B. Postl, MD, FRCPC M. Moffatt, MD, FRCPC

The Health of Canada's Native People: An Overview

SUMMARY

The health of Canada's Native people has improved considerably over the last 50 years. Nonetheless, standard rates of health measurement, including mortality and morbidity, remain remarkably elevated. There now exists a coincident burden of infectious and degenerative or chronic illness. Most significant, there is considerable mortality related to injuries, violence, and suicide, and these occurrences are related, to a large extent, to the abuse of alcohol. Many of the ensuing deaths are therefore preventable. The concepts of health promotion and of transfer of control overlap considerably. Both evidently increase the potential of improved health through individual and community empowerment. (*Can Fam Physician* 1988; 34:2413–2419, 2580.)

Key words: Indian, Native, health

RÉSUMÉ

L'état de santé des Autochtones du Canada s'est amélioré considérablement au cours des 50 dernières années. Il n'en reste pas moins que les taux standardisés permettant de mesurer l'état de santé, incluant la morbidité et la morbidité, demeurent remarquablement élevés. Et l'on constate parallèlement une forte incidence de maladies infectieuses et dégénératives ou chroniques. Fait significatif, la présence d'une mortalité considérable secondaire aux blessures, violence et suicide, est, en grande partie, attribuable à l'abus d'alcool. Il serait donc possible de prévenir beaucoup de ces décès. Il existe un important chevauchement entre les concepts de promotion de la santé et de transfert des moyens de contrôle. Il est évident que ces deux concepts favorisent l'amélioration de la santé si l'on augmente les pouvoirs des individus et des communautés.

Dr. Postl, a practitioner of pediatrics and community medicine, and Head of the Department of Community Health Sciences, University of Manitoba, has directed the J.A. Hildes Northern Medical Unit since 1982. He is extensively involved in the provision of services relating to Canada's Native people. Dr. Moffatt, a pediatrician, is now Acting Director of the J.A. Hildes Northern Medical Unit. He also serves as Chairman of the Indian and Inuit Health Committee of the Canadian Pediatric Society. Requests for reprints to: Dr. B. Postl, Department of Community Health Sciences, University of Manitoba, Rm S-100, 750 Bannatyne Ave., Winnipeg, Man. R3E 0W3

FAMILY PHYSICIANS are involved in the care of Canada's Native peoples, performing important roles in providing primary care and as consultants' services to primary-care nurse practitioners. As the health and social circumstance of Native peoples change, and the likelihood of increases of Native peoples' involvement in the delivery of their own health care, it is important for family practitioners to have an overview of the health of Canada's Native people.

