

The Health of American Indian Children

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SINCE 1955, when the Public Health Service was charged with responsibility for the health care of Indians and Alaska Natives, the health of the Indian family has improved. Evidence of this improvement is decreased mortality attributable to increased use of health and hospital services—hospital admissions and deliveries, clinic visits, and dental care, program expansion—particularly more health personnel and new emphasis on recruitment and training Indians in health-related disciplines, and improved environmental health services—water supply, waste disposal, and other sanitation measures (1). Despite the progress over the past 17 years, the need to narrow the gap between the health of Indian children and that of other American children remains. This paper is a report on the current status of the health of Indian children.

Relationship Between Poverty and Health

The relationship between family income and health status of family members is well documented. For example, poverty reflects many unfavorable conditions associated with childbirth and

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which affect survival of the infant. Women in poverty become pregnant younger, are pregnant more frequently, and therefore have shorter intervals between pregnancies. They also continue child-bearing until they are older than middle class women. Low income women are more likely to have either late or no prenatal care. They also have more complications of pregnancy and spontaneous abortions, premature babies, and stillbirths. Poor women are likely also to have a higher maternal mortality rate.

Infant and perinatal mortality rates are higher. An infant born in a poor family has only half the chance of reaching his first birthday as a middle class baby.

Unfavorable home conditions have an unfavorable effect on health. For example, crowding in the home may promote the spread of infection. The water may be polluted, lack of refrigeration may lead to eating unsafe foods, and lack of equipment and fuel may preclude preparation of safe infant foods and formulas. A crowded, dilapidated home is more likely to expose the young child to burns and falls, and lead or kerosene in homes is especially hazardous to young children. Poor home conditions are reflected in higher mortality rates of infants from 1 month to 1 year old because of environmental causes.

Children and youth in low income families—as compared with those in middle income families—have a higher incidence of gastrointestinal infections, tuberculosis, venereal disease, speech disorders, and behavioral or learning disorders. They

also have more mental illness, more dental disease, and more rheumatic fever. They have lower immunization rates against the common communicable diseases of childhood. Children in low income families make fewer visits to a physician or a dentist, and a smaller percentage of children under 15 years old see a physician or dentist within a year.

Children from low income families are disadvantaged when they enter school. On various tests, they evidence deficits in achievement potentiality. As schooling continues, children from low income families fall further behind; more such children are nonreaders, repeaters, and school dropouts. The possible reasons for these difficulties are (a) malnutrition, (b) illness, (c) poor teaching, (d) low expectations of parents and teachers, (e) poor language development, and (f) few learning opportunities in the home.

Families in poverty have little money for adequate nutrition. The diet of many pregnant or lactating women, of infants, and of children is inadequate because these families need various kinds of help: assistance in budgeting, availability of food stamps, supplemental foods, and education in nutrition. Preschool children in low income families have poor diets that are especially low in iron and vitamin C. These children are shorter than middle and upper class children and weigh less.

Families with low income are less likely than families with high or middle income to have health insurance (2). Low income families frequently do not use health services, especially prenatal care, supervisory health care of seemingly well children, and family planning. This underutilization of services results from differences in perceptions and expectations of illness and health care.

Concomitantly less health care is accessible to

Table 1. American Indian population in urban and rural areas, 1930-70

| Year | White | | Negro | | American Indian | |
|-----------|-------|-------|-------|-------|-----------------|-------|
| | Rural | Urban | Rural | Urban | Rural | Urban |
| 1930..... | 42.4 | 57.6 | 56.3 | 43.7 | 90.1 | 9.9 |
| 1940..... | 42.5 | 57.5 | 51.4 | 48.6 | 91.9 | 8.1 |
| 1950..... | 35.7 | 64.3 | 37.6 | 62.4 | 83.7 | 16.3 |
| 1960..... | 30.4 | 69.6 | 26.8 | 73.2 | 72.2 | 27.8 |
| 1970..... | 27.0 | 73.0 | 21.0 | 79.0 | 65.2 | 34.8 |

SOURCE: reference 3, p. 87, table 10.

Table 2. Percentage distribution of population by age, 1960

| Age (years) | United States | Indians (23 reservation States) | Alaska Natives |
|---------------------|---------------|---------------------------------|----------------|
| Under 5..... | 11.3 | 17.5 | 18.9 |
| 5-9..... | 10.4 | 15.3 | 15.8 |
| 10-14..... | 9.4 | 12.9 | 12.6 |
| 15-19..... | 7.4 | 9.5 | 10.4 |
| Total under 20..... | 38.5 | 55.2 | 55.7 |
| 20-24..... | 6.0 | 7.1 | 7.1 |
| 25-29..... | 6.1 | 5.9 | 6.8 |
| 30-34..... | 6.7 | 5.4 | 5.9 |
| 35-39..... | 7.0 | 4.9 | 5.0 |
| 40-44..... | 6.5 | 4.1 | 4.0 |
| 45-74..... | 26.3 | 15.7 | 12.6 |
| 75 and over..... | 3.1 | 1.7 | 1.2 |
| Median age..... | 29.5 | 17.3 | 16.3 |

SOURCE: reference 5, p. 20, table 1.

low income families: factors such as distance from a clinic or hospital and transportation are important. Health care for low income families is more likely to be episodic rather than continuous, and these families are more likely to use hospital emergency rooms. Also, the delivery of care to low income families is more likely to be fragmented—many kinds of clinics, long periods of waiting for each clinic, and loss of work because of the long waiting periods.

