

Urban Aboriginal Health Care Utilization:
A Comparative Study of Winnipeg Status Indians
and Other Winnipeg Residents

by

Brian I. Gudmundson

A thesis
submitted to the University of Manitoba
in partial fulfillment of the
requirements for the degree of
Master of Social Work

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BY

BRIAN L. GUDMUNDSON

A Thesis submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfillment of the requirements for the degree of

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ABSTRACT

The purpose of this study was to compare urban health care service utilization between Winnipeg Status Indians and Other Winnipeg Residents. This study distinguished between a downtown Core Area (low income) and the Suburbs (higher income) of Winnipeg, Manitoba. Detailed morbidity was documented in all 18 major diagnostic categories (ICD-9-CM), providing comparisons among five age cohorts and four subpopulations defined by ethnicity (Status Indians or Other Residents) and by geography (Core Area or Suburbs).

This study utilized the Manitoba provincial health care data base to observe and analyze a total urban Aboriginal population, specifically Status Indians (N = 12,168) who were residents within Winnipeg. Such findings were compared with all Other Winnipeg Residents (N = 634,936). This study subdivided the Winnipeg population into four subpopulations: Core Area Status Indians; Core Area Other Residents; Suburbs Status Indians and Suburbs Other Residents. This descriptive study quantified demographic profiles and health care service utilization. The research methodology incorporated small area analysis, using a large data base. Analysis focused upon observations of complete hospital utilization (in-patient days per 1,000 population) and complete medical utilization (annual per capita costs) by diagnosis and five age cohorts for a twelve month period, during the 1990-91 fiscal year.

Findings provided descriptive comparisons among all four study groups to Manitoba norms specified for each of 18 major diagnostic categories and specific for each age cohort. Data produced three products for each of the four subpopulations, including:

- Product #1: Population profile by age cohort.
- Product #2: Hospital in-patient morbidity ratios.
- Product #3: Medical (physician only) services
annual per capita morbidity ratios.

Results indicated that Winnipeg Status Indians' use of health care services (both Core Area and Suburbs) was substantially higher than Other Residents of Winnipeg. Core Area Status Indians demonstrated the highest combined hospital inpatient and medical services utilization of Winnipeg's four subpopulations. Suburbs Status Indians ranked second in high health care service utilization. Core Area Other Residents ranked third, demonstrating only a few high hospital inpatient utilization findings. Suburbs Other Residents ranked fourth, demonstrating all utilization rates close to the Manitoba averages. These findings suggest that ethnicity (i.e., being a Status Indian) was a greater factor than poverty in affecting high health care service utilization in Winnipeg.

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Associate Professor Peter Hudson, my Thesis Committee Chair, carefully read and reflected upon each chapter. I thank him for asking the fundamental questions to help me keep a clear focus.

Sincere thanks is also extended to Dr. Brian Postl, Thesis Committee Member, who provided the inspiration for undertaking this study on urban Aboriginal health care. He understood the potential practical benefits to the Aboriginal community, as well as the need for providing a focus for future research on urban Aboriginal health care issues.

I wish to thank Professor Barry Trute and Assistant Professor Sid Frankel for their contributions to design and statistical analyses.

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LIST OF TABLES

TABLE		PAGE
OA	Manitoba Population Distribution, June 1990	101
OB	Winnipeg Population Distribution, June 1990	101
1A	Selected Hospital Utilization of Winnipeg Residents, 1990/91: Infectious and Parasitic Diseases	105
1B	Selected Medical Utilization of Winnipeg Residents, 1990/91: Infectious and Parasitic Diseases	106
2A	Selected Hospital Utilization of Winnipeg Residents, 1990/91: Neoplasms	109
2B	Selected Medical Utilization of Winnipeg Residents, 1990/91: Neoplasms	110
3A	Selected Hospital Utilization of Winnipeg Residents, 1990/91: Endocrine, Nutritional and Metabolic Diseases	113
3B	Selected Medical Utilization of Winnipeg Residents, 1990/91: Endocrine, Nutritional and Metabolic Diseases	114
4A	Selected Hospital Utilization of Winnipeg Residents, 1990/91: Diseases of the Blood and Blood Forming Organs	117
4B	Selected Medical Utilization of Winnipeg Residents, 1990/91: Diseases of the Blood and Blood Forming Organs	118

LIST OF TABLES (continued)

TABLE		PAGE
5A	Selected Hospital Utilization of Winnipeg Residents, 1990/91: Mental Disorders	121
5B	Selected Medical Utilization of Winnipeg Residents, 1990/91: Mental Disorders	122
6A	Selected Hospital Utilization of Winnipeg Residents, 1990/91: Diseases of the Nervous System and Sense Organs	125
6B	Selected Medical Utilization of Winnipeg Residents, 1990/91: Diseases of the Nervous System and Sense Organs	126
7A	Selected Hospital Utilization of Winnipeg Residents, 1990/91: Diseases of the Circulatory System	129
7B	Selected Medical Utilization of Winnipeg Residents, 1990/91: Diseases of the Circulatory System	130
8A	Selected Hospital Utilization of Winnipeg Residents, 1990/91: Diseases of the Respiratory System	133
8B	Selected Medical Utilization of Winnipeg Residents, 1990/91: Diseases of the Respiratory System	134
9A	Selected Hospital Utilization of Winnipeg Residents, 1990/91: Diseases of the Digestive System	137
9B	Selected Medical Utilization of Winnipeg Residents, 1990/91: Diseases of the Digestive System	138

LIST OF TABLES (continued)

TABLE		PAGE
10A	Selected Hospital Utilization of Winnipeg Residents, 1990/91: Diseases of the Genitourinary System	141
10B	Selected Medical Utilization of Winnipeg Residents, 1990/91: Diseases of the Genitourinary System	142
11A	Selected Hospital Utilization of Winnipeg Residents, 1990/91: Pregnancy, Childbirth, and the Puerperium	145
11B	Selected Medical Utilization of Winnipeg Residents, 1990/91: Pregnancy, Childbirth, and the Puerperium	146
12A	Selected Hospital Utilization of Winnipeg Residents, 1990/91: Diseases of the Skin and Subcutaneous Tissue	149
12B	Selected Medical Utilization of Winnipeg Residents, 1990/91: Diseases of the Skin and Subcutaneous Tissue	150
13A	Selected Hospital Utilization of Winnipeg Residents, 1990/91: Diseases of the Musculoskeletal System and Connective Tissue	153
13B	Selected Medical Utilization of Winnipeg Residents, 1990/91: Diseases of the Musculoskeletal System and Connective Tissue	154
14A	Selected Hospital Utilization of Winnipeg Residents, 1990/91: Congenital Anomalies	157
14B	Selected Medical Utilization of Winnipeg Residents, 1990/91: Congenital Anomalies	158

LIST OF TABLES (continued)

TABLE		PAGE
15A	Selected Hospital Utilization of Winnipeg Residents, 1990/91: Conditions Originating in the Perinatal Period	161
15B	Selected Medical Utilization of Winnipeg Residents, 1990/91: Conditions Originating in the Perinatal Period	162
16A	Selected Hospital Utilization of Winnipeg Residents, 1990/91: Symptoms, Signs, and Ill-Defined Conditions	165
16B	Selected Medical Utilization of Winnipeg Residents, 1990/91: Symptoms, Signs, and Ill-Defined Conditions	166
17A	Selected Hospital Utilization of Winnipeg Residents, 1990/91: Injury and Poisoning	169
17B	Selected Medical Utilization of Winnipeg Residents, 1990/91: Injury and Poisoning	170
18A	Selected Hospital Utilization of Winnipeg Residents, 1990/91: Factors Influencing Health Status and Contact with Health Services	173
18B	Selected Medical Utilization of Winnipeg Residents, 1990/91: Factors Influencing Health Status and Contact with Health Services	174
19A	Selected Hospital Utilization of Winnipeg Residents, 1990/91: All Diagnoses	177
19B	Selected Medical Utilization of Winnipeg Residents, 1990/91: All Diagnoses	178

LIST OF TABLES (continued)

TABLE		PAGE
OC	Health Care Utilization Findings: (Frequency of High Utilization)	193
OD	Frequency Distribution: High Utilization of Hospital Days (Exceeding 2.0 Morbidity Ratio) by Subpopulation and Age Cohort	195
OE	Frequency Distribution: High Utilization of Medical Services (Exceeding 2.0 Medical Per Capita Ratio) by Subpopulation and Age Cohort	195
20	Age Cohort Analysis, 1990-91 Age Group: <10	230
21	Age Cohort Analysis, 1990-91 Age Group: 10 - 17	231
22	Age Cohort Analysis, 1990-91 Age Group: 18 - 34	232
23	Age Cohort Analysis, 1990-91 Age Group: 35 - 64	233
24	Age Cohort Analysis, 1990-91 Age Group: 65+	234
25	Age Cohort Analysis, 1990-91 Age Group: All Ages	235

LIST OF FIGURES

FIGURE		PAGE
	Postal Code Map: Winnipeg, Manitoba	75
OA	Manitoba Population Distribution, June 1990	98
OB	Winnipeg Population Distribution, June 1990	98
OC	Winnipeg Core Area Status Indians by Age Cohorts, June 1990	99
OD	Winnipeg Core Area Other Residents by Age Cohorts, June 1990	99
OE	Winnipeg Suburbs Status Indians by Age Cohorts, June 1990	100
OF	Winnipeg Suburbs Other Residents by Age Cohorts, June 1990	100
1A	Hospital Morbidity Ratio: Infectious and Parasitic Diseases	104
1B	Medical Per Capita Ratio: Infectious and Parasitic Diseases	104
2A	Hospital Morbidity Ratio: Neoplasms	108
2B	Medical Per Capita Ratio: Neoplasms	108
3A	Hospital Morbidity Ratio: Endocrine, Nutritional and Metabolic Diseases	112
3B	Medical Per Capita Ratio: Endocrine, Nutritional and Metabolic Diseases	112

LIST OF FIGURES (continued)

FIGURE		PAGE
4A	Hospital Morbidity Ratio: Diseases of the Blood and Blood Forming Organs	116
4B	Medical Per Capita Ratio: Diseases of the Blood and Blood Forming Organs	116
5A	Hospital Morbidity Ratio: Mental Disorders	120
5B	Medical Per Capita Ratio: Mental Disorders	120
6A	Hospital Morbidity Ratio: Diseases of the Nervous System and Sense Organs	124
6B	Medical Per Capita Ratio: Diseases of the Nervous System and Sense Organs	124
7A	Hospital Morbidity Ratio: Diseases of the Circulatory System	128
7B	Medical Per Capita Ratio: Diseases of the Circulatory System	128
8A	Hospital Morbidity Ratio: Diseases of the Respiratory System	132
8B	Medical Per Capita Ratio: Diseases of the Respiratory System	132
9A	Hospital Morbidity Ratio: Diseases of the Digestive System	136
9B	Medical Per Capita Ratio: Diseases of the Digestive System	136

LIST OF FIGURES (continued)

FIGURE		PAGE
10A	Hospital Morbidity Ratio: Diseases of the Genitourinary System	140
10B	Medical Per Capita Ratio: Diseases of the Genitourinary System	140
11A	Hospital Morbidity Ratio: Pregnancy, Childbirth, and the Puerperium	144
11B	Medical Per Capita Ratio: Pregnancy, Childbirth, and the Puerperium	144
12A	Hospital Morbidity Ratio: Diseases of the Skin and Subcutaneous Tissue	148
12B	Medical Per Capita Ratio: Diseases of the Skin and Subcutaneous Tissue	148
13A	Hospital Morbidity Ratio: Diseases of the Musculoskeletal System and Connective Tissue	152
13B	Medical Per Capita Ratio: Diseases of the Musculoskeletal System and Connective Tissue	152
14A	Hospital Morbidity Ratio: Congenital Anomalies	156
14B	Medical Per Capita Ratio: Congenital Anomalies	156
15A	Hospital Morbidity Ratio: Conditions Originating in the Perinatal Period	160
15B	Medical Per Capita Ratio: Conditions Originating in the Perinatal Period	160

LIST OF FIGURES (continued)

FIGURE		PAGE
16A	Hospital Morbidity Ratio: Symptoms, Signs, and Ill-Defined Conditions	164
16B	Medical Per Capita Ratio: Symptoms, Signs, and Ill-Defined Conditions	164
17A	Hospital Morbidity Ratio: Injury and Poisoning	168
17B	Medical Per Capita Ratio: Injury and poisoning	168
18A	Hospital Morbidity Ratio: Factors Influencing Health Status and Contact with Health Services	172
18B	Medical Per Capita Ratio: Factors Influencing Health Status and Contact with Health Services	172
19A	Hospital Morbidity Ratio: All Diagnoses	176
19B	Medical Per Capita Ratio: All Diagnoses	176
20A	High Utilization of Hospital Days for Select Winnipeg Residents, 1990/91 Age Cohort: <10	197
20B	High Utilization of Medical Services for Select Winnipeg Residents, 1990/91 Age Cohort: <10	198
21A	High Utilization of Hospital Days for Select Winnipeg Residents, 1990/91 Age Cohort: 10 - 17	199
21B	High Utilization of Medical Services for Select Winnipeg Residents, 1990/91 Age Cohort: 10 - 17	200

LIST OF FIGURES (continued)

FIGURE		PAGE
22A	High Utilization of Hospital Days for Select Winnipeg Residents, 1990/91 Age Cohort: 18 - 34	201
22B	High Utilization of Medical Services for Select Winnipeg Residents, 1990/91 Age Cohort: 18 - 34	202
23A	High Utilization of Hospital Days for Select Winnipeg Residents, 1990/91 Age Cohort: 35 - 64	203
23B	High Utilization of Medical Services for Select Winnipeg Residents, 1990/91 Age Cohort: 35 - 64	204
24A	High Utilization of Hospital Days for Select Winnipeg Residents, 1990/91 Age Cohort: 65+	205
24B	High Utilization of Medical Services for Select Winnipeg Residents, 1990/91 Age Cohort: 65+	206
25A	High Utilization of Hospital Days for Select Winnipeg Residents, 1990/91 Age Cohort: All Ages	207
25B	High Utilization of Medical Services for Select Winnipeg Residents, 1990/91 Age Cohort: All Ages	208

TABLE OF CONTENTS

	PAGE
Abstract.....	i
Acknowledgements.....	iii
LIST OF TABLES.....	iv
LIST OF FIGURES.....	ix
TABLE OF CONTENTS.....	xiv
1. STATEMENT OF THE PROBLEM	
1.1 Introduction.....	1
1.2 Cultural Context.....	3
1.3 Purpose.....	6
1.4 Definition of Terms.....	8
1.5 Hypotheses.....	17
1.6 Expected Research Findings.....	21
1.7 Conceptual Framework.....	22
1.8 Summary.....	25
2. REVIEW OF THE LITERATURE	
2.1 Introduction.....	27
2.2 Themes in the Literature.....	29
2.3 Socioeconomic Status and Health Care Utilization.....	30
2.4 Aborigines and Health Care Utilization.....	34
2.5 Demographic Statistics.....	37
2.6 Urban Acculturation Stress.....	41
2.7 Epidemiological Data.....	48
2.8 Local Control and Jurisdiction.....	55
2.9 Summary of the Literature.....	57
3. METHODOLOGY	
3.1 Design.....	60
3.2 Data Base.....	67
3.3 Validity and Reliability.....	70
3.4 Data Collection.....	73
3.5 Data Analysis.....	81
3.6 Limitations of the Method.....	90

TABLE OF CONTENTS (continued)

4.	FINDINGS	
4.1	Introduction.....	94
4.2	Demographic Profile.....	97
4.3	Hospital and Medical Services Utilization for Each of 18 Major Diagnostic Categories by Age Cohort for Each of Four Winnipeg Subpopulations, 1990/91.....	102-178
	A. Commentary for Each Diagnostic Category	
	B. Figures for Each Diagnostic Category (Figures 1A to 19A and 1B to 19B)	
	C. Hospital Utilization Tables for Each Diagnostic Category (Tables 1A to 19A)	
	D. Medical Utilization Tables for Each Diagnostic Category (Tables 1B to 19B)	
5.	DISCUSSION AND RECOMMENDATIONS	
5.1	Introduction.....	179
5.2	Summary of the Hypotheses.....	183
5.3	Products of the Study.....	184
5.4	Product #1: Population Profiles by Age Cohort.....	185
5.5	Product #2: Hospital Morbidity Ratios and Product #3: Medical Services Per Capita Ratios.....	187
5.6	Recommendations for the Aboriginal Community.....	213
5.7	Recommendations for Health Practitioners.....	215
5.8	Recommendations for Research.....	216
5.9	Summary of the Study.....	217
6.	REFERENCES.....	221
7.	APPENDIX A.....	225
8.	APPENDIX B.....	229

CHAPTER 1

STATEMENT OF THE PROBLEM

1.1 INTRODUCTION

Canada's insured health care services constitute an essential element of the nation's social fabric. Such social services provide an underpinning or safety net for economically disadvantaged groups within the country. One of these disadvantaged groups in Canada is Aboriginal people. Many federal and provincial studies have documented the conditions of poverty and social upheaval facing its Aboriginal residents. Such poverty has long been correlated with ill health, which corresponds with higher utilization of insured health services and higher mortality. (Canada Health & Welfare, 1987; Manitoba Subcommittee on Indian Health Care, 1985)

Manitoba follows this national pattern of poverty and high health care utilization by its Aboriginal people. Manitoba's Status Indians have been documented as having higher than average utilization of medical and hospital services. Their use of these insured health services has been associated with conditions of poverty (Postl, 1985). Such conditions include high unemployment, low educational achievement, poor housing, poor sanitary conditions and poor lifestyle choices. While the limited number of Aboriginal health

studies in Canada have referred to this association with poverty, none have provided quantitative data regarding specific urban subpopulations for comparative research and analysis. This study intends to provide such descriptive and comparative information.

The need for basic research regarding Aboriginal peoples' high rate of morbidity is apparent. A recent report (McClure et al., 1991) prepared for the National Health Research and Development Program, Health and Welfare Canada, called for such basic studies. It called for better data bases and information systems documenting the size, demographic characteristics and geographic distribution of the Aboriginal populations living in Canadian cities. It described the need for linking all medical information systems, including both hospital data files and medical services data files with population registry files for the same catchment area. This would increase the capacity to document service use, diagnoses and treatment patterns for both urban and rural Aboriginal people. It claimed that no one knows what, if any, are the major differences in the health status of Aboriginal people living in Canadian cities relative to people living on Canadian reserves, nor to what extent the stresses of urban life contribute to health problems. Examination of urban

Status Indian health care utilization, as a component of the Aboriginal community's health utilization, could fill this research void.

1.2 CULTURAL CONTEXT:

Ever since European migrants explored and settled in Canada's prairies, Aboriginal people have interacted with its "new" inhabitants. Because of close association, the Aboriginals were subject to many new infectious diseases such as influenza, measles, smallpox, scarlet fever and tuberculosis. Without any natural immunity, Aboriginal people fell prey to such ills. During early settlement periods, many Aboriginal communities were ravaged by these diseases which inflicted heavy losses. Consequences were devastating, and health care services were minimal (Young, 1986). Traditional medicine had no knowledge of or effective response to these new diseases. From the first reported smallpox epidemic during 1782 in northwestern Ontario, the speed and ferocity of the disease stunned the Indians, causing many to simply abandon their sick. Such catastrophes had profound socio-cultural impacts. From studies on epidemics of American Plains Indians, Taylor (1977) demonstrated that existing religious systems were challenged by these communal catastrophes,

and political leadership was disrupted since kinship, band structure and territorial boundaries were altered.

In Manitoba, the Status Indian populations consist of Cree, Ojibway, Island Lake Dialect, Sioux and Dene. Each has a distinctive culture and language. The lifestyle patterns of each group differ somewhat from each other as well as substantially from the dominant "white culture". Most have been directed toward a rural lifestyle on designated reserves and are controlled by the terms of the Federal Indian Act. While the federal government assumes responsibility for health care services for Status Indian reserve residents, it terminates such responsibility for Status Indians who choose to migrate from the reserves. The Cree use a term for such "city dwellers" whom they call Ihtawiniw (pronounced Outen-a-way-nin). Such "town persons" are seen as removed from the main clans based within the reserve (Manitoba Association for Aboriginal Languages, 1993 telephone interview).

Migration away from the reserve removes each Status Indian from programmatic supports from the federal government and subjects them to factors of urban stress. Many Status Indians migrate off reserves with limited educational and vocational skills. Such preconditions create difficulties for transition to an urban lifestyle for many of them. Urban Aboriginals

are faced with many economic and cultural differences. Such environmental elements cause high levels of stress for Aboriginals and contribute to frequent contact with the insured health services (Postl, 1985).

Health care services for the general populace in Canada are directed by the medical profession, which is based upon Western scientific knowledge. In contrast, health care for many Aboriginals is based within Aboriginal cultural traditions. Such traditions have suggested that sickness of the individual was the result of past transgressions (Dailey, 1958). The Aboriginal healer could intervene with rituals to address the past transgressions. An Aboriginal healer could provide psychological supports to his "patient" and/or treatments such as herbal medicines. The philosophy and practices of Aboriginal healers differ considerably from the Western scientific approach. Aboriginal healers may, however, augment the Western medical model when provided the opportunity, as these services are not necessarily in conflict. In a few instances (e.g., Kenora Health Centre, Kenora, Ontario) traditional healers are allowed to practice within the Western medical clinic setting.

Some Aboriginals adhere to Aboriginal healing practices. Some choose a mixture of the Western medical model as well as Aboriginal healing practices.

Some Aboriginals rely solely upon the dominant Western medical model of health services delivery. The different healing models reflect different assumptions of causation and treatment of illness. Acceptance, or "patient compliance", of the medical model treatment may be low, based upon the Aboriginal individual's understanding and philosophy of care. Recently, some Canadian hospitals have undertaken to add the services of Aboriginal Interpreters to bridge this linguistic and cultural difference. The Interpreter's role is to help the Aboriginal patient make informed medical decisions and to serve as a patient advocate within the Western medical model (O'Neill, 1987).

1.3 PURPOSE:

The purpose of this study is to compare urban health care service utilization between Winnipeg Status Indians and Other Winnipeg Residents. Such comparative analyses would be the first in Canada or the United States. The study will distinguish between a downtown Core Area (low income) and the Suburbs (higher income) in Winnipeg, Manitoba. The Core Area of Winnipeg was selected as a proxy for poverty. This study will detail health morbidity for urban Status Indians (Core Area and Suburbs) for five separate age cohorts. Findings

will provide descriptive comparisons to Manitoba norms specified for each of the 18 major diagnostic categories and each of the five age cohorts. This primary research is intended to result in a better understanding of urban health care service utilization and problems faced by Aboriginal groups. Such information is vital for self actualization and advocacy for change by Aboriginal groups, as recipients of the insured health care services.

Information can serve as a source of empowerment and a necessary tool for advocacy planning and service delivery. McClure et al. (1991) concluded that even very basic information on urban Aboriginal health care has not been collected to date. They noted that data is lacking on the size, demographic composition and migration experience of the urban-based Aboriginal population. This simply has not been collected or is dispersed across less accessible, unpublished program documents. The authors also noted that epidemiological information describing health status and probable causes of morbidity is lacking on the estimated number of Aboriginal people living in each of Canada's cities, along with their distribution, their migration patterns and current patterns of service use. They concluded that existing data on health and service utilization patterns are limited to unrepresentative samples of

survey respondents, self-selected groups of service users, or estimates drawn from medical information systems which can only identify Status Indians.

Improved information on urban Aboriginal health care is critical for the empowerment of Aboriginal people and for health care program directors to focus limited fiscal health care resources towards the best results.

1.4 DEFINITION OF TERMS:

Throughout the literature in Aboriginal studies, the terms "Aboriginal people", "Natives" and "First Nations Peoples" are used interchangeably. Both terms are imprecise due to interethnic marriage and legal definitions within Canada. The Canada Constitution Act (1982), Section 35(2) defines Aboriginal People as being three groups: Indian (Status and Non-Status), Metis and Inuit. This study will use Status Indians, specified by the Indian Act of Canada, as a subgroup of Aboriginal people within Winnipeg. The current research uses the term "Status Indian" because of the total number of Aboriginal people in Winnipeg, only Status Indians can be identified, and because their health care service utilization data is available within the Manitoba insured health care data files. This special population registry data file was created

during the 1960's when Health and Welfare Canada paid health insurance premiums on behalf of Status Indian families to the Manitoba Health Services Commission for coverage of the insured health care benefits. When the Manitoba health care premiums were abolished in 1973, the distinction for Status Indians within the insured population registry was maintained. Currently, insured health care benefits are totally funded from general tax revenues. The other groups of Aboriginal People are not identified in the population registry data files because they paid health care premiums like all other residents in Manitoba during the early 1970's. Status Indians within Canada are also eligible for specific uninsured health service benefits from the federal government when they reside on a rural reserve.