Historical Perspectives of Health

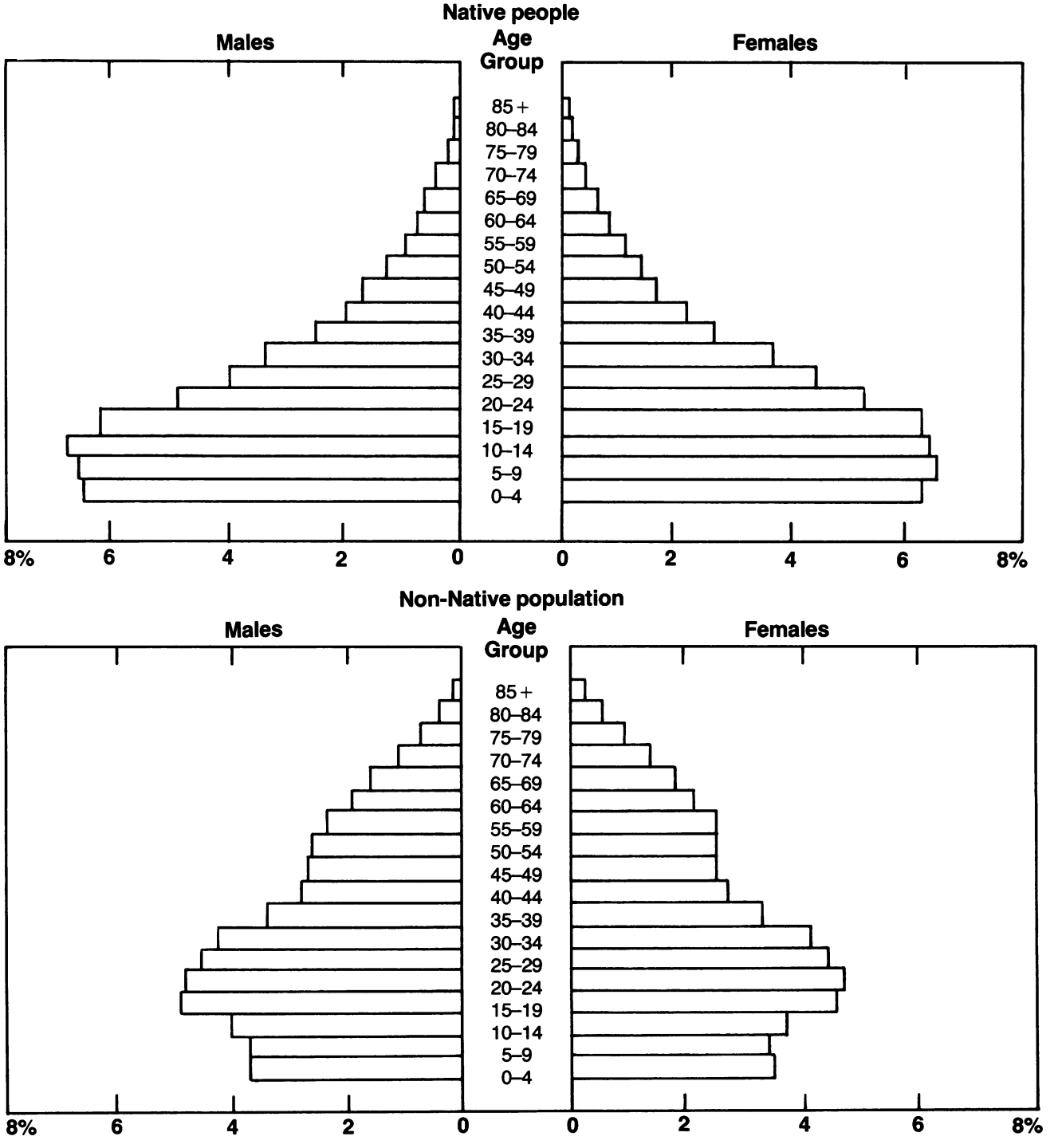
The health of Canada's Native peoples before their contact with Europeans is, at best, speculative. The scope and range of activities related to indigenous social and cultural practices and methods of obtaining food varied widely. Although a cultural richness may have existed, records based on first contact indicate that most groups were hunter gatherers, often surviving at a subsistence level.[1] First contacts occurred with explorer traders. The journals of these Europeans generally describe their Native contacts as vigorous and

healthful,[2] and many make note of the reverence with which the Natives treated their children.[3] If, however, patterns of life and death were consistent with other hunter-gatherer populations more completely studied, life expectancy was likely short, and strongly influenced by famine and injury.

Contact between the Natives and Europeans introduced the former to an era of illness that has been described as the "epidemiologic transition". Three phases of population illness have been proposed: the age of pestilence and famine, the age of receding pandemics; and the age of degenerative and man-made disease.[4]

Smallpox occurred among the first wave of epidemics, and its devastating effect has been well described.[5] Epidemics of measles, influenza, pertussis, and tuberculosis followed. The overall effect of these diseases is not well documented, but mortality was high and the social impact often devastating. The burden of infectious ill-

Figure 1
Age-sex Profile of Native People and of Non-Native Population, Canada, 1981



Source: 1981 Census of Canada

ness and the relatively new development of degenerative and chronic illnesses simultaneously influenced the health of Native Canadians.

Organization of Services

The provision of health services to Canada's Native people has traditionally been the responsibility of the federal government. The *British North America Act* (1867) incorporated Indians and Indian lands as a federal jurisdiction. At the same time the provision of health services was made the responsibility of the provinces. Neither the BNA Act nor the *Indian Act* (1874) specifically defines what is entailed in the provision of health services to Native people. This ambiguity of the *Acts* remains an important factor in the "negotiation" of services provided to Native people. Treaty No. 6 (1876) provides that a "medical chest [be] kept at the house of the Indian agent for the use and benefit of the Indians at the direction of such agent." This statement has been interpreted as making the federal government responsible for all of the health services provided to Native people, although the government has never accepted the concept of health-service provision as a treaty right.[6,7] In the early days, in fact, missionaries, the Hudson's Bay Company, and the Royal Canadian Mounted Police provided health care and medicaments to Native people as best they could. Federal government- and church-organized services were first provided in an itinerant fashion and were largely designed to contain epidemic disease.

The Department of National Health and Welfare assumed responsibility for providing Indian health services in 1945, and established its Medical Services Branch in 1962. There are currently eight regions administered by the Branch. Transfer of responsibility for health from the federal government to that of the Northwest Territories occurred in the spring of 1988.

The relative responsibilities of the federal and provincial governments in the provision of health care to Native people remain poorly defined. Provisions relating to universal hospital and medical care (1969) guarantee Native persons access to medical care consistent with that of other provincial citizens. Therefore, hospital and medical costs are borne by the provincial health insurance plans. Physician services in isolated areas are often co-ordinated and funded by the federal government to ensure opportunity for access. Community health services are largely funded by the federal government.

