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HEALTH SERVICES IN MACKENZIE AND INUVIK ZONES
NORTHWEST TERRITORIES

Stanley Greenhill, M.D.

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TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	i
TERMS OF REFERENCE	ii
SUMMARY	iii
RECOMMENDATIONS	v
1 INTRODUCTION	1
2 CLIMATE AND TOPOGRAPHY	1
3 SETTLEMENTS	1
4 DEMOGRAPHY	2
5 MORBIDITY	6
6 FOOD CONSUMPTION PATTERNS	10
7 MORTALITY	11
8 HEALTH MANPOWER	16
9 HOSPITAL FACILITIES	19
10 CONCLUSIONS	22
APPENDIX A	26
SOURCES CONSULTED	33

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TERMS OF REFERENCE

To assess the specialist requirements of the Mackenzie and Inuvik Zones of the Northwest Territories Region by:

Reviewing the present level of services provided through the University of Alberta contract,

by other specialists from Alberta not included in the above contract,

by specialists from the City of Yellowknife,

determining the needs of the population living within the confines of the abovementioned areas,

making recommendations to the Regional Director, Medical Services Branch, N.W.T. Region, to reflect a level of service in keeping with the Objectives of the Minister of National Health and Welfare, which state ". . . Comparable to the rest of Canada",

SUMMARY

1. An efficient network of nursing stations and base hospitals exists in the Mackenzie and Inuvik Zones.
2. Air transport and telecommunications in the zones is making "isolation" less important with respect to availability and accessibility of health services.
3. Potable water and safe sewage disposal varies from settlement to settlement. The adequacy of water supply and sewage disposal appear more related to the proportion of non-natives than to the total population of any given community.
4. The age-sex structure of the population in the two zones resembles that of a developing country with 41% below the age of 15 years. Between 1961 and 1971 the natural rate of increase was 4.2% per annum - higher than for most emerging countries. This high rate doubtless reflects the in-migration of single adult males.
5. The population of the N.W.T. is 38,000 made up of 21% Indian, 33% Inuit, and 46% "other". The population is 0.03 persons/square mile. Slightly more than 50% of the N.W.T. population live in the four largest communities - Yellowknife 9,000, Inuvik 4,200, Hay River 3,600, and Fort Smith 3,000. The remaining 50% of the people are widely scattered in small settlements. Doctors in the N.W.T. are in the four largest communities. These facts have to be remembered when considering doctor/population ratio - a ratio notorious for distorting the reality of a situation.
6. Morbidity patterns reflect the state of social flux and living conditions. Alcoholism and related conditions is the main problem. The rates for notifiable diseases are markedly higher than for Canada as a whole. Eating habits are changing with a marked proclivity amongst the young for sugar foods and beverages. Breast feeding is on the decline. Use of convenience foods is on the increase. Poor personal and domestic hygiene is common. Accidents, violence, and injuries are endemic.
7. Mortality patterns for all ages reflect the social pathology of the zones. One third of all deaths are attributed to accidents, injuries and violence. Infant mortality has dropped markedly since 1966 but still is twice the rate for Canada as a whole.

8. Health manpower resources in the two zones would appear to be more plentiful than for Canada as a whole for the categories of nurse and general practitioner. As mentioned in para 6 these rates require study as the low population density and concentration of doctors in the larger communities distort the true picture. The absence of specialists in the zones is compensated for by the contractual agreements with the University of Alberta Medical Faculty and the accessibility of tertiary referral centres in Edmonton.
9. The number of short-term beds in the H.W.T. is proportionally higher than for Canada as a whole. The utilization patterns of nursing station facilities reflects an efficient use of these resources. The number of long-stay beds in the zones is lower proportionally than for the country at large. The age structure of the population and its morbidity patterns would indicate the ratio of short-term to long-stay beds in the Inuvik and Mackenzie is a sensible one.
10. The utilization of hospital beds in the two zones and in the tertiary referral centres in Edmonton, suggests that the "others" group make disproportionate use of these beds. The Inuit make less use of hospital beds than the Indians.
11. The data now being en-coded by Territories Health Insurance Service (T.H.I.S.) could provide considerably more information if the programming were modified. At present T.H.I.S. data are used for determining costs, fees, etc. The data could provide useful indicators with respect to diagnoses, referral patterns, work loads, etc. Northern Medical Services have developed a sophisticated and effective method for surveillance of chronic diseases (e.g., tuberculosis) with a recall capability to ensure follow-up visits. The basis for an excellent health monitoring system is already in existence - linkage of these data would appear the next logical step.

RECOMMENDATIONS WITH COMMENT

The morbidity patterns in the Inuvik and Mackenzie Zones reflect the demographic, cultural and socio-economic changes now taking place. The aetiologies of both the morbidity and mortality in the zones are multifactorial. The type of health service best suited to deal with a society in a state of flux is one that is comprehensive and integrated. The effectiveness of such a service can be assessed by observing the trend in such accepted health indicators as infant and maternal mortality and the diagnostic categories of the leading causes of illness and death. These indices in the case of the Inuvik and Mackenzie Zones show a satisfying downward trend.

The author attributes this satisfactory state of affairs to the comprehensiveness of the health services now being provided - services that include the establishment of safe water supplies and sewage disposal, immunization programmes, health educators, disease surveillance, food inspection, and concern with environmental health in addition to medical care services.

The author doubts that such comprehensive services would have developed, let alone been maintained, if the zones had opted for services similar to those found in the more settled and populated areas of southern Canada.

Specialist services are now available in tertiary centres a few hours flying time from the two zones. An arrangement that is considered satisfactory and realistic both from the professional and fiscal points of view. Specialists, even if they could be persuaded to practice in the zones, would make no significant impact on the health indices and hence on the public health. The present referral system ensures that those who require specialist services get them. No change in the present system of medical specialist utilization is recommended.

HEALTH SERVICES IN MACKENZIE AND INUVIK ZONES
NORTHWEST TERRITORIES

1. INTRODUCTION

- 1.1 The approach taken in this Study of the health manpower and medical specialist requirements for the Mackenzie and Inuvik Zones of the Northwest Territories can be likened to that used in assessing the health care services of any other underdeveloped region. The geography, climate, distances, demography, attitudes, morbidity, mortality, health facilities, utilization patterns of health services, and existing health manpower have been taken into consideration by the author in reaching recommendations and conclusions.
- 1.2 The author has made use of the data in the Annual Reports of the N.W.T. Medical Services, the Territorial Health Insurance Service's (T.H.I.S.) computer printouts, and have reviewed the relevant literature relating to the general health status of those living in the Mackenzie and Inuvik Zones of the Northwest Territories. In accordance with the terms of reference comparisons have been made, when appropriate, with the patterns of utilization of health manpower and facilities prevailing in Canada as a whole and/or her provinces.
- 1.3 No attempt has been made in this study to review the medical literature with respect to the Mackenzie and Inuvik Zones as it was felt that involvement with the purely clinical was not within the terms of reference.

