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MORTALITY PATTERNS IN A CANADIAN INDIAN POPULATION

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Résumé — Dans cette étude, la mortalité de la population amérindienne de l'Alberta est comparée à la mortalité de la population totale albertaine. Les taux moyens annuels de cinq ans de mortalité pour la période 1974-1978 sont utilisés pour développer des tables de mortalité pour la population amérindienne à l'aide des probabilités de survie quinquennales Reed-Merrell. L'étude offre la preuve certaine qui suggère que la différence en espérance de vie entre la population autochtone de l'Alberta et la population totale albertaine est au-dessus de treize ans chez les hommes et au-dessus de dix-sept ans chez les femmes.

Une espérance de vie plus basse chez les amérindiens se rapporte aux taux très élevés de mortalité chez les adolescents et dans les groupes de jeunes adultes. Des accidents qui se rapportent à l'alcoolisme, à l'empoisonnement, et à la violence constituent une entrave majeure à l'amélioration des niveaux de la mortalité amérindienne.

Abstract — In this paper the mortality of the Alberta Indian population is compared to the mortality of the total Alberta population. Five-year annual average death rates for the period 1974-1978 are used to develop life tables for the Indian population using Reed-Merrell quinquennial survival probabilities. The article offers evidence which suggests that the difference in life expectancy between Alberta's native population and the total Alberta population is over thirteen years for males and over seventeen years for females.

Lower life expectancy of Indians is related to the very high death rates in the adolescent and young adult age groups. Alcohol-related accidents, poisoning, and violence constitute a major impediment to the improvement of Indian mortality levels.

Key Words — **life table, mortality, North American Indian**

Introduction

The purpose of this paper is to examine the patterns of mortality for the registered Indian population of Alberta, to compare the patterns to those experienced by the total population of Alberta, and to comment on the prospects for future mortality decline in the Indian population of Alberta. Demographic data relating to Alberta Indians are available through a number of sources. These include the annual census of the Indian population 1864-1917; quinquennial censuses of Indians 1924-1957; the Indian Register, maintained by the Department of Indian and Northern Affairs, 1960-1977; vital statistics compiled by the Health Statistics Division of Statistics Canada; and annual reports of Medical Services Branch, Health and Welfare Canada.

There is some variation in the definition of 'Indian' used by the Department of Indian Affairs and Northern Development and the Canada census. The term 'registered Indian' refers to an individual who is legally defined as an Indian under the terms of the Indian Act. The Department of Indian and Northern Affairs administers regulations relating to the Indian population. The term 'population of Indian origin', as defined by the census, includes registered Indians and persons of native origin who are not covered by the Indian Act. These persons generally include individuals who have lost Indian status under the Act and non-status Indians and Métis — those who are of mixed Indian and, usually, European ancestry. The difference in definitions results in census counts of Indians which are consistently higher than those collected and published by the Department of Indian and Northern

Affairs. The 1981 census of Canada will be asking more precise questions relating to the status of native people which may improve the quality of the statistics.

Data and Methodology

The present paper relies on data from two primary sources: the population of registered Indians by age group issued by the Department of Indian and Northern Affairs, and the annual reports of Medical Services Branch, Alberta Region. (Medical Services is a branch of Health and Welfare Canada that is responsible for providing public health and treatment services to registered Indians.)

There are some problems with the data in the Department of Indian Affairs registry. Although the majority of Indian births occur in a hospital context and are registered through provincial vital statistics, there are often long delays in registering the births in the Indian register maintained by the Department of Indian Affairs. Consequently, there is a problem of under-enumeration of children in the younger age groups in this data source (Piché and George, 1973). Since the 1976 Indian population was used as a base for the calculation of mortality rates, adjusted data which take into account delayed registration were used. These were provided by the Departmental Statistics Division of Indian Affairs. The methodology used to develop adjusted estimates of births and age groups (1-4) and (5-9) was similar to that used by Piché and George (Siggner and Brulotte, 1973).

