Indian children.

Table 12

Selected Facts on Dental Problems of Indian Children Compared to U.S. Children, 1983-84

Problem	Description		
Peridontal	58% of Indian children aged 0-19 years have at least incipient gum disease.		
Total decayed, missing and filled teeth (DMFT)	U.S. Indians	U.S.	Ratio U.S. Indians to U.S.
Ages 5-9 (primary teeth)	5.53	2.55	2.2
Ages 9-17	5.86	2.91	2.0
Caries Distribution (Ages 5-17)	U.S. Indians		U.S.
No caries	19.6%		36.6%
Ages 1-3 DMFT	23.0%		27.8%
Ages 4-6 DMFT	27.0%		20.9%
Ages 7+ DMFT	30.4%		14.6%

Note. From the Dental Branch, IHS (1985).

Other dental problems are evidenced by incipient periodontal disease. Finally, the IHS Oral Health Survey showed treatment needs in restorations, extractions, and other services that were 2 to 10 times the national averages (Dental Branch, IHS, 1985).

The dental problems of young Indian children have a great impact on their later life in terms of self-esteem, social relations, and general well-being. A poor start in oral health will certainly be cause for multiple problems for the remainder of the person's life.

Indian children show rapid development of the permanent teeth (Owsley & Jantz, 1983). This and the early onset of caries beg the prevention issue from birth. The breast feeding of babies must be emphasized more, but in all ways the nursing bottle caries must be prevented. More preventive efforts of all kinds must be undertaken, and they might be most effective if targeted primarily at children's parents, particularly the mothers (Chen & Tatsuoka, 1984). Studies on prevention targeted at adolescents have consistently yielded poor results (Kegeles & Lund, 1984). One study on the utilization of Indian Health Service dental services among the Navajo showed a much lower rate of use than in the general U.S. population. Only 19% of the Navajo saw a dentist in the survey

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year (1977), whereas, in the U.S. population it was 49% (Stewart et al., 1980). This is in spite of the fact that the services to Navajos are free. Studies in the general population show that prepaid services (e.g., with dental insurance) yield higher rates of dental visits, especially among those of lower socioeconomic status (Grembowski, Conrad, & Milgram, 1985). Therefore it seems that a major public education, outreach, and familiarization campaign is appropriate. Such a campaign might effectively use the most qualified of the large cadre of Indian and Native dental assistants employed by IHS. Goals should include a reduction in "dental care anxiety," encourage utilization of all services, and have a strong focus on preventive hygiene practices. These campaigns should be consonant with or based on local cultural ideation and incentives (Hagey, 1984). In addition, fluoridation services, although instituted and greatly expanded over the past several decades, should be pursued even further.

Inhalants, and Drug and Tobacco Use

Of all types of substance abuse, inhalant abuse begins the earliest among Indian and Hispanic youth in the U.S. (Beauvais, Oetting, & Edwards, 1985a; May, 1982; Oetting, Beauvais, Edwards, & Velarde, 1983; Reed & May, 1984). The use of inhalants is generally found to be isolated to 16-32% of Indian youth, and fortunately, use declines tremendously as Indian children move into their middle teens. Only a small percentage (1-2%) are chronically heavy users. Unfortunately though, longitudinal studies indicate the problem may be growing (Beauvais et al., 1985a). Of particular concern with the use of spray paint, gasoline, hair spray, and other solvents is that they contain a large variety (hundreds) of toxic chemicals which have both known and unknown harmful effects. Leaded gasoline has been documented as a serious problem in morbidity and mortality (Coulehan, Hirsch et al., 1983; Remington & Hoffman, 1984). Some solvents such as hair spray and household cleaners are actually consumed orally by some on particular reservations. Prevention can take a number of approaches from counseling individuals (Murphy & Deblassie, 1984) to extensive health education approaches, and large recreational opportunities (May, 1986). More research on specific inhalant abusers is needed.

Alcohol and drug use replaces inhalant use and experimentation as the child ages and can access these other drug items. Again, the problem grows throughout high school and varies from reservation to reservation (May, 1982; Oetting et al., 1983). By 12th grade, 60-90% of Indian youth report using alcohol and 22-62% have used marijuana. While the above data are slightly higher than the U.S. population, other drugs are not used as frequently by Indian youth. As with inhalant abuse, major programs using value clarification,

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self-esteem enhancement, recreation and positive energy outlets, education, and other approaches need to be used with this problem (Bach & Bornstein, 1981; Beauvais & LaBoueff, 1985; May, 1986; Winfree & Griffiths, 1983a).

Smoking cigarettes, chewing tobacco, and "dipping snuff" are all health risk behaviors which start at a young age among all groups. Although smoking behavior varies greatly among Indian groups, it generally starts in the teens. Higher rates of smoking are found among northern Plains tribes (Gillum, Gillum & Smith, 1984; Longclaws, Barnes, Grieve, & Dumhoff, 1980) and lower rates exist among southwestern tribes (Sievers, 1968). Chewing tobacco and snuff are quite commonly used and have become increasingly popular among youth on many reservations throughout the U.S. Although this writer is not aware of any major publications on this behavior, it is not uncommon for a significant percentage of young boys on many reservations to begin dipping and chewing well before age 10. In some reservations smokeless tobacco has been quite popular for 15 years or more. Therefore, an increased risk of morbidity and mortality from both lung and oral cancer may be forthcoming in the near future (Poulson, Lindensmith, & Greer, 1984; Squire, 1984). Probably the high mortality from accidents and other premature death has deflected attention from the chronic and incipient problems with tobacco-related deaths.

None of the above behaviors is easily solved or prevented, but large-scale efforts are necessary in many contexts. Indian youth can benefit from such basic improvements as a reduction in prejudice, increased self-esteem and coping skills, improved social and educational environments, and added resources for development. Any effort to eradicate or reduce addictive behaviors should address these basic issues as well as the specific problems of abuse and addiction (Blount & Dembo, 1984; Dinges & Hollenbeck, 1978; Holmgren, Fitzgerald, & Carmen, 1983; Martin, 1977). New behaviors can replace these negative ones through social learning dynamics (Winfree & Griffiths, 1983b) if positive, stimulating conditions are extant.

Child Abuse and Neglect

Some of the data on mortality in infancy have indicated that child abuse and neglect were slightly greater problems among U.S. Indians than in the general U.S. population. Much of this variance may be due to socioeconomic differences. Certainly the problems vary from one group of Indians to the next. But only recently a number of articles have begun to appear on these phenomena. Whether it is a growing problem is not known. Fischler (1983) points out that abuse is now more frequently identified by clinicians who work with Indians, and it is at least as common among U.S. Indians as in the general U.S. (Oakland & Kane, 1973; White & Cornely, 1981), and quite a bit more common in some tribes (Wichlacz, Lane, & Kempe, 1978). The causes of child

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abuse and neglect seem to be similar among Indians (e.g., poverty, stress, a learned family trait, etc.), but they are compounded by the conditions associated with rapid social change and cultural conflict. The prevention of abuse and neglect among Indians has both its special strengths and problems. The special strengths of the extended family and community can be an advantage as can be the Indian Child Welfare Act which protects the ethnic identity of the child. But as with abuse and neglect in many populations, detection, treatment, and prevention are difficult (Blanchard & Barsh, 1980; Fischler, 1980; Goodluck & Eckstein, 1978; Kessel & Robbins, 1984). Recognition of a family at risk for child abuse and neglect often locate a multiproblem family at risk for a variety of health and behavior problems (Niswander, 1984; Spivey, 1977).

Eye Care

In the recent past, Indian populations recorded higher rates of glaucoma and trachoma than did most other people in the U.S. Incidence of these problems has declined and they are becoming a survival or residual problem the way tuberculosis is now among most Indian groups (Broudy & May, 1983). But one current problem seems to require attention among Indian youth. High astigmatism (greater than 2 diopters) is found with tremendous frequency among Navajo children (26% compared to approximately 2% in the general U.S.) and possibly other southwestern tribes (Garber, 1981). An even greater frequency of astigmatism is seen in southwestern Indian children with FAS and FAE (Garber, 1982, 1984). The point to be made here is that Indian children may have even greater needs for early eye care and corrective lenses than other populations. Early eye exams and care would certainly benefit the children in a variety of ways, not the least of which would be to aid their overall self-esteem, development, and performance in school.

Obesity

Among a number of American Indian tribes, obesity, which begins at an early age, later causes major health problems (i.e., diabetes, high blood pressure). Among a number of tribes, adult onset diabetes (Type II) is epidemic (diabetes present in 28% or more of those over 35 years of age) and the problem is growing. Among the Pima, studies show that obesity is steadily increasing over recent years and mean weights already indicate excess weight in many youths by the age of 15 years (Bennett & Knowler, 1979). Because of genetic propensities, many tribes have an inordinate ability to gain weight (Knowler, Pettitt, Bennett, & Williams, 1983; Pettitt et al., 1983), so the problem must be aggressively

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addressed among the young and old alike to reduce the negative sequelae of obesity. In a later section of this paper, a program is described which deals with this problem.