Demography In Relation To Health

The American Indian population is relatively small: 561,100 in 1968, and they were only 0.3 percent of the total U.S. population both in 1940 and 1969 (3). The rate of population increase from 1955 to 1968 (4) was similar for Indians (20.9 percent) to that of the total U.S. population (21.6 percent), but for the Alaska Native it was almost double (39.4 percent).

| Population | 1955 | 1968 | Percent increase |
|--|----------------------|----------------------|------------------|
| American Indian and Alaska Native..... | 458,800 | 561,100 | 22.3 |
| American Indian..... | 423,800 | 512,300 | 20.9 |
| Alaska Native..... | 35,000 | 48,800 | 39.4 |
| Total U.S..... | ¹ 164,308 | ¹ 199,861 | 21.6 |

¹ In thousands.

The following table shows that the rate of urbanization of the American Indian has been higher than for any ethnic group from 1930 to 1970.

| Race | 1930 | 1970 |
|----------------------|------|------|
| White..... | 55 | 72 |
| Negro..... | 40 | 75 |
| American Indian..... | 10 | 35 |

Table 3. Enrollment in Project Head Start, by ethnic group, 1968 and 1969

| Ethnic group | 1968 | | 1969 | |
|----------------------|-----------|--------|-----------|--------|
| | Full year | Summer | Full year | Summer |
| Caucasian..... | 23.4 | 38.0 | 23.5 | 43.4 |
| Negro..... | 51.0 | 37.2 | 52.6 | 37.0 |
| Oriental..... | .2 | 0 | .2 | .1 |
| American Indian..... | 2.3 | 1.2 | 2.6 | 1.0 |
| Mexican-American.... | 8.8 | 10.2 | 10.0 | 8.8 |
| Puerto Rican..... | 6.6 | .6 | 5.8 | 3.9 |
| Eskimo..... | .5 | .3 | .2 | 0 |
| Other..... | 1.0 | 5.9 | .8 | 1.4 |
| Not reported..... | 6.2 | 6.5 | 4.3 | 4.4 |

SOURCE: reference 3, p. 118, table 71.

For example, from 1930 to 1970, the percentage of the Indian population in urban areas increased from approximately 10 percent to nearly 35 percent, three and one half times (table 1).

The American Indian population is relatively young (table 2). In 1960, the median age of the Indian was 17.3 and of the Alaska Native 16.3, compared with 29.5 years for the total population of the United States (5). Furthermore, there is a much higher percentage of children and youth under 20 years among the Alaska Natives (57.7 percent) and Indians (55.2 percent), compared with the total population of U.S. (38.7 percent). Indians will also have a proportionately higher number of girls entering the childbearing age in the 1970s.

The disparity in the median ages of the three populations has several implications. The Indian population has more dependents, that is, more children and youth. Indians have greater need for all types of community services for children and youth—hospitals, health centers, clinics, schools, school health services, recreation programs, pre-school programs such as day care and Head Start, and special health programs for adolescents.

Although many Indian and Alaska Native pre-school children are disadvantaged, nevertheless, they comprised only a small percentage of the children enrolled in Head Start in 1968 and 1969, about 3.5 percent for Indians and about 0.2 percent for Alaskan Natives (table 3).

Table 4 shows the enrollment in Federal schools for Indians from 1929 to 1930 through the fall semester of 1965. Based on the figures presented in reference 3, page 128, table 85, the 177,464 American Indian students constituted 0.4 percent of the 43,353,567 pupils enrolled in ele-

mentary and secondary schools in the continental United States during the fall of 1968. The table also shows data on Indians' attendance of minority schools by State.

Births

The birth rate among the American Indian and Alaska Native populations (39.2 and 31.5 per 1,000 population, respectively) is approximately twice that of the total U.S. population (17.5) in 1969.