The use of the term "Status Indian" excludes Non-Status Indians (disenfranchised) and Metis. These latter groups do not have the same legal standing in Canada as do Status Indians. Only a few Canadian provinces have set up their health care data files to identify and track Status Indians. The ability to examine the total Status Indian health care utilization currently exists within three provinces: Manitoba, Saskatchewan and British Columbia. Identification of other ethnic/racial groups such as Metis would be

contrary to Canada's Human Rights Legislation. Therefore, identification and tracking are not possible for Non-Status Indians or Metis using any provincial health care data base in Canada. Such groups may be studied by using lengthy survey methods only after locating the appropriate sample population.

It has been estimated by the Winnipeg Social Planning Council (1986) that the Non-Status and Metis Winnipeg Aboriginal population is approximately twice the size ($N = 24,000$ estimated) of the Winnipeg Status Indian population ($N = 12,000$). However, Census Canada (1986) estimated that the number of urban Aboriginals other than Status Indians equals the number of identified urban Status Indians. No precise estimate of Winnipeg Aboriginals, other than Status Indians, is available. Such other groups of Aboriginals are included in this study within the "Other Residents" population ($N = 634,936$) for both Core Area and Suburbs. There are approximately 300 Inuit residents in Manitoba, none who have been identified as residents in Winnipeg. The inability to specify Metis and Non-Status Winnipeg Aboriginal health care utilization is a limitation of this study.

The term "Core Area" designates Winnipeg's downtown and surrounding neighborhoods, which have been identified as low income areas (Census Canada, 1986).

Such neighborhoods were the focus of an economic redevelopment initiative by the federal, provincial and city governments during the 1980's, under a program called the Core Area Initiative. This program began in 1981 to offset several negative social and economic trends identified within the Core Area. The Core Area Initiative Policy Committee described an out-migration from the Core Area which left behind an increasing number of single-parent households, fewer children and a significantly larger proportion of the elderly. They observed a regular in-migration of Aboriginal People, mainly younger individuals and young families, from rural areas to the Core Area. They stated that over 40% of Aboriginal families in the Core Area have single parents. The Core Area Initiative concluded, "severe socioeconomic disparities exist between the native and non-native populations in the core" (p.5). Such observations concluded that the cumulative factors of inadequate employment preparation, poor social circumstances and poor housing contribute to a cycle of poverty in the Core Area.

Recent data from Statistics Canada confirmed that income levels within the Core Area remain low compared to the Non-Core areas of Winnipeg. Statistics Canada data (Small Area Data of Winnipeg, Husband and Wife

Dual Earnings Table, 1990) produced sharply contrasting median income figures for Winnipeg postal code areas.

Details of the Winnipeg median incomes by postal code were as follows:

<u>Core Area</u>	<u>Selected Suburbs</u>	
R2X = \$36,400	St.James:	R2Y = \$52,900
R3E = \$34,600	St.James:	R3K = \$58,400
R3G = \$38,900	Charleswood:	R3P = \$61,200
R2W = \$31,200	Ft.Garry:	R3T = \$52,200
R3A = \$26,500	St.Vital:	R2N = \$53,900
R3B = \$25,400	St.Boniface:	R2J = \$53,400
R3C = \$27,700	N.Kildonan:	R2E = \$65,600
	W. River Heights:	R3N = \$56,300

The lowest median incomes by postal code in the Core Area were R3B, North Portage (\$25,400) and R3A, Exchange District (\$26,500). Within Canada, these urban postal codes were the third and fifth lowest for median dual incomes in 1990. This sharp contrast in incomes between the Winnipeg Core Area and the Non-Core/Suburbs provided the rationale for this study to use the Core Area as a proxy for poverty.

The "Core Area" boundaries of this study approximate those of the Core Area Initiative, Phase I. Details of the boundaries of area for this study are elaborated within Chapter 3, Methodology. Other areas designated as "Suburbs", constitute all Winnipeg areas other than the "Core Area".

This study also utilizes age distinctions throughout all of the data analysis. The age cohorts selected for this study were as follows: Under 10,

10 to 17, 18 to 34, 35 to 64, and 65 and over. Each age cohort is a mutually exclusive grouping. Only five age cohorts were chosen to simplify the analysis for all diagnostic codes. The age distinctions generally represent the following groups: children, teenagers, young adults, middle-aged adults and the elderly. Illustration of morbidity by age cohorts is critical for analyzing the health care services utilization. Also the population profile for each subpopulation differs significantly. The age cohorts document the population distribution within each of the four subpopulations identified.

This study examines both hospital and annual medical (physician only) per capita utilization for the defined subpopulations within a 12 month period. The hospital data represents in-patient utilization only. Care in most emergency wards (without hospital admission) and out-patient department service is not documented through most of the Winnipeg hospitals' information collection systems. This is a further limitation of this study. It is important to note because hospital staff indicate a high percentage of Aboriginal patients choosing such service as opposed to walk-in clinics or physician office visits. As well, clinics such as Mount Carmel Clinic and Health Action Centre do not document utilization for this health

information collection system. Waldram and Layman noted in their Saskatoon study (1989) that hospital emergency departments were a key source of primary health care for urban Aboriginals. Convenience, measured by proximity to a health care facility and its hours of operation were more important to the Aboriginals studied in Saskatoon's inner city, than were loyalty to a particular facility or physician.

All hospital admissions in this study, however, are documented through the hospitals' information systems. Indicators include all hospital days utilized (actual), average length of stay, the ratio of days per 1000 population and expected days (estimate based upon the provincial average for the diagnosis and for the age cohort). The medical utilization represents annual medical costs (actual), annual per capita medical cost (actual) and expected annual per capita medical cost (estimate based upon the provincial average for the diagnosis and for the age cohort). The utilization ratios used in this study (i.e., days per 1000 population and annual per capita medical costs) allow comparison between subpopulations of varying size and with different age distributions.

The diagnostic categories used during this analysis include the standard terminology of the International Classification of Diseases, 9th Revision,

Clinical Modification (ICD-9-CM). This terminology was developed by the World Health Organization and is used internationally. These diagnostic categories were developed to assist the clinical management of individual patients' problems and serve to generate indicators of health status and health statistics. This methodology was adopted in the early 1950's in North America to uniformly access hospital records. The term "clinical" was added to later revisions to reflect the modifications for accessing medical records and ambulatory medical care programs.

The ICD-9-CM diagnostic categories include 18 major groups and are subdivided into smaller, more specific types of morbidity. A complete listing of all 118 diagnostic subcategories of the 18 major categories may be found in the ICD-9-CM Annotated Diseases Tabular List, Volume 1 (1988). Examples of subcategories within each of the 18 major categories are as follows:

- #1: Infectious and Parasitic Diseases:
e.g., Intestinal Infectious Diseases,
Tuberculosis, Viral Diseases, Venereal Diseases,
Parasitic Diseases and Human Immuno-Deficiency
Virus
- #2: Neoplasms:
e.g., Malignant Neoplasms (Cancerous Tumors) and
Benign Neoplasms (Noncancerous Tumors)
- #3: Endocrine, Nutrition and Metabolic Diseases,
Immune Disorders:
e.g., Disorders of Thyroid Gland, Disorders of
Other Endocrine Glands, Nutritional Deficiencies,
Diabetes

- #4: Diseases of Blood and Blood Forming Organs:
e.g., Anemia, Blood Clotting Disorders
- #5: Mental Disorders:
e.g., Organic Psychotic Conditions, Other Psychoses, Neurotic Personality and Non-psychotic Mental Disorders, Mental Retardation
- #6: Diseases of the Nervous System and Sense Organs:
e.g., Inflammatory Diseases of Central Nervous System, Hereditary and Degenerative Diseases of Central Nervous System, Disorders of Eye, Diseases of Ear and Mastoid Process
- #7: Diseases of the Circulatory System:
e.g., Acute Rheumatic Fever, Hypertensive Disease, Ischemic Heart Disease, Cerebrovascular Disease, Diseases of Arteries, Diseases of Veins
- #8: Diseases of the Respiratory System:
e.g., Acute Respiratory Infections, Pneumonia and Influenza, Chronic Obstructive Pulmonary Disease
- #9: Diseases of the Digestive System:
e.g., Diseases of Oral Cavity and Salivary Glands, Diseases of Esophagus and Stomach, Appendicitis, Hernia
- #10: Diseases of the Genitourinary System:
e.g., Disease of Urinary System, Diseases of Male Organs, Disorder of Breast, Inflammatory Diseases of Female Pelvic Organs
- #11: Complications of Pregnancy, Childbirth, and the Puerperium:
e.g., Ectopic and Molar Pregnancy, Abortive Outcome, Complications Mainly Related to Pregnancy, Normal Delivery
- #12: Diseases of the Skin and Subcutaneous Tissue:
e.g., Infections of Skin, Other Inflammatory Conditions of Skin
- #13: Diseases of the Musculoskeletal System and Connective Tissue:
e.g., Arthropathies, Dorsopathies, Rheumatism, Osteopathies
- #14: Congenital Anomalies:
e.g., Cleft Palate, Congenital Dislocation of the Hip, Spinabifida

- #15: Certain Conditions Originating in Perinatal Period:
e.g., Maternal Causes of Perinatal Morbidity,
Other Conditions Originating in Perinatal Period
- #16: Symptoms, Signs, and Ill-Defined Conditions:
e.g., Symptoms, Nonspecific Abnormal Findings,
Ill-Defined and Unknown Causes of Morbidity, and
Mortality
- #17: Injury and Poisoning:
e.g., Fractures, Dislocations, Sprains and Strains
of Joints and Muscles, Intracranial Injury,
Internal Injury, Open Wound, Late Effects of
Injuries and Poisonings, Contusion, Crushing
Injury, Burns, Poisoning by Drugs, Medical and
Biological Substances, Toxic Effects, Non-Medical
- #18: Factors Influencing Health Status and Contact With
Health Services:
e.g., Health Hazards - Communicable Diseases,
Personal and Family History, Reproduction and
Development, Liveborn Infants According to Type of
Birth, Conditions Influencing Own Health, Health
Services for Specific Procedures or Other
Circumstances, Examination - No Diagnosis

1.5 HYPOTHESES:

Assumptions exist among health care workers and administrators that urban Aboriginal people use health services in a manner similar to other urban residents. These are called assumptions, " . . . because there are no data on actual patterns of health service utilization among Aboriginal people living in Canadian cities. Most researchers have been uninterested in general patterns of service utilization and studies have focused on some clinic or program which largely,

or exclusively serves the Aboriginal community" (McClure et al., 1991, p.9). The absence of reliable urban population statistics for Status Indians in Canada underlies the dearth of information on urban Aboriginal health care utilization.

Previous urban Aboriginal health care studies (Postl, 1985 and Waldram, 1989) have sampled small populations and were unable to generalize from their findings. This descriptive, comparative study intends to move beyond such limited findings through its use of morbidity statistics for 100% of Winnipeg's Status Indian population (N = 12,168) during a 12 month period (1990/91 fiscal year).

Hypotheses of this author are that the health care services utilization of the four Winnipeg subpopulations will adhere to a rank order, based upon factors of poverty and urban acculturation stress. The predicted levels of health service utilization are as follows:

Core Area Status Indians	-	Highest Utilization
Core Area Other Residents	-	High Utilization
Suburbs Status Indians	-	Above Average Utilization
Suburbs Other Residents	-	Average Utilization

In each case, these hypotheses are based upon the premise that health care service utilization is inversely proportional to socioeconomic status if physical and geographic access is constant for all

subpopulations. In other words, if there are differential patterns of health care service utilization, these are associated more with socioeconomic status than with ethnicity (Status Indian or Other Residents). Existing literature has also suggested that Status Indians, regardless of residence, may be subject to greater acculturation stress than the general population. These factors directed the formulation of four hypotheses to predict health care service utilization for each of the four Winnipeg subpopulations.

The summary of this study's hypotheses are as follows:

Hypotheses in Rank Order
for Health Care Utilization

Subpopulation	Expected Utilization	Rationale
1. Core Area Status Indians	Highest	Poverty Acculturation Stress
2. Core Area Other Residents	High	Poverty
3. Suburbs Status Indians	Above Average	Higher Median Incomes Acculturation Stress
4. Suburbs Other Residents	Average	Higher Median Incomes

It is assumed that the question of service access within Winnipeg does not constitute a problem for any of the subpopulations. This author uses the premise that no structural limitations exist. This includes no limitations on access of health care services because all residents have the same geographical distances to service within Winnipeg. As well, it includes no financial barriers due to the existence of universal health care coverage for all Winnipeg subpopulations. If no structural limitations to health care services existed within Winnipeg, and morbidity was similar between Status Indians and Other Residents, then Status Indians would demonstrate near average health care service utilization. If there were barriers to service for Status Indians, then the existing data base would only understate findings of high health care service utilization. However, this author does not anticipate any patterns of low utilization by urban Status Indians because of the accessibility and availability of health care services within Winnipeg for all residents.

During the 1990/91 fiscal year, Winnipeg had a supply of 3148 acute care hospital beds, 691 extended treatment hospital beds, 426 general practitioners and 607 medical specialists to serve its urban population of 647,104, plus serve rural referrals for specialty care (M.H.S.C. Annual Report, 1990/91).

1.6 EXPECTED RESEARCH FINDINGS:

This basic research will examine whether the key hypotheses listed on page 19 are found to be correct, based upon the findings from the health care service utilization of four Winnipeg subpopulations. The focus of this study is on the Status Indian subpopulations (Core Area and Suburbs). Data will be generated from the Manitoba data bases of insured residents, insured in-patient hospital utilization and insured medical services utilization for all Winnipeg residents.

This study will produce three separate products for comparison of four Winnipeg subpopulations (Core Area Status Indian, Core Area Other Residents, Suburbs Status Indians and Suburbs Other Residents). These products will include:

- Product #1: Population profile by age cohort for each of four subpopulations;
- Product #2: Hospital morbidity ratios for four subpopulations; and,
- Product #3: Medical (physician only) services per capita ratios for four subpopulations.

Descriptive information provided within these three products will answer the following questions:

- A) What is the Status Indian population in Winnipeg for both the Core Area and its Suburbs?
- B) How is the population profile (age cohort distribution) different for each subpopulation?

- C) Do Core Area Residents (Status and/or Others) utilize higher rates of in-patient hospital services, by diagnosis, than Suburbs Residents?
- D) Do Core Area Residents (Status and/or Others) utilize higher rates of medical services, by diagnosis, than Suburbs Residents?

Similar research questions have been raised in previous urban Aboriginal studies (e.g., Waldram, 1989) which were limited to a sampling technique ($N < 300$). This study, however, is an attempt to provide an accurate baseline of health service utilization for all urban Status Indians, resident in Winnipeg ($N = 12,168$) during 1990-91. Both hospital data and medical data will be incorporated in the analysis to document variations in insured health care services utilization. All health services data will be linked to the insured population registry for the Province of Manitoba to calculate accurate rates of utilization for the identified 12 month period.

1.7 CONCEPTUAL FRAMEWORK:

Several studies on Aboriginal epidemiology (Moffat, 1987; O'Neil, 1986; Young, 1987) in Canada have been completed during the last two decades. Such studies have noted high incidence of respiratory disorders, diabetes, accidents and poisonings related to lifestyle factors. Other descriptive studies (Grescoe, 1977; Jarvis, 1982; Schaefer, 1977) have identified numerous health problems as products of

political and economic conditions which exist in Aboriginal communities. Conditions of poverty are linked to higher than average health care utilization. Questions of which types of urban Aboriginal morbidity which might be linked to a profile of poverty (e.g., Core Area conditions) remain unanswered. The First Nations Urban Bibliography (McClure et al., 1991) argued that such information is a source of empowerment and a necessary tool for advocacy planning and service delivery. These authors stated in their review that:

" . . . published and unpublished research indicated that even very basic information has not been collected; for example, data are lacking on the size, demographic composition and migration experience of the urban-based Aboriginal population. . . Data on health service utilization patterns are limited to unrepresentative samples of survey respondents, self-selected groups of service users, or estimates. . . Information is so critical to empowerment. . ." (p. 65).

Studies specific to Manitoba have used indicators of mortality and morbidity to demonstrate differences between Status Indians and other Manitoba residents. These include the 1976 Indian Health Care Review for Cabinet, the 1982 Review of Changes in the Living Conditions of the Registered Indian Population by the Social Planning Council of Winnipeg, the 1985 Core Area/Health Action Centre Study, and the 1985 Indian Health Services Subcommittee of the Health Services Review Committee. The limits of previous studies

(e.g., small sample size and restricted morbidity data) have restricted findings to date. Such comparisons have lacked specificity (e.g., urban poverty related to specific morbidity and age cohorts) and/or have failed to isolate the urban Winnipeg Status Indian population from rural Status Indians. This study identifies Winnipeg's Status Indian population within both the Core Area as well as in its suburbs. Age cohorts are identified within each subpopulation to examine the health care service utilization for distinctions among diagnostic and age variables.

The Core Area of Winnipeg, like other urban central areas in Canada, consists of a population easily described as at greater risk than the general population. The Core Area/Health Action Study (Postl, 1985) stated that high levels of poverty, unemployment, poor housing and high transiency in Winnipeg's Core Area all contribute to the risk of poor health. While this study noted a large concentration of people of Indian ancestry who contribute to the inherent risk, it was unable to describe or address the specific Aboriginal problems. An additional study completed by the Social Planning Council of Winnipeg entitled, "Community Infokit" (1983) utilized Core Area and Non-Core Areas to illustrate key urban Aboriginal social policy concerns. Morbidity and mortality

measures of Status Indians were not specific to the urban setting (data was for all of Manitoba Status Indians). Descriptive information (e.g., hospital admissions per 1000 population) contrasted utilization with national averages. The ability to suggest differences and outline concrete recommendations for improved urban Aboriginal or urban Status Indian health service delivery was thus prohibited in previous urban studies.

1.8 SUMMARY

This study will utilize the Manitoba provincial health care data base to observe and analyze the total Winnipeg Status Indian population (N = 12,168). The research design will be a descriptive, comparative study to quantify demographic profiles and health care services utilization. The research methodology shall be small area analysis, using a large data base. This study will subdivide the Winnipeg population into four subpopulations: Core Area Status Indians; Core Area Other Residents; Suburbs Status Indians and Suburbs Other Residents. The analysis will focus upon twelve months' (1990/91) hospital utilization and medical utilization by diagnosis and five age cohorts. All 18 major diagnostic categories (ICD-9-CM) will be

examined, providing comparison of four subpopulations defined by ethnicity (Status Indians or Other Residents) and by geography (Core Area and Suburbs).

This descriptive, comparative study will be the first of its kind in North America.

REVIEW OF THE LITERATURE

2.1 INTRODUCTION:

Urban Aboriginal health care service utilization patterns remain open to speculation and research. While a small number of previous Canadian health care studies have described differences between urban Native and other urban residents, no definitive findings have been provided. To date, there are no Canadian comparative studies on urban Aboriginals or urban Status Indians which clearly document patterns of health care service utilization, based upon the entire urban Status Indian population. Previous studies were limited by sampling techniques with small samples ($N < 300$, Waldram, 1989) or an inability to identify urban Aboriginal or Status Indian health care service utilization as a component within Winnipeg's Core Area (Postl, 1985). Generalizations drawn from such studies have therefore been quite limited and speculative. Neither an accurate population profile, nor a description of health care service utilization of urban Aboriginals or urban Status Indians have preceded the current study.

The intent of this descriptive, comparative study is to address this deficiency, using a total Status Indian population ($N = 12,168$) in Winnipeg, Manitoba

during the 1990/91 fiscal year. Information about the total Aboriginal population's health care utilization cannot be identified through existing large data files of the insured health care programs. This is because the component subgroups of Non-Status and Metis cannot be legally identified or tracked through the insured health care data files. However, it is feasible to quantify urban (Winnipeg) Status Indian health care service utilization and provide comparisons because they are legally identified and can be tracked through the insured health care data files. Descriptions of differences and similarities between Winnipeg Status Indians' and Other Winnipeg Residents' health care service utilization will be addressed in this study. The research design will use small area analysis to provide indirect comparisons of four urban subpopulations to the provincial utilization norm for each diagnostic category and each age cohort. Such new information can be used for the practical purposes of designing preventive health measures to address Core Area Status Indians' health care service utilization patterns. Precise utilization comparisons for Winnipeg Status Indians (Core Area and Suburbs) and Other Winnipeg Residents (Core Area and Suburbs) will be undertaken and may help in future health care planning.

2.2 THEMES IN THE LITERATURE:

During 1991, an annotated "First Nations Urban Health Bibliography" was compiled by McClure, Boulanger, Kaufert, and Forsyth. These authors described a dearth of research on the topic of urban Aboriginal health care. Their summary observations were as follows:

- A) Literature documenting the health status of Aboriginal peoples living in urban areas is limited in volume.
- B) The dominant theme in much of this literature was the negative impact of acculturation and adaptation to urban life on the health of the Aboriginal community.
- C) Very few sources of actual statistics on rates of morbidity, mortality or patterns of health services utilization exist to describe urban Aboriginals.
- D) Epidemiological materials describe the general health of Aboriginal peoples regardless of their residence (rural or urban).

McClure et al. (1991) concluded that there is only very limited literature dealing with Aboriginal urban health care issues. Previous contributions have addressed general themes of urban acculturation and socioeconomic factors affecting the urban Aboriginal migrant. A small number of studies have been undertaken in Vancouver (Stanbury, 1975) and Saskatoon (Waldram, 1989) on urban Aboriginal health care. Their sampling methodology of 200 to 300 per study limited the scope and findings. Where comparisons of health

care utilization were made, each study contrasted inner city Aboriginals with inner city non-Aboriginals.

Little hard data exists to document actual urban Aboriginal health care service utilization relative to the provincial average rates of utilization.

2.3 SOCIOECONOMIC STATUS AND HEALTH CARE UTILIZATION:

A review of the general literature on poverty and health status reveals clear linkages between low socioeconomic status and higher use of health care services regardless of affiliation to minority ethnic groups. Kosa et al. (1969) argued that, "on an a priori basis, there appear to be adequate reasons for expecting substantial differentials between the health level of the poor and that of the rest of the population" (p. 71). These authors suggested that reduced chances for the poor to move on the social ladder (an inelastic society) may perpetuate chronic conditions of poverty. Race (e.g., several minority ethnic groups such as Blacks, Hispanics and Puerto Ricans) was described as a major category of deprivation, which "blocks the acquisition of means and privileges" within society (p. 19). These authors argued that the poor demonstrate a lower resistance to infectious agents. In addition, it was suggested that disability days and family income clearly demonstrated

an inverse relationship. Kosa et al. (1969) labeled poverty as a causative factor regarding health status. These authors stated that, "The picture is clear. Whatever aspect of health, whatever stage of morbid episode is examined, the poor are at a disadvantage" (p. 325).

Others in the United States have described the health problems of the poor and disadvantaged as being both more numerous and more complex than those of higher income levels. Davis and Schoen (1978) observed that, "poor nutrition, inferior housing, inadequate sanitation, and the physical and psychological stresses of unemployment and deprivation all interact to intensify the health problems of the poor" (p. 10). They also noted that for every level of health status, those receiving public assistance utilized greater volumes of health care services than did the general population. Davis and Schoen (1978) cautioned, however, that an attack on ill health of the poor which focuses exclusively on the medical treatment of illness will not be as successful as one which deals with both the causes and the symptoms of ill health.

Luft (1978) also supported the inverse correlation between poverty and high health service use in the United States. Luft argued that comparisons of income and education results for adults supported the

hypothesis of a causal linkage between factors of income and education to morbidity patterns. In addition, Luft also noted that the probability of chronic disabilities was increased among low income groups.

Patrick (1988) supported this contention, noting that people in poverty experience more than their share of the excess of ill health and death in the United States. While debate continues about causal factors of poverty and ill health, low income has been linked repeatedly to poor health status. Patrick questioned the extent to which health care services by themselves could improve the health status of the poor when even combined initiatives, such as education and jobs programs, have had a minimal impact on reducing socioeconomic inequalities.