2. CLIMATE AND TOPOGRAPHY

- 2.1 The climate of the Mackenzie and Inuvik Zones requires no detailed description - harsh and extreme are words that immediately come to mind.
- 2.2 Topographically the Zones are not too remarkable but travel is made difficult by climate and terrain.

3. SETTLEMENTS

- 3.1 Probably the one characteristic common to the majority of settlements in the Mackenzie and Inuvik Zones is their isolation. Individually the settlements offer variety with respect to facilities and physical and human resources. Appendix A lists the settlements in the two zones and their resources and facilities as they relate to health status and services. It should be noted that all have nursing stations. All have landing strips. All have some form of communications but the complexity of the telecommunication system varies depending upon the population of the settlement. The potable water supplies range from wells to a piped supply. The sewage system can be a cesspit to piped

using the Utilidor system. Looking over these data it may perhaps be the case that the sophistication of water and sewage systems is related more to the number of whites in a settlement than to the number of natives e.g., Norman Wells.

- 3.2 As far as this report is concerned the main positive features that emerge are (1) all settlements have nursing stations, (2) all have some form of communication to the outside, and (3) all have landing strips. The negative features are the lack of consistency with respect to standards for water supply and sewage disposal. Considering the scattered population of 38,000(1976) - 0.03 persons/mile, the terrain and the climate, the health facilities and resources available to the inhabitants of the two zones are surprisingly good.

4. DEMOGRAPHY

- 4.1 The population of the Northwest Territories has in recent years shown rapid growth. Between 1921 and 1961 the average Annual Growth Rate of the N.W.T. was 2.7 percent. Between 1961 and 1971 the rate was 4.3 percent. The 1961-1971 figure for Canada as a whole was 1.7 percent. (Lu and Mathurin, 1973). (Table 1).
- 4.2 Available data indicate that the rate of natural increase in the Northwest Territories actually declined between 1961 and 1971. The increase in population in the 1961-71 decade was in the main due to net in-migration.
- 4.3 The age-sex structure indicates a very young population. (See Figure 1), Between 1961 and 1971 the proportion of the population under 15 years of age increased from 40.2 percent to 42.9 percent. The age-sex pyramid for the 1961-71 decade is reminiscent of those for under-developed countries. The high sex ratio of males to females 20 years and over is indicative of a frontier region reflecting the differential immigration of adult unmarried males to the new frontiers, attracted by an economy dominated by mining, heavy industry, etc. which attract unmarried males from the south.
- 4.4 The population of the Northwest Territories is customarily divided into three ethnic groups, Indian, Eskimo, and others. The latter is a "catch-all" term to describe persons who are neither Indian nor Eskimo. The "Other" group is the largest and its size is subject to migration fluctuations. The Eskimo group is the next largest. Fluctuations in its size are a result of differential rates of natural increase. Indians represent the smallest group and their proportion of the total has remained relatively stable. (see Table 2).

Table 1
Total Population and Average Annual Percentage
Change in Population,
Northwest Territories and Canada, 1911-1971

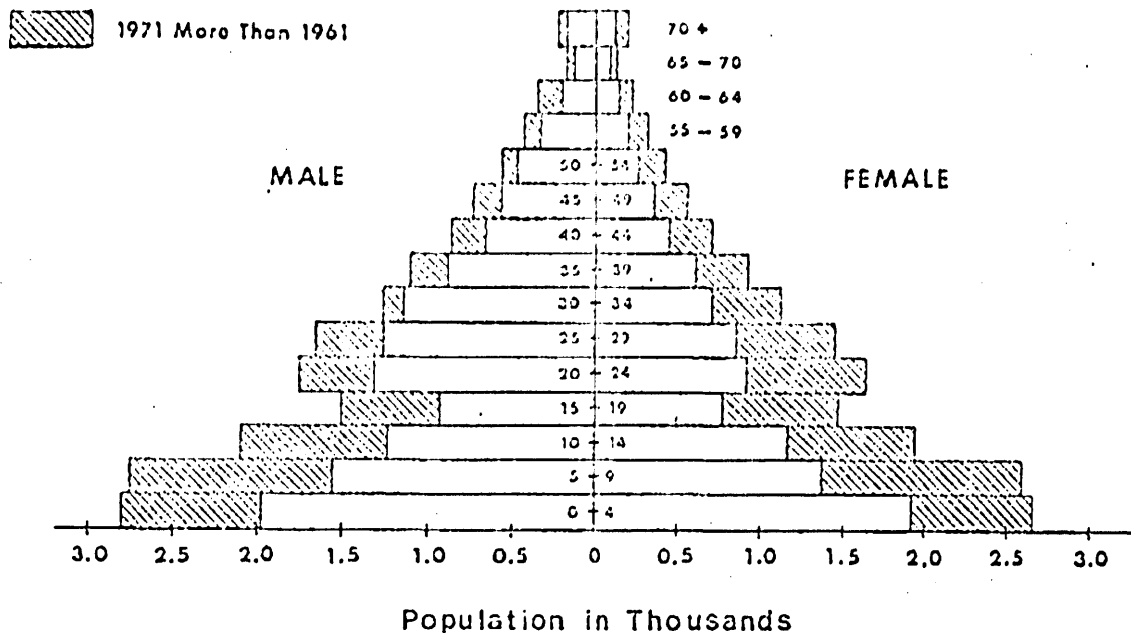
Year	Northwest Territories		Canada	
	Population (No.)	Av. Annual Percentage Change	Population (No.)	Av. Annual Percentage Change
1911	6,507		7,206,643	
1921	8,143	2.51	8,787,949	2.19
1931	9,316	1.44	10,376,786	1.81
1941	12,028	2.91	11,506,655	1.09
1951	16,004	3.31	14,009,429	2.18
1956	19,313	4.14	16,080,791	2.96
1961	22,998	3.82	18,238,247	2.68
1966	28,738	4.99	20,014,880	1.94
1971	34,805	4.22	21,568,310	1.70

Source: 1. Dominion Bureau of Statistics, Census of
Canada, 1961 and 1966.

2. Statistics Canada, 1971 Census of Canada,
Population by Age Group, Cat. No. 92-715,
Vol.1, Part 2, April 1973.

FIGURE 1

AGE-SEX PYRAMID, NORTHWEST TERRITORIES, 1961-71



Source of Data:

Statistics Canada, 1971 Census of Canada,
Population by Age Group, Cat. No. 92-715,
Vol. 1, Part 2, April 1973.