A high birth rate is of vital concern because it affects the health and probability of survival of mothers and their children. Maternal mortality is higher in women with many children than in those with few children. High infant and perinatal mortality is also associated with women who have many children. Too many babies born at too close intervals produce a well-known syndrome of illness in infants and young children. Diarrhea and malnutrition are often observed in the baby who

Table 4. Enrollment in Federal schools for Indians

| Decade or term | Kindergarten | Grades 1-8 | Grades 9-12 and post-graduates |
|----------------|--------------|------------|--------------------------------|
| 1929-30..... | 3,400 | 18,644 | 7,545 |
| 1939-40..... | 3,144 | 17,222 | 6,970 |
| 1949-50..... | 3,650 | 19,973 | 8,080 |
| 1959-60..... | 3,987 | 24,522 | 11,685 |
| 1963..... | 4,333 | 28,690 | 13,067 |
| Fall 1965..... | 4,440 | 31,766 | 13,588 |

SOURCE: reference 3, p. 120, table 73.

Table 5. Percentage of live births in hospitals

| Year | Indians and Alaska Natives (all areas) | Indian (all areas except Alaska) | Alaska | United States (all races) |
|-----------|--|----------------------------------|--------|---------------------------|
| 1955..... | 88.2 | 90.8 | 65.1 | 94.4 |
| 1956..... | 88.7 | 91.6 | 63.8 | 95.1 |
| 1957..... | 89.1 | 91.7 | 64.3 | 95.7 |
| 1958..... | 90.3 | 93.1 | 65.5 | 96.0 |
| 1959..... | 91.3 | 94.0 | 64.4 | 96.4 |
| 1960..... | 92.9 | 95.1 | 70.9 | 96.6 |
| 1961..... | 93.5 | 96.1 | 69.3 | 96.9 |
| 1962..... | 94.3 | 96.5 | 73.1 | 97.2 |
| 1963..... | 95.2 | 96.8 | 79.9 | 97.4 |
| 1964..... | 95.5 | 96.9 | 81.4 | 97.5 |
| 1965..... | 95.5 | 96.7 | 84.0 | 97.4 |
| 1966..... | 97.0 | 97.7 | 89.5 | 98.0 |
| 1967..... | 97.2 | 97.8 | 90.4 | 98.3 |
| 1968..... | 98.0 | 98.5 | 91.8 | 98.5 |

SOURCE: reference 4.

has been weaned from the breast too early because his mother became pregnant too soon.

A mother who has to take care of a large number of children at one time has less time and attention to give to each child. Lack of direct maternal care is also a factor in less than optimal physical and emotional growth and development of the individual children and in the incidence of illness among such deprived children. Frequent pregnancies also produce maternal depletion: the wornout mother, aged prematurely, with insufficient energy to take adequate care of her home and children.

Furthermore, there is a well-known relationship between the interval between pregnancies and birth weight of the babies. Babies who weigh less than 5½ pounds have higher mortality and higher incidence of residual neurological and brain damage—cerebral palsy, mental retardation, and epilepsy

Table 6. Indian and Alaska Native infant death rates compared with those for United States, all races, 1955-67

| Year | Indians and Alaska Natives | Indian (all areas except Alaska) | Alaska Native | United States (all races) |
|-----------|----------------------------|----------------------------------|---------------|---------------------------|
| 1955..... | 62.5 | 61.2 | 74.8 | 26.4 |
| 1956..... | 59.4 | 56.1 | 87.0 | 26.0 |
| 1957..... | 60.4 | 58.2 | 80.2 | 26.3 |
| 1958..... | 58.0 | 56.7 | 69.0 | 27.1 |
| 1959..... | 49.5 | 46.7 | 76.7 | 26.4 |
| 1960..... | 50.3 | 47.6 | 76.3 | 26.0 |
| 1961..... | 44.4 | 42.3 | 64.0 | 25.3 |
| 1962..... | 44.2 | 41.8 | 66.8 | 25.3 |
| 1963..... | 43.6 | 42.9 | 50.7 | 25.2 |
| 1964..... | 37.6 | 35.9 | 54.8 | 24.8 |
| 1965..... | 39.0 | 36.4 | 65.4 | 24.7 |
| 1966..... | 39.0 | 37.7 | 51.4 | 23.7 |
| 1967..... | 32.2 | 30.1 | 55.6 | 22.4 |

SOURCE: reference 4, p. 14, table 6.

—than heavier babies. So the many specific reasons for concern about the birth rate, the number and spacing of children, family size, and the need to make family planning services and health education available to everyone of childbearing age are valid (3).

Another important circumstance of birth is place of delivery. In a developed country, such as the United States, it is considered safer for the mother to deliver her baby in the hospital. For the total U.S. population 98.5 percent of all babies are born in hospitals; this percentage also applies to the American Indian population. However, only 91.8 percent of the Alaska Native babies are born in hospitals (table 5). Some questions need to be raised about this disparity. Is there a lack of hospital beds in Alaska? Or are there enough hospital beds, but are they not easily accessible to all the population? Or are mothers unwilling or afraid to deliver in a hospital?