A further examination of poverty and child health in the United States clearly linked poverty with both higher childhood mortality rates and with higher disability rates. Wise and Meyers (1988) observed that "the power of poverty lies as much in its pervasiveness as it does in its deadening persistence. It is not surprising, therefore, that childhood poverty has been linked to a variety of specific health care problems" (p. 1171). These authors described higher infant mortality rates for the poor and noted that

poverty increases the probability that a pregnancy will end in the delivery of a low birth weight baby (less than 2500 grams). Low birth weight babies are at greater risk and may more likely be born with chronic health care disabilities if they survive infancy. Wise and Meyers also observed that children of poor families experienced more time lost from school and more days of restricted activity due to illness than those of the nonpoor. Controlling for birth weight, these authors observed that poor infants had greater postneonatal mortality, lower IQ scores, and were more likely to exhibit behavioral problems in school. They concluded that the legacy of the low birth weight place the poor child in double jeopardy by sending a high risk infant into an obviously high risk environment. These conditions represent the worst scenario of the nature/nurture growth conditions for any child.

Such conditions are also mirrored within the Canadian context. Schlesinger (1982) described why many Canadians are poor. In addition to factors of high unemployment, low education, language barriers, being tied down by social responsibilities (single parent families), and disabilities, Schlesinger noted conditions of social and personal problems among the poor. "Many have sought escape in delinquency, drugs, or alcohol, and chronic dependence on assistance from

the government" (p. 5). The long term, chronic nature of poverty was underscored in relation to possible potential improvements resulting from interventions from either health or social service programs in Canada.

A further analysis of poverty in Canada by Vance and McKenzie (1991) indicated a clear relationship between ill health and childhood poverty. These authors raised concerns about the perpetuation of conditions of poverty and their associated problems, such as chronic ill health for many poor. Vance and McKenzie stated that "research suggests links between child poverty and poor physical and mental health, illiteracy, chronic unemployment, criminality and other problems in adult life" (p. 7). These authors described an association between low income and the other factors which are both additive and interactive. They did not provide any causal theories for poverty and ill health, nor did they link the special factors related to the Aboriginal communities in Canada.

2.4 ABORIGINALS AND HEALTH CARE UTILIZATION:

In 1983, factors within the Aboriginal communities were addressed when Canada's House of Commons received the Report of the Special Committee on Indian Self Government (Penner, Chairman) which documented the poor

socioeconomic status of Aboriginal People relative to the general Canadian population. This Report noted conditions of social disintegration and deprivation arising from the colonial treatment of Aboriginal people by the Government of Canada. Three areas of critical concern were identified which had caused damage to the Aboriginal cultures. These areas of concern included education, child welfare and health care. Health care concerns were discussed within the context of self-government (or lack of it) and social consequences. The Penner Report stated that:

"The interrelationship between health care and other factors such as housing, community infrastructure and employment cannot be denied. An unhealthy child with low resistance to colds and infections is unlikely to do well at school. An alcoholic mother may bear a child suffering from fetal alcohol syndrome. Health, in particular preventive health care, is an essential component of many other programs and activities. A holistic approach is required. Indian communities would like to have the power to establish priorities, co-ordinate over-all planning, and control the process of health care." (p. 34)

The Penner Report urged that jurisdiction over such areas as education, child welfare and health care was required to offset the problems of the past colonial treatment of Aboriginal peoples.

In 1985, the Manitoba Report of the Health Services Review Committee (Volume III) provided documentation on Indian Health Care. This Report stated:

" . . . that the health of Manitoba's Indians is far below acceptable levels on any health status index is beyond dispute . . . chronic and lifestyle diseases dominate.

"Overcrowded housing, poor water and sanitation, and high unemployment contribute to the ill health of Indian people. The impact of these social and environmental indices on health is evident in suicide rates and psychiatric illness that far exceed national averages.

"All of these factors contribute to a rate of service utilization that is highly disproportionate to the general population. Large amounts of monies are being expended and the impact of that expense is less than we might hope for. Superimposed on these problems are bureaucratic structures and jurisdictional wrangles that lead many Indians and Inuit to the frustrating perception that the system is insensitive to their needs and uncaring of their aspirations." (pp. 165-166)

Specific reference was made regarding the special health needs of urban Aboriginals. The Manitoba Report concluded that there was, "a great gap in knowledge pertaining to the health status of Indians and non-status Natives in urban areas" (p. 196). Based upon limited evidence, however, the Report observed that this urban population is growing, it is at high risk relative to the general population, and it will place even greater demands upon Winnipeg health

services in the future. It noted that 10% of recent Aboriginal migrants to Winnipeg listed their reasons for the migration as being medical in nature (e.g., renal dialysis is not available in some rural locations). This joint Report of three levels of government and Indian organizations recommended that a survey of urban migration and urban health needs be undertaken. This has not been done to date.

York (1990) argued that the current health status of Aboriginal people cannot be understood separately from a history of social and political oppression. He stressed that both factors required careful understanding. He cautioned, however, that, "an overly historical focus may distract attention from structural factors in the present situation" (McClure et al., 1991, p. 18). The many negative socioeconomic factors of urban Aboriginal life could be underscored before examining the negative health status indicators. Without such vital background information, a casual observer of high health care service utilization may "blame the victim" for abusing the health care system.

2.5 DEMOGRAPHIC STATISTICS:

Demographic measures of urban Aboriginals have been imprecise to date. Previous investigations concluded that "demographic statistics showing the

population distribution of people living on and off reserves are unreliable" (McClure et al. 1991, p. 9). Furthermore, no studies have been undertaken to quantify which proportion of urban Aboriginal residents are long-term and which proportion have recently migrated from reserves. It is possible that this study includes many Status Indian families who are third, fourth or fifth generation Winnipeg residents. For these long-term residents, however, factors of urban acculturation stress are not diminished due to cultural differences and pressures from the dominant society, such as discrimination and fewer opportunities for social mobility.

Using the 1986 Census data, the Social Planning Council of Winnipeg compiled a description of Winnipeg Aboriginals (including Status Indians, Non-Status Indians and Metis as per Statistics Canada methodology). The Planning Council's 1986 "Information Kit" illustrated demographic trends for all Winnipeg Aboriginals. This combined Aboriginal population was estimated to be 27,475 people (N = 11,640 inner-city and N = 15,855 non-inner city). Highlights of this Winnipeg Aboriginal demographic profile include the following:

- A) Winnipeg's Aboriginal population was much younger than the non-Native population.

- B) The average Aboriginal household contained 3.1 persons compared to 2.5 persons for the non-Aboriginal household.
- C) Aboriginal household maintainers were, on average, younger than non-Aboriginal maintainers.
- D) More than three times the proportion of single parent families existed among Aboriginal than non-Aboriginal families.
- E) While the level of education has improved since 1981, 19.9% of Aboriginals, city wide, had less than a grade 9 education. In the inner city, 27.7% of Aboriginals and 21.7% of non-Aboriginals had less than a grade 9 education.
- F) Aboriginal unemployment in 1986 was reported at 21.6% vs. 7.2% for the non-Aboriginal workforce. The Aboriginal labor force participation rates were 61.7% compared to 68.6% for non-Aboriginals.
- G) Household incomes showed a marked disparity. The city wide non-Aboriginal household average income was \$33,295. The average income was \$13,913 for inner-city Aboriginals, and \$26,609 for non-inner city Aboriginals.
- H) The income disparity between Aboriginals and non-Aboriginals increased as the age of the head of the household increased. Incomes for inner-city Aboriginals actually declined after the age of 44.
- I) Aboriginals had less opportunity to own housing due to low levels of education, employment and average income. Housing affordability was a problem for Aboriginals. Over 63% of Aboriginal households, city wide, spent more than 25% of their income on rent.
- J) Aboriginals were in a disadvantaged position in all socioeconomic areas. Earnings were less, education levels were less, and unemployment was higher. Inner-city Aboriginals suffered the most.

The demographic profile listed above made no specific reference to health care service utilization for Aboriginals.

Health and Welfare Canada is another source of demographic statistics. Their draft report Evaluation of Indian Health Services (1990) described general (not urban) Status Indian health conditions, noting general mortality, hospital morbidity, and factors affecting health status.

- A) General Mortality:
Indians have a shorter life expectancy. Indian infant mortality rates are three times that of non-Indians, due especially to infections, parasitic and respiratory diseases, injuries and poisonings. Mortality for Indian teenagers and young adults is four times that of non-Indians due largely to injuries and poisonings.
- B) Hospital Morbidity:
Hospital morbidity statistics for Manitoba, Saskatchewan and British Columbia show that Indians have higher hospitalization rates for all diagnoses other than cancer. Rates which are exceptionally high include infectious and parasitic diseases, respiratory problems and skin diseases. It was noted that chronic diseases are becoming a major health concern for Indians. Diabetes cases were indicated to be twice the rate for other Canadians.
- C) Factors Affecting Health Status:
These factors included general socioeconomic variables. The Health and Welfare Report noted that Indian per capita income in 1980 was only 38% of that of other Canadians. It stated that Indian dependence on government support was about twice that of other Canadians. Variables of education, employment, income and health status seemed to improve together. In Canada, there is a clear and inverse correspondence between the hospitalization rates and the socioeconomic conditions found on reserves.

The methodology of this Health and Welfare Report was limited to only three of Canada's provinces. It

made no distinction for urban Status Indians. Research has been frustrated by such limitations. "Demographic or health data provided by either the Indian Health Service or Medical Services tend to exclude urban migrants and are best described as fragmentary and incomplete" (McClure et al. 1991, p. 9).

2.6 URBAN ACCULTURATION STRESS:

McClure et al. (1991) have reported that Canadian psychiatrists, Brant and Katz in 1990, "suggest that problems of acculturation occur as the result of fundamental differences in the values of Aboriginal and Euro-Canadian cultures." (p. 22) Brant and Katz described traditional cultural traits of Aboriginal People which they see as dysfunctional for living in an urban society, such as communication styles which are non-assertive and do not express anger.

In 1985, Shah and Farkas suggested, "that problems of adaptation to urban life, unfamiliarity with urban health care systems and Aboriginal and non-Aboriginal communication problems exacerbate preexisting health problems" (McClure et al., 1991 p. 21).

Research on Aboriginal migration to urban centres is a limited body of literature. Authors Clatworthy (1980) and Stanbury (1975) have documented the motives of migrants who move from the rural and remote reserves

in British Columbia. The primary reasons for relocation were employment and family (e.g., avoiding family problems on the reserve, or incentives to share the urban setting with the Aboriginal family or relatives).

In his Winnipeg survey, Clatworthy (1980) listed five major reasons for Aboriginal migration from reserves:

- A) Search for better employment and education opportunities;
- B) Better access to quality medical services;
- C) Better access to and quality of housing;
- D) Desire to escape reserve-related problems; and,
- E) Maintain family ties in the urban context.

The hypotheses of this study listed in Chapter 1 suggest that poverty, not ethnicity, will be the primary factor to influence high health care services utilization. Health care service utilization is expected to be inversely proportional to family socioeconomic status. Existing literature did, however, also suggest that Aboriginals may be subject to greater acculturation stress than the general population (McClure, 1991), thereby negatively influencing health care service utilization. The factors of poverty and acculturation stress both led to the formulation of four hypotheses (in rank order) for predicting health care utilization for each of the four subpopulations.

In summary, this study's hypotheses are as follows:

Hypotheses in Rank Order
for Health Care Utilization

Subpopulation	Expected Utilization	Rationale
1. Core Area Status Indians	Highest	Poverty Acculturation Stress
2. Core Area Other Residents	High	Poverty
3. Suburbs Status Indians	Above Average	Higher Median Incomes Acculturation Stress
4. Suburbs Other Residents	Average	Higher Median Incomes

Due to lower incomes, higher unemployment, lower educational achievement, poorer housing and greater proportions of single parent families, the Social Planning Council (Information Kit, 1986) deemed Core Area families to be at greater disadvantage. Urban Aboriginals were deemed to be at the greatest disadvantage in the Core Area. Therefore, this author assumes that Aboriginal urban acculturation stress will be greater in the Core Area. Aboriginal urban acculturation stress in the Suburbs is assumed to have less impact due to higher median incomes and the use of

better coping measures, thus providing for greater adaptation than Aboriginals in the Core Area.

Urban migration requires adaptation. Migration from Indian reserves to urban areas is stressful. Such migrants often move from conditions of poverty to new conditions of poverty. Some buffers exist to cushion negative effects of the urban migration. Three authors attempt to explain how urban Aboriginal families use different mechanisms for coping with change, and how they survive within the context of urban stress.

The first view by Dosman (1972) suggests that close kinship relationships characterize only the Aboriginal poor and do not apply to upwardly mobile urban Aboriginals. A different view suggested by Frideres (1983) holds that the extended family is a cultural tradition serving a positive influence, a cushion for financial or emotional stress. The third view suggested by Peters (1984) provides a structural orientation which views the family as an adaptive coping mechanism to systemic economic stress (e.g., subsistence on welfare). Each of these views describing urban Aboriginal family coping mechanisms, suggests a few mitigating factors despite the high stress related to conditions of poverty.

Dosman has defined four urban Aboriginal family types based upon stability and access to resources.

These family subgroups illustrate Aboriginal differences in urban adaptation. They include:

- A) Affluent: Steady employment; comfortable private homes; migration to the city is carefully planned to "better" neighborhoods; home ownership is stable; family life is stable; extended family relationships are supported; visibility to the dominant community is demonstrated through leadership roles and articulation of Pan-Indianism with renewed interest in Indian languages and Native art work.
- B) Self-Supporting: Income is lower than the affluent; earnings replace or supplement welfare; political connections are not as prestigious as the affluent.
- C) Semi-Dependent: Welfare dependency; no household property of value; illegitimacy or illness illustrate family problems; and homes are described as "messy" by above groups.
- D) Confirmed Indigent: No desire for gainful employment; no aspirations for property ownership; family problems are multiple.

Frideres has provided a similar description of urban Aboriginal subgroups based upon stability of residence. Frideres' subgroups include:

- A) Successful Urban Entry:
Full time employment supports single family units with adults and children; housing is "acceptable"; access to education and health services approximates white middle-class families.
- B) Established Residency:
Employment is marginal or non-existent; predominantly female with young dependents; support is received from family and government services; established residency means not returning to the reserve.

C) Transient:

Seasonal urban residence is secured while social ties are retained on the reserve; urban employment is not secured; understanding of urban agencies is limited and repeated migration between reserve and city is frustrating for Indian residents in each locale.

Frideres contended that public service organizations have failed to integrate Aboriginals into urban society. He defines public service organizations by their provision of a functionally-specific service (e.g., health or education) to the general public. Little or no attention is given by the politicians and/or the service providers to the special needs of urban Aboriginals. Despite high rates of hospitalization and premature death, public service agencies have not targeted service resources to address the high service needs of urban Aboriginals. Frideres stated that such agencies, "do not assist most Natives to live in the city as competent citizens (rather, they) more often present a barrier that denies Natives entry into the mainstream of urban Canadian life." (p. 200) Urban Aboriginals are often viewed as insignificant to urban social problems because they are seen as outsiders, a transient within the urban setting. The stereotype of the 'Native urban migrant' still persists despite the fact that many Aboriginals have long established urban residency.

Urban Aboriginal alcohol usage was studied by Drew (nee Reiche, 1980). Her thesis examined drinking

relative to acculturation stress in Toronto. She argued that urban life for Aboriginals presented more stress than life on a rural reserve. Drew defined three types of stress for urban Aboriginals:

- A) Extrapersonal Stress:
Types of stress included managing finances, transportation, getting a job, type of housing, pace of urban life, number of people in the neighborhood.
- B) Intrapersonal Stress:
Types of stress included concern about being on time, amount of sleep, caring for personal belongings, language, type of food, type of clothes, religious practice.
- C) Interpersonal Stress:
Types of stress included non-Aboriginal understanding of Aboriginal behavior, raising children, family closeness, acceptance by non-Aboriginals.

Drew also linked alcohol abuse with urban living and the difficulties of acculturation faced by Aboriginal people moving to the city. She observed that 72% of those interviewed said that, "drinking was a major problem for many of those who had moved from the reserves to the city (Toronto)" (p. 198).

Drew concluded that extrapersonal stress was most taxing upon urban Aboriginals. Common reasons cited for drinking included: to forget about problems in the city, to relieve boredom, to be sociable and to meet people. Sources of help sought by urban Aboriginals for alcohol problems included: Aboriginal organizations, detoxification units, Alcoholics

Anonymous, friends and a family member. This study examined the stress of transition from rural reserves to a large urban centre. Demands to change, adapt and readjust to the dominant culture were detailed. The ability to cope varied with the level and preparation of each family to adapt. Drew's acculturation theory of urban Aboriginals suggested high levels of stress, difficulties in coping with urban life, and frequent contact with social service and health care agencies. Such preliminary evidence influenced the hypothesis that Winnipeg Core Area Status Indians would demonstrate the highest urban health care service utilization.

2.7 EPIDEMIOLOGICAL DATA:

McClure et al. (1991) concluded that "the epidemiological data on patterns of mortality and morbidity among Aboriginal people are relatively few, relatively unreliable, and relatively scattered" (pp. 10-11). They argued that "both the Canadian data and the international literature are marked by the same gaps in statistical data and by the same problems of interpreting those data which do exist" (p. 18). These authors insisted that there is a common failure to move beyond the immediate etiology of existing health problems and look at the broader historical, political

and economic context of health. The paucity of urban epidemiological studies about Aboriginal residents has led to speculation about factors associated with health care rather than health care utilization itself. Such health care data is not easy to access. These authors called for further research to provide precise documentation of urban Aboriginal health care service utilization patterns. This study seeks to address this concern.

The Winnipeg Core Area/Health Action Centre Study (Postl, 1985) published significant initial findings about the topic of Core Area health care utilization. This study noted a large concentration of people of Indian ancestry within the Winnipeg Core Area population, but their population numbers were not quantified and their health care utilization could not be specified. This Core Area general population was characterized by a high level of poverty, high unemployment rates, a low degree of educational achievement and a high number of single parent (usually female) families. From such findings, the Report's recommendations called for programatic change to include expanded family planning services, expanded health promotion activities, increased immunization coverage, enforced City housing by-laws to reduce the spread of contagious diseases, expanded treatment

services for alcoholics, and expanded mental health services and suicide response. The Report described many multiproblem families representing high morbidity, plus frequent use of Winnipeg public health services and insured health services.

A limitation of the Winnipeg Core Area/Health Action Centre Study was that it did not distinguish between Core Area Status Indians and Other Core Area Residents. While the authors noted a large concentration of people with Aboriginal ancestry, specific demographic and health care morbidity profiles of urban Core Area Status Indians were not developed. The current study adds such detail as well as morbidity comparisons specific to the diagnostic category and the particular age cohort. Such detail is necessary to test the hypotheses of this author as outlined in Chapter 1. The findings of this study should indicate similar high health care service utilization for the Core Area (Status Indians and Other Residents) as well as similar average health care service utilization for Suburbs Residents (Status Indians and Other Residents). The underlying premise of this study is that health care service utilization is inversely proportional to socioeconomic status. However, the additional factor

of acculturation stress as applied to both Status Indian subpopulations has been incorporated into the hypothesis, thus affecting the rank order.

A recent study did attempt to add some detailed comparisons between different inner-city residents. Waldram and Layman (1989) conducted a comparative health care study of Aboriginal and non-Aboriginal inner-city residents of Saskatoon. This study was based upon 226 total interviews. Comparisons were made between the two inner-city groups. The authors focused upon the kinds of services which were utilized, not on complete morbidity patterns of all the inner-city residents. The study found many similarities between the two inner-city groups. Key findings of the Saskatoon survey include the following:

- A) Poverty is of primary influence upon health care utilization patterns. Many similarities (e.g., lower mean income and higher unemployment) between disadvantaged Aboriginals and non-Aboriginals indicated similarities in patterns of health care utilization.
- B) Other socioeconomic factors (e.g., sex, age and marital status) influence health care utilization. Females, both Aboriginal and non-Aboriginal, demonstrated greater utilization of the health care system and better attitudes toward health than males.
- C) Hospital emergency departments were key sources of primary health care for both inner-city groups.
- D) Many Aboriginals demonstrated a strong attachment to the traditional medicine systems even though such systems were largely unavailable in Saskatoon.

In 1976, the Manitoba Government (unpublished Report to Cabinet) concluded a review of services provided to Status Indians on and off reserve. The findings regarding health services indicated a poor health status for all Manitoba Status Indians as demonstrated by hospital utilization (days per 1000 population), almost double that of the provincial average for other residents. The Report noted that health services generally provided an ill health, curative approach having limited impact upon Status Indians. It suggested that several preventive health care services were required in addition to the curative approach. The 1976 Report stated that "until risk factors are reduced, no reduction in current heavy hospital and medical utilization can be expected" (p. 26). The Report noted age specific diagnostic concerns for Status Indians in two major areas:

- A) Respiratory disorders and gastro-intestinal disorders for children under age 5 were noted much above the provincial norm; and,
- B) Accidents and poisonings for young adults (ages 15-39) were also much above the provincial norm.

This study concluded that per capita health care costs for Status Indians in Manitoba (federal and provincial expenditures) were double that of other Manitoba residents.

In 1982 the Social Planning Council of Winnipeg provided an additional report, entitled, A Review of Changes In Living Conditions of the Registered Indian Population of Manitoba During the 1970's. Documentation of Status Indian morbidity and mortality again contrasted all Status Indians with other provincial residents. No urban Status Indian information was available from either the Manitoba Health Service Commission or Health and Welfare Canada, Medical Services Branch. The Social Planning Council Report, however, did demonstrate reduced incidence of specific diagnoses during the previous decade. The Report illustrated major reduction in the Status Indians' health care utilization from 1.8 times the provincial average to 1.2 times the provincial average by 1982. The primary reason for the lower utilization was a lower incidence of tuberculosis, infectious and parasitic disease, respiratory diseases, special conditions and infants, as well as accidents, poisonings and violence.

Obstetrical conditions and digestive disorders for Manitoba Status Indians were noted as a continuing concern, slightly above provincial norms for days per 1000 population. The 1982 Social Planning Council of Winnipeg Report made no explicit comment about urban Status Indian morbidity.

Another health problem for Aboriginals is non-insuline dependent "adult onset" diabetes. This is important because it is life threatening and the incidence among Aboriginals is 4 times greater than the Manitoba cases per 1000 population during the 1980's (Young, 1988). Theories of causation of diabetes show little consensus. While family patterns of diabetes are anticipated, previous genetic theories of causation have been undermined. James Neil provided a competing view in 1962 called the "thrifty gene hypothesis" (Szathmary, 1987), which suggested that the feast and famine history of Natives developed a gene to quickly store blood sugar, acquire fat and thus survive longer. Neil argued that a shift to modern processed foods would therefore cause obesity for Natives. The pancreas would become exhausted and shut down, causing the onset of non-insuline dependent diabetes. Causal theories have not yet been proven in the face of contradictory evidence. For example, Indians in British Columbia did not go through feast and famine cycles, but the diabetes incidence rate is also high.

Diabetes has relevance for resident urban Aboriginals and for rural Aboriginals subject to compulsory migration to Winnipeg when renal dialysis is required. In an advanced state, diabetes can result in

renal failure, creating the need for dialysis.

Otherwise, death will result.

Childbirth represents another medical/social issue affecting the urban Aboriginals in Winnipeg. The need for culturally appropriate prenatal education has been repeatedly stated with little response (Community Task Force on Maternal and Child Health, 1981). As argued by Frideres (1983), little attention is given by the service providers to target the special needs of the Aboriginal population.

2.8 LOCAL CONTROL AND JURISDICTION:

Aboriginal epidemiology cannot be viewed separately from cultural and political influences which control the delivery of health care services. Penner's Report to The House of Commons (1983) concluded that a lack of local control negatively influenced Aboriginal health care problems. Further, York (1990) described a history of social and political oppression which underlies negative socioeconomic influences within Aboriginal communities, therefore resulting in a poor health status.

This theme was augmented by O'Neil (1986) who described Aboriginal health care as "politics in the Fourth World". He stated that successful primary health care programs must take into account the

concerns and priorities of local communities. O'Neil argued that this has not occurred for Aboriginal communities due to colonial control by the dominant society. Aboriginal communities have been characterized as Fourth World peoples, rather than ethnic minorities, because their lands have been expropriated, they have become subordinate politically and economically to the dominant immigrant population, and they have been historically exploited without consultation.

In terms of per capita government health expenditures, however, Aboriginal peoples in Canada have been seen to be well serviced because they have used many insured health care services. O'Neil noted a glaring paradox that the Canadian insured health care system provides a model for the rest of the world, but it is failing the Aboriginal communities because it continues to exclude its clients from a fundamental involvement in its structure. This paradox will remain until Aboriginal communities are included within the cultural and political process to identify priorities and interventions for Aboriginal epidemiological problems.