Medical Services Branch, Health and Welfare Canada, collects vital statistics on the Indian population to assess the impact of various public health programmes. Although the province of Alberta does not provide information on ethnic status in its vital statistics, Medical Services Branch compiles information on the vital events in the Indian population by crossreferencing information derived from Medical Services nursing reports, hospital notifications, and newspaper accounts. In addition, the nominal list of deaths in Alberta is crosschecked against the Indian Band lists from the Department of Indian Affairs and the Medical Services medicare registration list for Alberta Indians. Alberta is one of the few provinces in Canada in which each registered Indian is issued medical insurance. As may be imagined, the preceding process is time-consuming and tedious. However, there is reason to believe that the compilation of vital events for the registered Indian population is more accurate in Alberta than elsewhere in Canada.

Another source of error which affects the reliability of statisitics relating to the Indian population of Alberta is the problem of random variation. Since the population is relatively small, the number of vital events that occur annually is subject to chance fluctuations that could be large. By increasing the number of years of observation, it is possible to reduce the size of the probable error. It is for this reason that in this report, age-specific death rates for the Indian population were based on a five-year average (1974-1978) of deaths occurring within each age group applied against the adjusted 1976 mid-year population of Alberta Indians. In the case of the provincial population, annual average death rates for the three-year period 1974-1976 were calculated. The estimated 1975 mid-year of the province was used as the base.

The five-year average annual death rates of the Indian population were used to calculated abridged life tables for Indian males and females. One would not normally attempt to develop life tables on a population the size of the Indian population of Alberta, but it was done in order to see whether the quinquennial mortality probabilities developed by Reed and Merrell would yield plausible values of life expectancy. The Reed-Merrell method of abridged life table construction is commonly used in public health when one has access to approximations or estimates that do not permit construction of a complete life table based on single years of age. Reed and Merrell studied a number of populations and developed a functional relationship between death rates and mortality probabilities which took the form of a second order polynomial (Shyrock and Siegel, 1975). Death rates for the Indian population were converted into Reed-Merrell mortality probabilities through linear interpolation.

For the calculation of L_0 the relative weight of l_x and l_{x+1} was approximated through the separation factor $L_0 = .3l_0 + .7l_1$. For ${}_4L_1$ and subsequent ${}_nL_x$ values, it was assumed that deaths were evenly distributed throughout the interval and that ${}_nL_x = \frac{n}{2}(l_x + l_{x+n})$. The ${}_\infty L_x$ value for the over 80 age group was approximated by assuming that ${}_\infty L_{80}$ was $\frac{l_{80}}{{}_\infty m_{80}}$ where ${}_\infty m_{80}$ represents the death rate for the population over age 80 in the Indian population. A brief description of the notation employed in the life table may be useful to the reader.

${}_nq_x$ - refers to the probability of dying between exact age x and exact age $x+n$.

l_x - number of survivors at exact age x.

${}_nL_x$ - refers to the number of years lived by those who attain age x between exact age x and exact age $x+n$.

T_x - total number of years lived by the cohort after exact age x.

e_x^o - expectation of life, average number of years lived after exact age x.

Although problems in the quality of the basic data and the size of the Indian population exist, the problems do not totally rule out analysis of mortality patterns within the Indian population, or comparisons between the Indian population and the population of Alberta. The presence of such limitations is an argument for a conservative approach to the analysis of trends and an explanation of mortality differences.

Historical Data

Little is known about the demography of Alberta Indians prior to the settlement of western Canada. There are, however, some indirect sources of information that permit the estimation of the life expectancy of hunter-gatherer populations within a narrow range. The work of Ascadi and Nemeskéri (1970) and studies of contemporary nomadic groups elsewhere in the world would suggest life expectancy in the range of 30-40 years (Haraldson, 1975).

There is a temptation to believe that before the arrival of the Europeans and the exposure of Indians to acute infectious diseases, life expectancy was higher than the suggested range. However, it is likely that harsh environmental conditions, variations in food supply, birth traumas, exposure, accidents, warfare, and diseases with a non-human reservoir represented a sufficiently-lethal combination of risks to limit life expectancy values to the proposed limits (Dumond, 1975).