Table 2
Population Distribution by Ethnic Group,
Northwest Territories, 1961-1969 Inclusive
and 1971

Year	Distribution of Population(%)		
	Indian	Eskimo	Others
1961 (Census)	22.8	34.7	42.5
1962	21.7	34.9	43.4
1963	21.6	34.1	44.3
1964	21.7	36.0	42.3
1965	21.6	34.2	44.2
1966	21.7	36.5	41.8
1967	21.8	36.7	41.5
1968	21.5	38.2	40.3
1969	21.0	36.1	42.9
1971 (Census)	20.6	32.8	46.6

- Source: 1. The 1961 and 1971 population data by ethnic group were obtained from Census Division, Statistics Canada.
2. Total Indian population data for 1962-69 inclusive were obtained from Appendix 2; corresponding data for Eskimos were obtained from the Eskimo Disc List of the R.C.M.P. as of December 31 of each year.
3. Total population data at the end of each year represent the average mid-year population of that same year and the following year, obtainable from the Population Estimates and Projections Section, Statistics Canada.

- 4.5 The population of the Northwest Territories is widely dispersed over a vast area. The largest communities are Yellowknife (population 9,000), Inuvik (4,150), Hay River (3,595), and Fort Smith (2,810). The majority of the other settlements range in size from several hundred to 1000 people.
- 4.6 The settlements are separated by great distances with little, if any, road transportation. ~~All~~ have either aircraft landing strips (dirt, sand, or gravel) and/or some form of river transport. Transportation is primarily by scheduled or non-scheduled (charter) aircraft. It is both inconvenient and expensive.
- 4.7 The size and number of settlements precludes the installation of costly sewer and water treatment systems. In many cases sewage and water is trucked in and out of the settlement. (see Appendix A).

5. MORBIDITY

- 5.1 "Alcoholism is regarded as the greatest single health problem of the Arctic" (Haraldson 1974). The easy availability of alcohol, and the native people's relative inexperience of living with alcohol has resulted in its assuming the unenviable position of being the North's greatest health problem (see histogram on next page).
- 5.2 Tuberculosis is a problem through the N.W.T. but with the highest incidence in the Great Slave Lake area.

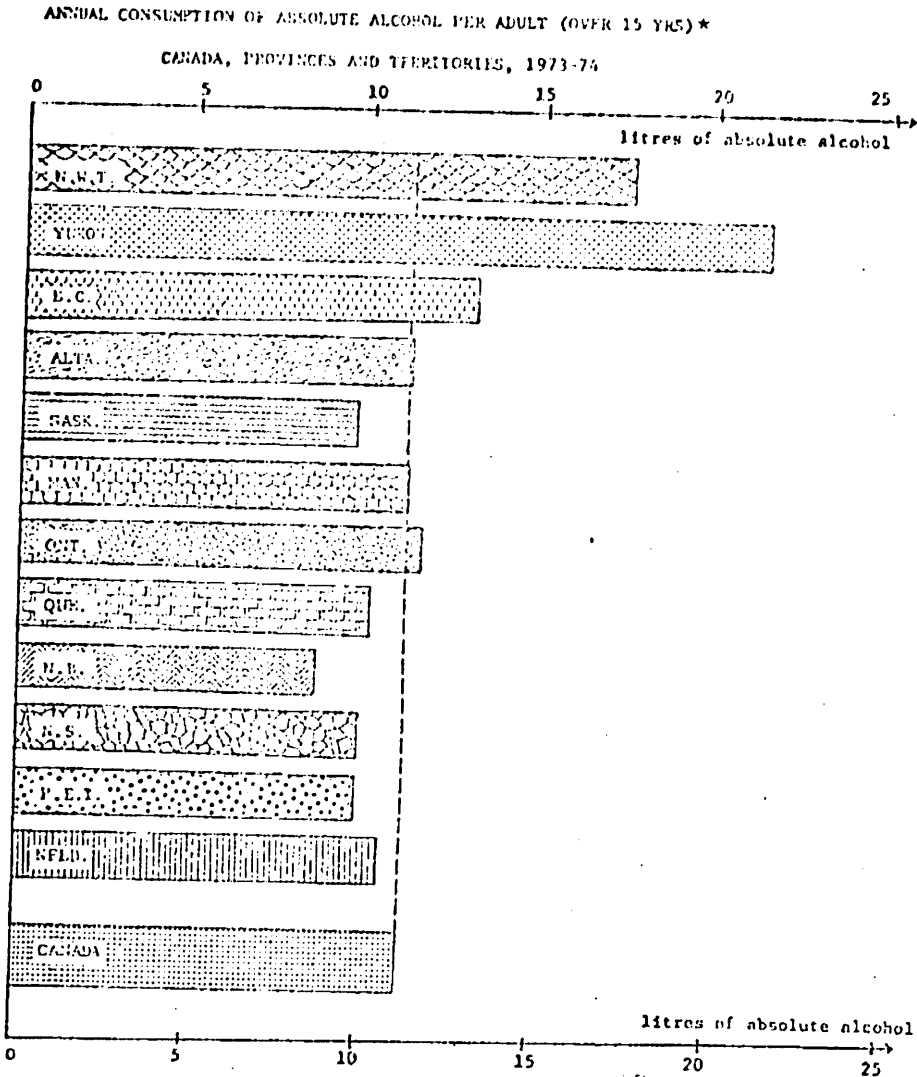
Comparative Rates - Tuberculosis, 1976

Treaty Indians (7745)	284/100,000
Eskimos (14,513)	137.8/100,000
Metis & Whites (17,100)	52.6/100,000
Total N.W.T.	129.58/100,000
Canada	30/100,000

Source: Report on Health Conditions in the Northwest Territories, 1976 (preliminary draft), p.39.

HEALTH SERVICES IN MACKENZIE AND INUVIK ZONES
NORTHWEST TERRITORIES

Page 7



*Health Field Indicators, H. & W. Canada, Dec. 76, p. 32.

- 5.3 The high rates noted in the above table for 1976 are in spite of the ever-increasing number of individuals taking oral anti-tuberculosis therapy. It cannot be determined from the information available if the high rates reflect non-compliance, new cases or re-infections - e.g., Igloolik had five active cases in a population of 608 listed native people or an incidence rate of 822/100,000.
- 5.4 Venereal disease presents a greater health problem in the N.W.T. than the rest of Canada. Whether a rate almost 30 times that for Canada as a whole is a true reflection of increased incidence is open to question. In the N.W.T. most if not all cases of venereal disease are reported and treated. In southern Canada it is estimated that only 10% of cases treated are ever reported. So the national statistics probably reflects gross under reporting.

Comparative Rates - Gonorrhoea

	<u>1976</u>	<u>1975</u>	<u>1974</u>
N.W.T.	3928 per 100,000	5896 per 100,000	5281 per 100,000
Canada	Figures not yet available (probably a very slight rise in rate)	222.6 per 100,000	212.4 per 100,000

Source: Report on Health Conditions in the Northwest Territories 1976 (preliminary draft, p.34)

- 5.5 The number and rates for notifiable diseases are useful indicators in the assessment of health care needs. The following table lists nine diagnostic categories from the thirty that make up Canada's notifiable diseases. The other twenty-one diagnostic categories have not been included in the table as the number of cases in the N.W.T. was too small to be significant.