2.9 SUMMARY OF THE LITERATURE REVIEW:

The health status and utilization of health care services by urban Aboriginals requires further research. This literature review highlighted six factors affecting urban Aboriginal health status. First, a review of socioeconomic conditions demonstrated that poverty is related to high health care service utilization. Second, studies on Aboriginal health care described high health care utilization in general. Third, a demographic profile of urban Aboriginals described high unemployment, low educational achievement, low family incomes, many single parent families, and poor housing conditions. Fourth, literature on acculturation stress noted continuing difficulties in coping with urban life and frequent contact with social service and health care agencies. Fifth, Aboriginal epidemiological studies observed specific problems associated with substance abuse, diabetes, and high use of obstetric services. Sixth, a significant structural factor has been the cultural and political exclusion of Aboriginal communities from the decision making process for the delivery of health care services throughout Canada.

Currently, little hard data exists to describe urban Aboriginal health care service utilization or the probable causes of excessive types of morbidity.

Available literature is limited in both quantity and quality. Several Canadian studies suggest associations between low socioeconomic status, urban acculturation stress and high health care utilization by Aboriginals. Stanbury's 1975 sampling study determined that Vancouver Status Indians consumed twice as many patient days of hospital care per capita than non-Aboriginals. Sampling approaches used by others (Clatworthy, 1980; Postl, 1985) concluded that urban Aboriginal populations in Saskatoon and Winnipeg rated poorly on all socioeconomic indicators; downtown core areas were characterized by extensive conditions of poverty.

In the First Nations Urban Health Bibliography: Final Report, (McClure et al., 1991) a summary of urban Aboriginal health care literature concluded that information about urban Aboriginals' health status, "suggests that they have many unmet needs, but this information is fragmented, lacks quantifiable data, and is seldom readily available or cited in a manner that can be retrieved from usual literature sources" (p. 9). They contend that this literature suggests,

"Indians who migrate to cities continue to have many of the health problems seen on reserves, but these are augmented by the stress of adaptation to urban living, unfamiliarity with urban health care systems, which often differ dramatically from the community-based health care systems on reserves, and Native-non-Native communication problems." (p. 21)

McClure's Report recommended that research be undertaken to document the realities of urban Aboriginal health care service utilization. The current urban Aboriginal health care literature was described as being limited in volume, with few statistical sources to document health care service utilization patterns. The current literature provides only suggested links or associations to the negative impact of poverty and of acculturation stress in adaptation to urban life. Quantification of urban Aboriginal health care service utilization is missing from the current literature.

METHODOLOGY

3.1 DESIGN:

This study undertakes a descriptive, comparative analysis of urban Status Indian health care service utilization. To date, no such collection of information or analysis has been undertaken in North America. The literature review in Chapter 2 indicates that the dearth of such information requires new baseline data on an urban Aboriginal population distribution as well as on their health care service utilization. Previous studies have only assumed which critical factors may be at play. Such studies have either been limited by sample size ($N < 300$), or have alluded to "a large concentration" of Aboriginal population within an urban setting (e.g., Core Area Winnipeg, 1985). These previous approaches each cautioned that no generalizations could be drawn from the findings due to the limitations of each study. In contrast, this study will make definitive measurements of the Winnipeg Status Indian population by age cohort. In addition, it will provide observations of their complete hospital utilization (in-patient days) and observations of their complete medical utilization for a 12 month period, during the 1990/91 fiscal year.

The purpose of this descriptive study is to collect population statistics and health care service utilization data on urban Status Indians to portray current conditions. Such documentation will augment the previous estimates of both Core Area and Suburbs Status Indian populations, as well as estimates of the type and quantity of urban health care services utilized. By choice, no sampling design will be used in this study. Rather, the complete universe, or 100% of the population (both Status Indian and Other Urban Residents) will be observed and documented.

The design of this descriptive, comparative study incorporates small area analysis. Small area analysis is a method used to describe the way individuals in a community utilize the community's health care resources. This approach documents the number of occurrences of a health care event in an area and within a defined time frame which is divided by the area's total resident population (Paul-Shaheen et al., 1987). All observations (e.g., patient days) of entire (100%) resident populations, rather than population samples, constitute this approach.

The small area analysis is a technique which incorporates large administrative data bases to secure population based measures of service utilization and resource consumption. This study, using this

technique, documents the number of occurrences of hospital in-patient days and annual medical expenses during the 1990/91 fiscal year. The observations, and findings, are divided by the geographic (Core Area and Suburbs) area's total specified population (Status Indians and Other Residents) within each geographic area. Small area analysis requires that the following steps be undertaken:

- (1) defining the areas for comparative study; and,
- (2) measuring utilization.

Small area analysis provides a framework for examining health care utilization in order to determine the population based hospital in-patient utilization and medical service expenditure ratios (i.e., annual per capita costs). Information about individuals is aggregated and used to create a profile of the community's characteristics. Morbidity ratios (comparisons to the Manitoba norm) for each Winnipeg subpopulation in this study include hospital days per 1,000 population (observed) and per capita medical costs (observed) for each major diagnostic category.

Paul-Shaheen et al. (1987) have reported that, "In order to appropriately identify over- or under-utilization, it is necessary to have a norm against which to compare community use" (p. 767). The norm

chosen for this study was the Manitoba utilization rate (observed) specific to each diagnosis and age cohort. Multiplication of this Manitoba utilization norm by the age cohort population provides an expected utilization rate for each subpopulation's age cohort for each diagnosis. Contrasting this Manitoba ratio (expected) with the observed ratio provides a comparison called the morbidity ratio. Results of this arithmetic process of division are 1.0 where the observed utilization equals the expected. High utilization results of 2.0 would indicate double the rate of the Manitoba norm.

Comparisons among the four subpopulations are made relative to the Manitoba norm for each diagnosis. Each subpopulation's morbidity ratio thus indicates proximity or variance from each Manitoba norm. Population size differences of each data cell have been adjusted to the actual utilization by the calculation of the rate per 1,000 population. Also, comparisons to a Manitoba norm provide the morbidity ratio for both hospital and medical services.

Two geographic areas selected within Winnipeg for this study are the Core Area and Suburbs. These are to serve as an implicit proxy for socioeconomic status of the residents. The Core Area is a proxy for poverty and Suburbs is a proxy for higher income levels. Documentation of poverty in the Core Area has been

provided by the Winnipeg Core Area Initiative (1981), through reports from the Winnipeg Social Planning Council (1982, 1986), and by Statistics Canada (1990). Such reports document key differences between Winnipeg's Core Area and other areas of Winnipeg. These previous reports identify lower median incomes, poorer housing, inadequate employment preparation, and a higher proportion of single parent families, which all contribute to a cycle of poverty for many Core Area families (see Chapter 1, Section 4 and Chapter 2, Section 5 for additional details).

Large administrative data bases are useful for the evaluation of health care utilization. Such data bases consist of hospital discharge abstracts and medical insurance claims. Roos and Nicol (1989) identified the strengths of health insurance data systems for a variety of studies. They claimed that an ideal data base would have the following characteristics:

- * System wide coverage of an entire population;
- * Unique identifying number for each patient;
- * Registry file to specify geographic areas;
and,
- * Comprehensiveness of observations
(e.g., patient days).

Roos and Nicol observed that a great potential for several types of analysis exists with the use of large administrative data banks. However, they noted that

the different philosophy of research design suggested by such data banks has been largely unexplored. Small area designs are feasible because individuals are assigned to small areas, usually on the basis of residence (geography). In this study, a further distinction of population subgroups is provided for Status Indians (ethnicity). The small area analysis methodology also provides a different slant to the problems of sample selection. It can deal with a number of diagnoses and is applicable outside the health care field. Small area analysis, with its identified population, is ideal for calculating utilization rates per 1000 population.

Paul-Shaheen et al. (1987) stated that "much of the research undertaken in small area analysis in North America has been confined to reviewing hospital care" (p. 768). They go on to say that it is important to link ambulatory care files and hospital care files. This comparative study draws upon both hospital and medical data files for the entire populations of each small area.

Within the hospital data base the following elements are routinely collected: admission date, length of stay, age, sex, discharge date, admission primary diagnosis, and patient geographic code. Within the medical insurance data base the following elements

are routinely collected to substantiate fee-for-service medical payments: primary diagnosis, service units, medical cost, bloc of practice and patient geographic code. Such administrative records can be arranged by diagnoses, age cohorts, area of residence, bloc of practice or by the area of service delivery for the entire insured population. It has been argued that small area analysis, which focuses on hospital admissions per capita, is the most suitable for understanding the overall variation in total days spent in hospital (Roos and Roos, 1989).

The objective for small area analysis is to identify the factors influencing small area variation. Research using small area analysis has attempted to ascertain whether variations in health care utilization were associated with characteristics of the population, whether they reflected differences in access and need, or whether a substantial portion of the variation was associated with differences in the medical care itself. The major elements believed to contribute to small area variation in the use of health care include:

- (1) the individual (e.g., predisposing illness level),
 - (2) the community (e.g., poverty, unemployment, physical environment), and
 - (3) the health care system, (e.g., access to service, health care personnel).
- (Paul-Shaheen, 1987)

The focus of the current study is to examine community influences through geography (Core Area and Suburbs), and ethnicity (Status Indians and Other Residents) for possible predisposing illness levels. The health care system (e.g., access to service) is not a component of the current study because this author did not identify structural barriers to health care services (e.g., large geographical distances within Winnipeg or health care user fees for the universally insured population).

This focus is integrated within the hypotheses of the current study. This study's hypotheses suggest that the four subpopulations of Winnipeg will adhere to a rank ordering of health care service utilization:

- 1) Core Area Status Indians - Highest Utilization
- 2) Core Area Other Residents - High Utilization
- 3) Suburbs Status Indians - Above Average Utilization
- 4) Suburbs Other Residents - Average Utilization

Further explanation of these hypotheses and assumptions was noted in Chapter 1, Section 5.

3.2 DATA BASE:

Data for this comparative study comes solely from the Manitoba Health Services Commission (M.H.S.C.). This agency funds insured health services for all Manitoba residents and maintains data files on the population, on hospital utilization and on medical utilization. By combining this information, a complete

history of medical visits, hospitalizations and surgery can be reconstructed for each individual, age cohort or area of residence. These large data files were originally created to monitor hospital utilization, which provided for Manitoba's hospital funding as well as physicians' fee-for-service payments. Both data files utilize the ICD-9-CM diagnostic codes. Population subgroups may be identified by geography (e.g., region, municipality or postal code).

Both the hospital data file and the medical data file are linked to the Manitoba Health Services Commission registered population file. All permanent residents are registered in order to be eligible for Manitoba's insured health services. The linkage of these data files allows comparison of utilization of subgroups (e.g., region) of the province. Status Indians (N = 57,368 as of June 1990) may be identified as a subgroup within the Manitoba population file (N = 1,130,845 as of June 1990) based upon their legal status under the Federal Indian Act. Manitoba's health care data files were created in 1958. An unusual aspect of Manitoba's health care data files is that a subfile of population was set up in 1958 for all Manitoba Status Indians. This was felt to be necessary because the federal government agreed to pay health care premiums on behalf of the Status Indians.

Existence of this subfile created the potential for special data runs of Status Indian health care utilization. Such data comparison could be done within a geographic area (e.g., Core Area) for Status Indians and Other Residents.

Input to the hospital data file comes from information forms completed by all hospitals in Manitoba. Each hospital admission is documented at the time of discharge/separation. The specific diagnosis and length of stay is identified for the insured resident (identified by age, sex and residency). Such data input from all Manitoba hospitals is processed centrally. It is important to note that most out-patient department utilization and emergency department utilization (both ambulatory services) are not captured in the hospital data file or the medical data file. This data omission is a limitation to the current study. Anecdotal accounts from Manitoba health care providers as well as Waldram (1989) indicate that this is a frequent point of service contact for Aboriginal People as opposed to walk-in clinics or physician office visits. A variety of statistical tables are published in the Manitoba Health Services Commission Annual Report indicating the volume and type of hospital services provided. To date, the Manitoba Health Services Commission annual reports have not

included tables illustrating Status Indians' health care utilization in Manitoba.

Input to the medical data file comes from information provided by physicians for direct payment (fee-for-service) or for services rendered under a salary arrangement. The specific diagnosis and medical cost (direct payment or equivalent) is documented for each patient contact. Such data from all physicians is processed centrally. The Manitoba Health Services Commission publishes an Annual Report which provides a variety of statistical tables indicating the volume and type of physician services provided for Manitoba residents.

3.3 VALIDITY AND RELIABILITY:

The large data base of the Manitoba Health Services Commission was established for administrative purposes but may also be used for research. Hospitals in Manitoba are required by legislation to report hospital admissions in the standardized hospital abstract form. While coding errors may occur, internal checks to verify date of birth, surname and current address are made to properly identify patients for each in-patient admission. Proper identification of diagnosis is the responsibility of each hospital.

Trained staff are provided to maintain on-site data files.

Medical files reflect the fee-for-service billing system in Manitoba. Accuracy is required for payments to be issued to physicians. In the case of salaried physicians, "dummy claim cards" are submitted to M.H.S.C. to reflect medical service utilization. Without the same fiscal incentive as fee-for-service claims, the accuracy of the "dummy claims" is reduced. The internal checks for date of birth, surname and current address are also made on medical files. Overall, the Manitoba hospital and medical data sets have been described as "rich and of high quality" (Roos, 1989).

The Manitoba health insurance data base is characterized by universal coverage. Both hospital and medical services are documented in considerable detail because of the fee-for-service payment scheme. The registration file contains data on the insured population, organized by family registration numbers. The hospital file is structured on the basis of each admission and contains patient identification, dates of admission and discharge, limited information on services rendered and one or more diagnoses. The medical file is structured on the basis of services rendered by diagnosis or by type of medical procedure.

At the point of each service contact the insured patient is asked about current address and date of birth to validate who the patient is as well as to amend file details (e.g., change of address).

Roos et al. (1989) described the process for assessing the data quality of a large M.H.S.C. data base. A labor-intensive approach had been undertaken using Manitoba data which showed "excellent correspondence among the various stages as information passes from the hospital medical record to the computerized file" (p. 175). Their article concluded that linkage between Manitoba hospital and physician data was excellent.

One great advantage of such secondary data is the coverage of an entire population, avoiding sampling errors. The data bases capture all service utilization of the designated four Winnipeg subpopulations (N = 647,048) for all in-patient hospital services and all medical services. Utilization records will illustrate a full year, avoiding any seasonal variations. The quality of the Manitoba data base has been praised for its research validity (Roos, 1989). The data will represent the universe. Thus sampling is not required. Potential sampling errors will be eliminated from this study. Threats to validity and reliability will be removed.

3.4 DATA COLLECTION:

This author presented a research proposal to the M.H.S.C. Access and Confidentiality Committee to obtain permission to use the health care data files for the proposed study. This Committee's criteria required the exclusion of individual patients (by name), individual practitioners or individual health care facilities. The proposed small area analysis satisfied such concerns. Formal approval by the Access and Confidentiality Committee was granted for using the hospital data base, the medical data base, and the population registry.

For the first step, the small area groups were defined within Winnipeg, Manitoba. The population registry allowed separation of population among Status Indians and Other Residents. This author chose to divide Winnipeg into two geographic areas, referred to as Core Area and Suburbs (all Winnipeg areas other than Core Area). The Core Area boundaries were based on previous studies and economic regeneration designed by the Core Area Initiative for this area.

Geographic areas were assigned by residents' postal codes. Four subpopulations were designated within Winnipeg using a 2 X 2 matrix.

The four subpopulations included the following:

- 1) Status Indians - Core Area
- 2) Other Residents - Core Area
- 3) Status Indians - Suburbs
- 4) Other Residents - Suburbs

This study used an operational definition of Core Area Winnipeg to include the following:

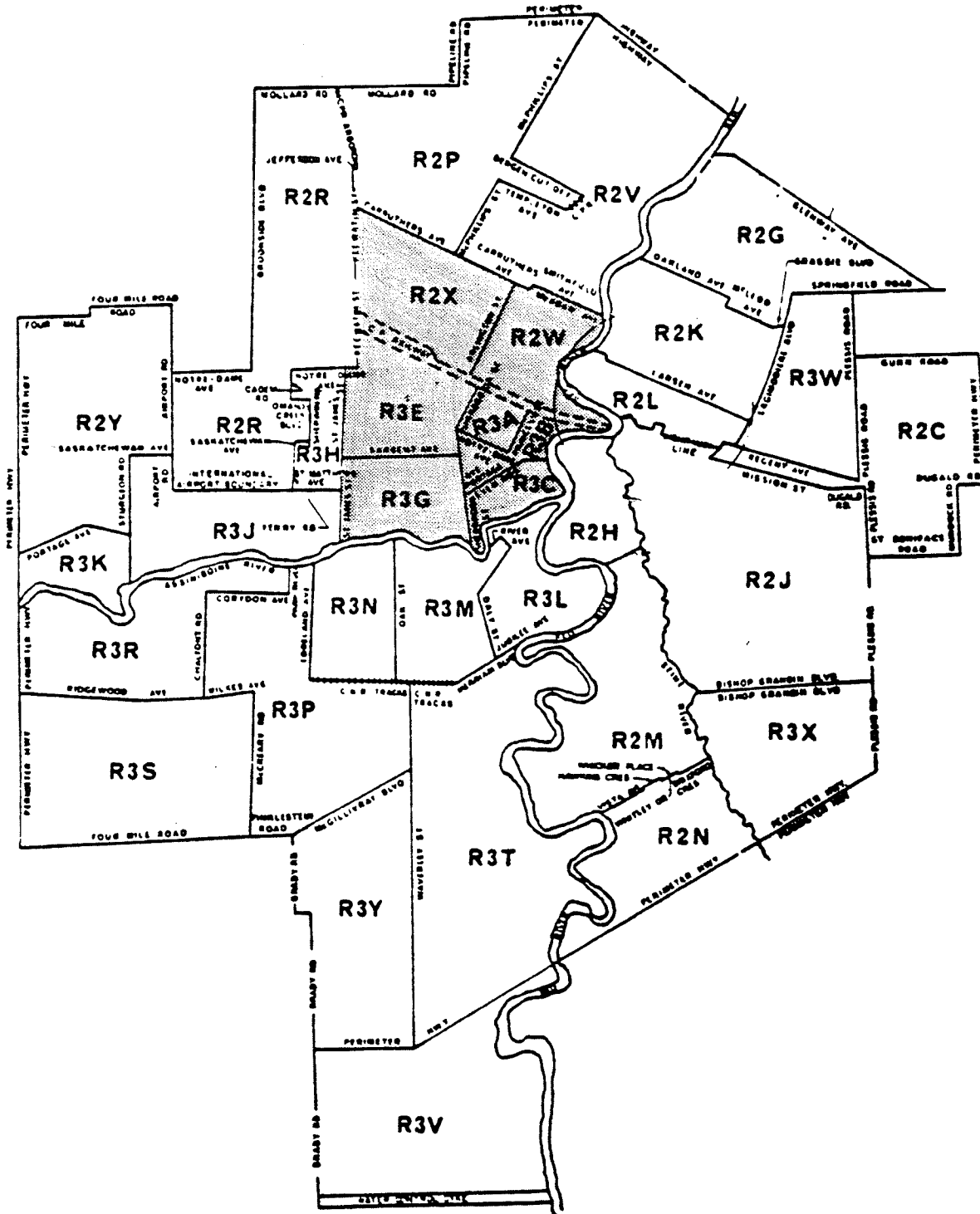
North boundary: Carruthers and Smithfield
East boundary: Red River
South boundary: Assiniboine River
West boundary: St. James and Keewatin.

While this operational definition deviates slightly from the original boundaries devised for Core Area economic redevelopment, it conforms to the closest approximation of postal codes (three digit) for the Core Area. The postal code designation is vital for identification of residents within the Manitoba Health Services Commission data base. This operational definition of the Core Area includes the following postal codes:

R3A, R3B, R3C, R3E, R3G, R2X and R2W.

Age cohorts were created to simply depict differences in utilization. Five age cohorts were chosen to include the following: under 10, 10 to 17, 18 to 34, 35 to 64, and 65 and older. Data was generated to illustrate all insured health care utilization for the period from April 1, 1990 to March 31, 1991 (a 12 month period).

Winnipeg Postal Code Map



The M.H.S.C. computer program was instructed to document several observations from the hospital data file. Each hospital measure (observation) was specific to the particular small area population, age cohort and diagnosis (18 major groups). The hospital measures included the following:

- A) Total Population by Subpopulation and Age Cohort
- B) Hospital Days (observed)
- C) Average Length of Stay (days / cases)

Other hospital measures included calculations for comparison of the small area groups to the provincial average utilization rate specific to an age cohort and a particular diagnosis. Such hospital calculations included the following:

- D) Days per 1000 Population (utilization ratio)
- E) Expected Days (based upon the age cohort's days per 1000 population for Manitoba, specific to each major diagnosis)
- F) Hospital Morbidity Ratio (local utilization ratio compared with the Manitoba ratio)

The M.H.S.C. computer program was also instructed to document several observations from the medical services data file. Each annual per capita medical services expense per diagnosis (utilization ratio) was specific to the particular small area population, age cohort and diagnosis (18 major groups). The calculated annual per capita medical costs were selected as a

utilization measure of the total medical resources consumed by each subpopulation per age cohort for each diagnosis. Other units of measure (e.g., medical visits or medical service units) did not provide discrete units which were required for valid calculations of per capita consumption. Medical service units may portray different items (e.g., 15 minute or 30 minute service periods) and should not be combined as if they measured items of equal magnitude. This was not done in the current research. This study selected medical utilization which could be quantified and attributed to each subpopulation's service utilization. The medical measures of this study included the following:

- A) Total Population by Subpopulation and Age Cohort
- B) Annual Medical Expense (observed costs)

Other medical measures included calculations for comparison of the small area groups. They included the following:

- C) Annual Per Capita Medical Cost (utilization ratio)
- D) Expected Per Capita Medical Cost (based upon the cohort's per capita cost for Manitoba, specific to each diagnosis)
- E) Medical Per Capita Ratio (local utilization ratio compared with the Manitoba ratio)

This study provides observed utilization of hospital in-patient days per 1,000 population, annual per capita medical costs, and the expected utilization for each subpopulation and age cohort. Calculations of the hospital in-patient morbidity ratio and the annual medical per capita cost ratio allow for the indirect comparison of each subpopulation (within each age cohort) relative to the Manitoba utilization ratio, which is the norm for each diagnosis and age cohort.

Such comparisons to the provincial norm (morbidity ratios) are vital to test the hypotheses identified in Chapter 1, Section 5. These hypotheses suggest that poverty, not ethnicity, will be the primary factor for influencing high health care service utilization. The Core Area will be selected as a proxy for poverty. Health care utilization is expected to be inversely proportional to family socioeconomic status and affected by acculturation stress for Status Indians. The hypotheses therefore suggest that health care services utilization of the four subpopulations should follow a rank order as follows:

- 1) Core Area Status Indians - Highest Utilization
- 2) Core Area Other Residents - High Utilization
- 3) Suburbs Status Indians - Above Average Utilization
- 4) Suburbs Other Residents - Average Utilization

The calculations of the morbidity ratios allow the necessary comparisons relative to the provincial norm for each diagnosis and age cohort. These calculations include a crude age adjustment necessary to adjust for the different subpopulation age cohort profiles between Status Indians and Other Residents (see Chapter 4, Section 2). Without the calculations of morbidity ratios, including the crude age adjustment, fair comparisons between the subpopulations would not be possible. These comparisons allow for testing of the hypotheses of this study.

Data that was produced for this study documented actual hospital days and actual medical expense by diagnosis and by age cohort for each of the four Winnipeg subpopulations. Few small area studies have combined both hospital data files and medical files for a more comprehensive analysis (Paul-Shaheen, et al. 1987). Most health care small area analyses have been previously limited to a hospital data file alone.

The data will be listed for age cohorts for each of the 18 major diagnostic categories of the International Classification of Diseases, 9th Revision. Specification of age cohorts in the study was important to isolate patterns of utilization (e.g., pediatric vs. elderly patterns) and to provide a crude age adjustment factor for all small area groups. Inclusion of this crude age adjustment was critical to

the interpretation of all data. Such adjustment is required because the age distribution for Status Indians is skewed towards the youngest age cohorts. The age adjustment was necessary to accurately provide comparisons among the small area groups with different age cohort profiles. Without this age adjustment, the comparisons would have been invalid, suggesting that observed utilization of Status Indians was not significantly different than the Manitoba average for all ages per diagnosis. An age adjustment is a common technique used in the analysis of large scale health care utilization data.