Mental Health, Suicide, and Young Indians

Of major importance to the adequate social and mental development of young Indians of all tribes is a well-functioning, secure family. Efforts to bolster the adequate functioning of Indian families should therefore be a major priority of mental health personnel concerned with youths (Dinges, 1982; Dinges, Yazzie, & Tollefson, 1974; Lefley, 1974, 1976). A strong family is particularly important in assisting the Indian child through some of the rigors of adolescence and the increased acculturation stress of bicultural adjustment. Certainly many studies have shown that a variety of mental health problems and psychopathologies arise in people who began life in disorganized and disrupted families (Berlin, 1986; Manson, Tatum, & Dinges, 1982). In addition, the Indian child and his or her family are vitally linked to the values and resources of their community and culture. Being raised in a vital, integrated culture provides stability, resources, and skills for the social and mental health of the child. Conversely, cultures and families undergoing stress and strain fail to provide for the adequate development of the children (Berlin, 1986; Lefley, 1974). The ultimate goal in this area, however, is for Indian youth to grow and develop the coping skills, self-esteem, and competencies which will allow them to exist, compete, and blossom in both traditional and modern settings. More and more studies are indicating that those Indians who are the least susceptible to alcohol and drug abuse, self-destruction, psychopathology, and other behavioral problems are those who can demonstrate competency in both traditional and modern settings (Berlin, 1986; May, 1982).

Much of the literature on mental health among Indian youths points to ages 10 and older as the period for onset of problems. Problems of adjustment in school with an alien cultural emphasis, racial prejudice, lack of established and satisfying paths for achievement, and lack of Indian role models are problems which create high levels of stress on Indian youths (Allen, 1973; Beiser, 1981; Beiser & Attneave, 1982; Green, Sack, & Pambrum, 1981). Since much of the conflict seems to arise in school settings, schools must lead the way in curricula (Dinges & Hollenbeck, 1978) and teaching which promotes broad competency and self-esteem (Kleinfeld, 1982). Public health professionals must work with the schools to aggressively develop relevant curricula and environments (Berlin, 1982).

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In the area of research on the epidemiology of the variety of mental disorders among Indians, few comprehensive studies exist (Manson et al., 1982). As more uniform criteria and diagnostic tools are currently being developed, the next decade should yield a better knowledge of the nature, incidence, and prevalence of mental disorders (Manson & Shore, 1981; Shore & Manson, 1981).

Suicide is and has been an important issue to consider among Indian youth (Dizmang, Watson, May, & Bopp, 1974). By age 10-14, suicide enters into the picture via mortality and attempts (Table 10). The data base of suicide studies is now over 120 articles and the evidence is accumulating for a more complete understanding of this behavior (May, 1987; McIntosh & Santos, 1981; Shore, 1975; Willard, 1979). Findings of major importance to young Indians which beg for solutions include the fact that the suicide rate is increasing in some tribes among ages 10 to 14 and 15 to 19 years. While the suicide rate of youth is increasing in the general U.S., most tribes had a higher rate than U.S. averages in the 1960s and their increases have been equal to or greater than U.S. increase. Much of the recorded increase among southwestern tribes does seem to parallel trends of rapid modernization and acculturation stress (Van Winkle & May, 1986). Finally, it seems evident that there is an imitative, contagion, or suggestibility factor to suicide among Indian adolescents, particularly on small reservations. How to best intervene in this process is of great importance (Shore, Bopp, Waller, & Dawes, 1972). Intervention methods must be pursued even though the approaches used may vary from one group to the next based on the special needs of each.

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Prevention

With all of the above statistics, ideas, and sources in mind, the focus now turns exclusively to prevention through change, particularly behavioral change. Since Indian groups are generally undergoing the demographic and epidemiologic transition, social change of all sorts is obviously occurring. The goal of prevention should be to enact programs which will utilize the current change, community strengths (both old and new), and local, state, and national resources to direct the change in a positive, healthy, and productive direction. Ultimately, public health intervention in an Indian community should then result in long-term improvement in health behavior.

Research shows that health-related practices, health-directed practices, and health-protective behaviors are all highly influenced by social networks (Gottleib & Green, 1984). Detailed analysis of the 1979 National Survey of Personal Health indicated that health behavior is influenced by social structure, stress, social support, lifestyle, and health status. Of greatest importance in health behavior are gender, education, age, and income. Negative life events (e.g.,

death in the family) are also related to health and tend to enhance negative behaviors such as smoking, sleep loss, reduction of physical activity, and alcohol use (Gottleib & Green, 1984). While these findings are not new, they promote a more explicit context for planning behavior change for health improvement. Prevention efforts must impact on large social networks and work to improve educational level, income, and other socioeconomic variables. Further, negative life events must be minimized and filtered through a strong social support system (marriage, family, religion) for the best possible health outcomes (Mitchell & Moos, 1984). Any and all programs should keep these principles as the basis of planning and activity (Mitchell, Billings, & Moos, 1982). This has been a goal of many programs all over the world and specifically in Indian country (Maynard & Twiss, 1970), but the task is so immense and complicated we may tend to lose the proper perspective. Certainly this has been shown to be one of the major forces of the modern, rather exclusively clinical approach in U.S. medicine (Starr, 1983). The task of public health improvement was so immense and involved such large-scale social intervention that many clinicians and researchers took an entrenched, "clinic-based professionalism."

Particular applications of the larger social network improvement approach for young Indians must address some key issues which have been pointed out repeatedly. First, a reduction in prejudice against Indians in all areas is vitally important to the self-esteem of young Indian children (Allen, 1973; Braroe, 1975). Second, efforts to build self-esteem and enhance a positive outlook on life need to be more obviously emphasized in Indian schools (Kleinfeld & Bloom, 1977). Third, included in the schooling of Indian children should be an emphasis on problem-solving techniques and applying information for one's general self-enhancement (Bach & Bornstein, 1981; Berlin, 1982; Schinke, Gilchrist, Smith, & Wong, 1978) and also for the avoidance of particular problems that an Indian youth is found to face in life. Fourth, in all of these efforts the local social networks in the community must be courted, supported, and enhanced. Any and all macrolevel health promotion efforts must work closely with local structures in a constructive and resourceful way (Green & McAlister, 1984; May & Hymbaugh, 1983). They should provide help and information which does not replace or destroy existing strengths in the community, but rather supports and enhances them (Hagey, 1984). Fifth, general and advanced education for Indian people has been emphasized for years by tribal leaders and Whites alike. High education levels are always correlated with health protective behavior (Gottlieb & Green, 1984), and self-determination will succeed or fail based on the education and experience of Indian leaders and their populace.

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Each of the above concepts has tremendous importance to the success of any prevention program with Indians and others. These lessons have been hard-learned and will, no doubt, be relearned. These concepts must be employed fully for the benefit of Indian youth today. All should combine for a more positive outlook for future generations and replace some of the fatalism towards health and death which has been all too common in the past decades.

Prevention Topics for Infants

Prevention of health problems of Indian infants begins with parents (particularly the mother's) behavior. In Table 13 the major topics for prevention of health problems are listed by the child's age when they should be considered. Prior to conception the specific topics of promise are: positive education and experience in social and health education, family planning information, and establishing a healthy lifestyle at a very young age. By the prenatal stage, however, the tasks become more specifically connected to the health of the baby. Early and regular prenatal care is very important to emphasize because both the literature and experience indicate that the first trimester is the most vital in terms of major structural development and birth defects. Further, Indian women are less likely to begin prenatal care at an early stage (Sullivan & Beeman, 1983), some tribes may have a higher rate of birth complications (Sullivan & Beeman, 1983), maternal and fetal mortality are frequently increased by toxemia (Slocumb & Kunitz, 1977) and prenatal care (particularly in the first pregnancies) is such an excellent time to promote healthy behavior in a variety of ways (Bratic, 1982; Koop, 1982). During the prenatal period the parents can be educated and prepared not only for a healthy pregnancy and birth, but also for healthy practices for the child's infant period. Vital prevention issues can be discussed, such as the pregnant mother's use of seat belts to protect the unborn (Crosby & Costiloe, 1971), the importance of breast feeding, use of car seats for the child (including where and what kinds to obtain), the challenge and rewards of successful parenting, and making the home ready for the newborn in the areas of hygiene and safety. Behavioral contracts can be made between the mother and the health care practitioner.

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Table 13

Ideas for Prevention of Health Problems and Promotion of the Health of Indian and Native Infants

Age Period		Prevention Topics and Behaviors to Promote
Prior to and pregnancy	1.	Health Education in schools from junior high and older Emphasize: a. Positive decision making and responsibility b. Values clarification c. Basic health knowledge d. Birth control and family planning concepts

Table 13 (continued)

Age Period		Prevention Topics and Behaviors to Promote
	2.	Regular exercise, good nutrition, and the importance of lifestyle
	3.	Strong and positive family ties and supportive social network
Prenatal	1.	Early prenatal check-up (first trimester)
	2.	Abstain from consuming harmful foods and substances
		a. Alcohol and recreational drugs
		b. Prescription drugs
		c. Certain foods
	3.	Avoid teratogenic exposure
		a. Measles and other infectious diseases
		b. Radiation and work hazards
	4.	Good nutrition and prenatal vitamins
	5.	Regular prenatal visits for all mothers
	6.	Closely monitor high-risk women
		a. Alcohol abusers
		b. Diabetics
		c. Those who show signs of toxemia
	7.	Prepare mothers for postpartum life by education on:
		a. Breast feeding
		b. Use of car seats for children
		c. Sanitation and home safety
	8.	Involve the father in all prenatal and birth activities
	9.	Advise pregnant mothers to wear their seat belts
	10.	Household review to evaluate for sanitation facilities, water supply, and overall hygiene needs
Birth to 1 year	1.	Maintain a low birth registry to monitor high-risk infants
	2.	Car seats for the infant
	3.	Breast feeding whenever possible
	4.	Household review to identify accident, injury, and risks
	5.	Early innoculation
	6.	Regular attendance of well child clinics
	7.	Preventive dental education
		a. Infant oral care instructions
		b. Specifically address baby bottle caries
		c. Adult hygiene encouragement
	8.	Special home services for high-risk infants (low birth weight)
		a. Fetal monitors for loan
		b. Follow closely from 2 to 7 months of age
	9.	Check CO levels in passenger compartment of family car/truck
	10.	Family planning and birth control information
	11.	Emphasize importance of parents as role models and social support
		a. Seat belt usage
		b. Parental use of alcohol, drugs
		c. Healthy lifestyle
	12.	Monitor child's physical condition to look for abuse/neglect

Once the child is born, breast feeding should be highly recommended, the child should leave the hospital and spend all of his/her travel time in a car seat, and the child should receive timely innoculation for DPT, measles, haemophilus B, and other agents. Well child clinics should be attended regularly and explicit provision should be made for the parents to receive preventive dental education in the early months. Environmental conditions (home, vehicle, family, etc.) of the child should be considered as a prime area for prevention of injury and disease. The parents of both normal and particularly high-risk infants should be supported in a variety of routine and special ways (Berger, 1981).