The impact of infectious diseases on previously unexposed populations is well documented. In the case of Alberta Indians, some information on the effect of the diseases of civilization is found in Indian records such as the Blackfoot 'winter count'. The winter count was a pictorial method of recording an event of significant importance to the tribe. The winter counts varied from year to year, but were likely to record epidemics, wars, treaties, and other important events. The following references are from a Blackfoot winter count described by Dempsey (1965). The winter count representations were correlated with historical records from Hudson Bay outposts.

1819 Saskima/Pastsimesin ... coughing/epidemic
In the winter of 1819-20 traders at Edmonton House reported that a measles epidemic had wiped out about one third of the Blackfoot and Gros Ventre tribes (Edmonton House entries for February 6, March 15, 1820).

1836 Pokax/otsitapotsiskarpi ... children when they had strangulation of the throat. Many children were said to have died of this ailment which informants believe was diptheria.

1837 Apixosin ... smallpox
This disease was brought to the Upper Missouri on the steamboat St. Peters of the American Fur Company. About two thirds of the Blackfoot nation, or six thousand died during the epidemic.

1864 Sikapixosin ... black smallpox
An epidemic of scarlet fever ravaged the Blackfoot tribes during the winter of 1864-65. By spring Father Lacombe reported to traders at Edmonton House that 1,100 Blackfoot had died (Edmonton House entries for March 24, 1865).

1869 Apixosin ... smallpox
The disease struck the Blackfoot in the autumn of 1869 again originating with a Missouri riverboat. By the spring of 1870 the death toll was estimated to be 1,080 Peigans, 630 Bloods and 676 North Blackfoot.

The preceding notes give some indication of the devastating effect of acute infectious diseases on Indian populations. It is possible that because of the nomadic nature and relatively small size of Indian populations, the Indian people were at a disadvantage in the development of immunological defences against infectious diseases. In the case of measles, it has been demonstrated that the disease shows a wave pattern peaking in periods of two years. If there are not enough susceptible individuals in a population, the infection dies and disappears until enough susceptible individuals accumulate and the disease is again introduced from outside. In order to maintain an ongoing infection pattern, measles require at least 7,000 susceptible individuals perpetually in its ranks. The critical population threshold below which the virus cannot survive falls between 300,000 and 400,000 persons. This pattern has been demonstrated by the study of disease patterns in island populations (Bartlett, 1957; Black, 1966).

The history of the Indian people in Alberta during the nineteenth and mid-twentieth centuries is characterized by epidemics of various types. The data series prior to 1960 do not enable one to make an accurate assessment of mortality levels, although native people undoubtedly benefited from the introduction of vaccination programmes and the development of antibiotics during the first half of the twentieth century. The present study is confined to the period between 1960 and 1976.

Infant Mortality

One of the single most important indexes of the quality of health care and level of socio-economic development is the infant mortality rate. In high mortality populations, infant mortality is the largest single age category of mortality. A larger number of persons die during the first year of life than at any other age. Even in populations with low levels of mortality, the infant death rate exercises strong influence in setting life table values of expectation of life. Infant mortality may change more rapidly than the general death rate because the level of mortality in the first year of life is affected more directly and quickly by health programmes and environmental changes.

Table 1 depicts infant and perinatal mortality rate for the Alberta Indian population and the province of Alberta between 1963 and 1976. The data for the Indian population indicates the level in 1963 was 56.9 infant deaths per 1,000 live births. By 1976, the rate had declined to 25.5 per 1,000. The provincial rates, by comparison, were 19.9 in 1963 and 11.4 per 1,000 in 1976.

The perinatal mortality rates do not indicate the same pattern of decrease. Although the perinatal mortality rates of the province declined, the rates for the Indian population remained stable. The perinatal rate is based on infant deaths that occur in the first week of life combined with stillbirths over twenty-eight weeks gestation. Although the perinatal death rate is valuable where the quality of registration is good, in areas where under-registration is a problem, the use of perinatal mortality rates may produce serious distortions.