Annual income is highly relevant to health. The most recent information indicates that the American Indian is the most economically disadvantaged of all Americans.

| Ethnic group | Annual income for 1970 |
|----------------------|------------------------|
| All groups..... | \$ 9,870 |
| White..... | 10,240 |
| Spanish descent..... | 7,330 |
| Black..... | 6,280 |
| American Indian..... | 1,900 |

Mortality

Infant mortality. The infant mortality rate is a sensitive index of the socioeconomic status of a population and their access to and use of health services. While the infant mortality rate has been declining for American Indians and Alaska Na-

Table 7. Neonatal and postneonatal mortality rates

| Ethnic group and time period | 1955 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 |
|------------------------------|------|------|------|------|------|------|------|------|------|
| Indian and Alaska Native: | | | | | | | | | |
| Neonatal..... | 22.7 | 19.1 | 19.8 | 16.6 | 18.6 | 16.9 | 15.8 | 17.3 | 15.3 |
| Postneonatal..... | 39.8 | 31.2 | 24.5 | 27.6 | 25.0 | 20.6 | 23.2 | 21.7 | 16.9 |
| Indian: | | | | | | | | | |
| Neonatal..... | 22.2 | 18.1 | 19.1 | 15.9 | 18.0 | 16.5 | 15.2 | 16.8 | 14.2 |
| Postneonatal..... | 39.0 | 29.5 | 23.1 | 25.9 | 24.9 | 19.4 | 21.1 | 20.9 | 15.9 |
| Alaska Native: | | | | | | | | | |
| Neonatal..... | 27.8 | 28.5 | 26.7 | 23.4 | 24.9 | 21.1 | 21.8 | 22.6 | 27.5 |
| Postneonatal..... | 47.0 | 47.8 | 37.2 | 43.4 | 25.8 | 33.7 | 43.6 | 28.8 | 28.1 |
| Total U.S. population: | | | | | | | | | |
| Neonatal..... | 19.0 | 18.7 | 18.4 | 18.3 | 18.2 | 17.9 | 17.7 | 17.2 | 16.5 |
| Postneonatal..... | 7.3 | 7.3 | 6.9 | 7.0 | 7.0 | 6.9 | 7.0 | 6.5 | 5.9 |

SOURCE: reference 4, p. 17, table 7.

Table 8. Neonatal and postneonatal death rates, by cause, Indians and Alaska Natives, 1965-67 average compared with United States, all races, 1966

| Cause of death | Indians and Alaska Natives, 1965-67 average | United States, all races, 1966 |
|--|---|--------------------------------|
| Neonatal: | | |
| Immaturity..... | 3.1 | 3.6 |
| Ill-defined diseases..... | 3.1 | 2.7 |
| Postnatal asphyxia and atelectasis..... | | |
| | 2.5 | 3.8 |
| Congenital malformations..... | 1.7 | 2.3 |
| Birth injuries..... | 1.6 | 2.0 |
| Postneonatal: | | |
| Respiratory diseases..... | 7.1 | 7.5 |
| Digestive diseases..... | 3.6 | .5 |
| Accidents..... | 1.9 | .8 |
| Infectious and parasitic diseases..... | 1.6 | .3 |
| Congenital malformations..... | 1.3 | 1.1 |

SOURCE: reference 4, p. 19, table 8.

tives, their rates are still much higher than for all races in the United States. For example, in 1967 the rate for American Indians (30.1 per 1,000 live births) was 34.5 percent higher than that of the total U.S. population (22.4), while the rate for Alaska Natives (55.6) was 148 percent higher than that of the total U.S. population (table 6).

Neonatal mortality (death before the 28th day after birth) is more an index of maternity care. Thus the neonatal mortality rate of the American Indian is similar to that of the total U.S. population; that of the Alaska Native is 67 percent higher than that of the total U.S. population, suggesting an even greater need for improvement in maternity care in the 49th State (table 7).

Postneonatal mortality (the 28th day but not reaching the first birthday) is primarily an index of the care the baby is given in his home environment. The picture is very unfavorable. For example, the postneonatal mortality rate of American Indians is almost three times that of the total U.S. population, while that of Alaska Natives is almost five times that of the total U.S. population (table 7).

Table 8, showing the causes of neonatal and postneonatal deaths, reveals the differences more specifically. During the neonatal period, obstetrical causes are predominant and the rates are more similar to those for the all races than during the postneonatal period. Respiratory, digestive, infective, and parasitic diseases and accidents account for much higher death rates among American In-

dian and Alaska Native infants than those in other American households.