The federal Indian Health Policy (1979) designated three supporting factors for the future development of health services for Native people: community development; confirmation of the special relationship between the federal government and Indian peoples of Canada; and the full use of, and participation in, the Canadian health system by Native people. This policy was the genesis of a number of programs, including the National Native Alcohol and Drug Abuse Program, and the Community-Based Health Demonstration Projects. Under the policy, bands administer certain programs according to contribution agreements with the federal government. These programs cover transportation agreements, the services of community health workers, and, in some communities, community health nursing.

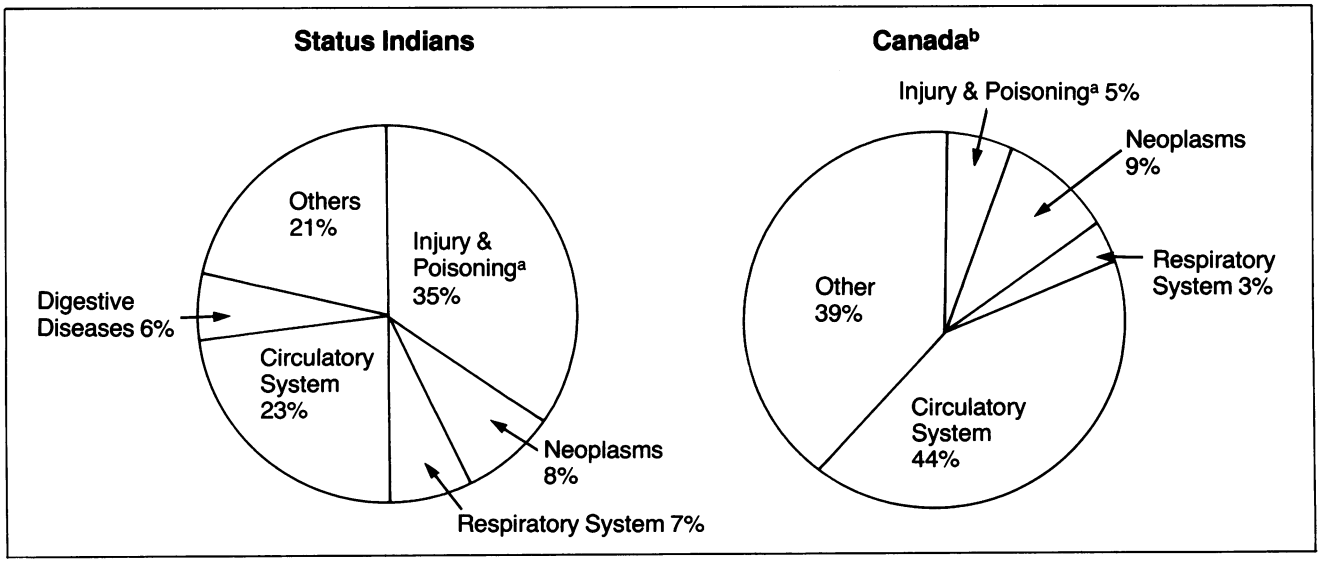
In 1983, the House of Commons Special Committee on Indian Self-

Table 1
Mortality Rates for Canada's Indian and Non-Indian Populations, 1979

Years	Indian	Non-Indian
1-4	3.1	0.8
5-19	1.9	0.7
22-44	6.0	1.5
45-64	15.7	9.0
65+	57.0	55.0

Note: Taken from A.J. Siggner: *An Overview of Demographic, Social & Economic Conditions Among Canada's Registered Indian Population.* Ottawa: DIAND, 1979.

Figure 2
Major Causes of Death: Percentage Distribution, 1979



[a]Injury & Poisoning (before 1979, called Accidents, Poisoning and Violence)
[b]Statistics Canada, 1978.

Government in Canada recommended in its *Report* that the federal government "establish a new relationship with Indian First Nations and that an essential element of this relationship be recognition of Indian self-government."[8] This recommendation has been the subject of several constitutional conferences, so far without positive outcome.

In 1986, the Honourable Jake Epp announced the Health Transfer Program with its intent to transfer the control of federal Indian.health services to Native peoples themselves. The transfer is to occur within the existing legal framework and the existing funding base. It is described as a developmental approach, aimed at achieving Indian control over the design and delivery of on-reserve health services.