TABLE 1. INFANT AND PERINATAL MORTALITY RATES, ALBERTA INDIAN AND PROVINCE OF ALBERTA, 1963-1976

	Infant Mortality		Perinatal Mortality[1]	
Year	Indian	Alberta	Indian	Alberta
1963	56.9	19.9	27.0	29.5
1964	40.1	19.7	28.3	25.6
1965	59.5	21.0	31.6	24.2
1966	43.8	17.6	28.2	22.0
1967	47.0	19.1	23.5	21.4
1968	48.1	18.3	24.5	21.0
1969	47.4	15.3	26.1	21.2
1970	42.2	16.6	15.5	21.3
1971	32.9	15.2	21.3	19.1
1972	40.2	14.9	23.1	18.6
1973	33.3	12.2	19.1	14.7
1974	37.2	12.7	26.2	14.0
1975	27.7	13.4	22.6	13.3
1976	25.5	11.4	24.3	13.8

Source: Health and Welfare Canada, Annual Reports, Medical Services Branch, Alberta Region, 1963-1976

Statistics Canada, Vital Statistics, Volume 3, Deaths 1976, Catalogue 84-206, Ottawa

[1] Perinatal mortality rate refers to foetal deaths of 28 or more weeks gestation plus infant deaths under 7 days (1 week) of age per 1,000 total births.

During the period 1963-1976, it is possible that the quality of registration of late foetal death and early infant death for the Indian population improved. This improvement may have been especially important in terms of late foetal deaths. Between 1963 and 1976, there was an expansion of public health services to serve the Indian population. Nursing stations and health centres were built on or near reserves. As a result of an expanded maternal and child health programme, public health staff may have been able to monitor the progress of known pregnancies with a consequent improvement in the registration of vital events.

If this argument has some validity, it would imply that perinatal deaths for Indians were higher in the past than indicated by Medical Services statistics. The fact that the stillbirth rates increased during the period while the neonatal rates declined, provides additional support for this interpretation.

Postneonatal deaths (Table 2) also declined, more for the Indian population than the province of Alberta because the rate for the Indian population was initially much higher than the provincial rate. Between 1969 and 1976, the rate for the Indian population had a relative decline of 46 per cent compared to a decline of nine per cent for the province. The proportion of all infant deaths that occurred in the postneonatal period (28 days to one year) was substantially greater in the Indian population. About 60 per cent of Indian infant deaths occurred in the postneonatal period compared to 37 per cent of all provincial infant deaths. Deaths in the postneonatal period are more likely to reflect environmental risks rather than risks associated with birth.

TABLE 2. COMPARISON OF SELECTED INDICATORS OF INFANT MORTALITY INDIAN POPULATION AND PROVINCE OF ALBERTA, 1963-1976

	Still Birth Rate[1]		Neonatal Death Rate[2]		Postneonatal Death Rate[3]	
Year	Indian	Alberta	Indian	Alberta	Indian	Alberta
1969	7.2	8.8	25.4	13.6	22.9	5.4
1970	*	9.4	*	13.5	29.9	5.6
1971	*	8.3	*	12.7	12.9	5.2
1972	*	7.8	*	12.4	27.5	5.0
1973	9.9	7.0	12.5	9.1	20.8	5.1
1974	14.4	5.7	12.7	9.3	24.8	5.7
1975	13.4	5.5	10.1	9.2	17.6	5.7
1976	14.8	6.1	13.2	9.3	12.3	4.9

[1] Stillbirth - foetal deaths of 28 or more weeks gestation per 1,000 live births

[2] Neonatal - Deaths under 28 days (4 weeks) of age per 1,000 live births

[3] Postneonatal - Deaths between 28 days and one year per 1,000 live births

Source: Health and Welfare Canada, Annual Reports, Medical Services Branch, Alberta Region, 1969-1977

Statistics Canada, Vital Statistics, Volume 3, Deaths 1976, Catalogue 84-206, Ottawa, 1978.