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Prevention Topics for Ages 1-14 Years

Prevention efforts in these years should be aimed at producing a healthy and safe lifestyle in youth which will reap tremendous benefits for 60 to 70 years to come. Of major concern is producing social networks in youth and early adulthood which encourage and reward exercise, education, safety, and decision making which is thoughtful and based on facts and not on uninformed, peer group hearsay. Further it is important that a safe environment be maintained for children in these ages. For reservation youth, summer employment, off-reservation trips and activities, recreational opportunities, and gradual and general cross-cultural exposure should be particularly beneficial.

In this author's experience, the flow of factual health information with local appeal to an Indian population is quite well-received by young and old. Too often Indian populations are the recipients of information which is only mainstream U.S. relevant, condescending, not empathetic, or presented in a culturally irrelevant manner (Jackson, Cornelius, & Johnson, 1983).

As presented in Table 14, there are a number of specific activities which can be promoted at various stages in the years from 1 to 14. Of major importance throughout these years is emphasizing the use of safety measures, safe environments at home and school, and health protective behaviors promoting diets and exercise for weight control. Weight control in some tribes is extremely important where adult onset diabetes is epidemic (Bennett et al., 1976). Also, in some areas of the U.S. obesity among both urban and rural Indians is being recognized as increasing the incidence of high blood pressure and heart disease (DeStefano, Coulehan, & Wiant, 1979; Gillum et al., 1984). In some tribes, redefining the definitions of obesity should be encouraged (Pine, 1983).

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Table 14

Topics for Prevention of Health Problems and Promotion of the Health of Indian and Native Youths (Ages 1 - 14)

Age Period		Prevention Topics and Behaviors to Encourage
1-4 years	1.	Child restraint seats
	2.	Safe home environment, yard, driveways, and recreation facilities
	3.	Continue to monitor low birth weight children through the low birth weight registry
	4.	Establish a child abuse task force to monitor suspected child abuse/neglect victims
	5.	Continue to promote complete vaccinations for all youth
	6.	Monitor for otitis media routinely
	7.	Promote awareness in the public, nursery, and head start on early detection for upper respiratory infections, sore throats, and other infectious diseases
	8.	Continue to monitor high-risk homes and environments, water supplies, etc. for sanitation and hygiene
5-9 years	1.	Begin to emphasize various health protective behavioral ideas in school courses
	2.	Have routine, short school presentations by health professionals on:

Table 14 (continued)

Age Period		Prevention Topics and Behaviors to Encourage
		a. dental hygeine b. personal hygiene c. safety
	3.	Promote seat belt use for all people, especially among parents of children in this age group
	4.	Discourage riding in the back of pick-ups
	5.	Promote exercise, weight control and nutrition through: a. school activities, (e.g., gymnastics, sports, etc.) b. recreation opportunities and facilities throughout the community
	6.	Begin to teach in ways which promote self-esteem, positive outlook and an adequate knowledge base for decision-making
	7.	Monitor multiproblem families for abuse/neglect
	8.	Monitor for otitis media in schools
	9.	Promote throat culture screening in schools during outbreaks of bronchitis, etc.
	10.	Eye exams for all kindergarten or first grade children
	11.	Promote the idea that tobacco use (smoking and chewing) is "not cool"
10-14 years	1.	Begin to integrate factual information on sex education in regular classes for both sexes
	2.	Make birth control information and services available in a nonthreatening situation
	3.	Continue to promote seat belt use
	4.	Promote a variety of positive recreation facilities for organized and free time activities
	5.	Begin drug education using positive applications of social learning theory, values clarification, and decision-making skills
	6.	Begin teaching in life science and human relations
	7.	Introduce defensive driving concepts
	8.	The public should be aware of signs of self-destruction in youth from 12 years on
	9.	Make positive role models available to youth
	10.	Promote educational and career opportunities in all ways possible
	11.	Continue to promote exercise and weight control
10-14 years	12.	Make students aware that healthy pregnancies are no accident a. Don't drink alcohol or take drugs b. Don't smoke c. Have an adequate diet d. Get prenatal care

Other Resources

Tables 13 and 14 are intended to serve as general guides for prevention activities among Indian youth. They are specifically keyed to the previous data and literature review in this paper. But health professionals working with Indian populations can benefit greatly by reviewing and adding numerous ideas and detailed tactics now available from programs and research with other populations. Whenever programs are attempted for Indians, however, the particular problems, strengths, and culture of the various Indian groups should be addressed and tactics and approaches applied as appropriate.

For more specific and detailed treatment of particular topics in prevention for infants and youth, the reader should consult the following works. For overall ideas about prevention of mental health problems among Indians, Manson (1982) has edited a work containing 14 articles on the most vital topics relating

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to prevention of mental health problems among Indians. For prevention of childhood treatment and injury, Berger (1981) has published an excellent review article. Sleet (1984) has edited an extensive volume on the prevention of occupant injuries in motor vehicles including topics from structural design of cars and infant seats to health promotion and evaluation of effectiveness. A major federal document on Prevention of Health Problems (U.S. Department of Health and Human Services, 1980) was prepared for the Surgeon General. Chapters in this federal report on Pregnancy and Infant Health, Immunization, Family Planning, Accident Prevention, Smoking, and Nutrition are excellent sources for specific prevention ideas for youth. Suicide prevention ideas for Indian adolescents can be found in Shore et al., (1972), Frederick (1973), and Berlin (1986). Finally, several sources exist for examining the prevention of alcohol problems among Indians (Beauvais & LaBoueff, 1985; Mail, 1985; May, 1986).

Unfortunately, some of the problems presented in this paper have no solution as yet. Certainly Sudden Infant Death Syndrome among Indians deserves a great deal more attention. Likewise, the specific epidemiology of accidents among Indians needs more study. But in this paper a number of other topics worthy of research have been highlighted throughout the text.

Evaluation of any prevention/intervention programs undertaken among Indians needs to be pursued more completely. Too often there is little or no sharing of ideas among different groups and professionals, and seldom is there any useful, scientific evaluation. Programs should be evaluated carefully using appropriate theoretical models (Barnes, 1984) and reported in mainstream professional channels for all to use. Even the lack of success of a treatment or intervention modality needs to be reported to inform others (Coulehan et al., 1976b).

Three Very Promising Programs

In researching and writing this paper I was impressed by the promise of three specific prevention programs which hold great importance for Indian populations, especially those on reservations.

Fetal Alcohol Syndrome and Birth Defects Prevention

The first is an area which is already proving to be successful. Fetal Alcohol Syndrome prevention education has already been underway in many Indian communities for up to 6 years. For various reasons (possibly the recognition of the total preventability of FAS, the zeal to protect the innocent and unborn, etc.), FAS prevention ideas and activities have received tremendous support from Indian communities throughout the United States and Canada. When many

programs aimed at prevention of other problems (e.g., adult alcohol abuse and alcoholism) are poorly received among particular groups, Fetal Alcohol Syndrome training and activity have been enthusiastically received by these same groups. Over the past 6 years with the National Indian FAS Prevention Program, a number of us have experienced the "magical" motivation of this topic. Once one initiates activity in the area of FAS, other prevention topics (e.g., healthy pregnancies, alcohol abuse in general, and community public health issues) can be more productively approached (May & Hymbaugh, 1983). This experience suggests that, with any number of topics, beginning with a focused, highly specific and heartfelt topic can lead to more diffuse, successful, and comprehensive prevention efforts. Possibly a major initiative on all birth defects, especially teratogenic ones, might motivate all kinds of health improvements among Indian youths which will eventually improve both their lives and those of their children.

A Tribal Infant Car Seat Initiative

A second program with great promise has not yet reached its full potential among Indians. Why not a comprehensive Child Car Seat Promotion Program for every tribe? All tribes could invest a minimal amount of their own money, write a proposal to a foundation or appeal to other sources (i.e., IHS) for seed money to buy enough car seats for their infant and young child (less than 5 years) populations. These car seats can then be loaned, rented, or sold cheaply to each and every parent of young children. With a comprehensive program no child would leave an IHS or contract care facility without an approved protective device. Encouragement and follow-up could also be put forth by a tribal agency so that all children under 5 years are in a seat. Tribal Councils could pass memorials or laws supporting these programs. Such programs exist in many states, counties, cities, and hospitals and now over 60 reservation service areas (Richard Smith, Director of the Office of Injury Control, IHS, personal communication, 1986). Therefore, why not all reservations and tribal groups? A positive, action-oriented program like this with a simple and understandable message can be a real spark for local prevention efforts of all sorts. Car seats certainly present a modern and useful parallel to the universally used cradleboard of the past. Such a spark may lead to many cooperative promotional activities between IHS and tribes and new social networks which will reinforce general health, concern, and healthy lifestyles.