The Population

To ensure understanding of the health status of a population, the characteristics of that population must be defined. Native people include treaty Indians, non-treaty Indians, Métis, and Inuit. Data are generally available for treaty Indians and Inuit, but only in incomplete form for non-treaty Indians and Métis. The health and life circumstance of all four groups are similar in many ways, however, and it is in that context that we have written this paper. A significant impact on the health of Canada's Native people occurs in the sociopolitical sphere. Although its coverage differs from the topic of this article, a summary as provided by Penner[9] (1983) is useful;

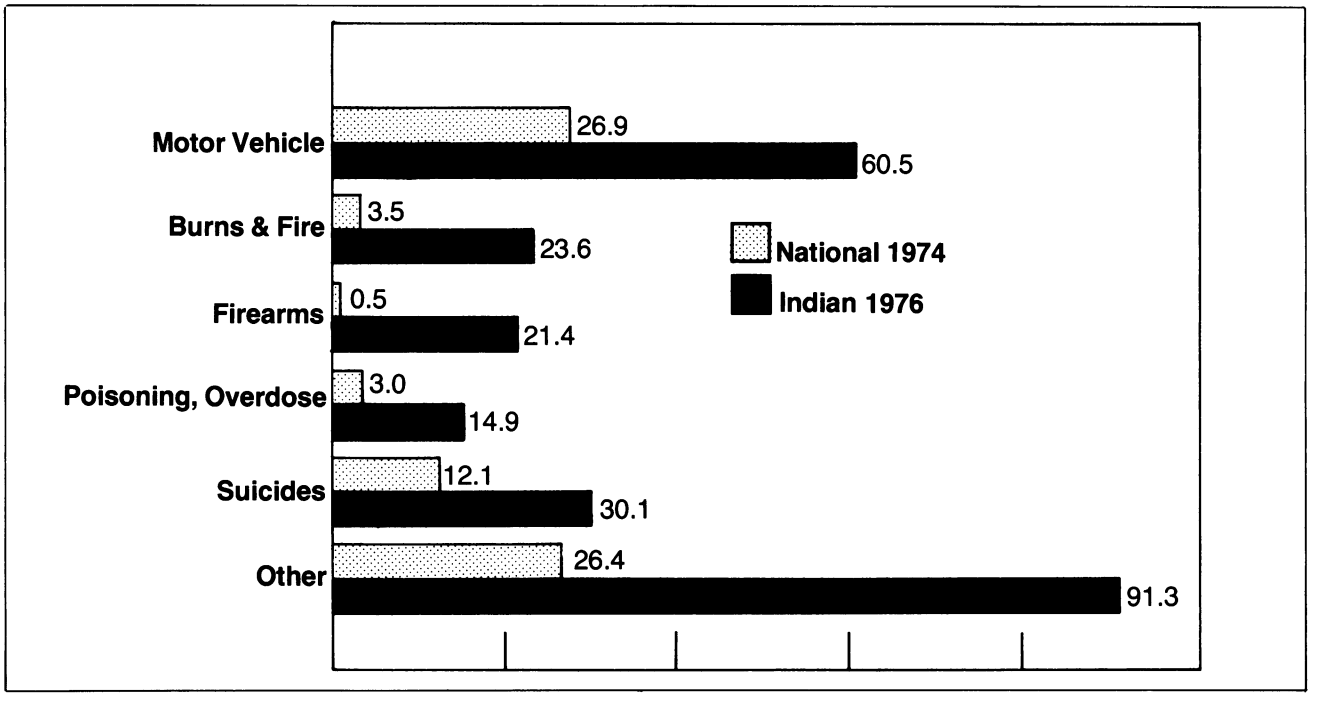
Child Welfare: The proportion of Indian children in care has risen steadily to more than five times the national rate.

Education: Only 20% of Indian children stay in school to the end of the secondary level; the comparable national rate is 75%.

Housing: Nearly 19% of on-reserve homes have two or more families living in them; these conditions affect 40% of all status Indian families.

Facilities: In 1977, fewer than 40% of Indian homes had running water, sewage disposal or indoor plumbing facilities; the national

Figure 3
Violent Deaths per 100 000 Population



Sources: *Medical Services Branch: Annual Report* Health and Welfare Canada, 1978
Vital Statistics, Statistics Canada, 1974.

Note: The overall rate of violent deaths for Indians is more than 3 times the national average. These deaths may be compared in non-Indian rural and remote populations where there is:

- greater use of firearms for hunting;
- substandard housing and heating systems;
- inadequate fire-fighting equipment;
- poor access to medical assistance.

Violent deaths among Indians are higher than in the national population at all age levels. Violent deaths among Indians, with the exception of those over 65, range from a low of 3 times the national rate in the 5-14 age group to a high of between 4 and 5 times the national rate in the 15-44 age group.

For Indians 1-14 years, burns, drowning and motor vehicles accounted for 69% af accidental deaths.