The environmental risks experienced by Indian infants include inadequate housing, cultural differences in the utilization of preventive health services such as immunization for pertussis, tetanus, diptheria, polio and tuberculosis, and poor sanitary conditions on reserves. The extent to which many Indian communities lack "basic services" was illustrated in a study conducted by Siggner and Locatelli (1980). In 1977 (Table 3) in Alberta, only 48 per cent of Indian reserves had housing with sewage disposal or indoor plumbing, and only 54 per cent of Indian houses had piped water. The proportion of housing with these services was related to proximity to urban areas. Various studies have documented the relationship between environmental conditions and infectious diseases (Puffer and Serrano, 1973; W.H.O., 1974; Houston, Weiler and Habbick, 1979). It is not surprising, therefore, that infant deaths resulting from infectious and parasitic diseases were twice as high in the Indian population. In Table 4, the data indicate that 12 per cent of Indian infants died from infectious and parasitic diseases, compared to 4.7 per cent of all infants in the province. Respiratory diseases accounted for twice as many infant deaths in the Indian population as in the provincial population.

TABLE 3. HOUSING CONDITIONS ON INDIAN RESERVES BY GEOGRAPHIC CLASSIFICATION, FOR ALBERTA, 1977

Band Location by Type of Area	Inadequate Housing per 100 Family[1] Units	Percentage of Housing				Over Crowded[6] Housing Per 100 Family Units
		Electricity	Sewage Disposal	Indoor Plumbing	Water	
All Areas	37	94	48	48	54	39
Urban Areas[2]	39	96	67	67	68	41
Rural Areas[3]	32	92	20	20	35	38
Remote Areas[4]	36	87	7	7	7	26
All Provincial[5] Housing	--[7]	99	97	98	98	--

1. Estimated by dividing the number of houses that need major repairs (both vacant and occupied) or replacement (only those that are occupied) by the total number of houses (except for vacant houses needing replacement).
2. Areas contiguous with an urban centre of 10,000 population and over and semi urban areas within 40 miles of an urban centre and havng available all weather roads.
3. Other areas having reasonable road access
4. Other areas lacking reasonable road access
5. From Annual Statistics Canada Housing Facilities and Equipment, 1977, Cat. No. 64-202
6. Estimated by dividing the number of houses that are overcrowded or require additions by the total number of family units
7. Not available

Source: Andrew Siggner and Chantal Locatelli, An Overview of Demographic, Social and Economic Conditions Among Alberta's Registered Indian Population, Indian and Inuit Affairs, Research Branch, January 1980.

One of the major trends in the Indian population in recent years has been a movement away from traditional breastfeeding practice. The shift away from breastfeeding is important because breast-feeding confers some degree of protection against lower respiratory and gastrointestinal tract infections (Jelliffe and Jelliffe, 1978; Murdock, 1978; Ellestad, Coodin, Dilling and Haworth, 1979).

Although a properly-prepared balanced formula might provide the basic nutrients for development, the problem of formula use by Indian mothers is related to the absence of many of the prerequisites for proper formula use: safe storage of the formula, the ability to read and comprehend the instructions, safe uncontaminated water, and properly sterilized bottles.

Congenital anomalies and causes of perinatal mortality contributed to a larger proportion of infant deaths in the provincial population primarily because the latter causes of death assume greater importance when environmental risks are reduced. Indian infants were also more likely to die as a result of accidents, poisoning, and violence than infants in the total population. Approximately 7.4 per cent of Indian infants died from this latter set of causes, compared to 3.5 per cent of all infants in Alberta. Death as a result of accidents, poisoning, or violence is a common theme throughout all stages of the Indian life cycle.

Adult Mortality

The Indian population of Alberta differs from the total population in terms of an overall mortality level that is twice the provincial level. The age patterns and causes of death are also quite distinct. Examination of age-specific death rates for the Indian population revealed that Indian mortality was higher than that for the total population in all age groups except the group aged 80 and over. The excess mortality of Indians was greatest in the early to mid-adult years. For the 30-34 age group, the Indian death rate was more than eight times the average for the total Alberta population.