The data format for each diagnosis was designed in the following manner:

Age Cohorts	Subpopulations			
	Status Indians Core Area	Other Residents Core Area	Status Indians Suburbs	Other Residents Suburbs
< 10				
10-17				
18-34				
35-64				
65 +				
All Ages				

3.5 DATA ANALYSIS:

Observed frequencies of each diagnosis will be exhaustive for each subpopulation. The Manitoba total population utilization, for each diagnosis and each age cohort, constitute the expected rates for hospital in-patient admissions per 1000 population and for annual per capita medical expenses. Differences in health care service utilization rates between each of the four Winnipeg subpopulations (by age cohort) and the expected rate per diagnosis (Manitoba total) were calculated for the 1990/91 fiscal year. Differences between observed and expected rates will be expressed as a morbidity ratio.

Specific calculations were used to provide comparisons among all of the four small area groups. Explanation of each calculation is as follows:

A) Hospital Days Per 1000 Population:

$$\text{This Utilization Ratio} = (\text{OD/P}) \times 1,000$$

OD = Observed Days for Each Data Cell

P = Population for Each Data Cell

The purpose of this calculation is to allow comparison among populations of different size. The use of age cohorts provides a crude age adjustment to ensure valid comparisons if the populations have a different age profile. This is indeed the case with the Status Indian population

profile. It has a skewed distribution towards the younger age cohorts as compared with the Manitoba population. Therefore, the age specific diagnostic comparisons serve as an important means for appropriate comparison within each age cohort.

B) Expected Days:

This calculation predicts the expected number of hospital days per diagnosis and per age cohort for each data cell.

$$\text{Expected Days} = \text{MD} \times \text{P}$$

MD = Manitoba Days per 1000 Population
per Diagnosis and Age Cohort

P = Total Population in Each Data Cell for
the Specific Diagnosis and Age Cohort

This calculation of expected days (for each cell) is based upon the Manitoba "norm" for the same age cohort and specific diagnosis. The expected days are calculated using the Manitoba "norm" per the population number of the specific data cell.

C) Hospital Morbidity Ratio:

This ratio compares the small area group's hospital utilization ratio to the Manitoba age cohort hospital utilization ratio for the same diagnosis. The calculation is as follows:

$$\text{Hospital M.R.} = \frac{\text{Hospital Days per 1000 Population for Each Small Area Group}}{\text{Hospital Days per 1000 Population for Manitoba for the Same Diagnosis and Age Cohort}}$$

This ratio illustrates the scale or magnitude of variance from the Manitoba days per 1000 population for each diagnosis and each age cohort. No variance from the provincial norm would indicate a ratio of 1.0. Twice the utilization rate (in the data cell) would indicate a ratio of 2.0. Such variation for each data cell within each diagnosis is illustrated by figures within the Chapters 4 and 5.

The comparisons of this study shall focus upon morbidity ratios of 2.0 or greater. Utilization of twice the Manitoba norm (specific to each diagnosis and each age cohort) will be deemed significant, high utilization, and noted by this author.

It should be noted that the use of Winnipeg as the norm instead of Manitoba as the norm would provide a few minor changes to the high utilization findings.

The M.H.S.C 1990/91 Annual Report documented that Winnipeg residents used 1,467 hospital days per 1,000 population whereas Manitoba residents used 1,459 hospital days per 1,000 population for all diagnoses. While there may be fluctuations between the two possible norms per diagnostic category, it was not anticipated to be a large concern. Consideration was given to the possibilities for using the Winnipeg norm. Where the Winnipeg norm and the Manitoba norm were the same, all comparisons (morbidity ratios) would be identical. Where the Winnipeg norm was below the Manitoba norm, the magnitude of any high utilization would increase the height of existing bar graph representations. This would not, however, increase the number of high utilization findings for any subpopulation. Where the Winnipeg norm exceeded the Manitoba norm (e.g., 1.6 morbidity ratio) and a subpopulation was found to barely exceed the threshold of 2.0 morbidity ratio, a difference in "high" finding would occur. Such a case would cause the high utilization finding to be reduced below the defined threshold for high findings. Examination of all hospital findings determined that this scenario occurred only once for Diagnostic Category 2, Neoplasms, 10 - 17 age cohort for Core Area Status Indians (2.0 morbidity ratio) relative to Suburbs Other Residents (1.6

morbidity ratio). Use of the Winnipeg norm in this single case would have eliminated this high finding. All other high hospital findings (greater than 2.0 morbidity ratio) would not have been altered.

A Chi Square test for significance of the variance is not appropriate because the morbidity ratios are not discrete numbers. The Chi Square would be invalid. In a similar fashion a Z-test is not feasible because all of the in-patient days per patient cannot be extracted from the summary data for each age cohort. The Z-test is not appropriate for application to the morbidity ratios for age cohort groupings in each data cell.

Questions of significance of this study's findings (over 2.0 M.R) may arise in a few instances where the population of the data cell is less than 1,000. This circumstance occurs 4 times for the Status Indians Suburbs age cohorts as well as once for Core Area Status Indians (aged 65+). Such small population numbers may indicate wide variation from the norm with small differences in the observed utilization. Caution will be noted for findings in each of these small data cells.

D) Per Capita Medical Cost:

This utilization ratio calculates the insured medical expense as a measure of utilization per diagnosis for each age cohort's population.

$$\text{Medical Per Capita Cost} = \frac{\text{Annual Medical Services Cost (\$) for Each Diagnosis}}{\text{Population of Each Age Cohort}}$$

E) Expected Per Capita Cost:

This ratio calculates the anticipated medical per capita cost for each diagnosis and each age cohort of each small area of analysis. It is the Manitoba average per diagnosis for a specific age cohort.

$$\text{Expected Per Capita Cost} = \frac{\text{Manitoba Medical Services Cost for a Specific Diagnosis and Age Cohort}}{\text{Manitoba Population for the Age Cohort}}$$

The medical per capita cost calculates the medical service expenditure relative to each distinct population subgroup. Medical per capita costs can be compared between subpopulations. Medical per capita costs are mutually exclusive from hospital budget expenses and hospital in-patient day observations.

F) Medical Per Capita Ratio:

This ratio compares the small area group's medical per capita cost (utilization) to the Manitoba medical per capita cost for the same diagnosis and age cohort. The formula is as follows:

$$\text{Medical P.C.R.} = \frac{\text{Medical Per Capita Cost of Each Small Area Age Cohort}}{\text{Medical per Capita Cost for Manitoba, Same Diagnosis, Same Age Cohort}}$$

This ratio illustrates the scale or magnitude of variance from the Manitoba per capita expense for each diagnosis and each age cohort. No variance from the provincial norm would indicate a ratio of 1.0. Twice the utilization rate (in the data cell) would indicate a ratio of 2.0. Such variation for each data cell within each diagnosis is illustrated by bar charts within the next chapter 4.

The comparisons of this study shall focus upon morbidity ratios of 2.0 or greater. Utilization of twice the Manitoba norm (specific to each diagnosis and each age cohort) will be deemed significant and noted by this author.

It should be noted that use of Winnipeg as the norm instead of Manitoba as the norm would provide no changes to the high utilization medical findings. The M.H.S.C 1990/91 Annual Report documented that Winnipeg residents used \$247 annual per capita medical costs whereas Manitoba residents used \$218 annual per capita medical costs for all diagnoses. While there may be fluctuations between the two possible norms per diagnostic category, it was not anticipated to be a large concern. Consideration was given to the possibilities for using the Winnipeg norm. Where the Winnipeg norm and the Manitoba norm were the same, all comparisons (morbidity ratios) would be identical. Where the Winnipeg norm was below the Manitoba norm, the magnitude of any high utilization would increase the height of existing bar graph representations. This would not, however, increase the number of high utilization findings for any subpopulation. Where the Winnipeg norm exceeded the Manitoba norm (e.g., 1.5 morbidity ratio) and a subpopulation was found to barely exceed the threshold of 2.0 morbidity ratio, a difference in "high" finding would occur. Such a case would cause the high utilization finding to be reduced below the defined threshold for high findings. Examination of all medical service findings determined that this scenario did not occur once. Whether the

Manitoba norm or the Winnipeg norm were to be used, it made no difference to the number of findings of high medical utilization.

A Chi Square test for significance of the variance is not appropriate because the morbidity ratios are not discrete numbers. The Chi Square would be invalid. In a similar fashion a Z-test is not feasible because all of the medical patients and each episode of care cannot be extracted from the summary data for each age cohort. The Z-test is not appropriate for application to the morbidity ratios for age cohort groupings in each data cell.

Questions of significance of this study's findings (over 2.0 M.R) may arise in a few instances where the population of the data cell is less than 1,000. This circumstance occurs 4 times for the Status Indians Suburbs age cohorts as well as once for Core Area Status Indians (aged 65+). Such small population numbers may indicate wide variation from the norm with small differences in the observed utilization. Caution will be noted for findings in each of these small data cells.

3.6 LIMITATIONS OF THE METHOD:

This small area method of analysis illustrates health care service utilization (hospital in-patient days and annual medical per capita costs) for four urban subpopulations during a 12 month period in 1990/91. Such measurements document service utilization, which can serve as a component of a needs assessment. Ambulatory services for most Winnipeg hospital out-patient departments and in-hospital emergency departments are not tabulated within the hospital data file or the medical services data file. Uninsured services (e.g., Aboriginal healers) are also excluded from these data files. If individuals did not use any insured health services within the 12 month study period, there would be no record of their patient days or their medical service cost. Such individuals, however, would be included in the study with the cross tabulation of the hospital and medical files with the population registry for the calculations of hospital in-patient days per 1000 population and annual medical per capita costs.

A limiting factor with this data is the means of identification of Winnipeg Status Indians by postal code. Those who did not establish a postal code but who resided in Winnipeg were excluded from this

population grouping (e.g., shown to be residents on a rural reserve in Manitoba). This limitation, however, may be mitigated because routine audits of the M.H.S.C. population registry are undertaken every six months. Errors in address for Status Indians noted by either M.H.S.C. or the Indian Affairs Department are cross checked manually to determine the accurate current address. Also, each patient is asked to verify date of birth, surname and current address at each point of contact for health services (i.e., hospital admission or medical service).

This urban research was limited due to the absence of previous small group analysis on this topic as well as the absence of extensive sampling studies of urban Aboriginal health care utilization. This study used Winnipeg's Core Area as a proxy for poverty. The definition of Suburbs implied higher median income for both Suburbs Status Indians and Suburbs Other Residents. The median income of Suburbs Status Indians (N = 2,969) could not be quantified for this study. If a large proportion of this subpopulation had median incomes similar to residents in the Core Area, then the geographic distinction between Status Indians (Core Area or Suburbs) may not have served a useful purpose.

The Suburbs contain several pockets of low income housing which may include many of the Suburbs Status Indians.

This study also used Winnipeg Status Indians as a proxy for urban Aboriginal people. This choice was made because health care service utilization data was available for Winnipeg Status Indians, whereas data for Winnipeg Aboriginal people was not available. Specific health care service utilization for Non-Status Indians and Metis is not known. It is only an assumption that Aboriginal health care service utilization may be similar to that of Status Indians.

It was also noted that Winnipeg hospital ambulatory services (other than Health Sciences Centre and St. Boniface General Hospital) as well as clinic ambulatory services (e.g., Mount Carmal Clinic and the Health Action Centre) are not included within the data base of Manitoba's insured health services. This component of health services is missing from the current study. Only in-patient hospital days and medical (physician provided) service costs are depicted in this study's findings. Uninsured health services such as Native healing practices are not included within the scope of this study.

When using any large data base, the researcher must be careful to avoid generalizing from groups to individuals. This type of error is called the ecological fallacy, also known as cross-level bias. This fallacy is equivalent to believing that information about groups can predict individual behavior. Small area analysis may have problems with the ecological fallacy as well as spurious correlation (Connell et al., 1987). This study avoids both potential problems by limiting the scope to a descriptive and comparative focus. Generalizations about individuals are not offered from these findings other than to suggest an association between high health care service utilization and community factors (e.g., poverty and ethnicity). Explanation of atypical individuals (e.g., low median income family in the Suburbs, male/female utilization differences per diagnostic category, or non-use of health services in 12 months) is not attempted within this study. Such atypical findings would be included within each data cell of this study and would be averaged within the data cell of the subpopulation's age cohort.

FINDINGS

4.1 INTRODUCTION:

A small area analysis, using Manitoba Health Services Commission data files, was completed to document Winnipeg Status Indian health care service utilization during 1990/91. Data files included hospital files, medical files and the insured population registry for all Winnipeg residents (N = 647,104). The small areas included the following Winnipeg subpopulations: Core Area Status Indians, Core Area Other Residents, Suburbs Status Indians and Suburbs Other Residents. The data represented total health care service utilization for all four urban subpopulations during twelve months.

Both hospital and medical service reports documented health care utilization for all 18 major diagnoses using the International Classification of Diseases, 9th Revision (ICD-9-CM). Each table identified utilization by age cohorts which included the following groups: under 10, 10 to 17, 18 to 34, 35 to 64, and 65 and over. The population figures for each subpopulation allowed for health care service utilization comparisons between each data cell and the provincial norm, specific to each diagnosis and age cohort.

The products of this small area analysis included the following components:

- A) Demographic profiles of the four Winnipeg subpopulations by age cohort;
- B) Hospital utilization (Tables 1A to 19A) by each of the 18 major diagnoses for the four Winnipeg subpopulations by age cohort;
- C) Medical utilization (Tables 1B to 19B) by each of the 18 major diagnoses for the four Winnipeg subpopulations by age cohort;
- D) Bar chart comparisons (Figures 1A to 19A) of hospital morbidity ratios for each of the 18 major diagnoses for the four Winnipeg subpopulations by age cohort; and,
- E) Bar chart comparisons (Figures 1B to 19B) of medical per capita ratios for each of the 18 major diagnoses for the four Winnipeg subpopulations by age cohort.

The hypotheses of this author were that the health care service utilization of the four Winnipeg subpopulations would follow this rank order:

- 1) Core Area Status Indians - Highest Utilization
- 2) Core Area Other Residents - High Utilization
- 3) Suburbs Status Indians - Above Average Utilization
- 4) Suburbs Other Residents - Average Utilization

Testing of the hypotheses was made possible with the calculations of the morbidity ratios, contrasted to the Manitoba norm, for each subpopulation's age cohort for each diagnosis. The comparisons of the utilization data for each of the four Winnipeg subpopulations are provided in Figures 1A to 19A (hospital data) and 1B to 19B (medical data). In all figures each small area was compared by ratio to the provincial norm, specific

to the diagnosis and the age cohort. A morbidity ratio of 1.0 indicated that no difference existed between the small area's health care service utilization and the provincial utilization for the same diagnosis and same age cohort. A morbidity ratio of 0.5 indicated a 50% rate of the provincial utilization rate. A morbidity ratio of 2.0 indicated a rate double that of the provincial health care service utilization.

The methodology provided an age adjustment for all comparisons because each comparison was made to the Manitoba norm, specific to both the age cohort and the diagnostic category. This age adjustment was critical for this study due to the dissimilar age profile of the Status Indians relative to the other Manitoba residents. The Status Indian population was skewed towards the younger age cohorts. This means that a greater proportion of the Status Indian population were found in the youngest age cohorts as compared with the total Manitoba population. The age specific cohort comparisons provided a crude adjustment factor to accomodate this population distribution difference between the Winnipeg Status Indians and Other Winnipeg Residents.

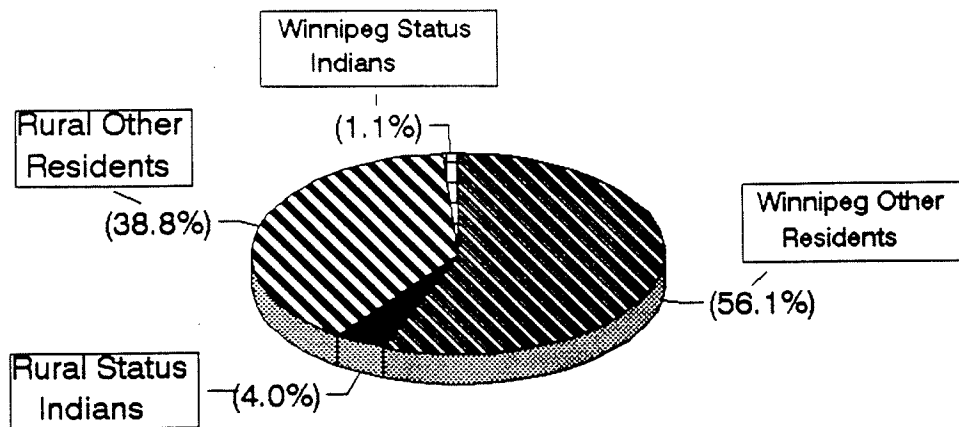
4.2 DEMOGRAPHIC PROFILE:

Figure OA, Manitoba Population Distribution, June 1990, illustrates that Status Indians comprise 5.1% of Manitoba's total population. Within Winnipeg, 12,168 Status Indians were identified by postal code. The Winnipeg Status Indians represent 1.9% of Winnipeg's population (Core Area 1.4% + Suburbs 0.5% = 1.9%). Figure OB illustrates this distribution of the subpopulations within Winnipeg. Figure OC shows the Winnipeg Core Area Status Indian Subpopulation by Age Cohorts. It shows that 47.3% of Core Area Status Indians are age 17 and under, and only 18.3% are ages 35 and over. A sharp contrast is provided in Figure OD, Winnipeg Core Area Other Residents by Age Cohort, since only 21.7% are age 17 and under, and 46.2% are ages 35 and over. The Suburbs Status Indian Population Distribution, Figure OE, indicates that 45.3% are age 17 and under, and only 17.0% are age 35 and over. The Status Indian subpopulations (Core Area and Suburbs) display a similar pattern skewed towards the younger age cohorts. Winnipeg Suburbs Other Residents show a pattern similar to the Manitoba distribution: 24.0% are 17 and under and 46.9% are age 35 and over. Details (absolute numbers) for Figures OA to OF are given in Tables OA and OB.

Manitoba Population Distribution June 1990

Figure 0A

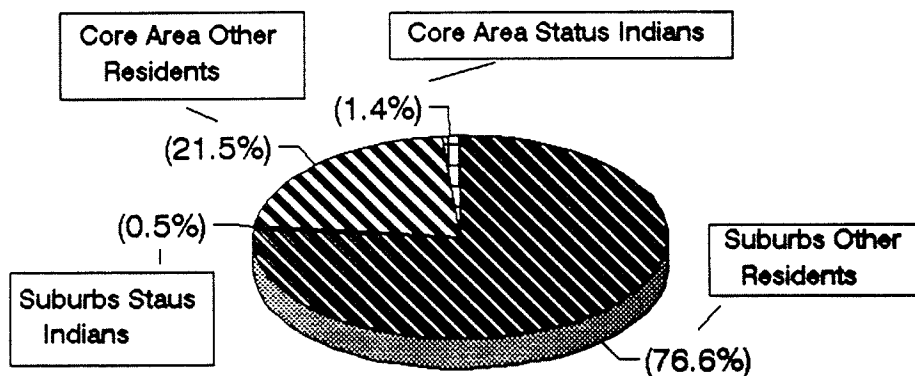
100% = 1,130,845



Winnipeg Population Distribution June 1990

Figure 0B

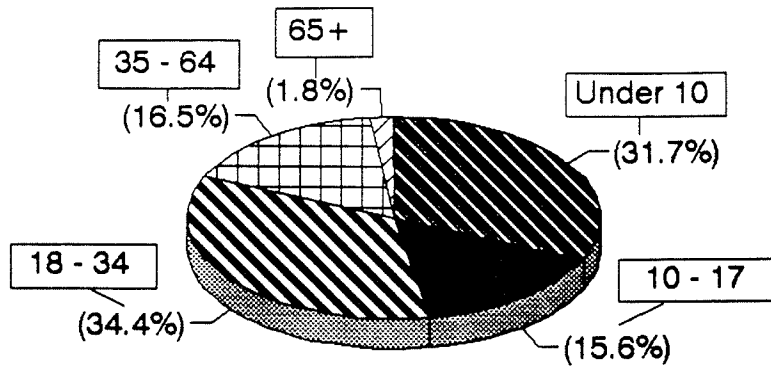
100% = 647,104



Winnipeg Core Area Status Indians By Age Cohorts, June 1990

Figure 0C

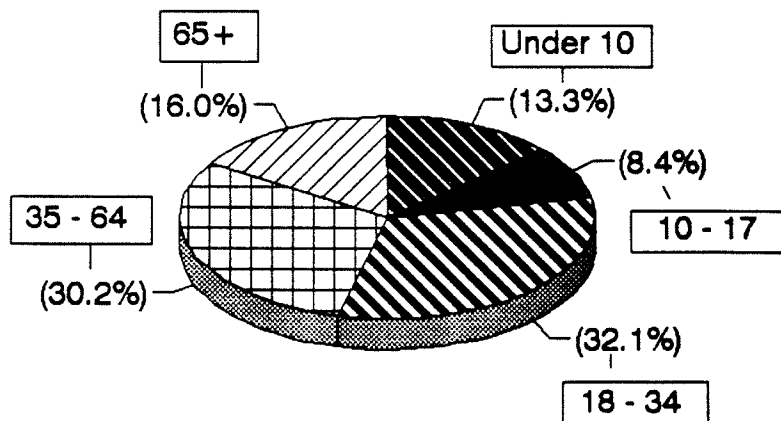
100% = 9,199



Winnipeg Core Area Other Residents By Age Cohorts, June 1990

Figure 0D

100% = 139,281

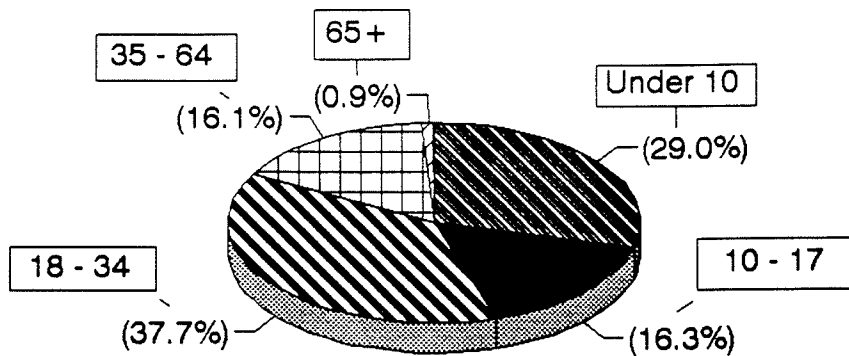


Winnipeg Suburbs Status Indians

By Age Cohorts, June 1990

Figure 0E

100% = 2,969



Winnipeg Suburbs Other Residents

By Age Cohorts, June 1990

Figure 0F

100% = 495,655

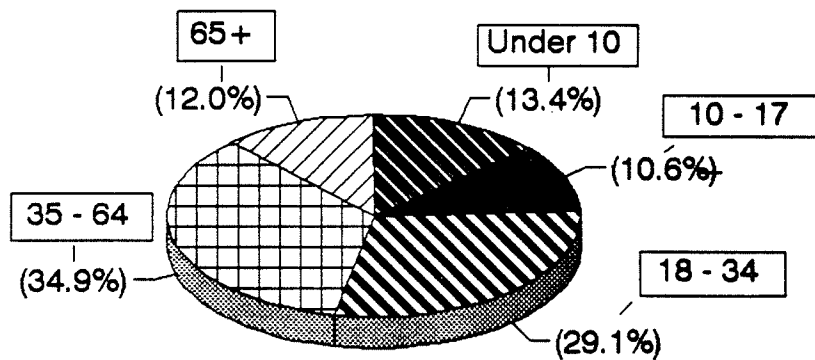


Table OA Manitoba Population Distribution
June 1990

Age Cohorts	Winnipeg Status Indians	Winnipeg Other Residents	Rural Status Indians	Rural Other Residents
<10	31.0%	13.4%	28.4%	15.4%
10 - 17	15.8%	10.2%	18.3%	12.8%
18 - 34	35.2%	29.8%	30.5%	25.3%
35 - 64	16.4%	33.8%	18.9%	32.4%
65+	1.6%	12.8%	3.9%	14.1%
All Ages	100.0%	100.0%	100.0%	100.0%
	N=12,168 1.1%	N=634,936 56.1%	N=45,200 4.0%	N=438,541 38.8%

Source: Manitoba Health Services Commission
Population Registry, June, 1990

Table OB Winnipeg Population Distribution
June 1990

Age Cohorts	Core Area Status Indians	Core Area Other Residents	Suburbs Status Indians	Suburbs Other Residents
< 10	31.7%	13.3%	29.0%	13.4%
10 - 17	15.6%	8.4%	16.3%	10.6%
18 - 34	34.4%	32.1%	37.7%	29.1%
35 - 64	16.5%	30.2%	16.1%	34.9%
65 +	1.8%	16.0%	0.9%	12.0%
All Ages	100.0%	100.0%	100.0%	100.0%
	N=9,199 1.4%	N=139,281 21.5%	N=2,969 0.5%	N=495,655 76.6%

Note: The observed differences in the subpopulations distributions, according to the Chi Square Test, are statistically significant at the 1% level of significance (see Appendix A).