For Indians 15 years and older, the leading causes were motor vehicle accidents (29%), drowning (10%), and firearms (9%).

level of properly serviced houses is over 90%.

Income: The average income of Indian people is one-half to two-thirds of the national average.

Unemployment: The unemployment rate among Indian people is about 35% of the working age population; in some areas it is as high as 90%.

Prisoners: Native people are overrepresented in proportion to their population in federal and provincial penitentiaries. In Manitoba, Saskatchewan, and the north, native people represent more than 40% of the prison population. The proportion of juveniles that are considered delinquent is three times the national rate.[9]

It is within this context that health services must be provided and the health of individuals promoted and maintained.

The population pyramid for Indians/Inuit in Canada has a broad base and a typical pyramidal shape, in contrast with the pear shape of that for Canadians as a whole (Figure 1). The Native configuration creates a proportionately larger population that is dependent on corresponding health services. Life expectancy of Native persons at less than one year of age remains approximately 10 years less than that of Canadians as a whole. The gap narrows with survival through adolescence, and the Native figures approximate the Canadian figures at age 60. Approximately 50% of the Native population is under 20 years of age as compared to 20% of the Canadian population.[10]

Birth rates for Native Canadians remain approximately 50% above national averages, but have declined approximately 30% over the last 20 years. In some jurisdictions the annual rate of population growth exceeds 3%, as compared to 1% or less for Canadians as a whole.

The total population of treaty Indian and Inuit people numbers approximately 400 000 and represents a higher proportion of the population in the western provinces (2%–4%) and the Territories (65%).

There has been a population shift from reserves to urban centres, and almost 30% of treaty Indians now live off reserve.

Mortality

Mortality is commonly used as a crude measure of population health. Mortality rates are higher for Indians of all age groups under 65 years than for those of the non-Indian population (Table 1). The causes of death vary remarkably between the Native and the non-Native Canadian population in that injury and poisonings account for approximately 33% of all deaths as in the former group compared to 5% in the latter (Figure 2). All-cause standardized mortality ratios (SMRs) for Indians are approximately 1:75. Significantly elevated SMRs for both sexes derive from infective causes, diabetes mellitus, alcoholism, chronic obstructive lung disease, motor vehicle accidents, falls, fires, drownings, suicide, homicide, and poisonings. Rates of lung and colon cancer rates are lower as is the risk of breast cancer in Indian women. Circulatory-disease mortality rates of Indians are similar to Canadian figures for men, but are above the averages for Canadian women under 70 years of age. As noted, violent deaths involving Native people are 50%–100% higher[11,12] than those of non-Native Canadians (Figure 3).

Infant-mortality rates among Indians remain roughly double the national average. Significantly increased postnatal mortality rates include deaths from infective and parasitic diseases (SMR 11.8), pneumonia (SMR 12.1), SIDS (SMR 3.6) and fires (SMR 8.2).[13] Neonatal death rates are also elevated above national averages, but the differential is less dramatic. Regrettably, the causes of many of the postneonatal deaths are preventable.

Suicides are a particularly distressing cause of mortality in the 15–24-year age group, where a sixfold differential exists in some areas. The SMR suicide for all ages exceeds 3.0. Not all Natives, of course, suffer increased suicide risk or mental health problems. Rather, some communities are known to suffer inordinately high rates, while others enjoy low rates.[14] This observation is important in allowing the rapid deployment of services to high-risk communities once a suicide has occurred, to prevent the frequent phenomenon of cyclical multiple suicides.

Table 2
Standardized Morbidity Ratios of Manitoba Status Indians

Disease	Discrete Patients SMR[a]
Infectious diseases	4.27
Neoplasms	0.73
Endocrine	3.91
Blood	3.13
Mental disorders	2.50
Neurology	2.65
Cardiovascular	1.83
Respiratory	3.03
Digestive	2.18
Genitourinary	2.18
Ectopic & molar pregnancies	2.01
Normal delivery	2.28
Complications of pregnancy	3.91
Skin	6.12
Musculoskeletal disorders	1.11
Congenital anomalies	1.20
Perinatal conditions	1.89
Symptoms, signs	2.55
Accidents, violence	3.33
Factors influencing health	1.92

Source: Manitoba Health Services Commission data, 1981/82.
a. SMR: Standardized morbidity ratio = rate of hospitalization in Manitoba Status Indians/rate of hospitalization in general Manitoba population

Morbidity

Morbidity may also be used as a measure of population health, although it is a condition somewhat difficult to measure. Discrete hospital separations are the most commonly used morbidity indices. Using Manitoba data for 1981–82, we were able to measure standardized morbidity ratios for all of the major ICDA 9 categories (Table 2).[15]

Infectious diseases continue to contribute a fourfold differential as a cause for hospital admission, compared to the rate for Manitoba as a whole. At a time when Canadians have entered the era of the second epidemiologic revolution of chronic and lifestyle illness, Native people continue to bear an enormous burden of infectious illness.