HEALTH SERVICES IN MACKENZIE AND INUVIK ZONES
NORTHWEST TERRITORIES

Page 9

Reported Cases of Notifiable Diseases*
1975
Rates/100,000 population

<u>Disease</u>	<u>Canada</u> <u>Rate</u>	<u>N.W.T.</u> <u>No. of Cases</u>	<u>Rate</u>
Serum Hepatitis and Infectious Hepatitis	19.9	190	502.6
Measles	57.9	135	357.1
Rubella	53.0	108	285.7
Strep Throat & Scarlet Fever	94.9	1,062	2,809.5
Venereal Diseases	240.2	6,000	2,268.0
Diphtheria	0.5	6	15.9
Tuberculosis	13.5	49	129.6
Salmonella infections	15.2	20	52.9

* Health & Welfare Canada 1976

- 5.6 The higher rates recorded for the N.W.T. reflect the important roles played by environmental and social factors in most notifiable disease categories. The incidence of these diseases will fall as public health measures increase in their effectiveness and monitoring and surveillance is maintained.
- 5.7 The higher rates for the N.W.T. doubtless reflect the higher incidence of these diseases in the Territories compared with Canada as a whole. However, it is important to remember, as stated in Section 3.3, that the recording of health and sickness data in the N.W.T. is carried out more diligently by N.W.T. health personnel than by their peers in the provinces. Even allowing for this it is safe to assume that these notifiable diseases are indeed of greater significance to the N.W.T. than to the provinces.

6. FOOD CONSUMPTION PATTERNS

6.1 The mean caloric intake of Eskimos is lower than the national mean. The percentage of calories derived from protein was, however, above the national mean. The nutrient intake for Vitamin A, folate and calcium is lower for all age groups of Eskimos than recommended, as was the intake of Vitamin C for the older age groups and pregnant women. The mean consumption of foods, primarily sugar, was twice the national average for most age groups, and the intake of beverages and soft drinks for children 1 to 11 years was almost three times the average for Canada.

Percent Contribution of Selected Food Categories
to Total Carbohydrate Intake of Eskimo and
National Physiological Groups

Physiological Group	Foods mostly sugar		Beverages and soft drinks	
	Eskimo	National	Eskimo	National
1-4 yrs.	16	11	5	2
5-11 yrs.	23	12	9	3
12-19 yrs. Males	24	13	4	6
12-19 yrs. Females	19	13	8	5
20-39 yrs. Males	37	14	13	11
20-39 yrs. Females	30	15	15	7
40-54 yrs. Males	35	15	12	7
40-54 yrs. Females	31	14	7	4
55+ yrs. Males	38	17	2	3
55+ yrs. Females	44	14	5	2
Pregnant women	27	13	6	5

Source: Nutrition Canada, Food Consumption Patterns Report, p.236.

HEALTH SERVICES IN MACKENZIE AND INUVIK ZONES NORTHWEST TERRITORIES

Page 11

- 6.2 The mean caloric intake for Indians is similar to the national population. The 5-11 age group, males 12 years and older, and pregnant women had total caloric intakes below the national norm. The intake of vitamins and minerals, and iron intake for females 12-54 years of age by the Indian population are below the national norms. Thiamine intake is below the recommendations for pregnant women, and borderline for Indians over 40 years of age. Indians consume less milk, fruits and vegetables than the national population but more meat, fish, poultry and cereals. Pregnant Indians have lower intake of all nutrients than the national population. The intake of calcium, thiamine, and folate is below recommended level.
- 6.3 The Indian and Eskimo populations' eating habits have undergone marked changes in recent decades. The utilization of canned and convenience foods has increased, the average breast-feeding time has decreased, and the intake of imported carbohydrates, foods mostly sugar, and soft beverages has increased markedly. These trends in food consumption doubtless contributed to the high morbidity and mortality rates of infants. The high prevalence rates of otitis media, upper respiratory infections, and the pneumonias found in children in the two regions may well be related to nutritional lacks as well as prevailing hygienic and environmental inadequacies. The Report of the Second Canadian Press Conference 1975 discusses this at considerable length in the chapter on the "Nutritional Basis of Disease".

7. MORTALITY

- 7.1 The leading cause of death in the Northwest Territories is "accidents, injuries and violence". In 1976, it accounted for 33 percent of all deaths. This was a 42 percent increase from the previous year. The other seven major causes of death are shown in Table 3.

TABLE 3
Cause of Death, 1976

	No. of Deaths	Percentage of Total Deaths
Accidents, Injuries & Violence	77	33.62
Cardiovascular Disease	40	17.39
Malignant Neoplasm	32	13.91
Pneumonia	27	11.73
Diseases of Infancy	19	8.26
Diseases of Central Nervous System	13	5.65
Gastrointestinal Diseases	9	3.91
Senility, Unknown & Other Causes	12	5.2

Source: Report on Health Conditions in the N.W.T. 1976 (preliminary draft), p.11.

- 7.2 The order of frequency was the same in 1975. The next two most common causes of death, heart disease, and cancer follow the mortality pattern of the rest of Canada. However, the significance of pneumonia and diseases of infancy represent particular problems for the North. Table 4 shows that pneumonia is the second leading cause of death among the Indian population. (see 6.3).
- 7.3 All three ethnic groups are most susceptible to accidents, poisonings and violence. This is undoubtedly related to alcohol consumption discussed in Section 3.1. Table 5 shows that the leading cause of accidental death is drowning. The importance of other causes varies among the different ethnic groups, although drowning and suicide are significant in all three. How many of the drownings, burns, motor vehicle accidents, or homicides are attributable to acute alcohol intoxication and/or alcoholism cannot be determined from the data available. It is safe to assume they reflect the social pathologies to be found in the Mackenzie and Inuvik Zones.

HEALTH SERVICES IN MACKENZIE AND INUVIK ZONES
NORTHWEST TERRITORIES

Page 13

TABLE 4
Causes of Death by Ethnic Groups, 1976

Cause	Indians		Eskimos		Others	
	#	Rank	#	Rank	#	Rank
Injuries & Accidents	21	1	34	1	22	1
Cardiovascular Diseases	7	3	15	3	18	2
Malignant Neoplasms	5	5	17	2	10	3
Pneumonia	8	2	9	4	3	6
Diseases of Infancy & Malformations	6	4	5	7	8	4
Gastrointestinal	3	6	4	8	2	6
Other Respiratory	-	-	7	5	-	-
Senility, Unknown & Other Diseases	1	7	6	6	1	8
Diseases of the Nervous System	1	7	5	7	7	5
Cirrhosis of Liver & Hyperplasia of Prostate	1	7	1	9	2	7

Source: Report on Health Conditions in the Northwest Territories 1976, p.13.