Adults who begin to use car seats routinely for their children will also become more receptive to seat belt use themselves. Likewise children who are brought up using restraints will form a new generation of seat belt users. New safety

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norms should develop. Thus, the advocacy of child protective devices will not only save the lives of many youths, but the overall effect should be health protective for many others.

Exercise and Recreation Programs

Since a number of the adult health problems of American Indians are either behavioral, related to lifestyle, or are related to obesity, an effective exercise program would have tremendous preventive value. Since exercise and recreation produce both physical fitness and a positive outlook and orientation, there would be multiple benefits. If children are accustomed to exercising, being physically fit, and striving for accomplishment in daily activities, they will likely carry these values into adulthood. Regular exercise and physical fitness in the coming generations would certainly serve to lower the current problems with diabetes and related diseases and also reduce the likelihood of the new incipient problems of high blood pressure, heart disease, and other problems. An adult exercise program at Zuni, New Mexico, has proven to be very effective in reducing obesity and diabetes (Leonard & Leonard, 1985). A similarly strong and organized investment in exercise for youth holds great promise for many tribes.

The above three programs have two common advantages. Each would deal with a specific health problem and, ostensibly, reduce the occurrence of the problem. But, secondly, the programs will enhance prevention efforts in the tribes in several simple, easily supported programs. Efforts dealing with infants and youths seem to stimulate positive social networks. Their message carries an air of optimism, self-determination, and control over elements which cuts through fatalism and negativism, which are the mortal enemies of prevention efforts. For this reason and for reducing the total number of years lost through early death, prevention programs dealing with the very young are the most feasible. Social networks which are activated by these programs can then be used for other efforts in social, cultural, educational, and health enhancement. Individuals affected by these networks may then be motivated and socialized to more healthful lifestyles. Only more efforts in these areas and time to evaluate their results will tell the true story.

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Conclusion

As in the general U.S. population (Hamburg et al., 1982), a heavy burden of illness and death among U.S. Indians is related to behavior. While these illness-producing behaviors become more manifest from young adulthood, prevention must begin in the early years. In this article, all current mortality and morbidity patterns of young Indians were reviewed in detail. Behavioral

changes, in either the parents or young children, and environmental interventions hold great promise for reducing current high rates of morbidity and mortality from birth defects—especially fetal alcohol syndrome, post-neonatal death, trauma and injury from motor vehicle and other accidents, nursing bottle caries, otitis media, gastroenteritis, meningitis, and selected other infectious and parasitic diseases. Environmental and simple behavior changes which can bring major reductions in the above problems are: (a) increased rates of early and overall prenatal care, (b) cessation of prenatal alcohol consumption, (c) a safer and more hygienic environment for infants and youth, (d) increased breast feeding of infants to 6 to 8 months of age, (e) careful and informed use of baby bottle feeding at all ages, and (f) the use of car seats and other protective devices for infants and all youth.

So often social and health programs for Indians have been instituted in an unfocused and confusing manner that allows Indian people little opportunity for input or control. Each of these highlighted behavior changes is quite different in that they are concrete, positive steps for health improvement which can be practiced readily by all. Routinely following these simple behavioral and environmental changes adds a heightened dimension to self-determination and self-control, and the net effect will be an improvement in the health status of the U.S. Indian population.

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Notes

1. All birth, death, and other vital statistics rates reported in this paper for Indians in 1980, 1981, or 1982 are for all Indians and Alaska Natives living in 28 reservation states. These states are: Iowa, Nebraska, South Dakota, North Dakota, Alaska, Colorado, New Mexico, Utah, Michigan, Minnesota, Wisconsin, Montana, Wyoming, California, Arizona, Oklahoma, Kansas, Idaho, Nevada, Oregon, Washington, Florida, Louisiana, Maine, Mississippi, New York, North Carolina, and Pennsylvania. The Indian and Native population in these states represents 87% of the total U. S. Indian and Alaska Native population in 1980. Vital statistic data from years prior to 1980 are in some cases calculated for Indians in fewer states. For example, IHS vital statistics data from 1955-1968 were calculated from 50% samples of U.S. records, while 1969-1974 data are based on 24 reservation states. In the years from 1974 to 1980, the number of states included are the 28 listed above.

2. This changing of population base is described in Note 1.

3. Youth dependency ratio is calculated by dividing the population under 15 years by the population 15-64 years of age.

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References

Abel, E. L., & Sokol, R. J. (1987). Incidence of fetal alcohol syndrome and economic impact of FAS-related anomalies. *Drug and Alcohol Dependence, 19(1),* 51-70.

Adams, M. M. (1985). The descriptive epidemiology of sudden infant deaths among Natives and Whites in Alaska. *American Journal of Epidemiology, 122(4),* 637-643.

Adams, M. S., Brown, K. S., Iba, B. Y., & Niswander, J. D. (1970). Health of the Papago Indians children. *Public Health Reports, 85(12),* 1047-1061.

Adams, M. S., & Niswander, J. D. (1968). Birth weight of North American Indians. *Human Biology, 40,* 226-234.

Adams, M. S., & Niswander, J. D. (1973). Birth weight of North American Indians: A correction and amplification. *Human Biology, 45(3),* 351-357.

Allen, J. R. (1973). The Indian adolescent: Psychological tasks of the Plains Indian of Western Oklahoma. *American Journal of Orthopsychiatry, 43(3),* 368-3755.

Arsenault, P. S. (1980). Maternal and antenatal factors in the risk of sudden infant death syndrome. *American Journal of Epidemiology, 111(3),* 279-284.

Bach, P. J., & Bornstein, P. H. (1981). A social learning rationale and suggestions for behavioral treatment with American Indian alcohol abusers. *Addictive Behaviors, 6,* 75-81.

Barnes, G. M. (1984). Evaluation of alcohol education: A reassessment using socialization theory. *Journal of Drug Education, 14(2),* 133-150.

Beauvais, F., & LaBoueff, S. (1985). Drug and alcohol abuse interventions in American Indian Communities. *International Journal of the Addictions, 20(1),* 139-172.

Beauvais, F. Oetting, E. R., & Edwards, R. W. (1985a). Trend in drug use of Indian adolescents living on reservations, 1975-1983. *American Journal of Drug and Alcohol Abuse, 11(3-4),* 209-330.

Beauvais, F., Oetting, E. R., & Edwards, R. W. (1985b). Trends in the use of inhalants among American Indian adolescents. *White Cloud Journal, 3(4),* 3-11.

Beiser, M. (1981). Mental health of American Indians and Alaska Native children: Some epidemiological perspectives. *White Cloud Journal, 1(2),* 37-47.

Beiser, M., & Attneave, C. L. (1982). Mental disorders among Native American children: Rates and risk periods for entering treatment. *American Journal of Psychiatry, 139(2),* 193-198.

Bennett, P. H., & Knowler, W. C. (1979). Increasing prevalence of diabetes in the Pima Indians of a 10-year period. *Diabetes, Proceedings of the 10th Congress of the International Diabetes Federation,* 507-511.

Bennett, P. H., Rushforth, N. B., & Miller, M. (1976). Epidemiologic studies of diabetes in the Pima Indians. *Recent Progress in Hormone Research, 32,* 333-376.

Berger, L. R. (1981). Childhood injuries: Recognition and prevention. *Current Problems in Pediatrics, 12(1),* 1-59.

Berlin, I. N. (1982). Prevention of emotional problems among Native American children: Overview of developmental issues. *Journal of Preventive Psychiatry, 1(3),* 319-330.

Berlin, I. N. (1986). Psychopathology and its antecedents among American Indian adolescents. *Advances in Clinical Child Psychology, 9,* 125-152.

Bingle, G. J., & Niswander, J. D. (1975). Polydactyly in the American Indian. *American Journal of Human Genetics, 27,* 981-999.

Blanchard, E., & Barsch, R. (1980). What is best for tribal children? *Social Work, 25,* 350-357.

Blount, W. R., & Dembo, R. (1984). The effect of perceived neighborhood setting on self-reported tobacco, alcohol and marijuana use among inner-city minority junior high school youth. *International Journal of the Addictions, 19(2),* 175-198.

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Boyd, D. L., Maynard, J. E., & Holmes, L. M. (1968). Accident mortality in Alaska. *Archives of Environmental Health, 17,* 101-106.

Braroe, N. W. (1975). *Indian and White: Self-image and interacting in a Canadian Plains community.* Stanford, CA: Stanford University Press.

Bratic, E. B. (1982). Healthy mothers, healthy babies coalition: A joint private-public initiative. *Public Health Reports, 97(6),* 503-509.

Broudy, D. W., & May, P. A. (1983). Demographic and epidemiologic transition among the Navajo Indians. *Social Biology, 30(1),* 1-16.

Brown, R. C., Gurunanjappa, B. S., Hawk, R. J., & Bitsuie, D. (1970). The epidemiology of accidents among the Navajo Indians. *Public Health Reports, 85,* 881-888.

Carr, B., & Lee, E. S. (1978). Navajo tribal mortality: A life table analysis of the leading causes of death. *Social Biology, 25,* 279-287.

Chen, M., & Tatsuoka, M. (1984). The relationship between American women's preventive dental behavior and dental health beliefs. *Social Science and Medicine, 19(9),* 971-978.