Mortality in childhood. The death rate in children aged 1-14 years is almost three times greater in the American Indian and Alaska Native population than among the total U.S. population (table 9). This high death rate is caused primarily by infectious diseases and accidents. In addition to a high incidence of respiratory and gastrointestinal infections, tuberculosis (table 9) and meningitis claim a high toll. All kinds of accidents, including

Table 9. Causes of death, children 1-14 years, Indians and Alaska Natives, 1965-67 average compared with United States, all races, 1966

| Cause of death | Indians and Alaska Natives, 1965-67 average | United States, all races, 1966 |
|--|---|--------------------------------|
| All deaths 1-14 years..... | 144.2 | 57.1 |
| Tuberculosis, all forms..... | 2.1 | .2 |
| Dysentery, all forms..... | 1.5 | .1 |
| Whooping cough..... | .1 | 0 |
| Meningococcal infections..... | 1.3 | .7 |
| Other infectious and parasitic diseases..... | | |
| | 3.8 | 1.4 |
| Meningitis, except meningococcal and tuberculosis..... | 2.8 | .8 |
| Diseases of heart..... | 2.1 | 1.0 |
| Influenza..... | .4 | .2 |
| Pneumonia, except of newborn... .. | 13.9 | 4.4 |
| Bronchitis..... | .7 | .4 |
| Hernia and intestinal obstruction..... | .6 | .2 |
| Gastroenteritis..... | 5.3 | .7 |
| Cirrhosis of liver..... | .4 | .1 |
| Congenital malformations..... | 6.0 | 4.9 |
| Motor vehicle accidents..... | 22.6 | 10.1 |
| Other accidents..... | 45.9 | 13.6 |
| Suicide..... | .6 | .2 |
| Homicide..... | 1.9 | .8 |

SOURCE: reference 3, p. 95, table 22.

Table 10. Percentage of deaths by age group, American Indians and Alaska Natives, 1967

| Age group (years) | Indians and Alaska Natives, 1967 | Total U.S. population, 1967 |
|----------------------------|----------------------------------|-----------------------------|
| Under 1..... | 13.9 | 4.3 |
| 1-4..... | 4.3 | .7 |
| 5-14..... | 2.5 | .9 |
| Total under 15..... | 20.7 | 5.9 |
| 15-24..... | 7.5 | 2.0 |
| 25-34..... | 8.2 | 1.9 |
| 35-44..... | 9.0 | 4.0 |
| 45-54..... | 9.7 | 8.9 |
| 55-64..... | 11.6 | 15.9 |
| 65-74..... | 15.0 | 23.7 |
| 75 and over..... | 18.2 | 37.7 |

SOURCE: reference 4.

motor vehicle, are involved. Furthermore, homicides and suicides begin to appear in the statistics and thereby reflect mental health problems.

More than one-fifth of all deaths among American Indians and Alaska Natives occur in infants and children. In contrast, only 5.9 percent of the deaths among the total U.S. population as a whole occur in infants and children (table 10). The high incidence of gastroenteritis as a cause of death among infants and children of the American Indian and Alaska Native population is shown in table 11.

Illness Among Children

Table 12 shows the major causes of illness among Indians and Alaska Natives. Most of these illnesses occur in children (table 13). The incidence of the various diseases has changed very little since 1965, although progress has been made toward eradication of measles (where a new vaccine has been available) and trachoma (table 14).

A significant aspect of the illnesses in the children is that most of these conditions could be prevented by improving living conditions mentioned earlier in this paper.

The relationship between the method of feeding and diarrhea is shown by French in a study of Navajo children during their first 2 years of life (6). This study showed a higher incidence of diarrhea in bottle-fed babies than in breast-fed babies. Furthermore, bottle-fed babies had a higher incidence of all illnesses, but it was not statistically significant.

A study of 631 Cherokee children on their reservation in North Carolina included 96 percent of the 655 students enrolled in the elementary

Table 12. Rank of notifiable diseases among Indians and Alaska Natives, 1965-69

| Illness | 1969 | 1968 | 1967 | 1966 | 1965 |
|---|------|------|------|------|------|
| Otitis media..... | 1 | 1 | 1 | 1 | 1 |
| Gastroenteritis..... | 2 | 2 | 2 | 2 | 2 |
| Streptococcal throat, scarlet fever..... | 3 | 3 | 4 | 5 | 4 |
| Pneumonia..... | 4 | 4 | 3 | 3 | 3 |
| Influenza..... | 5 | 5 | 5 | 4 | 6 |
| Gonorrhea..... | 6 | 6 | 7 | 7 | 7 |
| Trachoma..... | 7 | 7 | 6 | 6 | 5 |
| Chickenpox..... | 8 | 8 | 9 | 9 | 10 |
| Dysentery..... | 9 | 10 | 8 | 10 | 9 |
| Mumps..... | 10 | 9 | 11 | 11 | 11 |
| Measles..... | 11 | 12 | 10 | 8 | 8 |

SOURCE: reference 5, p. 6, table A.

school. Ninety-two percent of these children were infected with one or more parasites (7). The need to improve sanitation on the reservation and to intensify the residents' health education is evident.