Source: Manitoba Health Services Commission
Population Registry, June 1990

4.3 HOSPITAL AND MEDICAL SERVICE UTILIZATION:

Health care service utilization findings of the study are documented in this section for each of the 18 major diagnostic categories plus the summary, All Diagnoses. All tables and figures are presented in the ICD-9-CM numeric order (e.g., #1 = Infectious and Parasitic Diseases). Findings for each of the major diagnostic categories include the following detail:

- A. Commentary for Each Diagnostic Category
- B. Figures for Each Diagnostic Category (Figures 1A to 19A: Hospital Morbidity Ratios and Figures 1B to 19B Medical Services Morbidity Ratios)
- C. Hospital Utilization Tables for Each Diagnostic Category (Tables 1A to 19A)
- D. Medical Services Utilization Tables for Each Diagnostic Category (Tables 1B to 19B).

Comparisons within each age cohort and diagnosis are illustrated in Figures 1A to 19A and 1B to 19B. The number for each figure corresponds to the same numbered table (e.g., Figure 1A illustrates Table 1A). Comparisons of each age cohort and subpopulation are made relative to the Manitoba norm for the same age cohorts. Such comparisons constitute the hospital morbidity ratio or annual medical per capita ratio, described in Chapter 3.

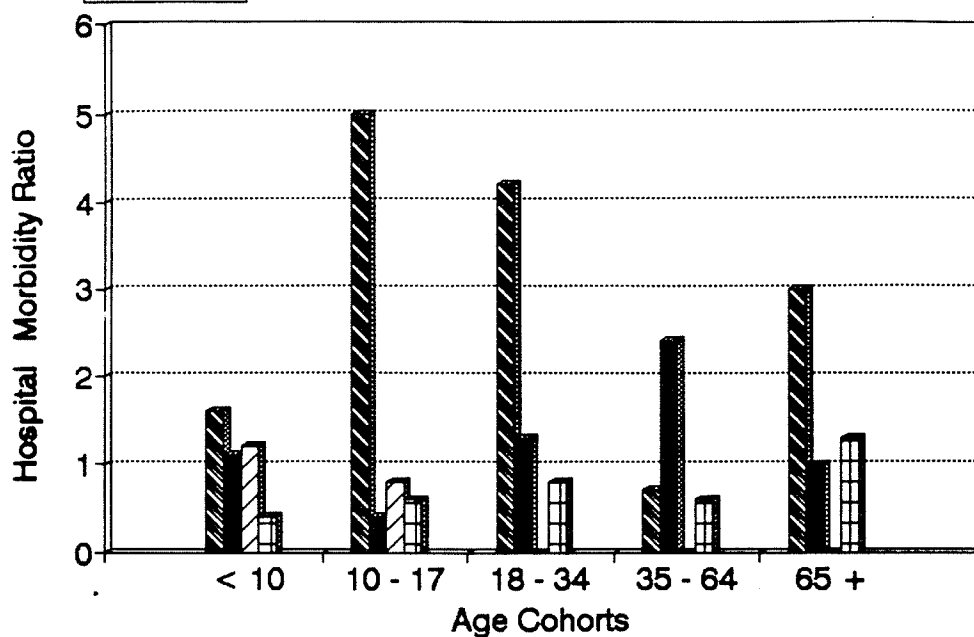
Diagnosis No. 1: Infectious and Parasitic Diseases

Hospital utilization for Infectious and Parasitic Diseases indicated high utilization (above 2.0 morbidity ratio) for Core Area Status Indians in three age cohorts, ages 10 to 17 (5.1 M.R.), ages 18 to 34 (4.2 M.R.) and age 65+ (3.0 M.R.). Other high utilization included Core Area Other Residents, ages 35 to 64 (2.4 M.R.). Both Suburbs subpopulations did not show marked variance from the Manitoba norm of 1.0 hospital morbidity ratio.

Medical utilization for Infectious and Parasitic Diseases indicated high utilization (above 2.0 per capita ratio) for Core Area Status Indians in two age cohorts, ages 35 to 64 (2.0 P.C.R.) and age 65+ (P.C.R. 2.3). Other high utilization included Suburbs Status Indians, ages 65+ (2.0 P.C.R.). However, confidence in this finding is low because the population in the data cell was only 28. Two subpopulations, Core Area Status and Suburbs Other Residents did not show marked variance from the Manitoba norm of 1.0 annual medical per capita ratio.

Infectious and Parasitic Diseases

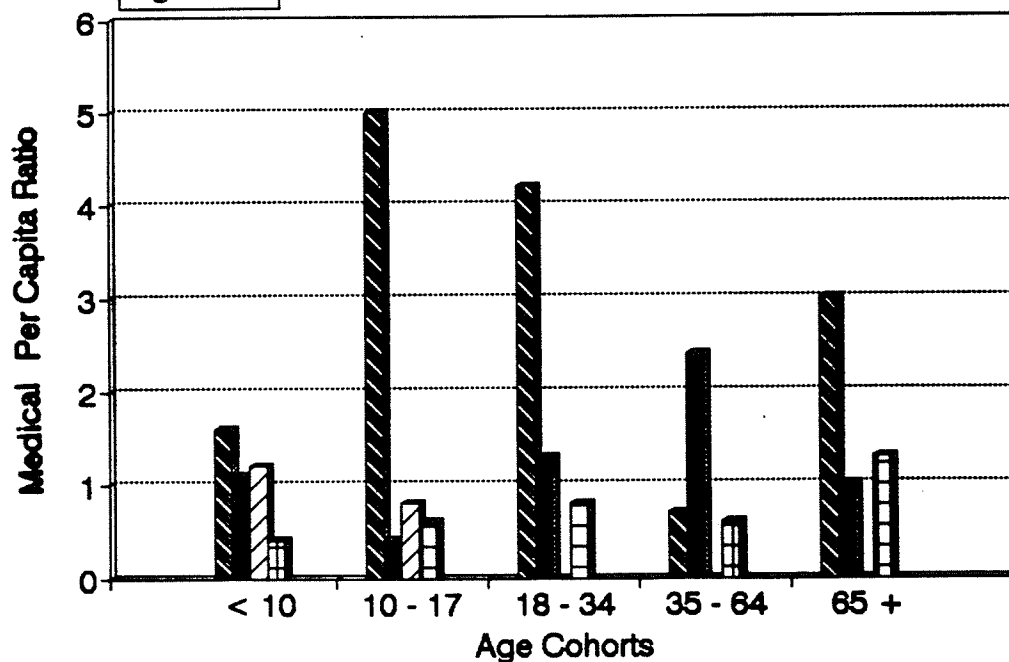
Figure 1A



Core Area Status Core Area Other Suburbs Status Suburbs Other

Infectious and Parasitic Diseases

Figure 1B



Core Area Status Core Area Other Suburbs Status Suburbs Other

TABLE 1A:

SELECTED HOSPITAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

105

Infectious and Parasitic Diseases

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	HOSPITAL DAYS	72	313	16	417
	AVERAGE STAY	5.2	6.1	2.7	4.2
	DAYS/1000 POP.	25	17	19	6
	EXPECTED DAYS	46	296	14	1059
	HOSPITAL M.R.	1.6	1.1	1.2	0.4
10 - 17	POPULATION	1436	11722	483	52801
	HOSPITAL DAYS	36	25	2	142
	AVERAGE STAY	18	2.8	2	5.9
	DAYS/1000 POP.	25	2	4	3
	EXPECTED DAYS	7	53	2	241
	HOSPITAL M.R.	5.1	0.4	0.8	0.6
18 - 34	POPULATION	3164	44718	1120	144324
	HOSPITAL DAYS	80	369	0	782
	AVERAGE STAY	11.4	10	0	8.6
	DAYS/1000 POP.	25	8	0	5
	EXPECTED DAYS	19	268	7	865
	HOSPITAL M.R.	4.2	1.3	0.0	0.8
35 - 64	POPULATION	1520	41994	478	172777
	HOSPITAL DAYS	14	1306	0	1317
	AVERAGE STAY	4.7	23.7	0	11.8
	DAYS/1000 POP.	9	31	0	8
	EXPECTED DAYS	20	552	6	2272
	HOSPITAL M.R.	0.7	2.4	0.0	0.6
65 +	POPULATION	163	22269	28	59281
	HOSPITAL DAYS	36	1662	0	5596
	AVERAGE STAY	36	25.2	0	45.1
	DAYS/1000 POP.	221	75	0	94
	EXPECTED DAYS	12	1632	2	4345
	HOSPITAL M.R.	3.0	1.0	0.0	1.3
ALL AGES	POPULATION	9199	139281	2969	495655
	HOSPITAL DAYS	238	3675	18	8254
	AVERAGE STAY	8.8	16.9	2.6	18.3
	DAYS/1000 POP.	26	26	6	17
	AGE ADJUSTED DAYS	104	2801	31	8782
	HOSPITAL M.R.	2.3	1.3	0.6	0.9

TABLE 1B: SELECTED MEDICAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

Infectious and Parasitic Diseases

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	MEDICAL COST	22703	134993	8986	469537
	PER CAPITA COST	7.79	7.27	10.45	7.06
	EXPECTED PER CAPITA	5.90	5.90	5.90	5.90
	MEDICAL P.C.R.	1.3	1.2	1.8	1.2
10 - 17	POPULATION	1436	11722	483	52801
	MEDICAL COST	6205	51131	2734	293044
	PER CAPITA COST	4.32	4.36	5.66	5.55
	EXPECTED PER CAPITA	4.49	4.49	4.49	4.49
	MEDICAL P.C.R.	1.0	1.0	1.3	1.2
18 - 34	POPULATION	3164	44718	1120	144324
	MEDICAL COST	21042	228502	7439	810416
	PER CAPITA COST	6.65	5.11	6.64	5.62
	EXPECTED PER CAPITA	4.72	4.72	4.72	4.72
	MEDICAL P.C.R.	1.4	1.1	1.4	1.2
35 - 64	POPULATION	1520	41994	478	172777
	MEDICAL COST	8464	142280	2447	565813
	PER CAPITA COST	5.57	3.39	5.12	3.27
	EXPECTED PER CAPITA	2.80	2.80	2.80	2.80
	MEDICAL P.C.R.	2.0	1.2	1.8	1.2
65 +	POPULATION	163	22269	28	59281
	MEDICAL COST	1001	61869	148	183469
	PER CAPITA COST	6.14	2.78	5.29	3.09
	EXPECTED PER CAPITA	2.66	2.66	2.66	2.66
	MEDICAL P.C.R.	2.3	1.1	2.0	1.2
ALL AGES	POPULATION	9199	139281	2969	495655
	MEDICAL COST	59415	618775	21753	2.32E6
	PER CAPITA COST	6.46	4.44	7.33	4.69
	ADJUSTED PER CAPITA	4.70	3.95	4.70	3.94
	MEDICAL P.C.R.	1.4	1.1	1.6	1.2

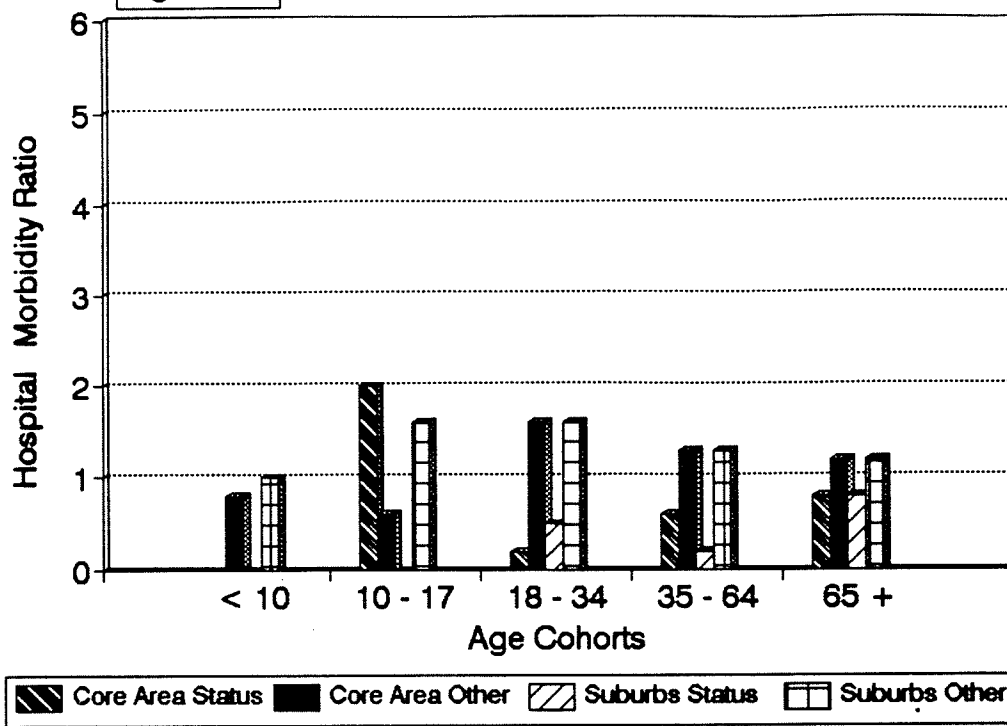
Diagnosis No. 2: Neoplasms

Hospital utilization for Neoplasms indicated high utilization (above 2.0 morbidity ratio) for Core Area Status Indians in only one age cohort, ages 10 to 17 (2.0 M.R.). The three other subpopulations did not show marked variance from the Manitoba norm of 1.0 hospital morbidity ratio.

Medical utilization for Neoplasms indicated high utilization (above 2.0 per capita ratio) for none of the subpopulations or age cohorts. None showed marked variance from the Manitoba norm of 1.0 annual medical per capita ratio.

Neoplasms

Figure 2A



Neoplasms

Figure 2B

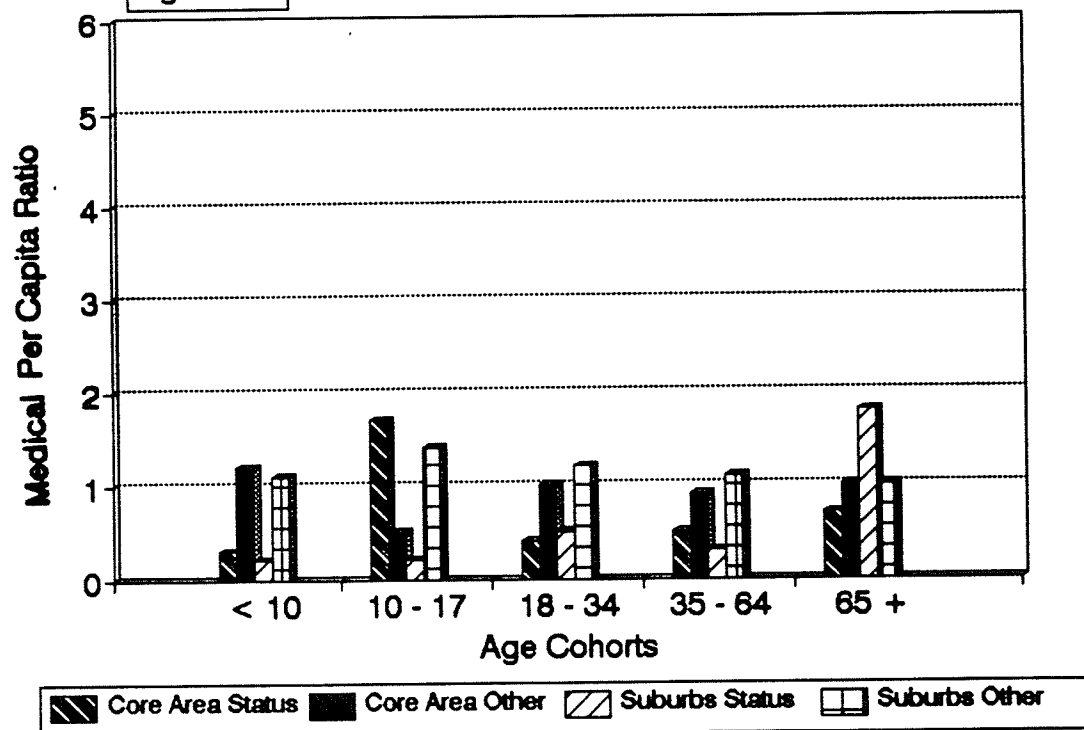


TABLE 2A: SELECTED HOSPITAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

Neoplasms

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	HOSPITAL DAYS	0	80	0	314
	AVERAGE STAY	0	5	0	8.2
	DAYS/1000 POP.	0	4	0	5
	EXPECTED DAYS	15	95	4	341
	HOSPITAL M.R.	0.0	0.8	0.0	1.0
10 - 17	POPULATION	1436	11722	483	52801
	HOSPITAL DAYS	14	31	0	432
	AVERAGE STAY	14	6.2	0	9
	DAYS/1000 POP.	10	3	0	8
	EXPECTED DAYS	7	60	2	60
	HOSPITAL M.R.	2.0	0.6	0.0	1.6
18 - 34	POPULATION	3164	44718	1120	144324
	HOSPITAL DAYS	7	791	6	791
	AVERAGE STAY	2.3	8.3	6	8.3
	DAYS/1000 POP.	2	18	5	18
	EXPECTED DAYS	35	492	12	492
	HOSPITAL M.R.	0.2	1.6	0.5	1.6
35 - 64	POPULATION	1520	41994	478	172777
	HOSPITAL DAYS	100	6422	10	6422
	AVERAGE STAY	14.3	14.9	5	14.9
	DAYS/1000 POP.	66	153	21	153
	EXPECTED DAYS	176	4861	55	4861
	HOSPITAL M.R.	0.6	1.3	0.2	1.3
65 +	POPULATION	163	22269	28	59281
	HOSPITAL DAYS	94	18674	16	18674
	AVERAGE STAY	18.8	22.4	16	22.4
	DAYS/1000 POP.	577	839	571	839
	EXPECTED DAYS	116	15791	20	15791
	HOSPITAL M.R.	0.8	1.2	0.8	1.2
ALL AGES	POPULATION	9199	139281	2969	495655
	HOSPITAL DAYS	215	25998	32	25998
	AVERAGE STAY	13.4	18.9	8	18.9
	DAYS/1000 POP.	23	187	11	187
	AGE ADJUSTED DAYS	349	21299	93	21299
	HOSPITAL M.R.	0.6	1.2	0.3	1.2

TABLE 2B: SELECTED MEDICAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

Neoplasms

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	MEDICAL COST	704	17599	112	54631
	PER CAPITA COST	0.24	0.95	0.13	0.82
	EXPECTED PER CAPITA	0.78	0.78	0.78	0.78
	MEDICAL P.C.R.	0.3	1.2	0.2	1.1
10 - 17	POPULATION	1436	11722	483	52801
	MEDICAL COST	2936	7039	103	91054
	PER CAPITA COST	2.04	0.60	0.21	1.72
	EXPECTED PER CAPITA	1.23	1.23	1.23	1.23
	MEDICAL P.C.R.	1.7	0.5	0.2	1.4
18 - 34	POPULATION	3164	44718	1120	144324
	MEDICAL COST	3190	105217	1410	413765
	PER CAPITA COST	1.01	2.35	1.26	2.87
	EXPECTED PER CAPITA	2.45	2.45	2.45	2.45
	MEDICAL P.C.R.	0.4	1.0	0.5	1.2
35 - 64	POPULATION	1520	41994	478	172777
	MEDICAL COST	7196	388601	1531	2E6
	PER CAPITA COST	4.73	9.25	3.20	11.55
	EXPECTED PER CAPITA	10.15	10.15	10.15	10.15
	MEDICAL P.C.R.	0.5	0.9	0.3	1.1
65 +	POPULATION	163	22269	28	59281
	MEDICAL COST	3636	725065	1758	2.34E6
	PER CAPITA COST	22.31	32.56	62.79	39.45
	EXPECTED PER CAPITA	34.35	34.35	34.35	39.35
	MEDICAL P.C.R.	0.7	1.0	1.8	1.0
ALL AGES	POPULATION	9199	139281	2969	495655
	MEDICAL COST	17662	1.24E6	4914	4.89E6
	PER CAPITA COST	1.92	8.93	1.66	9.87
	ADJUSTED PER CAPITA	3.57	9.55	3.31	8.60
	MEDICAL P.C.R.	0.5	0.9	0.5	1.2

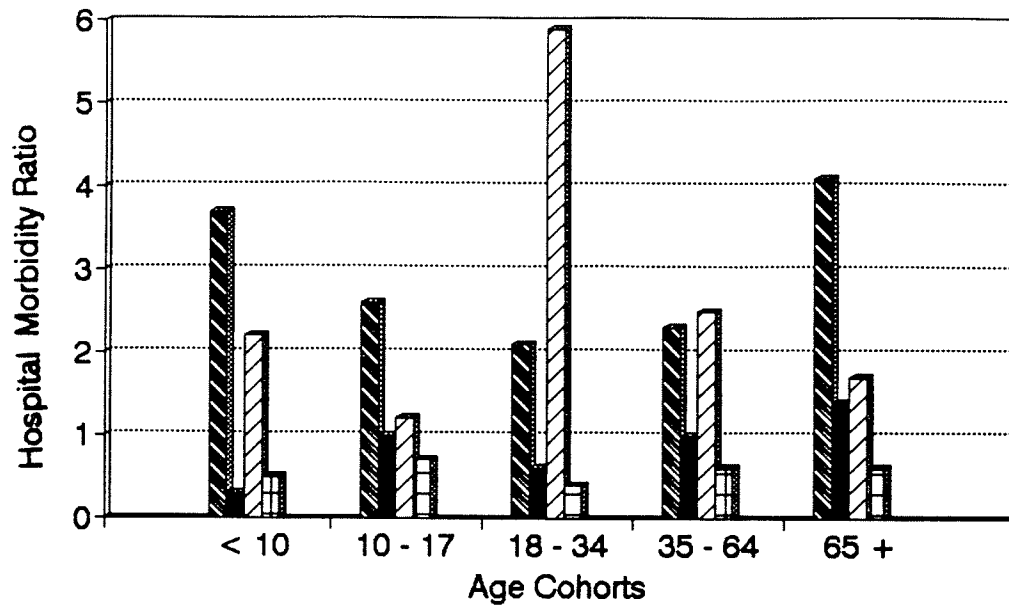
Diagnosis No. 3: Endocrine, Nutritional and
Metabolic Diseases

Hospital utilization for Endocrine, Nutritional and Metabolic Diseases indicated high utilization (above 2.0 morbidity ratio) for Core Area Status Indians in all five age cohorts: ages <10 (3.7 M.R.), ages 10 to 17 (2.6 M.R.), ages 18 to 34 (2.1 M.R.), ages 35 to 64 (2.3 M.R.) and age 65+ (4.1 M.R.). Other high utilization included Suburbs Status Indians in three age cohorts: ages <10 (2.2 M.R.), ages 18 to 34 (5.9 M.R.), and ages 35 to 64 (2.5 M.R.). Both subpopulations of Other Residents (Core Area and Suburbs) did not show marked variance from the Manitoba norm of 1.0 hospital morbidity ratio.

Medical utilization for Endocrine, Nutritional and Metabolic Diseases indicated high utilization (above 2.0 per capita ratio) for Core Area Status Indians in only one age cohort, ages 35 to 64 (2.8 P.C.R.). Other high utilization included Suburbs Status Indians, also ages 35 to 64 (2.5 P.C.R.). Neither Core Area Other Residents nor Suburbs Other Residents showed marked variance from the Manitoba norm of 1.0 annual medical per capita ratio.