Coulehan, J. L. (1978). Health and social needs of Navajo Indian children. In W. T. Well, & C. L. Young (Eds.), *New concepts in human services for the developing child* (pp. 64-70). Pittsburgh, PA: University of Pittsburgh Press.

Coulehan, J. L., Bracke, G., Welty, T. K., & Goldtooth, N. L. (1982). Cost benefit of a streptococcal surveillance program among Navajo Indians. *Public Health Reports, 97(1),* 73-77.

Coulehan, J. L., Eberhard, S., Kapner, L., Taylor, F., Rogers, K., & Garry, P. (1976a). Bacterial meningitis in Navajo Indians. *Public Health Reports, 91,* 464-468.

Coulehan, J. L., Eberhard, S., Kapner, L., Taylor, F., Rogers, K., & Garry, P. (1976b). Vitamin C and acute illness in Navajo school children. *New England Journal of Medicine. 295,* 973-977.

Coulehan, J. L., Hallowell, C., Michaels, R. Welty, T., Lui, N., & Kuo, J. (1983). Immunogenicity of a haemophilus influenza type B vaccine in combination with DPT vaccine in infants. *The Journal of Infectious Diseases, 148(3),* 530-534.

Coulehan, J. L., Hirsch, W., Brillman, J., Sanadria, J., Welty, T. K., Colaiaco, P., Koros, A., & Lober, A. (1983). Gasoline sniffing and lead toxicity in Navajo adolescents. *Pediatrics, 71(1),* 113-117.

Coulehan, J. L., Michaels, R. H., Hallowell, C., Schults, R., Welty, T., & Kuo, J. (1984). Epidemiology of haemophilus influenza type B disease among Navajo Indians. *Public Health Reports, 99(4),* 404-409.

Crosby, W. M., & Costiloe, P. (1971). Safety of lap belt restraint for pregnant victims of automobile collisions. *New England Journal of Medicine, 284(12),* 632-635.

Dental Branch, Indian Health Service. (1985). *Preliminary findings from an oral health survey of Native Americans.* Unpublished manuscript.

DeStefano, F., Coulehan, J. L., & Wiant, M. K. (1979). Blood pressure survey on the Navajo Indian reservation. *American Journal of Epidemiology, 109(3),* 335-345.

Dinges, N. (1982). Mental health promotion with Navajo families. In S. M. Manson (Ed.), *New directions in prevention among American Indian and Alaska Native communities* (pp. 119-140). Portland, OR: Oregon Health Sciences University.

Dinges, N. G., & Hollenbeck, A. R. (1978). The effect of instructional set on the self-esteem of Navajo children. *The Journal of Social Psychology, 104,* 9-13.

Dinges, N., Yazzie, M., & Tollefson, G. D. (1974). Developmental intervention for Navajo family mental health. *Personnel and Guidance Journal, 52(6),* 390-395.

Dizmang, L. H., Watson, J., May, P. A., & Bopp, J. (1974). Adolescent suicide at an Indian reservation. *American Journal of Orthopsychiatry, 44(1),* 43-49.

Ellestad-Sayed, J., Cooden, E. H., Drilling, L. H., & Hayworth, J. (1979). Breast feeding protects against infection in Indian infants. *Canadian Medical Association Journal, 120,* 295-298.

Evers, S. E., & Rand, C. G. (1983). Morbidity in Canadian Indian and non-Indian children in the second year. *Canadian Journal of Public Health, 74(3),* 191-194.

Fischler, R. S. (1980). Protecting American Indian children. *Social Work, 25,* 342-349.

Fischler, R. S. (1983). Child abuse and neglect in American Indians. *IHS Primary Care Provider, 8(10),* 1-7.

Fischler, R. S., & Fleshman, C. (1985). Comprehensive health services for developmentally disabled Navajo children. *Developmental and Behavioral Pediatrics, 6(1),* 9-14.

American Indian and Alaska Native Mental Health Research
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Colorado School of Public Health/University of Colorado Anschutz Medical Campus www.ucdenver.edu/caianp

Fleshman, J. K., & Peterson, D. R. (1977). The sudden infant death syndrome among Alaska Natives. *American Journal of Epidemiology, 105(6)*, 555-558.

Forman, M. R., Granbard, B. I., Hoffman, H. J., Beren, R., Harley, E. E., & Bennett, P. (1984). The Pima infant feeding study: Breast feeding and gastroenteritis in the first year of life. *American Journal of Epidemiology, 119(3)*, 335-349.

Frederick, C. (1973). *Suicide, homicide, and alcoholism among American Indians: Guidelines for help.* (Publication No. HSM 73-9124). Washington, DC: U.S. Government Printing Office.

French, J. G. (1967). Relationship of morbidity to the feeding patterns of Navajo children from birth through 24 months. *American Journal of Clinical Nutrition, 20*, 375-385.

Garber, J. M. (1981). High corneal astigmatism in Navajo school children and its effect on classroom performance. *Journal of American Optometric Association, 52(7)*, 583-586.

Garber, J. M. (1982). Corneal curvature in the fetal alcohol syndrome: Preliminary report. *Journal of American Optometric Association, 53(8)*, 641-644.

Garber, J. M. (1984). Strep corneal curvature: A fetal alcohol syndrome landmark. *Journal of American Optometric Association, 55(8)*, 595-598.

Gillum, R. F., Gillum, B. S., & Smith, N. (1984). Cardiovascular risk factors among urban American Indians: Blood pressure, serum lipids, smoking, diabetes, health knowledge, and behavior. *American Heart Journal, 107(4)*, 765-775.

Goodluck, C., & Eckstein, F. (1978). American Indian adoption program: An ethnic approach to child welfare. *White Cloud Journal, 1*, 3-6.

Goodman, R. A. (1984). Secondary sex ratio and birth weight of Navajo Indians in an area of uranium mining and milling. Unpublished master's thesis, Arizona State University.

Gottleib, N. H., & Green, L. W. (1984). Life events, social network, life-style and health: An analysis of the 1979 National Survey of Personal Health Practices and Consequences. *Health Education Quarterly, 11(1)*, 91-105.

Green, B. E., Sack, W. H., & Pambrum, A. (1981). A review of child psychiatric epidemiology with special reference to American Indian children. *White Cloud Journal, 2(2)*, 22-36.

Green, L. W., & McAlister, A. L. (1984). Macro-intervention to support health behavior: Some theoretical perspectives and practical reflections. *Health Education Quarterly, 11(3)*, 322-339.

Grembowski, D., Conrad, D., & Milgram, P. (1985). Utilization of dental services in the United States and an insured population. *American Journal of Public Health, 75(1)*, 87-89.

Hackenberg, R. A., & Gallagher, M. M. (1972). The costs of cultural change: Accident injury and modernization among the Papago Indians. *Human Organization, 31(2)*, 211-226.

Hagey, R. (1984). The phenomenon, the explanations and the responses: Metaphors surrounding diabetes in urban Canadian Indians. *Social Service and Medicine, 18(3)*, 265-272.

Hamburg, D. A., Eliott, G. R., & Parron, D. L. (Eds.). (1982). *Health and behavior: Frontiers of research in the biobehavioral sciences.* Washington, DC: National Academy Press.

Holmgren, C., Fitzgerald, B. J., & Carmen, R. S. (1983). Alienation and alcohol use by American Indian and Caucasian high school students. *The Journal of Social Psychology, 120*, 139-140.

Horwitz, M. A., Pollard, R. A., Merson, M. H., & Martin, M. S. (1971). A large outbreak of food-born salmonellosis on the Navajo Indian reservation: Epidemiology and second transmission. *American Journal of Public Health, 67*, 1071-1076.

Hughes, J. M., Rouse, J. D., Barada, F. A., & Guerrant, R. L. (1980). Etiology of summer diarrhea among the Navajo. *American Journal of Tropical Medicine and Hygiene, 29*, 613-619.

Indian Health Service. (1974). *Indian health trends and services.* Washington, DC: U.S. Government Printing Office.

Indian Health Service. (1984a). *Chart book series.* (Publication No. 1984-421-166:4393). Washington, DC: U.S. Government Printing Office.

Indian Health Service. (1984b). *American Indian and Alaska Native life expectancy, 1979-81.* (Publication No. 105K-0051K). Washington, DC: U.S. Government Printing Office.

Indian Health Service. (1985). *Unpublished vital statistic and patient care data, 1980-84.* Washington, DC: Office of Planning, Evaluation and Legislation.

Jackson, M. Y., Cornelius, M. S., & Johnson, C. I. (1983). Dietetic training for American Indians and Alaska Natives. *Journal of the American Dietetic Association, 83*, 48-50.

Jason, J. M., Neiburg, P., & Marks, J. S. (1984). Mortality and infectious disease associated with infant-feeding practices in developing countries. *Pediatrics, 74(4)*, 702-727.

American Indian and Alaska Native Mental Health Research
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Colorado School of Public Health/University of Colorado Anschutz Medical Campus (www.ucdenver.edu/caianh)

Kaplan, D. W., Bauman, A. E., & Kraus, H. F. (1984). Epidemiology of sudden infant death syndrome in American Indians. *Pediatrics, 74(6),* 1041-1046.

Katz, P. S., & May, P. A. (1979). *Motor vehicle accidents on the Navajo reservation, 1973-1975.* Window Rock, AZ: Navajo Health Authority.