Otitis media is one of the most serious illnesses among Indian and Alaska Natives. As with infectious diseases, otitis media is closely associated with crowded living conditions. Children under 2 years of age are at greater risk. Furthermore, if a child has otitis media before his first birthday, the risk of repeated attacks is increased. Otitis media is significant because it results in permanently impaired hearing.

If hearing loss occurs, medical and surgical treatment is usually necessary and the child may require special education. Unless these special services are available, the child's speech and language development may be impaired, his progress in school may be poor, and his vocational opportunities and social development may be restricted.

For these reasons it is necessary to improve general living conditions, provide continuous health supervision of well children, and promptly treat children with respiratory infections. The need of prompt treatment for otitis media and special medical, surgical, and educational measures for these children with chronic otitis media is urgent.

Dental problems are common among all children. The preventives include improved diet and oral hygiene, use of fluoridated water supplies or topical applications of fluoride to children's teeth, and dental prophylaxis. Filling of decayed teeth and orthodontic programs are continuing needs. Despite the shortage of dental health personnel of all types—dentists, dental hygienists,

Table 11. Age-specific death rates from gastroenteritis, Indians and Alaska Natives

| Age group (years) | Indians and Alaska Natives, 1965-67 | United States, 1966 | Ratio: Indian to total United States |
|-------------------|-------------------------------------|---------------------|--------------------------------------|
| All ages..... | 18.2 | 3.9 | 4.7 |
| Under 1..... | 309.6 | 36.9 | 8.4 |
| 1-4..... | 16.2 | 2.1 | 7.7 |
| 5-14..... | | .2 | |
| 15-64..... | 2.6 | 1.6 | 1.6 |
| 65 and over..... | 43.4 | 20.9 | 2.1 |

SOURCE: reference 4, p. 39, table 18.

Table 13. Major reportable diseases among Indians and Alaska Natives, 14 years and under and 15 years and over, by number and percent, 1969

| Disease | Total cases | 14 years and under | | 15 years and over | |
|--|-------------|--------------------|---------|-------------------|---------|
| | | Number | Percent | Number | Percent |
| Otitis media..... | 39,351 | 33,139 | 84 | 6,212 | 16 |
| Gastroenteritis..... | 29,811 | 20,224 | 68 | 9,587 | 32 |
| Streptococcal throat, scarlet fever..... | 20,022 | 12,185 | 61 | 7,837 | 39 |
| Pneumonia..... | 13,423 | 10,478 | 78 | 2,945 | 22 |
| Influenza..... | 8,666 | 4,145 | 48 | 4,521 | 52 |

SOURCE: reference 5, p. 9, table D.

and assistants—considerable progress has been made in improving dental care of Indians. More teeth are being filled, and fewer teeth are decayed or missing, as shown by the following average number of teeth decayed, missing, or filled per child 6–16 years old.

| Dental condition | 1957 | 1969 |
|----------------------|------|------|
| Total DMF teeth..... | 4.00 | 5.88 |
| Decayed..... | 2.49 | 2.42 |
| Missing..... | .40 | .32 |
| Filled..... | 1.11 | 3.13 |

Nevertheless, less than 54 percent of the population under 20 years of age is receiving dental service.

| Age group (years) | 1957 | 1969 |
|-------------------|--------|---------|
| All ages: | | |
| Number..... | 72,479 | 151,310 |
| Percent..... | 19.1 | 37.5 |
| Under 20: | | |
| Number..... | 56,079 | 120,120 |
| Percent..... | 29.5 | 53.5 |
| 20 and over: | | |
| Number..... | 16,400 | 31,190 |
| Percent..... | 8.6 | 17.4 |

Table 14. Change in leading notifiable diseases among Indians and Alaska Natives, 1969 and 1965

| Disease | Reported cases | | Percent change, 1969–65 |
|--|----------------|--------|-------------------------|
| | 1969 | 1965 | |
| Otitis media..... | 39,351 | 22,614 | +74.0 |
| Gastroenteritis..... | 29,811 | 20,000 | +49.1 |
| Streptococcal throat, scarlet fever..... | 20,022 | 7,433 | +169.4 |
| Pneumonia..... | 13,423 | 13,525 | + .8 |
| Influenza..... | 8,666 | 3,652 | +137.3 |
| Gonorrhea..... | 4,543 | 2,849 | +59.5 |
| Trachoma..... | 3,388 | 4,731 | -28.4 |
| Chickenpox..... | 1,735 | 1,867 | -7.1 |
| Dysentery..... | 1,130 | 1,901 | -40.6 |
| Mumps..... | 1,083 | 1,131 | -4.2 |
| Measles..... | 774 | 2,508 | -69.1 |

SOURCE: reference 5, p. 8, table C.