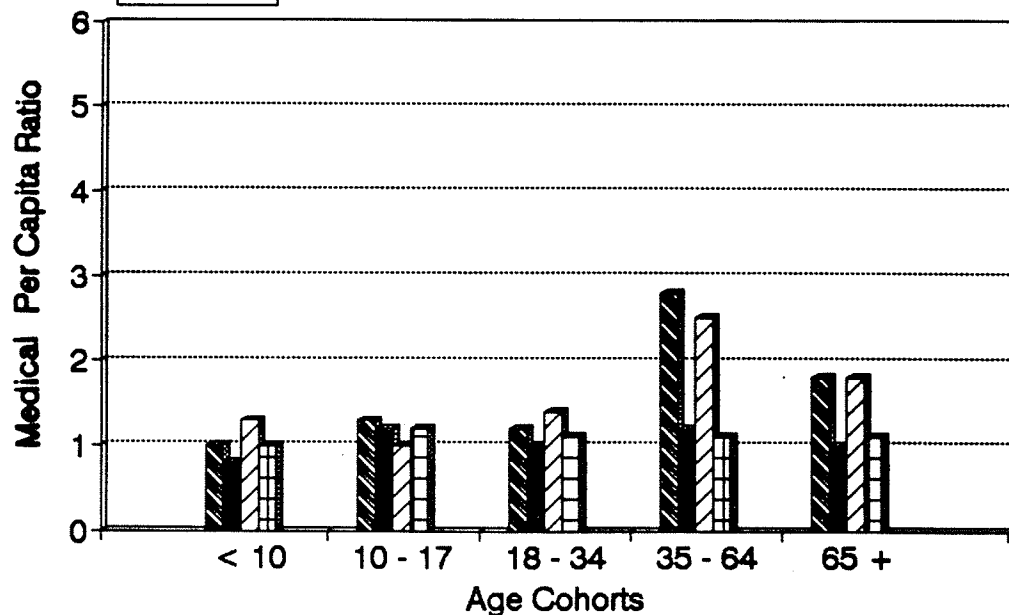
Endocrine, Nutritional and Metabolic Diseases

Figure 3A



Endocrine, Nutritional, and Metabolic Diseases

Figure 3B



Core Area Status Core Area Other Suburbs Status Suburbs Other

TABLE 3A:

SELECTED HOSPITAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

113

Endocrine, Nutritional and
Metabolic Diseases

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	HOSPITAL DAYS	65	33	11	175
	AVERAGE STAY	16.2	3.3	3.7	4.6
	DAYS/1000 POP.	22	2	13	3
	EXPECTED DAYS	18	114	5	407
	HOSPITAL M.R.	3.7	0.3	2.2	0.5
10 - 17	POPULATION	1436	11722	483	52801
	HOSPITAL DAYS	19	63	3	198
	AVERAGE STAY	9.5	6.3	3	8.3
	DAYS/1000 POP.	13	5	6	4
	EXPECTED DAYS	7	58	2	261
	HOSPITAL M.R.	2.6	1.0	1.2	0.7
18 - 34	POPULATION	3164	44718	1120	144324
	HOSPITAL DAYS	53	225	53	444
	AVERAGE STAY	8.8	5.2	26.5	5
	DAYS/1000 POP.	17	5	47	3
	EXPECTED DAYS	27	378	9	1219
	HOSPITAL M.R.	2.1	0.6	5.9	0.4
35 - 64	POPULATION	1520	41994	478	172777
	HOSPITAL DAYS	96	1196	32	2997
	AVERAGE STAY	6	13.6	8	18.2
	DAYS/1000 POP.	63	28	67	17
	EXPECTED DAYS	40	1116	13	4591
	HOSPITAL M.R.	2.3	1.0	2.5	0.6
65 +	POPULATION	163	22269	28	59281
	HOSPITAL DAYS	98	4557	7	5260
	AVERAGE STAY	8.2	30.2	7	23.6
	DAYS/1000 POP.	601	205	250	89
	EXPECTED DAYS	24	3271	4	8709
	HOSPITAL M.R.	4.1	1.4	1.7	0.6
ALL AGES	POPULATION	9199	139281	2969	495655
	HOSPITAL DAYS	331	6074	106	9074
	AVERAGE STAY	8.3	20.1	9.6	16.9
	DAYS/1000 POP.	36	44	36	18
	AGE ADJUSTED DAYS	116	4937	33	15187
	HOSPITAL M.R.	2.9	1.2	3.2	0.6

TABLE 3B:

SELECTED MEDICAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

114

Endocrine, Nutritional, and
Metabolic Diseases

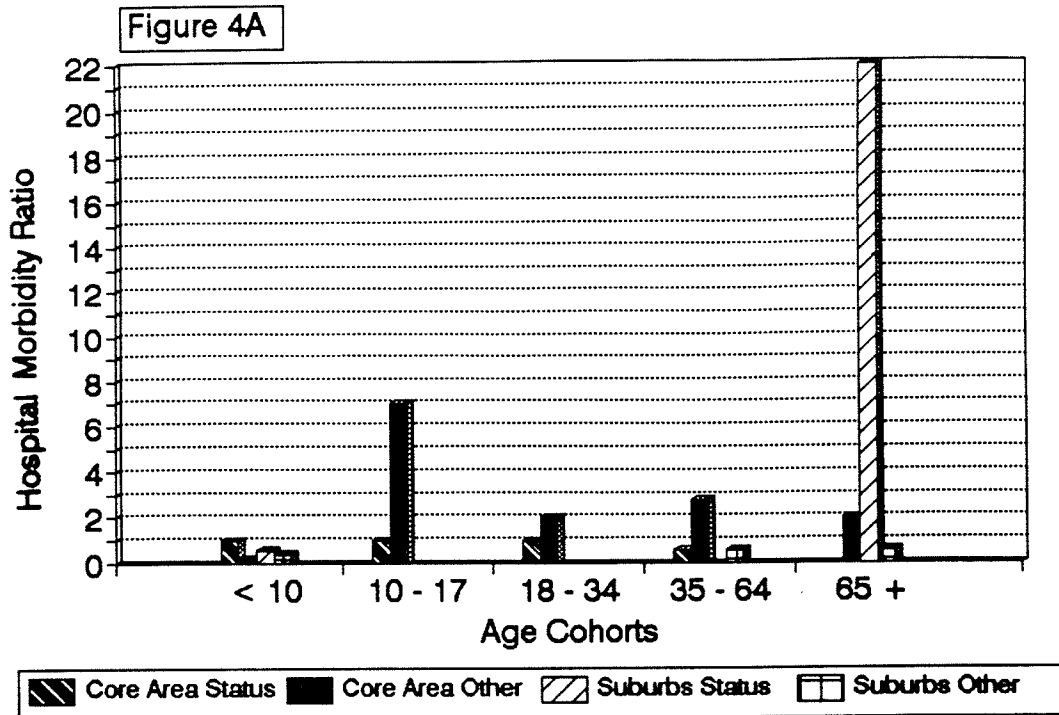
AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	MEDICAL COST	1763	9658	698	42531
	PER CAPITA COST	0.60	0.52	0.81	0.64
	EXPECTED PER CAPITA	0.63	0.63	0.63	0.63
	MEDICAL P.C.R.	1.0	0.8	1.3	1.0
10 - 17	POPULATION	1436	11722	483	52801
	MEDICAL COST	1825	14448	466	62593
	PER CAPITA COST	1.27	1.23	0.96	1.19
	EXPECTED PER CAPITA	1.01	1.01	1.01	1.01
	MEDICAL P.C.R.	1.3	1.2	1.0	1.2
18 - 34	POPULATION	3164	44718	1120	144324
	MEDICAL COST	9751	110046	4134	417886
	PER CAPITA COST	3.08	2.46	3.69	2.90
	EXPECTED PER CAPITA	2.56	2.56	2.56	2.56
	MEDICAL P.C.R.	1.2	1.0	1.4	1.1
35 - 64	POPULATION	1520	41994	478	172777
	MEDICAL COST	38245	432818	10690	1.67E6
	PER CAPITA COST	25.16	10.31	22.36	9.66
	EXPECTED PER CAPITA	9.00	9.00	9.00	9.00
	MEDICAL P.C.R.	2.8	1.2	2.5	1.1
65 +	POPULATION	163	22269	28	59281
	MEDICAL COST	5502	412555	905	1.23E6
	PER CAPITA COST	33.75	18.53	32.32	20.76
	EXPECTED PER CAPITA	18.29	18.29	18.29	18.29
	MEDICAL P.C.R.	1.8	1.0	1.8	1.1
ALL AGES	POPULATION	9199	139281	2969	495655
	MEDICAL COST	57086	979525	16892	3.42E6
	PER CAPITA COST	6.21	7.03	5.69	6.90
	ADJUSTED PER CAPITA	3.05	6.63	2.93	6.26
	MEDICAL P.C.R.	2.0	1.1	1.9	1.1

Diagnosis No. 4: Diseases of Blood and Blood
Forming Organs

Hospital utilization for Diseases of Blood and Blood Forming Organs indicated high utilization (above 2.0 morbidity ratio) for Core Area Status Indians in none of the age cohorts. High utilization was demonstrated by Core Area Other Residents: ages 10 to 17 (7.0 M.R.), ages 18 to 34 (2.0 M.R.), ages 35 to 64 (2.8 M.R.) and age 65+ (2.0 M.R.). Also, Suburbs Status age 65+ were high (21.9 M.R.). While this finding is high the population was only 28 in the data cell. Suburbs Other Residents did not show marked variance from the Manitoba norm of 1.0 hospital morbidity ratio.

Medical utilization for Diseases of Blood and Blood Forming Organs indicated high utilization (above 2.0 per capita ratio) for Core Area Status Indians in three age cohorts: ages 10 to 17 (3.1 P.C.R.), ages 18 to 34 (2.1 P.C.R.) and ages 35 to 64 (2.2 P.C.R.). Other high utilization included Suburbs Status Indians: ages <10 (3.0 P.C.R.), ages 18 to 34 (2.1 P.C.R.) and ages 35 to 64 (2.1 P.C.R.). Neither population of Other Residents showed marked variance from the Manitoba norm of 1.0 annual medical per capita ratio.

Diseases of Blood and Blood Forming Organs



Diseases of Blood and Blood Forming Organs

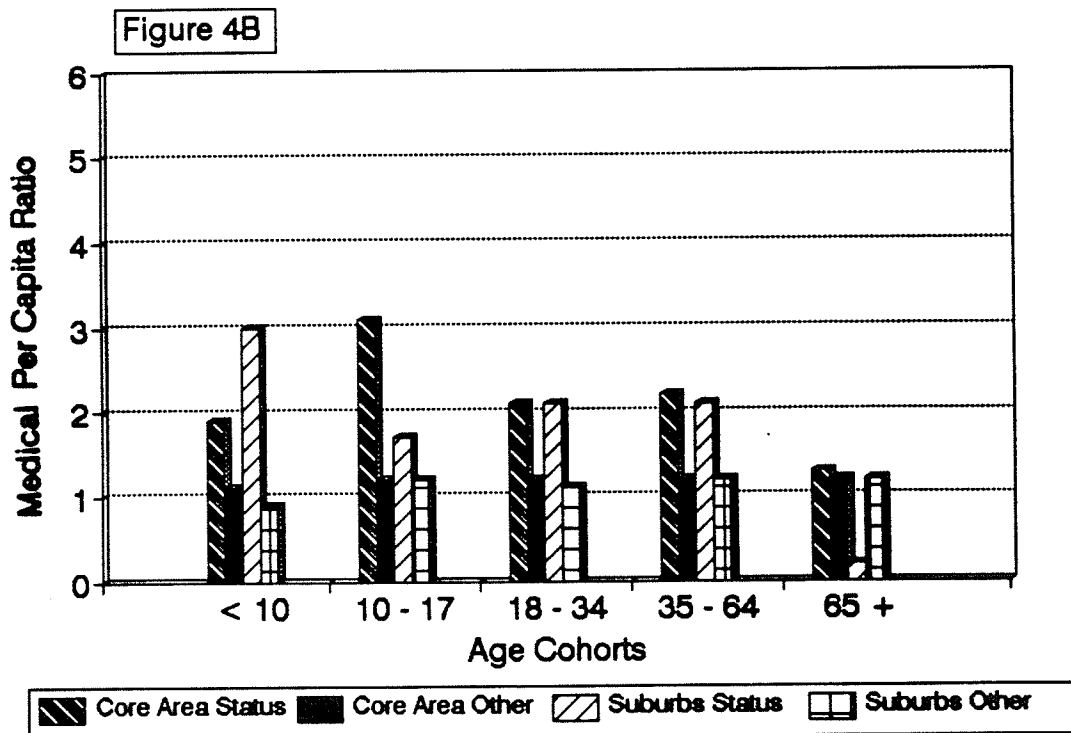


TABLE 4A:

SELECTED HOSPITAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

117

Diseases of Blood and
Blood Forming Organs

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	HOSPITAL DAYS	15	19	3	119
	AVERAGE STAY	5	2.7	1.5	4.5
	DAYS/1000 POP.	5	1	3	2
	EXPECTED DAYS	15	99	5	352
	HOSPITAL M.R.	1.0	0.2	0.6	0.4
10 - 17	POPULATION	1436	11722	483	52801
	HOSPITAL DAYS	2	77	0	18
	AVERAGE STAY	2	7	0	3
	DAYS/1000 POP.	1	7	0	0
	EXPECTED DAYS	2	15	1	69
	HOSPITAL M.R.	1.0	7.0	0.0	0.0
18 - 34	POPULATION	3164	44718	1120	144324
	HOSPITAL DAYS	2	68	0	64
	AVERAGE STAY	2	7.6	0	4.9
	DAYS/1000 POP.	1	2	0	0
	EXPECTED DAYS	3	39	1	127
	HOSPITAL M.R.	1.0	2.0	0.0	0.0
35 - 64	POPULATION	1520	41994	478	172777
	HOSPITAL DAYS	5	607	0	547
	AVERAGE STAY	5	28.9	0	7.7
	DAYS/1000 POP.	3	14	0	3
	EXPECTED DAYS	8	210	2	863
	HOSPITAL M.R.	0.6	2.8	0.0	0.6
65 +	POPULATION	163	22269	28	59281
	HOSPITAL DAYS	0	1935	27	1482
	AVERAGE STAY	0	28.9	27	14.5
	DAYS/1000 POP.	0	87	964	25
	EXPECTED DAYS	7	984	1	2619
	HOSPITAL M.R.	0.0	2.0	21.9	0.6
ALL AGES	POPULATION	9199	139281	2969	495655
	HOSPITAL DAYS	24	2706	30	2230
	AVERAGE STAY	4	23.5	10	10.2
	DAYS/1000 POP.	3	19	10	4
	AGE ADJUSTED DAYS	35	1347	10	4030
	HOSPITAL M.R.	0.7	2.0	3.0	0.6

TABLE 4B: SELECTED MEDICAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

Diseases of Blood and
Blood Forming Organs

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	MEDICAL COST	3836	14871	1848	43789
	PER CAPITA COST	1.32	0.80	2.15	0.66
	EXPECTED PER CAPITA	0.71	0.71	0.71	0.71
	MEDICAL P.C.R.	1.9	1.1	3.0	0.9
10 - 17	POPULATION	1436	11722	483	52801
	MEDICAL COST	1677	5232	303	24177
	PER CAPITA COST	1.17	0.45	0.63	0.46
	EXPECTED PER CAPITA	0.38	0.38	0.38	0.38
	MEDICAL P.C.R.	3.1	1.2	1.7	1.2
18 - 34	POPULATION	3164	44718	1120	144324
	MEDICAL COST	3845	32729	1373	95702
	PER CAPITA COST	1.22	0.73	1.23	0.66
	EXPECTED PER CAPITA	0.59	0.59	0.59	0.59
	MEDICAL P.C.R.	2.1	1.2	2.1	1.1
35 - 64	POPULATION	1520	41994	478	172777
	MEDICAL COST	4694	71654	1450	295822
	PER CAPITA COST	3.09	1.71	3.03	1.71
	EXPECTED PER CAPITA	1.44	1.44	1.44	1.44
	MEDICAL P.C.R.	2.2	1.2	2.1	1.2
65 +	POPULATION	163	22269	28	59281
	MEDICAL COST	1263	164531	33	429274
	PER CAPITA COST	7.75	7.39	1.18	7.24
	EXPECTED PER CAPITA	5.99	5.99	5.99	5.99
	MEDICAL P.C.R.	1.3	1.2	0.2	1.2
ALL AGES	POPULATION	9199	139281	2969	495655
	MEDICAL COST	15315	289016	5007	888763
	PER CAPITA COST	1.66	2.08	1.69	1.79
	ADJUSTED PER CAPITA	0.83	1.71	0.78	1.53
	MEDICAL P.C.R.	2.0	1.2	2.2	1.2

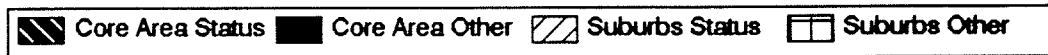
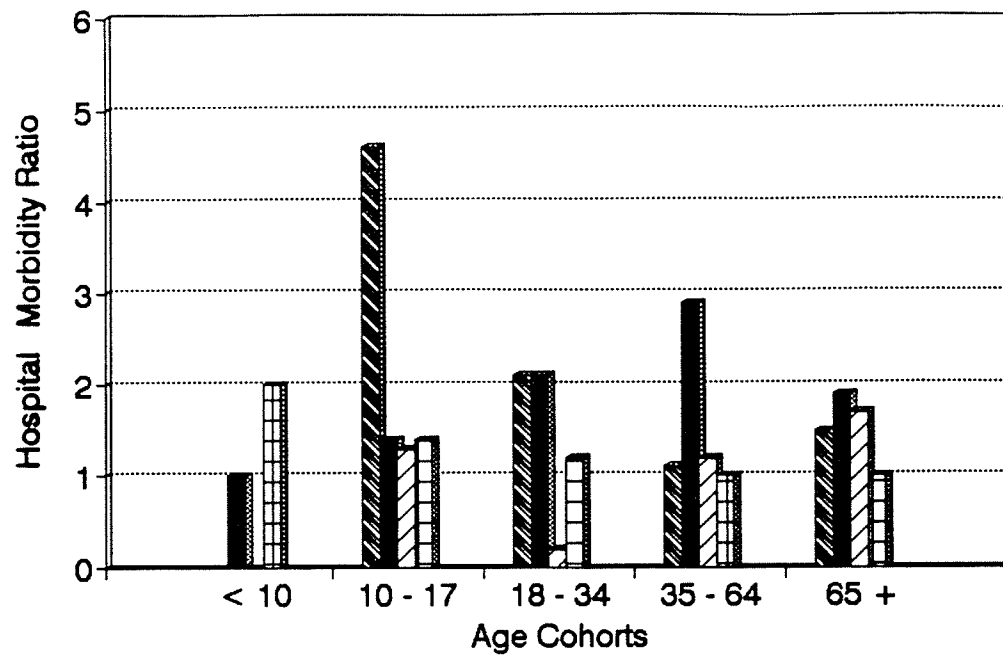
Diagnosis No. 5: Mental Disorders

Hospital utilization for Mental Disorders indicated high utilization (above 2.0 morbidity ratio) for Core Area Status Indians in two age cohorts: ages 10 to 17 (4.6 M.R.) and ages 18 to 34 (2.1 M.R.). Other high utilization included Core Area Other Residents: ages 18 to 34 (2.1 M.R.) and ages 35 to 64 (2.9 M.R.) and Suburbs Other Residents, ages <10 (2.0 M.R.). Suburbs Status Indians did not show marked variance from the Manitoba norm of 1.0 hospital morbidity ratio.

Medical utilization for Mental Disorders indicated high utilization (above 2.0 per capita ratio) for none of the subpopulations or age cohorts. None showed marked variance from the Manitoba norm of 1.0 annual medical per capita ratio.

Mental Disorders

Figure 5A



Mental Disorders

Figure 5B

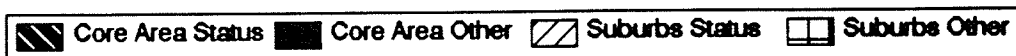
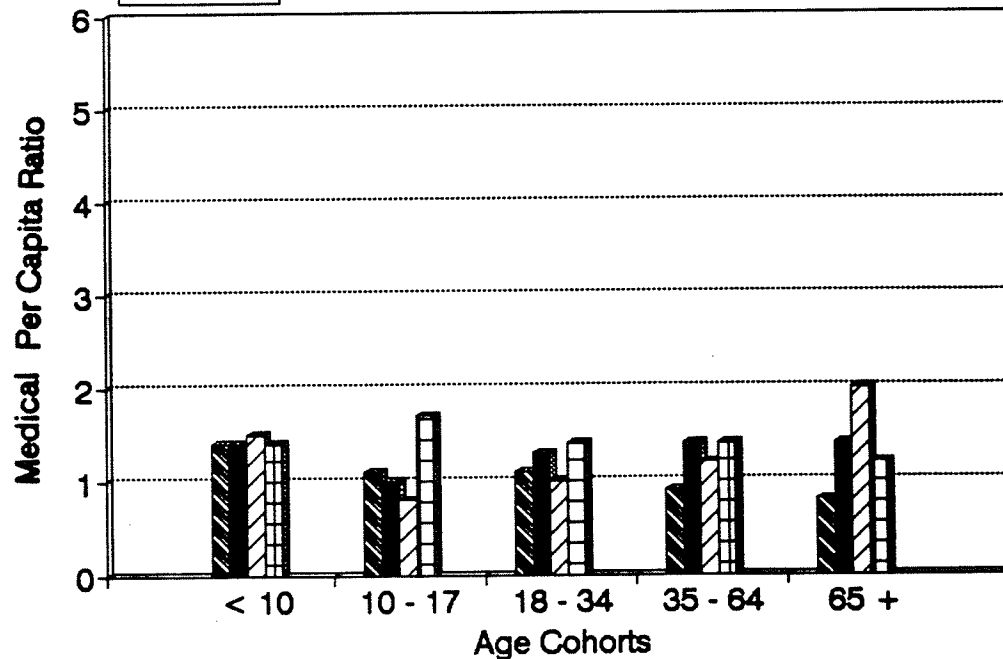


TABLE 5A: SELECTED HOSPITAL UTILIZATION
 OF WINNIPEG RESIDENTS, 1990/91

Mental Disorders

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	HOSPITAL DAYS	0	15	0	130
	AVERAGE STAY	0	7.5	0	13
	DAYS/1000 POP.	0	1	0	2
	EXPECTED DAYS	3	22	1	79
	HOSPITAL M.R.	0.0	1.0	0.0	2.0
10 - 17	POPULATION	1436	11722	483	52801
	HOSPITAL DAYS	544	1330	52	6030
	AVERAGE STAY	60.4	36.9	26	42.5
	DAYS/1000 POP.	379	113	108	114
	EXPECTED DAYS	118	967	40	4355
	HOSPITAL M.R.	4.6	1.4	1.3	1.4
18 - 34	POPULATION	3164	44718	1120	144324
	HOSPITAL DAYS	726	10254	30	18918
	AVERAGE STAY	13.7	22.6	4.3	31.2
	DAYS/1000 POP.	229	229	27	131
	EXPECTED DAYS	348	4918	123	15874
	HOSPITAL M.R.	2.1	2.1	0.2	1.2
35 - 64	POPULATION	1520	41994	478	172777
	HOSPITAL DAYS	192	14193	69	20730
	AVERAGE STAY	4.4	26.5	4.9	24.8
	DAYS/1000 POP.	126	338	144	120
	EXPECTED DAYS	179	4932	56	20291
	HOSPITAL M.R.	1.1	2.9	1.2	1.0
65 +	POPULATION	163	22269	28	59281
	HOSPITAL DAYS	181	32032	36	45028
	AVERAGE STAY	60.3	103.7	12	90.2
	DAYS/1000 POP.	1110	1438	1286	760
	EXPECTED DAYS	123	16846	21	44845
	HOSPITAL M.R.	1.5	1.9	1.7	1.0
ALL AGES	POPULATION	9199	139281	2969	495655
	HOSPITAL DAYS	1643	57824	187	90836
	AVERAGE STAY	15.2	43.3	7.2	43.4
	DAYS/1000 POP.	179	415	63	183
	AGE ADJUSTED DAYS	771	27685	241	85444
	HOSPITAL M.R.	2.1	2.1	0.8	1.1

TABLE 5B: SELECTED MEDICAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

Mental Disorders

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	MEDICAL COST	6188	38470	1881	140011
	PER CAPITA COST	2.12	2.07	2.19	2.11
	EXPECTED PER CAPITA	1.48	1.48	1.48	1.48
	MEDICAL P.C.R.	1.4	1.4	1.5	1.4
10 - 17	POPULATION	1436	11722	483	52801
	MEDICAL COST	8249	64578	2179	477319
	PER CAPITA COST	5.74	5.51	4.51	9.04
	EXPECTED PER CAPITA	5.37	5.37	5.37	5.37
	MEDICAL P.C.R.	1.1	1.0	0.8	1.7
18 - 34	POPULATION	3164	44718	1120	144324
	MEDICAL COST	58655	1.02E6	19327	3.4E6
	PER CAPITA COST	18.54	22.73	17.26	23.55
	EXPECTED PER CAPITA	16.95	16.95	16.95	16.95
	MEDICAL P.C.R.	1.1	1.3	1.0	1.4
35 - 64	POPULATION	1520	41994	478	172777
	MEDICAL COST	37479	1.56E6	14855	6.49E6
	PER CAPITA COST	24.66	37.26	31.08	37.55
	EXPECTED PER CAPITA	26.58	26.58	26.58	26.58
	MEDICAL P.C.R.	0.9	1.4	1.2	1.4
65 +	POPULATION	163	22269	28	59281
	MEDICAL COST	2546	634687	1135	1.48E6
	PER CAPITA COST	15.62	28.50	40.54	24.97
	EXPECTED PER CAPITA	20.18	20.18	20.18	20.18
	MEDICAL P.C.R.	0.8	1.4	2.0	1.2
ALL AGES	POPULATION	9199	139281	2969	495655
	MEDICAL COST	113117	3.32E6	39377	1.2E7
	PER CAPITA COST	12.30	23.83	13.26	24.18
	ADJUSTED PER CAPITA	11.89	17.33	12.17	17.38
	MEDICAL P.C.R.	1.0	1.4	1.1	1.4

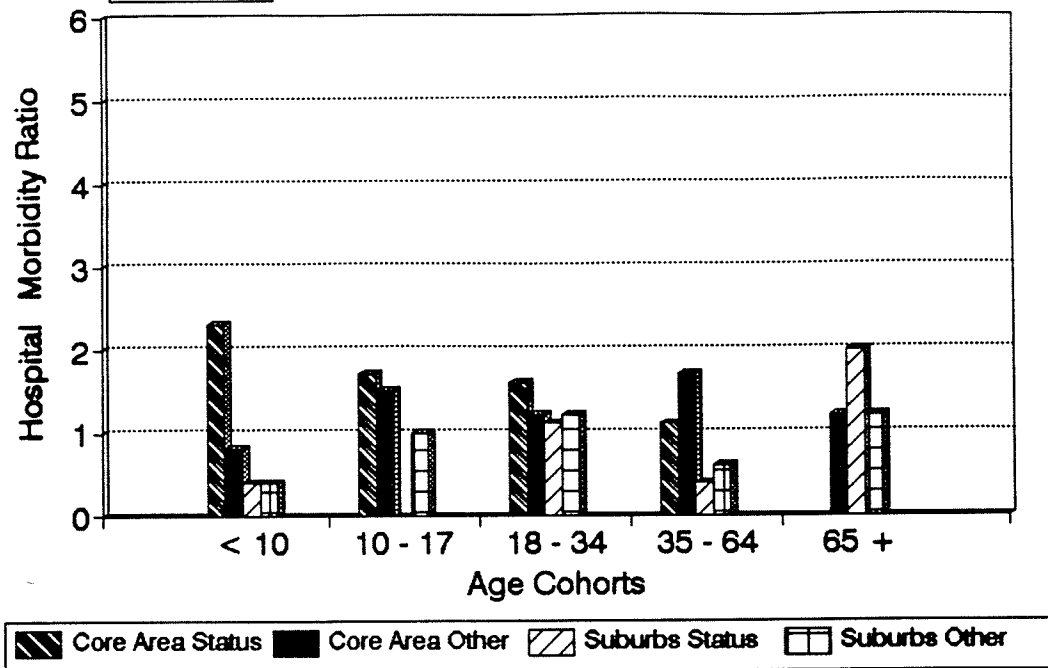
Diagnosis No. 6: Diseases of the Nervous System and
Sense Organs

Hospital utilization for Diseases of the Nervous System and Sense Organs indicated high utilization (above 2.0 morbidity ratio) for Core Area Status Indians in only one age cohort, ages <10 (2.3 M.R.). Other high utilization included Suburbs Status Indians, ages 65+ (2.0 M.R.). However, this finding is questionable because the population was only 28 in the data cell. Both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 hospital morbidity ratio.