An exhaustive discussion of infectious illness is not possible here, but there are several key conditions that we shall note briefly.

In terms of its incidence, tuberculosis remains a disproportionate cause of morbidity among Canadian Natives. There has been a dramatic

decline over 20 years from a high rate in Inuit populations of 2000/100 000 in the early 1960s to approximately 100 cases of new and reactivated tuberculosis per 100 000 in the Inuit of the Northwest Territories. Manitoba Indians had a rate of 76/100 000 in 1984. The national comparison is 10 or fewer/100 000.[16,17] To combat this disease Bacillus Calmette-Guerin (BCG) vaccine has been used routinely in this population since 1965, and continues to be recommended. The protective effect of BCG in Manitoba Indians has been estimated at 60%.[18,19]

Meningitis is an infectious illness causing considerable concern in the pediatric Indian and Inuit population. By seven years of age, fully 7% of Inuit babes born 1973/74 had suffered an episode of meningitis. This rate is approximately 200 times that expected in southern areas of our country. Rates in Indian children have been found as intermediate between those of our Inuit and Caucasian populations. Hemophilus influenzae is responsible for 50%–60% of these cases. The peak incidence has been documented at 12 months of age or younger. The introduction of conjugate H-flu vaccines, to two-, four-, and six-month age groups may have a profound and positive impact on this illness.[20]

Indian infants in the first year of life have demonstrated 17 times greater rates of pneumonia requiring hospitalization than have non-Indian children.[21]

Gastroenteritis causing hospitalization has been recorded at a relative risk of greater than 20 in the first year of life compared to general age-specific populations. There continue to be outbreaks of gastroenteritis causing hospitalization and death in Native children. An occurrence was documented, for instance, as recently as 1983, in the James Bay rotavirus outbreak.[22]

Otitis media is seen twice as often in Indian children as in non-Indian children in office-based visits and is seven times more likely to lead to hospitalization. Inuit children suffer a propensity to otitis media even greater than that of Indian children. In prevalence studies, up to 80% of Inuit ears examined demonstrated either active or healed ear pathology.[23] Multiple explanations have been offered for this phenomenon, including bottle propping, low humidity, immunologic dysfunction, or particularly patulous eustachian tubes. The use of tympanoplasties in the treatment of perforated tympanic membranes is controversial and occurs differentially across the country.

Hepatitis A and hepatitis B are more prevalent in the Canadian North than in the southern regions. The overall prevalence of hepatitis A virus (anti-HAV) is 70% in some communities. By six years of age, approximately 50% of children are positive for hepatitis A antibody, and virtually 100% of inhabitants tested positive by 50 years of age, in some communities. The endemicity in the Native population of hepatitis A has led to the routine use of immune serum globulin (ISG), prior to confirmation, for contacts of cases presenting with jaundice or acholic stools.[24]

Prevalence of Hepatitis B varies among communities in the Canadian North: some have a prevalence of HB markers in excess of 20%. The use of HBV in populations of moderate-to-high prevalence of markers is now under way in the Northwest Territories.[25]

The incidence of sexully transmitted diseases is high in the Northwest Territories, particularly among Inuit and Dene groups. In 1983, the N.W.T. reported 3408 confirmed cases of gonorrhea per 100 000 population. This rate compared with a Canadian rate of 181. If unconfirmed but suspected cases were included, the N.W.T. rate climbed to 5303 per 100 000. The associated morbidity caused by chlamydia, herpes, and other STDs is not known. Significant concerns have been expressed in many Northern communities about the potential introduction of HIV into these populations.[16]

The risk of neoplastic disease is less, overall, for Indians and Inuit than for Canadians as a whole. There are, however, several patterns of incidence that differ from those of Caucasians. The risk of lung cancer in men and breast cancer in women is less in Indian populations. Greater risk exists, however, in both sexes for kidney cancer and for gallbladder and cervical cancer in women.[26,27] In the Inuit population tumours of the salivary glands, kidney, and nasopharynx were the most frequent between 1950 and 1966, but their incidence subsequently declined. Lung, cervical, and colorectal cancers have become more prevalent, while breast cancer remains extremely rare.[28]

Endocrine disease is a significant relative cause of morbidity involving hospitalization. The Pima Indians of the Southwestern United States have one of the highest known prevalences of diabetes mellitus. Canadian studies show that the risk of dying from diabetes is two to four times higher among Canadian Indians than other Canadians. Prevalence in the 15–64-year age group has also been recorded in several studies as twice as high in the Indian population as compared to non-Indians. The effects of genetic propensity, obesity, inactivity, and diet remain poorly defined. There is some evidence that the current epidemic is a new one. Cases have not been described prior to the First World War.[29]

Canada's Native people have a significantly higher risk of mental disorders than has the Caucasian population, as manifest by hospitalizations, suicides, and parasuicides. In a recent study of community perceptions of mental health problems, alcohol and solvent abuse were identified as particular areas of concern.