Although progress is being made in the prevention of tuberculosis, it remains a major disease and cause of death among American Indians and Alaska Natives, particularly children and youth (tables 15 and 16). Vaccination of infants and children with BCG, screening by use of tuberculin testing, followup and diagnostic workup of persons with positive reactions, the use of isoniazid to treat persons who have recently had a positive reaction to a tuberculin test when they have a history of negative reactions to such tests, treatment and supervision of patients with active tuberculosis, and followup and supervision of persons in close contact with a patient with active tuberculosis are the key measures in a program for prevention and control of tuberculosis.

The incidence of gonorrhea and syphilis is increasing among teenagers and young adults, and the rate of venereal disease among the Indian and Alaska Native population is particularly alarming. Although the incidence of syphilis is less than that of gonorrhea, it is of special importance because untreated in pregnant women, it will cause congenital syphilis in the infant (table 17).

Nutrition of Indian Children

The nutritional status of a significant number of Indian children is substandard. For example, the records of children born in 1964 and living on the Pine Ridge Reservation in South Dakota were reviewed. Of 190 children whose hemoglobin determinations were recorded, 40.5 percent had hemoglobin determinations below 10 grams, and 15.8 percent had hemoglobin determinations below 8 grams at some time during their first 2 years (8). A survey of six Kodiak Island villages by Brown showed that 82 children under 3 years had an average hemoglobin determination of 10.3 grams (8).

A report of discharges from the Tuba City (Ariz.) Hospital from July 1, 1967, to April 30,

1968, revealed the following data regarding malnutrition in infants and children: children aged 0–4 years (676 discharges)—malnutrition 44, iron deficiency anemia 38, marasmus (under 1 year of age) 13, and kwashiorkor 8; children 5 years of age and older (1,591 discharges)—iron deficiency anemia 44 and malnutrition 2.

Preliminary data from a subsequent study of Alaska Natives in Kodiak Island villages revealed a high incidence of iron deficiency (nutritional) anemia among infants and young children. Similar iron deficiencies have been noted in other parts of the State among Alaska Native infants and children as well as pregnant women (8).

Twenty percent of the children admitted to Indian Hospitals in the Window Rock, Ariz., area in fiscal year 1966 evidenced malnutrition. Of patients discharged from these hospitals in fiscal year 1966, 10 percent of 4,167 children aged 0–4 years and 10 percent of pregnant women had iron deficiency anemia (8).

In the 5-year period, 1963–1967, there were 4,355 admissions to the pediatric service of the Indian Hospital in Tuba City, Ariz., of children under 5 years of age. Of the total number, 616 had conditions diagnosed as malnutrition, and 44 of these had kwashiorkor or marasmus. The 572 other children were small for their ages (9).

From this study, it appeared that the Navajo mothers who do not breast feed are those most likely to have infants with malnutrition. It also appeared that those infants with marasmus and kwashiorkor were weaned too early and were not

Table 16. Tuberculosis, age-specific death rates

| Age group (years) | Indians and Alaska Natives, 1965–67 | United States, all races, 1966 | Ratio: Indians to United States, all races |
|-------------------|-------------------------------------|--------------------------------|--|
| All ages..... | 17.4 | 3.9 | 4.5 |
| Under 15..... | 2.0 | .2 | 10.2 |
| 15–24..... | 1.1 | .2 | 5.5 |
| 25–34..... | 11.3 | 1.0 | 11.3 |
| 35–44..... | 34.1 | 3.0 | 11.4 |
| 45–54..... | 31.2 | 5.5 | 5.7 |
| 55–64..... | 43.3 | 10.1 | 4.3 |
| 65 and over..... | 155.7 | 19.2 | 8.1 |

SOURCE: reference 4.

provided with a suitable safe infant formula or weaning supplement afterwards.

Kwashiorkor in an older child was frequently associated with displacement from the breast by a younger child because of a successive pregnancy. Diarrhea was a frequent occurrence in the children with marasmus and kwashiorkor, probably related to poor environmental sanitation and lack of personal hygiene.

Mental Health

The Third National Conference on American Indian Health reported that mental health problems were emerging as a major disability among American Indians (10). It was estimated that 20–25 percent of the American Indian population may be affected by some type of mental health

Table 15. Number of cases and incidence rates of tuberculosis, Indians and Alaska Natives compared with rates for United States, all races, 1955–69