Kegeles, S. S., & Lund, A. K. (1984). Adolescents' health beliefs and acceptance of a novel preventive dental activity: A further note. *Social Science and Medicine, 19,* 979-982.

Kessel, J. A., & Robbins, S. P. (1984). The Indian Child Welfare Act: Dilemmas and needs. *Child Welfare, 63(3),* 225-232.

Kleinfeld, J. (1982). Getting it together in adolescence: Case studies of positive socializing environments for Eskimo youth. In S. M. Manson (Ed.), *New directions in prevention among American Indian and Alaska Native communities* (pp. 341-364). Portland, OR: Oregon Health Sciences University.

Kleinfeld, J., & Bloom, J. (1977). Boarding schools: Effects on the mental health of Eskimo adolescents. *American Journal of Psychiatry, 134(4),* 411-417.

Knowler, W. C., Bennett, P. H., Hamman, R. F., & Miller, M. (1978). Diabetes incidence in Pima Indians: A 19-fold greater incidence than in Rochester, Minnesota. *American Journal of Epidemiology, 108,* 497-505.

Knowler, W. C., Pettitt, D. J., Bennett, P. H., & Williams, R. C. (1983). Diabetes mellitus in the Pima Indians: Genetic and evolutionary considerations. *American Journal of Physical Anthropology, 62,* 107-114.

Koop, C. E. (1982). The importance of providing healthful behavior among pregnant women. *Public Health Reports, 97(6),* 1.

Koopman, J. S., Turkish, V. J., Monto, A. S., Thompson, F. E., & Isaacson, R. E. (1984). Milk fat and gastrointestinal illness. *American Journal of Public Health, 74(12),* 1371-1373.

Kraus, J. F., Franti, C. E., & Borham, N. O. (1972). Discriminatory risk factors in post neonatal sudden unexplained death. *American Journal of Epidemiology, 96(5),* 328-333.

Kunitz, S. J. (1983). *Disease change and the role of medicine: The Navajo experience.* Berkeley, CA: University of California Press.

Kunitz, S. J. (1986). Mortality since Malthus. In D. Coleman & R. Schoenfield (Eds.), *The state of population theory: Forward from Malthus.* Oxford: Blackwells.

Kunitz, S. J., & Slocumb, J. D. (1976). The changing sex ratio of the Navajo tribe. *Social Biology, 23,* 33-44.

Lefley, H. P. (1974). Effects of a cultural heritage program on the self-concept of Miccosuckee Indian children. *The Journal of Educational Research, 67(10),* 462-466.

Lefley, H. P. (1976). Acculturation, child rearing and self-esteem in two North American Indian tribes. *Ethos, 4(3),* 385-401.

Leonard, C., & Leonard, B. (1985). Zuni diabetes project. *IHS Primary Care Provider, 10(4),* 17-20.

Levy, J. E. (1981). *Epilepsy in the Tuba City and Keams Canyon Service Unit.* IHS Unpublished report. Albuquerque, NM: Indian Children's Program.

Levy, J. E., & Kunitz, S. J. (1974). *Indian drinking.* New York: Wiley Interscience.

Longclaws, L., Barnes, G., Grieve, L., & Dumhoff, R. (1980). Alcohol and drug use among the Brokenhead Ojibway. *Journal of Studies on Alcohol, 41(1),* 21-36.

Longstaff, S., Postl, B., Kao, H., Nicolle, L., & Ferguson, C. (1982). Rheumatic fever in native children in Manitoba. *Canadian Medical Association Journal, 127,* 497-498.

Mail, P. D. (1985). Closing the circle: A prevention model for Indian communities with alcohol problems. *IHS Primary Care Provider, 10(1),* 2-5.

Manson, S. M. (Ed.). (1982). *New directions in prevention among American Indian and Alaska Native communities.* Portland, OR: Oregon Health Sciences University.

Manson, S. M., & Shore, J. H. (1981). Psychiatric epidemiological research among American Indians and Alaska Natives: Some methodological issues. *White Cloud Journal, 2(2),* 48-56.

Manson, S. M., Tatum, E., & Dinges, N. D. (1982). Prevention research among American Indian and Alaska Native communities: Charting future courses for theory and practice in mental health. In S. M. Manson (Ed.), *New directions in prevention among American Indian and Alaska Native communities* (pp. 11-62). Portland, OR: Oregon Health Sciences University.

Martin, J. C. (1977). Choice of defense mechanisms by Indian and White adolescents. *Journal of Clinical Psychology, 33(4),* 1027-1028.

American Indian and Alaska Native Mental Health Research
Copyright © Regents of the University of Colorado
Colorado School of Public Health/University of Colorado Anschutz Medical Campus

May, P. A. (1976). Alcohol legalization and Native Americans: A sociological inquiry. (Doctoral dissertation, University of Montana, Missoula). *Dissertation Abstracts International, 37(7),* 77-720.

May, P. A. (1982). Substance abuse and American Indians: Prevalence and susceptibility. *International Journal of the Addictions, 17(7),* 1185-1209.

May, P. A. (1983). *Estimating the incidence of fetal alcohol syndrome in Indian tribes outside of the Southwest.* Unpublished manuscript.

May, P. A. (1986). Alcohol and drug abuse prevention programs for American Indians: Needs and opportunities. Journal of Studies on Alcohol, 47(3), 187-195.

May, P. A. (1987). *Suicide and suicide attempts among American Indians and Alaska Natives: An annotated bibliography.* Albuquerque, NM: Indian Health Service, Mental Health Branch.

May, P. A., & Hymbaugh, K. J. (1983). A pilot project on fetal alcohol syndrome for American Indians. *Alcohol Health and Research World, 7(1),* 3-9.

May, P. A., Hymbaugh, K. J., Aase, J. M., & Samet, J. M. (1983). Epidemiology of fetal alcohol syndrome among American Indians of the Southwest. *Social Biology, 30(4),* 374-387.

Maynard, E., & Twiss, B. (1970). *That these people may live: Conditions among the Ogalala Sioux of the Pine Ridge Reservation.* (Publication No. HSM 72-508). Washington, DC: U.S. Government Printing Office.

Maynard, J. E., & Hammes, L. M. (1970). A study of the growth, morbidity and mortality among Eskimo infants of Western Alaska. *Bulletin of the World Health Organization, 42,* 613-622.

McIntosh, J. L., & Santos, J. F. (1981). Suicide among Native Americans: A compilation of findings. *Omega, 11,* 303-316.

McShane, D. (1982). Otitis media and American Indians: Prevalence, etiology, psychoeducational consequences, prevention and intervention. In S. M. Manson (Ed.), *New directions in prevention among American Indian and Alaska Native communities* (pp. 264-295). Portland, OR: Oregon Health Sciences University.

Mitchell, R. E., Billings, A. G., & Moos, R. H. (1982). Social support and well being: Implications for prevention programs. Journal of Primary Prevention, 3(2), 77-98.

Mitchell, R. E., & Moos, R. H. (1984). Deficiencies in social support among depressed patients: Antecedents or consequences of stress? *Journal of Health and Social Behavior, 25(4),* 438-452.

Murphy, S., & Deblassie, R. R. (1984). Substance abuse and the Native American student. *Journal of Drug Education, 14(4),* 315-321.

National Center for Health Statistics. (1983). *Advance report, final mortality statistics, 1981.* (Monthly Vital Statistics Report, 1983, 32(9), Supplement DHHS Publication No. (PHS) 84-1120). Washington, DC: U.S. Government Printing Office.

National Center for Health Statistics. (1984). *Advance report, final mortality statistics, 1981.* (Monthly Vital Statistics Report, 1984, 33(3), Supplement DHHS Publication No. (PHS) 84-1120. Washington, DC: U.S. Government Printing Office.

Nelson, S. M., & Berry, R. I. (1984). Ear disease and hearing loss among Navajo children: A mass survey. *Laryngoscope, 94,* 316-323.

Niswander, J. D., & Adams, M. S. (1967). Oral clefts in the American Indian. *Public Health Reports, 82,* 807-817.

Niswander, J. D., Barrow, M. V., & Bingle, S. J. (1975). Congenital malformations in the American Indian. *Social Biology, 22(3),* 203-215.

Niswander, T. S. (1984). High utilizers of ambulatory care services: 6-year follow-up at Alaska Native Medical Center. *Public Health Reports, 99(4),* 400-404.

Norwood, C. (1985, January). Terata. *Mother Jones,* pp. 15-21.

Oakland, L., & Kane, R. L. (1973). The working mother and child neglect on the Navajo reservation. Pediatrics, 51(5), 849-853.

Oetting, E. R., Beauvais, F., Edwards, R., & Velarde, J. (1983). *Drug use among Native American youth.* NIDA Grant Report, Ft. Collins, CO: Colorado State University.

Omran, A. R. (1971). The epidemiologic transition. *Milbank Memorial Fund Quarterly, 49,* 509-538.

Omran, A. R., & Laughlin, B. (1972). An epidemiologic study of accidents among the Navajo Indians. *Journal of the Egyptian Medical Association,* 55, 1-22.

Owsley, D. W., & Jantz, R. L. (1983). Formation of the permanent dentition in Alaska Indians: Timing differences that affect dental age assessments. *American Journal of Physical Anthropology, 61,* 467-471.

American Indian and Alaska Native Mental Health Research
Copyright © Regents of the University of Colorado
Colorado School of Public Health/University of Colorado Anschutz Medical Campus

Pettitt, D. J., Baird, H. R., Aleck, K. A., Bennett, P. H., & Knowler, W. C. (1983). Excessive obesity in offspring of Pima Indian women with diabetes during pregnancy. *New England Journal of Medicine, 308(5),* 243-245.