Transfer of Control

The description and cataloguing of increased risk, incidence, and prevalence of illness in Canada's Native populations are extensive. The illness burden is a significant part of the manifestation of sociopolitical disadvantage of this group in our society. Poverty, unemployment, poor sanitation, geographic isolation, cultural change, and stress all contribute to the ill health of this population and the burdens it imposes. Interventions applied to the problems listed must, therefore, take into account the broader context of health and its determinants.

In 1986, the Honourable Jake Epp released *Achieving Health for All: A Framework for Health Promotion*.[30] Although applied to the larger population, some of the tenets have particular importance for the Native community. The health challenges include reducing inequities, increasing prevention, and enhancing coping. If these are the challenges facing

all of Canadian society, they are particularly applicable to Native Canadians. Inequities in our system of health care are perhaps most profound in relation to Indians and Inuit.

Mechanisms for meeting these challenges include self-care, mutual aid, and healthy environments. There are particular risks to the Native community if these mechanisms become, to any degree, an "unloading" of responsibility and care for those individuals who suffer the greatest inequities. Strategies include fostering public participation, strengthening community health services, and coordinating healthy public policy.

Perhaps the ultimate manifestation of health promotion rests in the concept of empowerment of the individual and the community in relation to their health. It is in the context of empowerment that transfer of control and health promotion share common ground.

The transfer process was defined in 1986, to provide a framework for the assumption of control of health services by Native people. The intent is to allow communities to control their internal health-care system. By implementing this strategy, concepts of health promotion suggest, the stakeholders, through their "empowerment", will be able to improve the system and their own health.

The transfer process includes four phases: consultation; pre-transfer research and development; community decision and ratification; and transfer negotiations. To enter the transfer process, the community must first satisfy the requirements of a defined pre-transfer phase. This phase may include certain research requirements, assessment of community-health needs, assessment of community-health status, training of health committees, community-awareness workshops, and finally a community-health development plan. The pre-transfer process is limited to 24 months. Participation in the transfer process is entirely optional and rests with the community.

The transfer process is designed to occur within the present funding base of federal health programs for Native people. The overall transfer program is fraught with significant difficulties. Some Native leaders have expressed concern that the program is intended to "rid itself of fiduciary obligations to First Nations." The program is seen by some as contravening basic treaty rights to receive health care. In this context, it is significant that the federal government has never formally acknowledged health care as a treaty right. Many leaders express concern that the limit to the present funding base will not allow leaders to fill present gaps in health-care coverage. Certain programs are not eligible for transfer. These include the non-insured services (travel, appliances, pharmaceutics), and these services are seen as important features of any future health-care system.

Indian communities would be required, under transfer arrangements, to provide certain mandatory programs, including communicable disease control, environmental and occupational health and safety programs, and treatment services. Certain features of liability and insurance of facilities, essential to the maintenance of any health-care system, have yet to be worked out.

Finally, the recruitment of qualified professionals is essential to any health-care system. On transfer, this task would fall to the communities. The recruitment of professionals to provide service to remote communities is a difficult one.

Although initiatives have been taken, and the potential for enhanced involvement of Native people in their health-care system exists, considerable obstacles remain to be overcome before transfer is likely to have a positive impact on health. Until this occurs, the providers of health services to Native people must recognize the increased burden of illness within that population. They must be sensitive to the broader context of health and must recognize the sociopolitical framework within which Native people must function. By so doing, they will provide a needed and much appreciated service to Canada's Native people. ■

References

1. Schaefer O. When the Eskimo comes to town. *Nutrition Today* 1971 (Nov/Dec); 6–16.

2. Rasmussen K. *Across Arctic America: narrative of the fifth Thule expedition.* New York: Greenwood Press Publishers, 1927.

3. Friesen G. *The Canadian Prairies: A History.* Toronto: University of Toronto Press, 1984.

4. Omram AR. Epidemiologic transition: a theory of the epidemiology of population change. New York, N.Y. *Milbank Memorial Fund Quarterly,* 1971; 49:509.