TABLE 5
Deaths from Accidents, Injuries, Violence, N.W.T. - 1976

	Indians	Eskimos	Others	Total
Exposure	2	4	-	6
Drowning	3	3	5	11
Inhalation of Gastric Contents	2	2	-	4
Asphyxia	-	2	2	4
Suicide	2	4	2	8
Burns	-	10	-	10
Aircraft Crashes	-	-	5	5
Motor Vehicle Accidents	-	1	2	3
Poisons (Excluding Alcohol)	-	-	1	1
Gunshot Wounds (Accidental)	1	-	1	2
Homicide	5	1	0	6
Alcohol Poisoning	1	1	1	3
Others (Falls, Crushing)	2	1	2	5
Crib Deaths	3	5	1	9
Totals	21	34	22	77

Source: Report on Health Conditions in the Northwest Territories
1976, p.12

HEALTH SERVICES IN MACKENZIE AND INUVIK ZONES
NORTHWEST TERRITORIES

Page 15

7.4 The Infant Mortality Rate (deaths under one year of age) in the N.W.T. has been declining. In 1975 it was 35.1 per 1,000, in 1976 it was 34.4. Ten years previously (1966) the Infant Mortality Rate had been 79.9/1000. The most remarkable drop has been amongst the Eskimos - from 157 per 1000 in 1966 to 40.1 per 1000 in 1975.

Rates - Both Sexes* - 1974

Rate	Canada	N.W.T.
Infant Mortality ⁽¹⁾	15.0	42.2
Neonatal Deaths ⁽²⁾	10.1	19.2
Post Neonatal Deaths ⁽³⁾	4.9	23.0
Peri-Natal Deaths ⁽⁴⁾	16.7	33.0
Still Births ⁽⁵⁾	7.5	14.4
Maternal Deaths ⁽⁶⁾	1.0	9.6

* Vital Statistics Vol.III 1974 Statistics Canada

(1) less than 1 year

(2) 0-28 days

(3) deaths 0-7 days plus still births

(4) Foetal deaths 28 or more weeks gestation plus infant deaths under 7 days.

(5) Foetal deaths 28 or more weeks gestation

(6) Death due to delivery, complication of pregnancy, childbirth and puerperium.

7.5 The major causes of infant deaths may be classified as follows:

<u>Neonatal</u>	<u>Post-neonatal</u>
Prematurity	(sudden)crib death
Crib death	Pneumonia
Asphyxia	Congenital anomalies
Pneumonia	(acute) gastro-enteritis
Congenital anomalies	Meningitis
	Suffocation

Deaths (with the exception of pneumonia) in the neonatal period may be presumed to be largely non-preventable, but those in the post-neonatal period, with the exception of crib death and congenital anomalies are a reflection of poor living conditions, lack of education, and relative ignorance regarding good health practices.

8. HEALTH MANPOWER

8.1 Nurses: Health services to most of the settlements are based in a nursing station and provided by 1-3 nurses. All routine medical and public health problems are handled at the nursing station. Emergency cases are flown to the nearest hospital by air.

All nursing services (hospital and field positions) are supplied by Health and Welfare Canada. The nurses in the field work without direct supervision, but nearly all have had advanced training and qualifications:

Nursing Qualifications:

N = 172

	<u>Number</u>	<u>Percent</u>
Bachelor's degree(nursing)	28	16
Public health nursing certificates	20	12
Midwifery(or advanced obstetrics)	38	22
Outpost nursing(midwifery and Public Health)	8	5
Post-graduate psychiatric nursing	<u>2</u>	<u>1</u>
Total	<u>96</u>	<u>56</u>

Source: Report on Health Conditions in the Northwest Territories, 1976 (preliminary draft), p.16.

8.1.1 The biggest problem faced in providing nursing coverage in the North is staff nurse turnover. In 1976 the Mackenzie Zone had 51 percent, the Inuvik Hospital 46 percent and Inuvik Field 54 percent turnover of nurses. The number of vacant positions is not large at any one time, but the problems associated with recruitment are considerable. These high turnover rates result in discontinuity of health services.

TABLE 6

Registered Nurses, Full and Part Time; Nursing Assistants(1974)
(No. and Rate/100,000 Pop.)

	Registered Nurses						Nursing Assistants	
	Full Time		Part Time		Total		No.	Rate
	No.	Rate	No.	Rate	No.	Rate		
NWT/Yukon	268	470	38	67	306	537	-	-
Canada	92,570	412	32,905	146	125,475	558	65,313	288

8.2 Physicians: The physician/population ratio is much lower in Northwest Territories than in the rest of Canada (see Table 7). 89 physicians per 100,000 population is significantly lower than the 138 per 100,000 for Canada as a whole.

8.2.1 It is of interest that the rate for general practitioners to population is higher in the Northwest Territories than Canada as a whole. (see Table 7.

8.2.2 The populations of the Yellowknife and Hay River areas support private practitioners. There is a private practitioner (specializing in ophthalmology) in Fort Smith, and a part-time private practitioner in Inuvik. The remaining physician services are supplied by Medical Services, Northwest Territories Region. (Health and Welfare Canada).

8.2.3 The breakdown of physicians by community is as follows:

Yellowknife:

15 doctors (plus 1 M.D. administrator (H. & W.))

Private practitioners - 7 doctors including

2 G.P. surgeons with F.R.C.S.

1 surgeon F.R.C.S.

1 internist

1 obstetrician/gynaecologist

1 orthopaedic surgeon(+70 years of age)

1 ophthalmologist

HEALTH SERVICES IN MACKENZIE AND INUVIK ZONES
NORTHWEST TERRITORIES

Page 18

TABLE 7
Physicians - G.P.s and Specialists(1974)
(No. and Rate/100,000 Pop.)

Province	G.P.s		Specialists		Total	
	No.	Rate	No.	Rate	No.	Rate
N.W.T.	27	73	6	16	33	89
Canada	15,543	69	15,565	69	31,108	138

Source: Medical Services, Northwest Territories Region

Medical Services Personnel - 8 doctors including
2 G.P.s with F.R.C.S.(one orthopaedic)
3 ophthalmologists
1 E.H.T.
1 obstetrician/gynaecologist
1 psychiatrist(H. & W. Canada full-time)

Hay River

4 doctors, all in private practice, including one
with F.R.C.S.

Fort Smith

4 doctors

Private practice - 1 specializing in ophthalmology
Health & Welfare - 3 G.P.s.

Inuvik

5 doctors plus 1 administrator
Health & Welfare - 5 G.P.s.