| Year | Number of cases | | | Rates per 100,000 population | | | |
|-----------|----------------------------|---------|----------------|------------------------------|---------|----------------|--------------------------|
| | Indians and Alaska Natives | Indians | Alaska Natives | Indians and Alaska Natives | Indians | Alaska Natives | United States, all races |
| 1955..... | 2,400 | 1,586 | 814 | 758.1 | 563.2 | 2,325.7 | 60.1 |
| 1956..... | 2,208 | 1,363 | 845 | 680.6 | 474.3 | 2,283.8 | 54.1 |
| 1957..... | 1,869 | 1,252 | 617 | 565.2 | 426.9 | 1,649.7 | 51.0 |
| 1958..... | 1,603 | 1,236 | 367 | 485.0 | 421.8 | 978.7 | 47.5 |
| 1959..... | 1,394 | 1,001 | 393 | 418.0 | 338.2 | 1,048.0 | 42.6 |
| 1960..... | 1,096 | 877 | 219 | 322.4 | 292.3 | 547.5 | 39.4 |
| 1961..... | 1,122 | 880 | 242 | 318.8 | 284.8 | 562.8 | 37.0 |
| 1962..... | 907 | 647 | 260 | 257.7 | 209.4 | 604.7 | 28.9 |
| 1963..... | 826 | 596 | 230 | 234.0 | 142.3 | 534.9 | 28.7 |
| 1964..... | 849 | 578 | 271 | 237.8 | 184.1 | 630.2 | 26.6 |
| 1965..... | 801 | 563 | 238 | 218.6 | 175.9 | 511.8 | 25.3 |
| 1966..... | 579 | 461 | 118 | 155.1 | 141.5 | 248.9 | 24.4 |
| 1967..... | 661 | 574 | 87 | 171.1 | 169.8 | 180.5 | 23.0 |
| 1968..... | 580 | 492 | 88 | 145.0 | 140.0 | 180.3 | 21.4 |
| 1969..... | 623 | 556 | 67 | 153.2 | 155.7 | 135.6 | 19.1 |

SOURCE: reference 5.

Table 17. Venereal diseases, United States, all races, Indians and Alaska Natives, rates, per 100,000 population, 1963-69

| Year | Gonorrhea | | | Syphilis | | |
|-----------|-----------|----------------|-----------------------|----------|----------------|-----------------------|
| | Indians | Alaska Natives | Total U.S. population | Indians | Alaska Natives | Total U.S. population |
| 1963..... | 833.9 | 541.9 | 147.5 | 119.0 | (1) | 65.8 |
| 1964..... | 826.4 | 455.8 | 157.1 | 129.0 | (1) | 59.7 |
| 1965..... | 768.1 | 840.9 | 167.7 | 113.5 | 15.1 | 58.2 |
| 1966..... | 793.8 | 829.1 | 179.5 | 108.9 | 23.2 | 64.6 |
| 1967..... | 770.1 | 1,217.8 | 204.6 | 123.4 | 14.5 | 51.8 |
| 1968..... | 860.0 | 1,293.0 | 232.4 | 179.6 | (1) | 48.1 |
| 1969..... | 1,019.0 | 1,827.9 | 264.9 | 200.4 | (1) | 45.6 |

¹ Less than 5 cases.

SOURCE: reference 5, p. 14, table G.

problem, ranging from major psychoses to personality disorders.

Factors cited as fostering development of mental illness included disintegration of American Indian culture, transition from the American Indian culture to current American society, inadequate education, poverty, and disturbing childhood experiences. Furthermore, the removal of Indian children from their families to Government boarding schools for their education may be a contributing factor.

Recommendations of the conference included the following.

1. Pilot studies to determine the most acute needs of persons with psychiatric problems.
2. Consultative services to young couples on the health care of their children.
3. Counseling to the staff of boarding schools and to children with problems in boarding schools.
4. Development of mental health services strengthening family life.
5. Improving child-rearing practices among Indian families.
6. Making it possible for Indian children to attend school while living with their families or a substitute family at home.
7. Psychiatric services for those children and families in need of it.

It was generally agreed that the parent-child relationship, especially in the first 5 years, plays an important role in fostering optimal emotional and social development of the child.

More Recent Problems of Youth

Among the problems of youth are school dropout, juvenile delinquency, out-of-wedlock pregnancy, and drug abuse, as well as venereal disease

mentioned earlier. These are complex emotional problems related to a number of possible factors—weakening of the family and of family life; increased sexual freedom in general in Western culture; increased movement of young people and families to the large cities with inability of the cities to provide sufficient preventive and remedial health, social, educational, recreational, housing, and employment services for them; increasing emphasis on technology and technical education and training in American society, with difficulty of young people not so trained to fit in; lack of education and services in the field of family planning; and the need for educational programs, information, counseling, and treatment in regard to drugs and drug abuse.

Health Is a Team Affair

The delivery of health care in the United States has changed to delivery by a health team from delivery by one person. On the health team are various professionals—the physician, dentist, nurse, nutritionist, social worker—and various equally important supportive and educational personnel.

The new trend is the use of local representatives of the people to be served, in order to reach the people more effectively. The community health representative is an example of extending health services to reach the people more extensively in their own homes, and to interpret the need for health care, and the services available to be used (11-13).

The community health representative has become an important means of outreach of the Indian Health Service, and is important in upgrading the quality of care of mothers and children. Health education is a fundamental part of

maternal and child health services, and the community health representative can be a key person in this.

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