Normally, when one describes the mortality experience of populations, it is advisable to calculate age-standardised cause-specific death rates as a basis of comparison. However, in this report the analysis is limited to a description of proportionate cause mortality due to the small size of the Indian population. Table 5 indicates that accidents, poisoning, and violence are the major causes of death in the Indian population. Over one third of Indian deaths result from violence. In the general population of Alberta, accidents, poisoning, and violence account for 12 per cent of all deaths. A large proportion of deaths from violence in the Indian population are alcohol-related. A prospective study on a sample of thirty-five Alberta reserves and Métis colonies between 1976 and 1977 revealed that for accidental and violent causes of death, the majority of native victims were under the influence of alcohol as signified by legal impairment levels (Jarvis and Boldt 1980).

Diseases of the circulatory system are responsible for about 45 per cent of Alberta deaths, compared to six per cent of Indian deaths. Neoplasms are a cause of death in 19 per cent of provincial deaths and six per cent of Indian deaths. The lower proportion of deaths from both causes in the Indian population is probably due to differences in age distribution between the two populations, the importance of accidents, poisoning, and violence as a competing cause of death in the Indian population, and the possible under-reporting of deaths from neoplasms in the Indian population. To assess the importance of accidents, poisoning, and violence, this cause of death was excluded from the percentage distribution of causes for both populations. This procedure resulted in an increase in the proportion of deaths caused by neoplasms and circulatory diseases in both populations. However, the ratios of the proportion of death in the provincial population compared to the proportion in the Indian population were reduced in size.

Table 6 details causes of accidental or violent death. Motor vehicle accidents, suicides, drownings, falls, and homicides account for the largest proportion of violent deaths in the Indian population. In the general population, motor vehicle accidents, falls, and suicide were the major causes of violent death.

Tables 7 and 8 present life tables for the male and female Indian population of Alberta. If the life table functions can be viewed as an approximation of Alberta Indian life expectancy, it would appear that there is still a considerable gap between the survival probabilities of Alberta Indians and of the

population of Alberta. In 1969, life tables were constructed for the Indian population of Canada for the period 1965-68. At that time, the life expectancy of Indian males was 60.49 years, and females, 65.6 years. The values derived in this report suggest a life expectancy of 57.8 years for males and 60.3 years for females. Comparisons of the life tables for the Indian population with life tables for the total Alberta population indicated differences in life expectancy of 13 years for males, and over 17 years for females (Statistics Canada, 1979). If the estimates of Indian life expectancy obtained in the earlier period for the national Indian population were a reflection of the mortality levels of the Indian population of Alberta during the same period, the values derived in this report would suggest that there has been little improvement or even a deterioration in the overall life expectancy of Alberta Indians in the past decade.

TABLE 4. SELECTED CAUSES OF INFANT MORTALITY AS A PERCENTAGE OF INFANT DEATHS, ALBERTA INDIANS AND ALBERTA, 1974-1976

Cause	Indian	Alberta
Infectious and Parasitic Diseases	12.0	4.7
Neoplasms	--	0.3
Endocrine, Nutritional and Metabolic	2.8	1.1
Disease of Nervous System	0.9	1.6
Respiratory	13.9	7.0
Digestive	3.7	1.6
Congenital Anomalies	12.0	20.5
Certain Causes Perinatal Mortality	27.8	45.5
Accidents, Poisoning, Violence	7.4	3.5
Symptoms, Senility, Ill Defined Conditions	10.2	13.9
Unknown	3.7	--
Other Causes	5.6	--
Total	100.0	100.0
N	108	1,391

Source: Health and Welfare Canada, Medical Services Branch, Alberta Region Vital Statistics 1974, 1975, 1976.

Statistics Canada, Vital Statistics, Vol. 3 Deaths. Catalogue 84-206 1974, 1975, 1976

Recently, life tables were developed for the Navajo population in the United States (Carr and Lee, 1978). Their study indicated that Navajo males had a life expectancy in 1972-74 of 58.8 years. This estimate is quite close to the estimated life expectancy of Alberta Indian males. Both groups live under similar environmental and social conditions. Their estimate for Navajo females of 71.8 years appears to be high. The authors suggested that the large differential was consistent with male/female differences in mortality rates.