Rae Edzo

1 Health & Welfare doctor

Fort Simpson

1 Health & Welfare G.P.

Cambridge Bay

1 Health & Welfare G.P.

8.2.4 Specialist services to the Mackenzie and Inuvik Zones are provided by the University of Alberta Medical Faculty, and doctors from the Medical Services, Northwest Territories Region. An agreement between U. & W. and U. of A. Medical Faculty provides for a specified number of visits by specialists (and in some cases residents) in E.N.T., Paediatrics, Ophthalmology, Obstetrics and Gynaecology, Psychiatry and Internal Medicine.

8.2.4.1 The Inuvik program consists of six 5-day visits from E.N.T. and Paediatric specialists; three 8-day visits from ophthalmologists; and one 5-day visit from an Ob-Gyn. specialist.

8.2.4.2 The Mackenzie program allows for ten visits from paediatricians, six from E.N.T. specialists, four from internists, and two from Ob-Gyn. specialists; for a total of 94 days (1976).

9. HOSPITAL FACILITIES

9.1 The following hospital facilities are located in the Inuvik and Mackenzie Zones:

Inuvik

- i. Inuvik General Hospital - 129 beds
- ii. Horman Wells Nursing Station - 13 beds, 2 nurses
- iii. Fort Good Hope Nursing Station - 4 beds, 2 nurses

Mackenzie

- i. Stanton Yellowknife Hospital - 78 beds
- ii. St. Ann's Hospital (Fort Smith) - 35 beds
- iii. Fort Simpson Hospital - 30 beds
- iv. H.H. Williams Memorial Hospital (Hay River) - 22 beds
- v. Edzo-Cottage Hospital
- vi. Coppermine Nursing Station - 4beds

- 9.2 The rated bed capacity for all of the Northwest Territories is shown in Table 8. The number of short-term beds provides more beds per capita in the N.W.T. than in other Yukon or Canada as a whole. The rate for long-term beds is not so favourable. The availability of short-term beds reflects the functions and the location of nursing stations in most N.W.T. communities.
- 9.3 The efficient use of nursing stations in the provision of medical care in the Northwest Territories results in the rate of patient days in general hospitals being lower than the rate for Canada as a whole (see Table 9). The higher rate for utilization of outpatient services in general hospitals in the N.W.T. (Table 10) again reflects the efficacy of the nursing services and the referral system.

TABLE 8
Rated Bed Capacity (1974)
No. and Rate/100,000 Population

	Short Term		Long Term	
	No.	Rate	No.	Rate
Yukon	154	811	9	47
N.W.T.	395	1,039	22	58
Canada	117,742	524	34,589	154

Source: Medical Services, Northwest Territories Region.

TABLE 9
Patient - Days in General Hospitals, 1974

Province	General Hospitals*	Rate
N.W.T.	62,218	1,637
Canada	43,113,599	1,923

* Excludes patient-days in psychiatric units

Source: Medical Services, Northwest Territories Region

Table 10

Hospital Services to Outpatients in General Hospitals (1974)
(No. and Rates/100,000 Pop.)

Province	Visits to Emerg. Units		Visits to Amb. Care Units	
	No.	Rate	No.	Rate
N.W.T.	23,673	623	-	-
Canada	12,362,514	550	5,734,665	255

Source: Medical Services, Northwest Territories Region

- 9.4 A more detailed examination of the hospital data provided by the Territorial Health Insurance Service (T.H.I.S.) reveals that over 80% of hospital services in the N.W.T. are provided by the facilities in the Mackenzie or Inuvik Zones with the contract facilities in Alberta (see Tables 11 and 12)
- 9.5 The average length of stay in the N.W.T. hospitals is considerably shorter than in Alberta hospitals (Table 11). This difference in length of stay may be a reflection of (1) the demographic structure of the N.W.T. - a young population (see figure 1 page 4) and (2) utilization of the tertiary referral centres in Edmonton for the more complicated cases. Unfortunately no diagnostic data are available to support this supposition.
- 9.6 The ethnicity of patients utilizing hospital services does not reflect the proportion of Indians, Inuit, and "Others" that together constitute the population of the N.W.T. (Table 13). The "Others" represent 43 percent of the population of the N.W.T. but account for 53% of the patients using N.W.T. hospital facilities, and 64% of similar facilities in Alberta.
- 9.6.1 The Indian utilization of in-patient resources is in line with their representation in the population.
- 9.6.2 The Inuit utilization rates seem well below their representation in the population of the N.W.T. Even when allowance is made for the fact that the majority of Inuit are in the Eastern Arctic and therefore less likely to use Mackenzie, Inuvik and Alberta facilities, their utilization of in-patient beds when the Churchill Health Centre, Winnipeg Health Sciences Centre and the Montreal General Hospital are included is still only 23%, yet they represent 37% of the population. Again

it is not possible from the data available to postulate why this difference pertains. Are the determinants of utilization of health care facilities cultural and attitudinal, or are they due to such disincentives as problems related to transport, climate, terrain, and geography.

- 9.6.3 The greatest differences in hospital usage by three ethnic categories occur in those tertiary referral centres outside the N.W.T. The "Other" category exhibits a disproportionately high utilization of hospital beds in Alberta (Table 13).

10. CONCLUSIONS

- 10.1 The existing method of providing health care to the Inuvik and Mackenzie Zones of the N.W.T. is ideally suited to the conditions that prevail in this region of Canada. The patterns of acute morbidity lend themselves to a system of primary care now being provided in the main by well-trained nurses with back-up resources of doctors and hospitals in the zones, and tertiary facilities in Edmonton.
- 10.2 The aetiological factors of most of the morbidity - and mortality - is to be found in the environment, in the cultural mores of the inhabitants, and in the rapid changing socio-economic conditions. The provision of health services appropriate for the prevailing situation in the two zones requires an integrated and comprehensive health service. Such a service could not be provided by individual practitioners working on a fee-for-service basis in the four major communities in the two zones.
- 10.3 The Inuvik and Mackenzie Zones require the sorts and types of resources - human and physical - that the Northern Medical Services now provides. The author cannot envisage the same calibre of comprehensive care being provided to the scattered population of the region by entrepreneur doctors working out of their offices in the four main centres.