Pettitt, D. J., Knowler, W. C., Baird, H. R., & Bennett, P. H. (1980). Gestational diabetes: Infant and maternal complications of pregnancy in relation to third trimester glucose tolerance in Pima Indians. *Diabetes Care, 3,* 458-464.

Pine, C. J. (1983). Obese and non-obese American Indian and Caucasian performance in the mini-multi MMPI and I-E scale. *Journal of Clinical Psychology, 39(2),* 251-256.

Poulson, T. C., Lindensmith, J. E., & Greer, R. O. (1984). A comparison of the use of smokeless tobacco in rural and urban teenagers. *Ca-A Cancer Journal for Clinicians, 34(5),* 248-261.

Rebich, T. J., Kumar, J., & Brustman, B. (1983). The St. Regis environmental health issue: Assessment of dental defects. *Journal of the American Dental Association, 106,* 630-633.

Reed, B. F. J., & May, P. A. (1984). Inhalant abuse and juvenile delinquency: A control study in Albuquerque, NM. *International Journal of the Addictions, 19(7),* 789-903.

Remington, G., & Hoffman, B. F. (1984). Gas sniffing as a form of substance abuse. *Canadian Journal of Psychiatry, 29,* 31-35.

Restraint law for children saving lives. (1985, February 17). *Albuquerque Journal,1(11),* 1.

Runkle, B., Dahl, R., Coulehan, J., Michaels, R., Welty, T., & Cushing, A. (1983). Summer diarrhea in an Indian population. *Arizona Medicine, 40(4),* 228-230.

Sack, R. B., Hirshhorn, N., Brownlee, J., Cash, R. A., Woodard, W. E., & Sack, D. A. (1975). Enterotoxigenic eschecichia coli-associated diarrheal disease in Apache children. *New England Journal of Medicine, 292,* 1041-1045.

Schinke, S. P., Gilchrist, L. D., Smith, T. E., & Wong, S. E. (1978). Improving teenage mothers' ability to compete for jobs. *Social Work Research and Abstracts, 14(3),* 25-59.

Schmidt, N., Hole, L. W., & Barclay, W. S. (1966). Accident deaths among British Columbia Indians. *Canadian Medical Association Journal, 94,* 228-234.

Shore, J. H. (1975). American Indian suicide: Fact and fantasy. *Psychiatry, 38,* 86-91.

Shore, J. H., Bopp, D. F., Waller, T. R., & Dawes, J. W. (1972). A suicide prevention center on an Indian reservation. *American Journal of Psychiatry, 128(9),* 1086-1091.

Shore, J. H., & Manson, S. M. (1981). Cross cultural studies of depression among American Indians and Alaska Natives. *White Cloud Journal, 2,* 5-12.

Sievers, M. L. (1968). Cigarette and alcohol usage by Southwestern American Indians. *American Journal of Public Health, 58,* 71-82.

Sleet, D. A. (Ed.). (1984). Occupant protection and health promotion. *Health Education Quarterly, 11(2),* 1-220.

Slocumb, J. C., & Kunitz, S. J. (1977). Factors affecting maternal mortality and morbidity among American Indians. *Public Health Reports, 92(4),* 349-356.

Slocumb, J. C., Ordoff, C. L., & Kunitz, S. J. (1975). The use effectiveness of two contraceptive methods in a Navajo population: The problem of program dropout. *American Journal of Obstetrics and Gynecology,* 122(6), 717-726.

Spivey, G. H. (1977). The health of American Indian children in multi-problem families. *Social Science and Medicine, 11,* 357-359.

Spivey, G., & Hirschhorn, N. (1977). A migrant study of adopted Apache children. *Johns Hopkins Medical Journal, 40,* 43-46.

Squier, C. A. (1984). Smokeless tobacco and oral cancer: A cause for concern. *Ca-A Cancer Journal for Clinicians, 34(5),* 242-247.

Starr, P. (1983). *The social transformation of modern medicine.* New York: Basic Books.

Stewart, T. J., May, P. A., & Muneta, A. (1980). A Navajo health consumer survey. *Medical Care, 18(12),* 1183-1195.

Stull, D. D. (1972). Victims of modernization: Accident rates and Papago Indian adjustment. *Human Organization, 31(2),* 227-240.

Stull, D. D. (1977). New data on accident victim rates among Papago Indians: The urban case. *Human Organization, 36(4),* 395-398.

Sullivan, D. A., & Beeman, R. (1983). Utilization and evaluation of maternity care by American Indians in Arizona. *Journal of Community Health, 9(1),* 18-29.

American Indian and Alaska Native Mental Health Research
Copyright © Regents of the University of Colorado
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U.S. Bureau of Census. (1984a). *American Indian areas and Alaska Native villages: 1980.* (Supplementary Report, PC80-51-13). Washington, DC: U. S. Government Printing Office.

U.S. Bureau of Census. (1984b). *A statistical profile of the American Indian population: 1980 census.* Washington, DC: Census Fact Sheet.

U.S. Bureau of Census. (1984c). *Statistical abstract of the United States,* (104th ed.). Washington, DC: U. S. Government Printing Office.

U.S. Department of Health and Human Services (DHHS). (1980). *Promoting health preventing disease: Objectives for the nation.* Washington, DC: U. S. Government Printing Office.

Van Winkle, N. W., & May, P. A. (1986). Native American suicide in New Mexico, 1957-1979: A comparative study. *Human Organization, 45(3).*

Wallace, H. M. (1973a). The health of American Indian children. *American Journal of Diseases of Childhood, 125,* 449-454.

Wallace, H. M. (1973b). The health of American Indian children: A survey of current problems and needs. *Clinical Pediatrics, 12(2),* 83-87.

Ward, J. L., Lum, M. K., Margolis, H. S., Fraser, D. W., & Bender, T. R. (1981). Haemophilus influenza disease in Alaskan Eskimos: Characteristics of a population with an unusual incidence of invasive disease. *Lancet, 8233,* 1281-1284.

Weeks, J. R. (1981). *Population* (2nd ed). Belmont, CA: Wadsworth Publishing Company.

Weit, R. J. (1979). Patterns of ear disease in the Southwestern American Indian. *Archives Otolaryngol, 105,* 381-385.

White, R., & Cornely, D. (1981). Navajo child abuse and neglect study. *Child Abuse and Neglect, 2,* 9-17.

Wichlacz, C., Lane, J., & Kempe, C. (1978). Indian child welfare: A community team approach to protective services. *Child Abuse and Neglect, 2,* 29-35.

Willard, W. (1979). American Indians. In L. D. Hankoff & B. Eihsidler (Eds.), *Suicide.* New York: PSG Publishing Company.

Williams, R. L. (1985). Vehicular carbon monoxide screening: Identification in a cross-cultural setting of a substantial public health risk factor. *American Journal of Public Health, 75(1),* 85-86.

Wills, J. E. (1969). Psychological problems of the Sioux Indians resulting in the accident phenomena. *Pine Ridge Research Bulletin, 8,* 49-63.

Winfree, L. T., & Griffiths, C. T. (1983a). Social learning and adolescent marijuana use: A trend study of deviant behavior in a rural middle school. *Rural Sociology, 48(2),* 219-239.

Winfree, L. T., & Griffiths, C. T. (1983b). Youth at risk: Marijuana use among Native American and Caucasian youths. *International Journal of the Addictions, 18(1),* 53-70.

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Discussion

Dr. Hunter: Phil covers a lot of statistics that make a good argument for preventive programs. He outlines a number of areas that are preventive public health in nature as opposed to a direct clinical, hands-on type of situation which many physicians are far more comfortable with. If someone comes in with a discrete illness and I can give them something for it, I'm happy, and they're happy, assuming they get well. That's what I have been trained to do. Public health, which this paper addresses, is a much more difficult area.

It is extremely frustrating to have situations where you can see a need and a fairly simple solution. How do you get people to listen to you in order to implement that solution? A good example would be the program regarding car seats for children. I don't know if anyone in the room wouldn't perceive that as a self-evident, inexpensive truism, not just for Indian people, but for everybody else who leaves the hospital with a newborn child. Yet obviously that's not in effect right now.

Phil makes a very important point that, at least from the perspective of IHS, needs further thought: playing with statistics. We could probably drop infant neonatal mortality rates below White rates. It's a matter of increasing a denominator. You can come up with any kind of figures you want. I don't know how fair that is to underserved populations.

We now have something like 120-126 tribes in the Nashville program office area, and there are a lot on the waiting list. I think there have been something like five added in the last couple of years. These are small tribes; they're people who get added to IHS rolls of numbers. They haven't been being served by IHS. Oklahoma is probably the prime example where large numbers suddenly came into the system, so that you add these people that we don't serve or serve in name only to the denominator, and the rates for illness can be made to decrease. I don't suggest that as anything malicious on anybody's part, but the people who are underserved, who have been underserved before the increase in that denominator, in my opinion, continue to be underserved, and one has to be wary of becoming complacent about these particular statistics.

Another public health issue that is touched on in the paper, and that very little work seems to be being done on right now, has to do with stereotypes. Again, I don't know that anybody would call stereotypes, useful or desirable. Certainly the stereotypes that we have regarding Indians are not particularly complimentary. There is low visibility of the successful Indian in terms of a role model. Just parenthetically, we're working with the Office of Research and Development in the Tucson program office to try and address this issue on a national level sometime during the coming year.