TABLE 5. PROPORTIONATE CAUSE MORTALITY FOR SELECTED CAUSES ALBERTA INDIANS COMPARED TO TOTAL ALBERTA, 1974-1976

Cause of Death	Males		Females		Total	
	Indian	Alberta	Indian	Alberta	Indian	Alberta
Accidents, Poisoning, Violence	43.5	15.1	26.3	9.1	36.4	12.8
Diseases of Circulatory System	18.3	43.8	15.3	46.5	17.1	44.8
Neoplasms	4.9	18.4	8.0	21.2	6.2	19.5
Disease of Respiratory System	7.8	8.2	7.4	6.4	7.6	7.5
Disease of Digestive System	3.5	3.8	8.3	3.7	5.5	3.7
Certain Causes, Perinatal Mortality	3.3	1.7	4.7	2.0	3.9	1.8
Infectious and Parasitic Diseases	3.7	0.7	3.5	0.9	3.8	0.8
Ill Defined Conditions and Symptoms	3.9	1.4	6.2	1.4	4.9	1.4
Endocrine, Metabolic, Nutritional	1.2	1.8	3.8	3.2	2.5	2.3
Congenital Anomalies	1.4	1.0	2.7	1.4	1.9	1.2
Other Causes	8.5	4.1	13.8	4.2	10.2	4.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
N	487	20,945	339	13,288	826	34,233

Source: Statistics Canada, Vital Statistics, Vol. 3 Deaths, 1974, 1975, 1976 Catalogue 84-206

Health and Welfare Canada, Medical Services Branch, Alberta Region, Vital Statistics. 1974, 1975, 1976.

Causes of death are classified according to the 8th (1965) revision of the International Statistical Classification of Diseases, Injuries and Causes of Death.

TABLE 6. PROPORTIONATE CAUSE MORTALITY, ACCIDENTS, POISONINGS AND VIOLENCE: ALBERTA INDIANS AND PROVINCE OF ALBERTA, 1974-1976

Cause	Indian			Province		
	Male	Female	Total	Male	Female	Total
Motor Vehicle	38.2	34.8	37.2	37.0	34.3	36.3
Other Transport	2.8	2.3	2.7	4.5	0.3	3.3
Poisoning	4.3	7.9	5.3	4.5	4.9	4.6
Falls	7.5	5.6	7.0	8.0	15.7	10.1
Fire	4.2	5.6	4.6	3.1	3.9	3.3
Drowning	13.2	--	9.3	3.7	2.1	3.3
Firearms	--	--	--	1.5	0.3	1.2
Industrial	--	--	--	6.8	1.8	5.4
All Other	6.2	15.7	8.9	4.3	6.9	5.0
Suicide	13.2	9.0	12.0	19.7	19.0	19.5
Homicide	6.6	12.4	8.3	3.1	5.2	3.7
Injury Undetermined whether Accidental or Intentional	3.8	6.7	4.7	3.8	5.6	4.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
N	(212)	(89)	(301)	(3,168)	(1,208)	(4,376)

Sources: Statistics Canada, Vital Statistics, Vol. 3 Deaths, Catalogue 84-206 1974, 1975, 1976.

Health and Welfare Canada, Medical Services Branch, Alberta Region Vital Statistics, 1974, 1975, 1976.

TABLE 7. LIFE TABLE FOR ALBERTA INDIAN MALES, 1974-1978
(REED-MERRELL METHOD)