Table 11
Adult/Child Hospital Services by Hospital/Nursing Station
1976-77 Fiscal Year
N.W.T. - Inuvik & Mackenzie Zones

Hospitals	Separations		A.L.O.S.*
	Number	Percent	
<u>N.W.T. Hospitals:</u>			
H.H. Williams Memorial	1,433		4.7
Stanton Yellowknife	2,601		6.4
St. Ann's General	506		4.8
Ft. Simpson General	184		5.0
Edzo Cottage	370		4.7
Frobisher Bay General	1,086		6.4
Inuvik General	1,071		6.3
Sub-Total	7,251	66	5.5
<u>Selected Alberta Hospitals:</u>			
University of Alberta	292		14.4
Royal Alexandra	148		8.9
Misericordia	34		3.7
Edmonton General	61		6.4
Charles Camshell	790		13.6
Sub-Total	1,325	12	10.4
<u>Selected N.W.T. Nursing Stations:</u>			
Ft. Resolution	21		1.3
Ft. Providence	12		1.6
Ft. Liard	45		1.9
Coppermine	25		1.1
Cambridge Bay	42		1.5
Holman Island	14		1.0
Aklavik	18		1.5
Tuktoyaktuk	59		1.3
Snowdrift	12		1.2
Ft. McPherson	30		1.4
Ft. Good Hope	10		2.0
Ft. Franklin	28		1.4
Norman Wells	4		1.0
Sub-Total	320	3	1.4
Total (of above services)	8,896	81	6.1
Total (all N.W.T. Services of T.H.I.S.)	11,001	100	6.8

* "A.L.O.S." = Average length of stay

Source: Territorial Health Insurance Service, Quarterly Reports.

TABLE 12

Out-Patient Hospital Services by Hospital/Nursing Stations
1976-77 Fiscal Year
Inuvik and Mackenzie Zones

Hospital	Separations	
	Number	Percent
<u>N.W.T. Hospitals</u>		
H.H. Williams Memorial	5,207	
Stanton Yellowknife	15,034	
St. Ann's General	4,287	
Ft. Simpson General	895	
Edzo Cottage	666	
Frobisher Bay General	2,630	
Inuvik General	2,352	
Sub-Total	31,071	77
<u>Selected Alberta Hospitals:</u>		
University of Alberta	380	
Royal Alexandra	113	
Misericordia	41	
Edmonton General	104	
Charles Camsell	765	
Sub-Total	1,403	3
<u>Selected Nursing Stations:</u>		
Ft. Resolution	159	
Ft. Providence	228	
Ft. Liard	546	
Coppermine	395	
Cambridge Bay	382	
Holman Island	145	
Aklavik	200	
Tuktoyaktuk	415	
Ft. McPherson	338	
Ft. Good Hope	60	
Ft. Franklin	177	
Norman Wells	26	
Snowdrift	47	
Sub-Total	3,118	8
Total (of above services)	35,592	88
Total (all N.W.T. Services of T.H.I.S.)	40,255	100

Source: Territorial Health Insurance Service,
Quarterly Reports.

TABLE 13
Adult/Child Hospital Services by Hospital and Ethnicity
1976-77 Fiscal Year
Inuvik and Mackenzie Zones

Hospital	Separations						
	Total	Indian	%	Inuit	%	Other	%
<u>N.W.T. Hospitals:</u>							
H.H. Williams Memorial	1433	251	17.5	7	0.5	1175	82.0
Stanton Yellowknife	2601	607	23.3	359	13.8	1635	62.9
St. Ann's General	506	125	24.7	25	4.9	356	70.4
Ft. Simpson General	184	116	63.0	-	0.0	68	37.0
Edzo Cottage	370	350	94.6	-	0.0	20	5.4
Frobisher Bay General	1086	1	0.1	968	89.1	117	10.8
Inuvik General	1071	244	22.8	335	31.3	492	45.9
Total	7251	1694	23.6	1694	23.4	3853	53.3
<u>Selected Alberta Hospitals:</u>							
University of Alberta	292	39	13.4	37	12.7	216	74.0
Royal Alexandra	148	9	6.1	10	6.8	129	87.2
Misericordia	34	1	2.9	1	2.9	32	94.1
Edmonton General	61	1	1.6	1	1.6	59	96.7
Charles Camshell	790	210	26.6	161	20.4	419	53.0
Total	1325	260	19.6	210	15.8	855	64.5
Proportion of Total N.W.T. Population			19.6		36.9		43.5

Source: Territorial Health Insurance Service, Quarterly Reports

APPENDIX A

COMMUNITY DATA ON SETTLEMENTS IN THE
MACKENZIE AND INUVIK ZONES

The following information is listed for each settlement:¹

1. Population
2. Water
3. Sewage
4. Medical Facilities
5. Transportation Services

INUVIK ZONE

Aklavik:

1. 135
2. Piped from nearby lake or from Peel River - trucked to buildings, chlorinated.
3. Truck service
4. Nursing station - 3 nurses; nearest hospital Inuvik.
5. Landing strip (silt and sand), summer float plane wharf, winter road to Inuvik, Water transport (NTCL) - June to September.

Arctic Red River

1. 135
2. From a small lake and delivered by means of a TD-9 cat, using a 500 gallon tank mounted on a wheeled vehicle or from Mackenzie River, same method of delivery.
3. Collection and disposal by means of a cat and skid in winter and summer.
4. None - nearest hospital Inuvik.
5. Landing strip (dirt), winter road to Ft. McPherson Water transport (NTCL) - June - September.

¹Source: Canada North Almanac 1976, edited by Donald G. Wood, Research Institute of Northern Canada, Yellowknife, N.W.T.

Ft. Franklin

1. 400
2. Trucked
3. Trucked
4. Nursing station - 2 nurses; nearest hospital Inuvik.
5. Landing strip (natural ground) no road
Water transport - June-October.

Ft. Good Hope

1. 376
2. Truck
3. Truck
4. Nursing station - 4 beds; 2 nurses; nearest hospital Inuvik.
5. Landing strip (sand & gravel), winter road to Mackenzie Highway; Water NTCL to Hay River (June-September).

Ft. McPherson

1. 817
2. Piped to government buildings; truck service to others
3. truck service
4. Nursing station - 3 nurses; nearest hospital Inuvik.
5. Landing strip (gravel) highway to Inuvik & Dawson under construction; NTCL from Hay River - June-September.

Ft. Norman

1. 294
2. Truck service
3. Truck service
4. Nursing station - 1 nurse; nearest hospital Inuvik
5. Landing strip (earth and sand) winter road to Mackenzie Highway; NTCL from Hay River - June-September.

Norman Wells

1. 353
2. Utilidor operated by Imperial Oil, M.O.T. and Government of N.W.T.; also tanked water delivery.
3. Utilidor operated by Imperial Oil, M.O.T., and Government of N.W.T.; also truck pick-up.
4. Nursing station - 13 beds; 2 nurses; nearest hospital Inuvik, 380 miles.
5. Landing strip (asphalt); winter road (not open every year) to Mackenzie Highway at Ft. Simpson N.T.C.L. from Hay River - July-September.

Tuktoyaktuk

1. 706
2. Truck service
3. Truck service
4. Nursing station - 3 nurses; nearest hospital Inuvik 85 air miles.
5. Landing strip (gravel); no road N.T.C.L. from Hay River - June-September.