5. MacGregor JG. *Father Lacombe.* Edmonton: Hurtig Publishers, 1975.

6. Graham-Cumming G. Health of the original Canadians, 1867–1967. *Med Services J Canada* 1967; 23(2):115–66.

7. Young TK. Indian health services in Canada: a sociopolitical perspective. *Soc Sci Med* 1984; 8(3):257–64.

8. Canada. *Indian self-government in Canada.* Report of the Special Committee, 1983 (October).

9. Penner K. Report of the Special Committee on Indian Self-Government. House of Commons, 1983:15.

10. Canada. Indian and Northern Affairs. *Indian conditions: a survey.* Ottawa: The Department, 1980.

11. Mao Y, Morrison H, Semenciw R, Wigle D. Mortality on Canadian Indian reserves, 1977–82. *Can J Public Health* 1986; (July/Aug.) 77:263–8.

12. Young TK. Mortality pattern of isolated Indians in northwestern Ontario: a ten year review. *Public Health Reports* 1983; (98)5:467–75.

13. Morrison HI, Semenciw RM, Mao Y, Wigle DT. Infant mortality on Canadian Indian reserves, 1976–83. *Can J Public Health* 1986; 77:269–73.

14. First Nations Confederacy Indian Mental Health Research Formulation. *Final Report.* Winnipeg: The Confederacy, 1985.

15. Manitoba. Health. Report of the Health Services Review Committee. Vol. 3. *Subcommittee Reports.* Winnipeg, 1985.

16. Northwest Territories. *Report on health conditions in the Northwest Territories.* Yellowknife: Northwest Territories, 1984.

17. Canada. Health & Welfare Canada. Medical Services Branch. *Manitoba region annual review* 1986. Ottawa: The Department, 1986.

18. Young TK. Case-control study to evaluate the effectiveness of mass neonatal BCG vaccination among Canadian Indians. *Am J Public Health* 1986; 76(7):783–6.

19. Young TK. BCG vaccination among Canadian Indians and Inuit: the epidemiological basis for policy decision. *Can J Public Health* 1985; 76:124–9.

20. Postl B, Carson J. Perinatal and infant mortality and morbidity study: followup. In: *Proceedings of 6th International Symposium on Circumpolar Health, Alaska.* Seattle, University of Washington Press, 1984; 125–33.

21. Evers S. Rand C. Morbidity in Canadian Indian and non-Indian children in the first year of life. *Can Med Assoc J* 1982; 126:249–52.

Continued on page 2580

Continued from page 2419

22. Robinson EJ, Moffatt M. Outbreak of rotavirus gastroenteritis in a James Bay Cree community. *Can J Public Health* 1985; 76:21–4.

23. Baxter J, Julien G, Tewfik T, et al. Observations on the prevalence of ear disease in the Inuit and Cree Indian school population of Kuujjuaraapik. *J Otolaryngol* 1986; 15(1):25–30.

24. Minuk GY, Waggoner JG, Jerrigan R. Prevalence of antibody to hepatitis A virus in a Canadian Inuit community. *Can Med Assoc J* 1982; 127:850–2.

25. Minuk GY, Ling N, Postl B, et al. Changing epidemiology of hepatitis B virus infection in the Canadian North. *Am J Epidemiol* 1985; 121(4):598–604.

26. Young TK, Choi NW. Cancer risks among residents of Manitoba Indian reserves, 1970–79. *Can Med Assoc J* 1985; 132:1269–72.

27. Young TK, Frank J. Cancer surveillance in a remote Indian population in northwestern Ontario. *Am J Public Health* 1983; 73(5):515–20.

28. Hildes J, Schaefer O. Changing pattern of neoplastic disease in the western and central Canadian Arctic. (1950–1980). *Can Med Assoc J* 1984; 130:25–31.

29. Young TK. *Diabetes in the Canadian Native population: biocultural perspectives*. Toronto: Canadian Diabetes Association, 1987.

30. Epp J. (Hon.) *Achieving Health for All: A Framework for Health Promotion*. Ottawa: Minister of Supply and Services Canada, 1986.

31. Assembly of First Nations. *Special Report*. The National Indian Health Transfer Conference, Montreal, November 2–4, 1987.

For Further Reading

1. Longclaws L, Barnes G, Grieve L. Alcohol and drug use among the Brokenhead Ojibwa. *J Stud Alcohol* 1980; 41(1):21–36.

2. Boeckx R, Postl B, Coodin F. Gasoline sniffing and tetraethyl lead poisoning in children. *Pediatrics* 1977; 60(2):140–5.

3. Birt A. Photodermatitis in Indians in Manitoba. *Can Med Assoc J* 1968; 98:392–7.

4. Gofton J, Chalmers A, Price G, Reeve C. HLA 27 and ankylosing spondylitis in B.C. Indians. *J Rheumatol* 1975; 2(3):314–8.

5. Walker J. Congenital hip disease in a Cree-Ojibwa population: a retrospective study. *Can Med Assoc J* 1977; 116:501–4.