	$_nq_x$	l_x	$_nL_x$	T_x	e^0_x
AGE					
0	.02494	100,000	98,254	5,787,586	57.8
1 - 4	.00870	97,506	388,328	5,689,332	58.3
5 - 9	.00399	96,658	482,448	5,301,004	54.8
10 - 14	.00549	96,321	480,283	4,818,556	50.0
15 - 19	.03744	95,792	469,995	4,338,273	45.3
20 - 24	.05595	92,206	448,133	3,868,278	42.0
25 - 29	.04504	87,047	425,433	3,420,145	39.3
30 - 34	.06158	83,126	402,833	2,994,712	36.0
35 - 39	.04537	78,007	381,188	2,591,879	33.2
40 - 44	.05690	74,468	361,748	2,210,691	29.7
45 - 49	.09553	70,231	334,383	1,848,943	26.3
50 - 54	.07958	63,522	304,973	1,514,560	23.8
55 - 59	.08692	58,467	279,630	1,209,587	20.7
60 - 64	.11359	53,385	251,765	929,957	17.4
65 - 69	.19162	47,321	213,935	678,192	14.3
70 - 74	.19862	38,253	172,270	464,257	12.1
75 - 79	.34531	30,655	126,810	291,987	9.5
80 +	1.00000	20,069	165,177	165,177	8.2

TABLE 8. LIFE TABLE FOR ALBERTA INDIAN FEMALES, 1974-1978 (REED-MERRELL METHOD)

	$_nq_x$	l_x	L_x	T_x	e^0_x
AGE					
0	.02566	100,000	98,204	6,026,121	60.3
1 - 4	.00870	97,434	388,040	5,927,917	60.8
5 - 9	.00369	96,586	482,040	5,539,877	57.4
10 - 14	.00190	96,230	480,693	5,057,837	52.6
15 - 19	.04317	96,047	469,870	4,577,144	47.7
20 - 24	.04153	91,901	449,963	4,107,274	44.7
25 - 29	.02011	88,084	435,993	3,657,311	41.5
30 - 34	.03153	86,313	424,763	3,221,318	37.3
35 - 39	.11528	83,592	393,870	2,796,555	33.5
40 - 44	.06116	73,956	358,473	2,402,685	32.5
45 - 49	.05429	69,433	337,740	2,044,212	29.4
50 - 54	.06318	65,663	317,943	1,706,472	26.0
55 - 59	.07540	61,514	295,975	1,388,529	22.6
60 - 64	.10301	56,876	269,733	1,092,554	19.2
65 - 69	.13101	51,017	238,375	822,821	16.1
70 - 74	.16923	44,333	202,908	584,446	13.2
75 - 79	.33241	36,830	153,543	381,538	10.4
80 +	1.00000	24,587	227,995	227,995	9.3

Summary and Conclusion

A number of demographers have suggested that mortality has become increasingly dissociated from the level of economic development in a population because of the diffusion of medical

technology, personnel, and facilities (Coale and Hoover, 1958; Arriaga, 1970). In the case of Alberta Indians, the last decade was associated with an expansion of health facilities, preventive programmes, and services, yet overall improvements in mortality have been slow. It would appear that the inter-relationship between health services and socioeconomic and mortality levels is also influenced by the social anomie created by rapid change.

There are a number of areas in which reductions in mortality would lead to increased life changes for Alberta Indians. A continuation in the decline of infant mortality is one of the more obvious. This would depend to a degree on improvements in environmental conditions on reserves. In general, improvements in community infrastructure have not kept pace with the development of health services. This is partly related to the division of responsibility between the two federal departments responsible for Indian people. Although Medical Services provides health services to native people, the Department of Indian Affairs and Northern Development is responsible for housing, water, sewage, and roads.

Cultural differences between Indians and health care professionals have been an inhibiting factor as far as the utilization of public health preventive services is concerned. A number of reports have recently stressed the importance of involving indigenous people in the delivery of health services (W.H.O., 1979; Berger, 1980). In the next decade, it is likely that there will be an expansion of the Indian 'Community Health Representative Programme', increased entry of Indians into the health professions at all levels, and a movement toward the administration of health services by Indian communities. This process may reduce the social distance between the consumers of Indian health services and the providers of services, and improve the utilization of preventive health services, i.e., maternal and child health, dental, environmental, and immunization programmes.

Reductions in the number of deaths due to accidents, poisoning, and violence would be a major factor in the improvement of Indian mortality levels. The phenomenon of violent death is closely linked to the problem of alcohol use in Indian communities. The problem of alcohol is, in turn, related to the social, political, and economic inequality of native people in Canada.

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