MACKENZIE ZONE

Yellowknife

1. 9,000
2. Piped - chlorinated/fluoridated; old town - surface pipe in summer, truck system in winter.
3. Piped - New town; truck system - old town.
4. Stanton Yellowknife Hospital. - 78 beds; staff 13 medical practitioners, 3 dentists, ophthalmologist, optometrist, 6 medical clinics; 1 chiropractor, 1 dental clinic, 2 visiting veterinarians.
5. Landing strip (asphalt) float base and landing facilities; Mackenzie Highway continuous except during freeze-up and break-up.; N.T.C.L. from Hay River - June-October.

Snowdift

1. 262
2. Water wagon, D5 cat
3. Sewage bags
4. Nursing station - 1 nurse; nearest hospital Yellowknife 125 air miles.
5. Landing strip (sand and gravel); no road; N.T.C.L. (Hay River) - Jul.

Fort Resolution

1. 736
2. Truck service
3. cess pits
4. Nursing station - 2 nurses; nearest hospital Hay River, 80 air miles, 102 road miles.
5. Landing strip (crushed gravel); Mackenzie Highway system; N.T.C.L. from Hay River - June-October.

Ft. Simpson

1. 1050
2. Piped
3. Piped
4. Hospital, capacity 30 beds; 1 doctor, 6 nurses.
5. Landing strip (asphalt); Mackenzie Highway N.T.C.L. Hay River - June-September.

Ft. Smith

1. 2810
2. Piped municipal system, chlorinated and fluoridated
3. Piped municipal system
4. St. Ann's Hospital; Federal Medical Clinic; capacity 35 beds; 2 nurses, 2 doctors; 1 dentist and 1 ophthalmologist.
5. Landing strip (asphalt) sand strip (no winter maintenance); Mackenzie Highway system; no water transportation.

Ft. Providence

1. 659
2. Trucked
3. Trucked
4. Nursing station - 2 nurses; nearest hospital Hay River.
5. Airstrip (gravel); Mackenzie Highway system N.T.C.L. from Hay River (June-September).

Ft. Liard

1. 253
2. Government and private company buildings have wells and pressure systems. Most of settlement draws water from Liard and Petitot Rivers or two community wells.
3. Government and private company buildings - cess pit system. Bulk of community uses outhouses.
4. Nursing station - 1 nurse; nearest hospital Ft. Nelson, B.C. (164 miles).
5. Landing strip (dirt); Anchorage for float planes on Liard River. Winter road from Ft. Nelson Water transport (Nelson, May-September)

Rae-Edzo

1. 1,319
2. Rae- part utilidor system and trucked; Source - Marian Lake, treated.

Edzo - full main system; source - wells and Great Slave Lake.
3. Sewage collected by packer-truck to Lagoon 2 miles from townsite (one in Rae, two in Edzo).
4. Rae- Medical Clinic; Edzo- Cottage hospital; staff, 1 doctor, 6 nurses, 1 public health nurse; nearest hospital Yellowknife, 70 air miles.
5. Float planes land on Russell Lake, improvised strip at Russell Lake; Mackenzie Highway; no water transport.

Hay River

1. 3,595
2. Piped, chlorinated and fluoridated.
3. Piped
4. Two public health centres; H.H. Williams Memorial Hospital; capacity 22 beds, 4 doctors, 1 dentist, 3 nurses and 2 health workers.
5. Landing strip (asphalt) (gravel strip); Mackenzie Highway: harbour and embarkation point for most water transport in Western Arctic.

Holman Island

1. 288
2. Wagon service
3. Bag service
4. Nursing station - 1 nurse; nearest hospital Inuvik.
5. Landing strip (shale); no road; N.T.C.L. from Hay River - Aug. and Sept.

Bathurst Inlet

1. 61
2. From adjacent river
3. Sewage bags
4. Lay dispenser, nearest facility 160 miles to Cambridge Bay; nearest hospital Yellowknife, 360 miles.
5. Air strip capable of landing DC3; no road; N.T.C.L. from Hay River - July to Aug.

Cambridge Bay

1. 846
2. Truck service
3. Truck service
4. Nursing station; staff 1 doctor, 4 nurses; nearest hospital Yellowknife.
5. Landing strip (gravel); float base in Bay; no road; N.T.C.L. from Hay River - Aug. and Sept.

Coppermine

1. 756
2. Chlorinated truck service
3. Bag system
4. Nursing station - 4 beds; 3 nurses, nearest hospital Yellowknife.
5. Landing strip (gravel); winter - ice runway; no road; H.T.C.L. from Hay River.

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HEALTH SERVICES IN MACKENZIE AND INUVIK ZONES
NORTHWEST TERRITORIES

7-63
17-10-77

Stanley Greenhill, M.D.
July, 1977

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ᐃᐃ, 1977ᐃᐃᐃᐃᐃᐃ

SUMMARY

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7. ሲኒማታ ስራ ላይ ለውጥ ለማድረግ ለሚያስፈልጉት ስራዎች ላይ ለውጥ ማድረግ አለብን።

Some Comments on the Report Entitled
"HEALTH SERVICES IN MACKENZIE AND INUVIK ZONES
NORTHWEST TERRITORIES

By Stanley Greenhill, M.D. July 1977

From the "Terms of Reference" the report was to assess the specialist requirements of the Mackenzie and Inuvik Zones of the Northwest Territories Region. However, the title of the report is "Health Services in Mackenzie and Inuvik Zones, Northwest Territories". Had the "Terms of Reference" been met the report could have served as a valuable tool for future planning.

The fact is that there is little reference to "specialist requirements" and the following specific "Terms of Reference" have certainly not been met.

1. "Reviewing the present level of services provided through the University of Alberta contract".
2. "by other specialists from Alberta not included in the above contract".
3. "by specialists from the City of Yellowknife".
4. "determining the needs of the population living within the confines of the above mentioned areas".

It must be pointed out that there are several inaccuracies and omissions associated with the report. For example:

1. No reference is made to Specialists resident and practising in the Northwest Territories.
2. No reference is made to Budget Review Hospitals and, therefore, the numbers provided for professional personnel are inaccurate.

3. The figures stated for bed totals are in error. In addition, Nursing Station beds should not be considered as active treatment beds as they are usually only used for emergencies, for holding, or for maternity cases.
4. In comparing utilization rates the writer only used separations -- whereas, total days of care, and average length of stay, are valuable indicators when considering utilization.
5. Certain communities have been omitted from the report (Sachs Harbour, Paulatuk) and this also affects the number of professional personnel available.

Perhaps the errors in the report are due to the following:

1. In preparing this report, Doctor Greenhill never visited any of the communities.
2. In reviewing documents in preparing this report, no reference is made to valuable documents tabled in this Legislative Assembly, such as:
 - a) "Mackenzie River Area Health Services Study", tabled in the Legislative Assembly in the spring of 1975.
 - b) "Central and Eastern Arctic Health Services Study", tabled in the Legislative Assembly in the spring of 1977.
 - c) The report was never presented for the review of the Northwest Territories Health Co-ordinating Committee.

Dept. of Health and Social Services
October 1977