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The public health approach that Phil is talking about can target relatively large populations. I think in doing this, my impression is that one may be also targeting relatively lower risk groups, or they may be included, but that doesn't make any difference. A good example again being the car seat. Probably if you made it mandatory that everybody leaving a hospital with a newborn infant had to leave with that infant in a car seat, there are going to be some people who would have been doing that anyway, so you give out a free car seat where someone may have brought it with them. I think that is going to happen in a public health measure, but the benefits to the higher risk group will be far larger.

The paper lists a number of health issues where prevention is the key, in particular with children. I was struck—and this may be my own particular bias, coming out of my interests and work—by the lack of any comment on adolescent pregnancies, which seems to me to be a preventable type of problem, and one which, at least in the Southwest, seems to me to be very problematic.

There are problems inherent in developing programs in prevention, and while Phil didn't touch on these specifically, I would like to touch on them a bit. One is, how can effective preventive techniques be developed and implemented? There are serious problems with the development of preventive programs. One of the discussants yesterday talked about the notion of model programs that can go out and provide training to different Indian groups in the country. How does one get a model program? I am not talking about money. I think that the funding programs that we perceive have to do more with the threat of death to the program than enough money, and there is a constant pressure to end preventive type programs that are in the developmental stage. I think Phil was telling me, his program has been ended three times.

One of the problems is that everybody is short of money. A program like the fetal alcohol syndrome program, or an Indian Children's Program, are not dependent upon any of the 12 areas in the Indian Health Service. These areas are all strapped for money. Right now Alaska is in very bad shape, and one of their plans was to cut out the mental health services at the Alaska Native Medical Center, which shows where mental health can be in the priorities when it really gets down to nickels and dimes and survival.

In developing programs such as Phil described, another problem has to do with the tremendous variety among the tribes. Where do you draw the line between the American Indians and Canadian Indians? It's fairly easy to draw the line between United States Indians and Mexican Indians. The Canadians pose a different situation. Who does one see in terms of entry to a particular tribe? These may sound like trivial things, but they have to do with whether your program is going to succeed or not in a particular area. For example, it would be

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of some jeopardy for someone affiliated with the IHS or anybody else having to do with health delivery to go in a reservation in the Southwest without talking with the service unit director. I would be apprehensive about doing that myself.

In the East, it's wholly different, because there are no service unit directors. There is no IHS presence. You're not dealing with the eastern tribes from Maine to Florida, west to the Mississippi River, and north up to the Bemidji area, which is Wisconsin and Minnesota. IHS presence there is largely confined to project offices, and the whole tenor of approach is different dealing with a tribe that has developed its own resources, and knows what its particular needs and desires are, rather than if you're dealing with an IHS program.

I wish that Phil had taken a closer look at the fetal alcohol syndrome. This has been a program that has grown very dramatically, since it was started in 1979. By growth, I mean it's moved from a research-based program that has maintained an interest in research, to the people that have or that perceive themselves as having problems. Again, there is no way in the world that any program is going to serve all of the Indian population. I don't think that Phil could imagine being able to provide services for fetal alcohol syndrome children. What he is able to do, however, is to go on working with the tribes and help them develop programs that are compatible with their particular situation. That's what a small national program is able to offer that perhaps a larger program or a hit-and-miss type of program has difficulty offering.

Finally, one of the things that has impressed me has been that with tribally contracted programs you are able to get a clearer perception of what the tribe considers to be the problem. It may or may not be, but that's at least their perception, as opposed to your perception, or the perception of the IHS. The implementation and the enthusiasm are really quite superior going in with a private contract, where in essence there is no IHS presence, as compared to a situation where there is an IHS presence.

Dr. May: There are very poor IHS programs; there are very good ones; there are very poor tribal programs; there are some outstanding tribal programs. It's hard to tell.

Dr. Dinges: Phil, I was curious that you didn't deal with mental health issues in your presentation, and that is a part of the major section in the *Health and Behavior* chapter.

Dr. May: It's one of the weakest parts of that whole chapter, first of all. Secondly, when I reviewed the literature, I was utterly amazed at the lack of anything on developmental disabilities with Indians. I think that is probably an area I should have highlighted as needing a lot more research. The third reason is that I felt these issues were so outstanding, and I had data that could really promote them.

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Dr. Hunter: I think, too, that mental health has been bandied about so much since the mental health centers movement in the '60s and '70s, that one has to be careful about it. The cutting edge of mental health is in areas of prevention, fetal alcohol syndrome, adolescent pregnancy, violence, and that sort of thing. This seems to me to be the role of mental health in the coming years.

Dr. Manson: One of the areas that strikes me as clear targeting for mental health services goes back to the 1982 article by Beiser and Attneave in the *American Journal of Psychiatry*, which clearly shows up in your IHS data. There is an explosion of program contracts with kids at about 8-10 years of age. This may be a reporting phenomenon or a service utilization phenomenon, but it's there. It also coincides with the alleged crossover effect with respect to academic performance and achievement in Indian kids. It suggests to me that, in fact, it might be an area ripe for preventive effort and also close linkages between the BIA, IHS, and tribal education programs, in terms of appropriate identification, early identification screening of kids at risk for mental health problems, whether they be adjustment problems, and so forth. What I heard was a biomedicalization of the mental health problems, and if that indeed begins to characterize the ways we approach these things because we think they are amenable to prevention, then I'm concerned about that.

Dr. Hunter: I don't think what you're saying is in conflict at all with what I'm saying.

Dr. May: I would agree. I don't think that there is a conflict here.

Dr. Manson: I don't think it's a conflict; it sounds like a matter of prioritization. In the IHS Children's Program, they have tried for years to standardize psychological tests among various tribes. It's always been amazing to me that the funding for AI's efforts at getting the MMPI and WIS-R standardized in Indian populations has been so underfunded. There are a lot of psychiatric/psychological evaluations of school-aged kids being done by contract doctors. I've seen kids who were interviewed at home on the reservation and are perfectly bright kids, except that they have got a medical problem, epilepsy, but their psychological profiles indicate they are retarded and are having all kinds of problems.

Dr. Levy: Work with epileptic kids has shown that when they've been classed in certain ways in certain contexts, they have a lot of trouble.

Dr. Guilmet: Two thirds of them are labeled mentally retarded.

Dr. Levy: It's not just a matter of labeling them as retarded, you get labeling in personality problems of aggression, or inability to express certain emotions, and so on.

Dr. Guilmet: Has there every been a major study on that?

Dr. Levy: No, no one has ever been able to get the funding to do even the standardization of the test. This is what we're talking about.

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Dr. Guilmet: A lot of labeling happens without tests.

Dr. Levy: There's been a lot of work done in L.A. with Hispanic and Black school kids that come up with very clear results, and one can read that literature, and I assume that the results will be the same. They've had the experiments in the school room where teachers were told, "These 10 kids are very bright, and these 10 kids come out very, very poor," and what they have actually done is invert the real scores, and the kids perform according to what the teachers expected of them. The point is bringing the results of these research advances to an underserved population. This is the problem.

Dr. Walker: A comment I'd like to make on use of psychometric instruments, and maybe neuropsychological assessments, too, which we're doing in our sample. It's important to think about these instruments in relationship to the sample that you're working with, not in comparison to either the norms or other groups of people. Sometimes we want these tests to do more than they are really designed to do for any studies, for any populations. As long as we look at them as part of an effective differentiating process, they can give us information within the sample, and then we can talk about issues of prevention within the sample. But what goes along with the psychometric assessment process?

Jim and Jerry yesterday talked a little bit about the importance of the interaction, the assessment and the therapist trying to understand what is happening with that individual. Then the test material becomes very helpful. We have overexpected and maybe put down psychometric assessments in our samples, and maybe then written them off, maybe indeed labeled the sample as being unlearned or unable to learn, et cetera, and that's a real danger in the prevention process.

Dr. May: I'd like to answer Spero's question. Essentially, I didn't mean in any way to minimize the importance of mental health issues. Let me just say this. The one thing I felt I was bringing to the paper, and I probably over-emphasized, is that a task orientation on a highly acceptable subject opens the door for all of these issues, and I really think that those kinds of issues go hand in hand. Now, what I'm trying to do is emphasize positive tasks here that will be accepted. And then, in the same movement, that same flow, all of these developmental issues and mental health issues can be approached. I probably did a disservice to it by not giving it enough time in this paper, but I didn't mean to minimize it at all.

Dr. Manson: It's just that the other people who take up these primary interventions have that kind of attitude as potential spin-off effects with regard to enhancing and improving the competence and well-being on these kinds. But my sense is the providers tend to be much more limited in focus.

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Dr. Hunter: Phil's lack of discussion of mental health issues didn't bother me, and mental health is one of my main interests, obviously. I think it's because we're so closely married in terms of our day-to-day work, there's no question about the commitment towards that.

Dr. Ghodes: Well, I have a little bit different perspective. Children have an uncanny way of growing into adults, and some of the health problems of adults have their foundations in childhood. Simply looking at prevention opportunities by tallying up the children's age groups and what's happening there is to miss the perspective of what we can do in childhood that is going to pay off in earlier and later adulthood. I bring up the issue of childhood obesity as something that has enormous implications later on to the person in terms of hypertension, diabetes, etc., and that is probably another perspective in prevention in childhood that we really ought to think about and take a look at.

Dr. Joos: One of your suggestions about the State Board of Health and Education program was at the junior high and high school levels, and I think in light of what Dorothy just said, the same types of things could be introduced at a much earlier age in elementary school, especially in view of the early onset of obesity and diabetes and problems of dental care in the populations.

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