Medical utilization for Diseases of the Nervous System and Sense Organs indicated high utilization (above 2.0 per capita ratio) for Core Area Status Indians in no age cohorts. The only high utilization was Suburbs Status Indians, ages 35 to 64 (2.2 P.C.R.). This represented a small data cell population of 478. Both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 annual medical per capita ratio.

Diseases of the Nervous System and Sense Organs

Figure 6A



Disease of the Nervous System and Sense Organs

Figure 6B

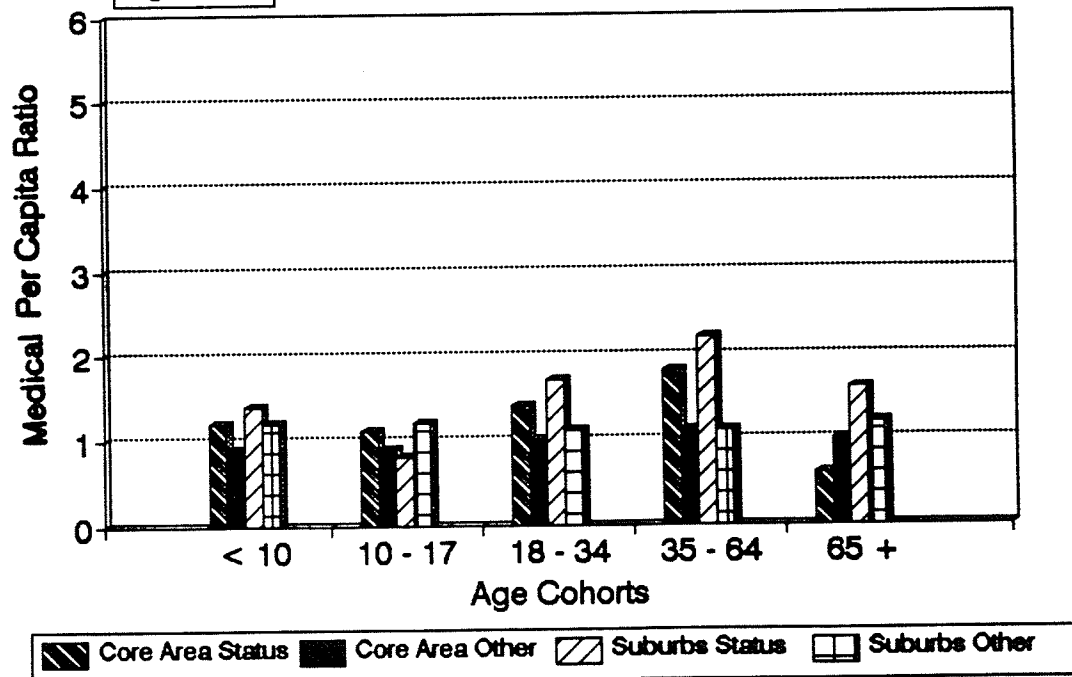


TABLE 6A:

SELECTED HOSPITAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

125

Diseases of the Nervous System
and Sense Organs

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	HOSPITAL DAYS	141	300	7	596
	AVERAGE STAY	7	8.4	3.5	5.3
	DAYS/1000 POP.	48	16	8	9
	EXPECTED DAYS	61	391	18	1398
	HOSPITAL M.R.	2.3	0.8	0.4	0.4
10 - 17	POPULATION	1436	11722	483	52801
	HOSPITAL DAYS	14	101	0	312
	AVERAGE STAY	2.3	11.2	0	6.8
	DAYS/1000 POP.	10	9	0	6
	EXPECTED DAYS	9	73	3	330
	HOSPITAL M.R.	1.7	1.5	0.0	1.0
18 - 34	POPULATION	3164	44718	1120	144324
	HOSPITAL DAYS	59	608	15	1989
	AVERAGE STAY	4.5	8.3	3.8	12.6
	DAYS/1000 POP.	19	14	13	14
	EXPECTED DAYS	39	553	14	1786
	HOSPITAL M.R.	1.6	1.2	1.1	1.2
35 - 64	POPULATION	1520	41994	478	172777
	HOSPITAL DAYS	93	4049	10	5503
	AVERAGE STAY	4.9	29.8	2.5	16.4
	DAYS/1000 POP.	61	96	21	32
	EXPECTED DAYS	89	2448	28	10072
	HOSPITAL M.R.	1.1	1.7	0.4	0.6
65 +	POPULATION	163	22269	28	59281
	HOSPITAL DAYS	0	11627	24	31340
	AVERAGE STAY	0	36.9	8	42.4
	DAYS/1000 POP.	0	522	857	529
	EXPECTED DAYS	70	9498	12	25285
	HOSPITAL M.R.	0.0	1.2	2.0	1.2
ALL AGES	POPULATION	9199	139281	2969	495655
	HOSPITAL DAYS	307	16685	56	39740
	AVERAGE STAY	5.3	29.3	4.3	28.5
	DAYS/1000 POP.	33	120	19	80
	AGE ADJUSTED DAYS	268	12963	75	38871
	HOSPITAL M.R.	1.1	1.3	0.7	1.0

TABLE 6B: SELECTED MEDICAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

Diseases of the Nervous System
and Sense Organs

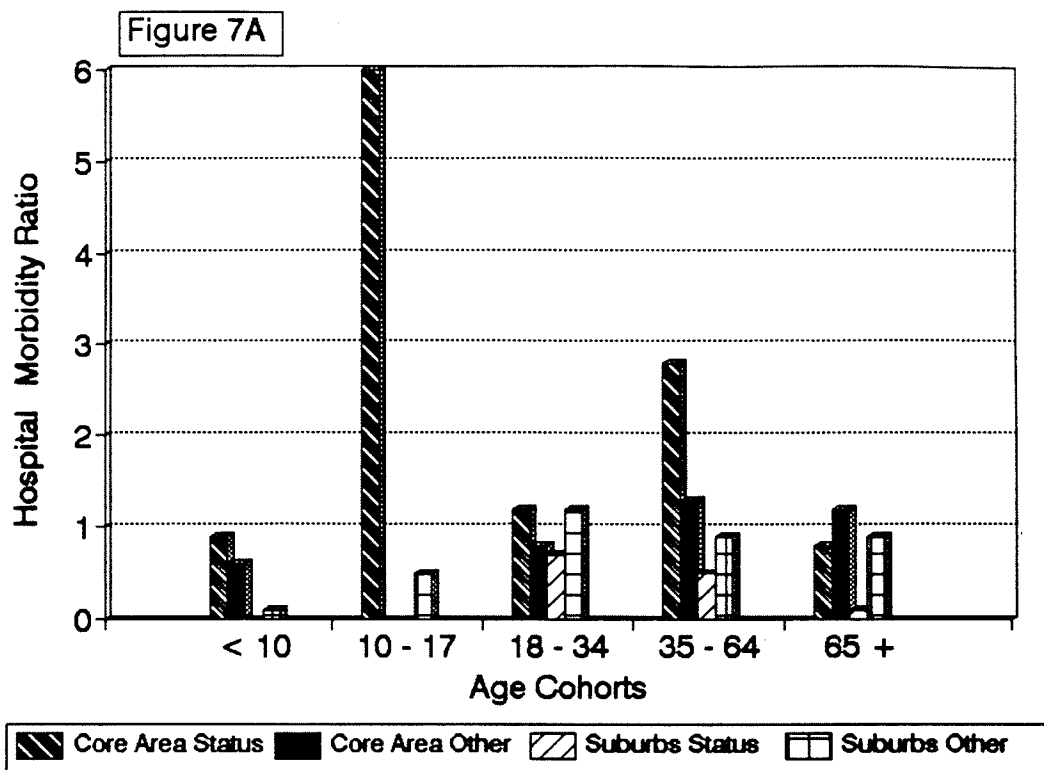
AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	MEDICAL COST	76809	375216	27453	1.74E6
	PER CAPITA COST	26.34	20.20	31.92	26.25
	EXPECTED PER CAPITA	22.69	22.69	22.69	22.69
	MEDICAL P.C.R.	1.2	0.9	1.4	1.2
10 - 17	POPULATION	1436	11722	483	52801
	MEDICAL COST	14708	94219	3712	584745
	PER CAPITA COST	10.24	8.04	7.69	11.07
	EXPECTED PER CAPITA	9.27	9.27	9.27	9.27
	MEDICAL P.C.R.	1.1	0.9	0.8	1.2
18 - 34	POPULATION	3164	44718	1120	144324
	MEDICAL COST	39762	383142	16588	1.47E6
	PER CAPITA COST	12.57	8.57	14.81	10.15
	EXPECTED PER CAPITA	8.95	8.95	8.95	8.95
	MEDICAL P.C.R.	1.4	1.0	1.7	1.1
35 - 64	POPULATION	1520	41994	478	172777
	MEDICAL COST	44933	737705	17001	3.27E6
	PER CAPITA COST	29.56	17.57	35.57	18.91
	EXPECTED PER CAPITA	16.54	16.54	16.54	16.54
	MEDICAL P.C.R.	1.8	1.1	2.2	1.1
65 +	POPULATION	163	22269	28	59281
	MEDICAL COST	4670	1.15E6	2280	3.77E6
	PER CAPITA COST	28.65	51.57	81.43	63.56
	EXPECTED PER CAPITA	51.50	51.50	51.50	51.50
	MEDICAL P.C.R.	0.6	1.0	1.6	1.2
ALL AGES	POPULATION	9199	139281	2969	495655
	MEDICAL COST	180883	2.74E6	67034	1.08E7
	PER CAPITA COST	19.66	19.66	22.58	21.85
	ADJUSTED PER CAPITA	15.36	19.90	14.61	18.56
	MEDICAL P.C.R.	1.3	1.0	1.6	1.2

Diagnosis No. 7: Diseases of the Circulatory System

Hospital utilization for Diseases of the Circulatory System indicated high utilization (above 2.0 morbidity ratio) for Core Area Status Indians in two age cohorts: ages 10 to 17 (6.0 M.R.) and ages 35 to 64 (2.8 M.R.). None of the other three subpopulations showed marked variance from the Manitoba norm of 1.0 hospital morbidity ratio.

Medical utilization for Diseases of the Circulatory System indicated high utilization (above 2.0 per capita ratio) for none of the subpopulations or age cohorts. None showed marked variance from the Manitoba norm of 1.0 annual medical per capita ratio.

Diseases of the Circulatory System



Disease of the Circulatory System

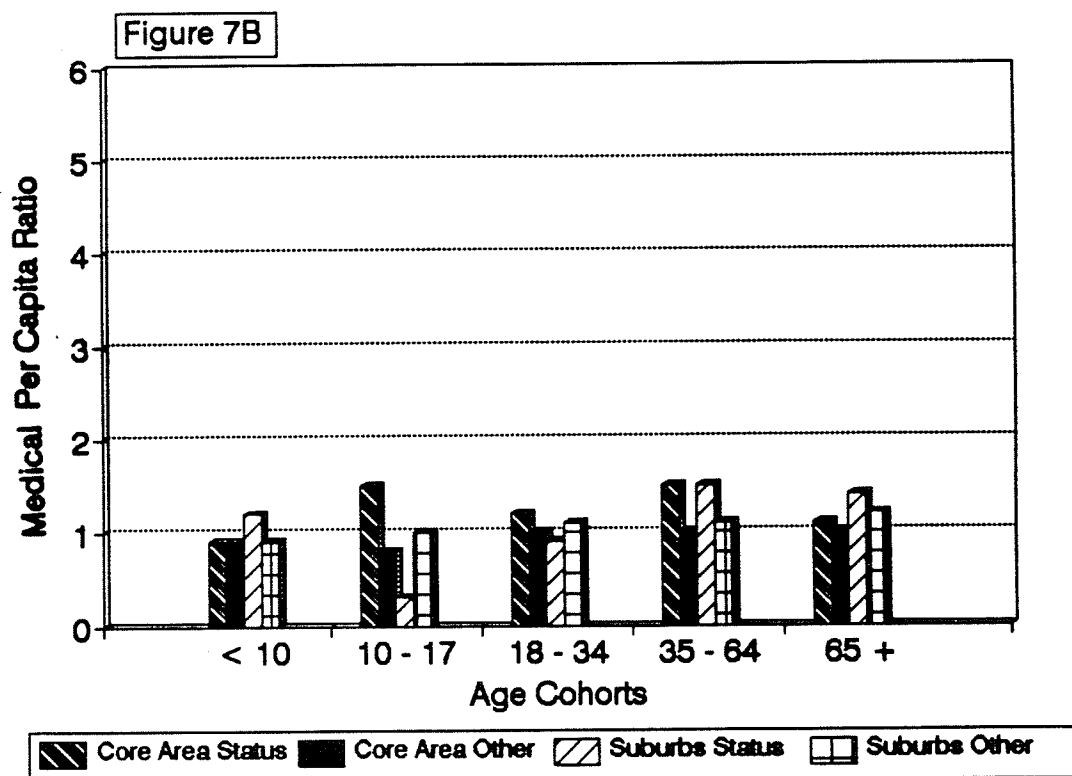


TABLE 7A: SELECTED HOSPITAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

Diseases of the Circulatory System

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	HOSPITAL DAYS	17	81	0	88
	AVERAGE STAY	8.5	11.6	0	4.9
	DAYS/1000 POP.	6	4	0	1
	EXPECTED DAYS	20	130	6	464
	HOSPITAL M.R.	0.9	0.6	0.0	0.1
10 - 17	POPULATION	1436	11722	483	52801
	HOSPITAL DAYS	17	4	0	67
	AVERAGE STAY	8.5	2	0	9.6
	DAYS/1000 POP.	12	0	0	1
	EXPECTED DAYS	3	25	1	114
	HOSPITAL M.R.	6.0	0.0	0.0	0.5
18 - 34	POPULATION	3164	44718	1120	144324
	HOSPITAL DAYS	49	492	10	2280
	AVERAGE STAY	8.2	7.5	10	15.3
	DAYS/1000 POP.	15	11	9	16
	EXPECTED DAYS	42	589	15	1901
	HOSPITAL M.R.	1.2	0.8	0.7	1.2
35 - 64	POPULATION	1520	41994	478	172777
	HOSPITAL DAYS	470	6277	29	16332
	AVERAGE STAY	10.4	12.3	4.1	9.3
	DAYS/1000 POP.	309	149	61	95
	EXPECTED DAYS	169	4680	53	19253
	HOSPITAL M.R.	2.8	1.3	0.5	0.9
65 +	POPULATION	163	22269	28	59281
	HOSPITAL DAYS	191	39751	5	77839
	AVERAGE STAY	12.7	27.8	5	20.9
	DAYS/1000 POP.	1172	1785	179	1313
	EXPECTED DAYS	237	32368	41	86164
	HOSPITAL M.R.	0.8	1.2	0.1	0.9
ALL AGES	POPULATION	9199	139281	2969	495655
	HOSPITAL DAYS	744	46605	44	96606
	AVERAGE STAY	10.6	23.2	4.4	17.1
	DAYS/1000 POP.	81	335	15	195
	AGE ADJUSTED DAYS	471	37792	116	107896
	HOSPITAL M.R.	1.6	1.2	0.4	0.9

TABLE 7B: SELECTED MEDICAL UTILIZATION
 OF WINNIPEG RESIDENTS, 1990/91

Diseases of the Circulatory System

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	MEDICAL COST	1415	5807	338	20305
	PER CAPITA COST	0.29	0.31	0.39	0.31
	EXPECTED PER CAPITA	0.33	0.33	0.33	0.33
	MEDICAL P.C.R.	0.9	0.9	1.2	0.9
10 - 17	POPULATION	1436	11722	483	52801
	MEDICAL COST	856	3712	58	20408
	PER CAPITA COST	0.60	0.32	0.12	0.39
	EXPECTED PER CAPITA	0.40	0.40	0.40	0.40
	MEDICAL P.C.R.	1.5	0.8	0.3	1.0
18 - 34	POPULATION	3164	44718	1120	144324
	MEDICAL COST	7668	87596	1998	315473
	PER CAPITA COST	2.42	1.96	1.78	2.19
	EXPECTED PER CAPITA	2.07	2.07	2.07	2.07
	MEDICAL P.C.R.	1.2	1.0	0.9	1.1
35 - 64	POPULATION	1520	41994	478	172777
	MEDICAL COST	45492	853111	14166	3.61E6
	PER CAPITA COST	29.93	20.32	29.64	20.88
	EXPECTED PER CAPITA	19.60	19.60	19.60	19.60
	MEDICAL P.C.R.	1.5	1.0	1.5	1.1
65 +	POPULATION	163	22269	28	59281
	MEDICAL COST	15989	1.96E6	3530	6.06E6
	PER CAPITA COST	98.09	87.82	126.07	102.26
	EXPECTED PER CAPITA	88.58	88.58	88.58	88.58
	MEDICAL P.C.R.	1.1	1.0	1.4	1.2
ALL AGES	POPULATION	9199	139281	2969	495655
	MEDICAL COST	71420	2.91E6	20091	1E7
	PER CAPITA COST	7.76	20.86	6.77	20.23
	ADJUSTED PER CAPITA	5.69	20.81	4.93	18.12
	MEDICAL P.C.R.	1.4	1.0	1.4	1.2

Diagnosis No. 8: Diseases of the Respiratory System

Hospital utilization for Diseases of the Respiratory System indicated high utilization (above 2.0 morbidity ratio) for Core Area Status Indians in four age cohorts: ages <10 (2.3 M.R.), ages 18 to 34 (3.0 M.R.), ages 34 to 64 (3.4 M.R.) and ages 65+ (3.1 M.R.). Other high utilization included Suburbs Status Indians: Ages <10 (2.2 M.R.) and ages 18 to 34 (11.8 M.R.). Both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 hospital morbidity ratio.

Medical utilization for Diseases of the Respiratory System indicated high utilization (above 2.0 per capita ratio) for Core Area Status Indians in two age cohorts: ages 35 to 64 (2.5 P.C.R.) and ages 65+ (2.5 P.C.R.). Other high utilization included Suburbs Status Indians: ages 35 to 64 (2.8 P.C.R.) and ages 65+ (2.4 P.C.R.). Both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 annual medical per capita ratio.

Diseases of the Respiratory System

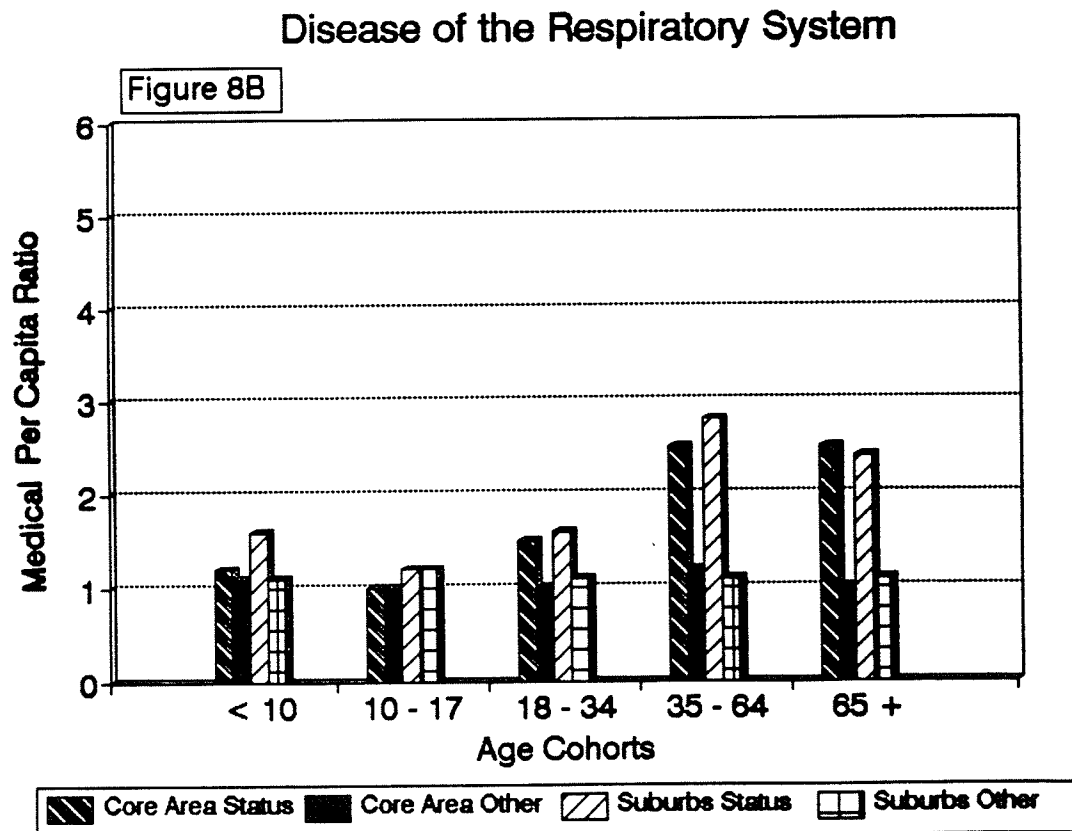
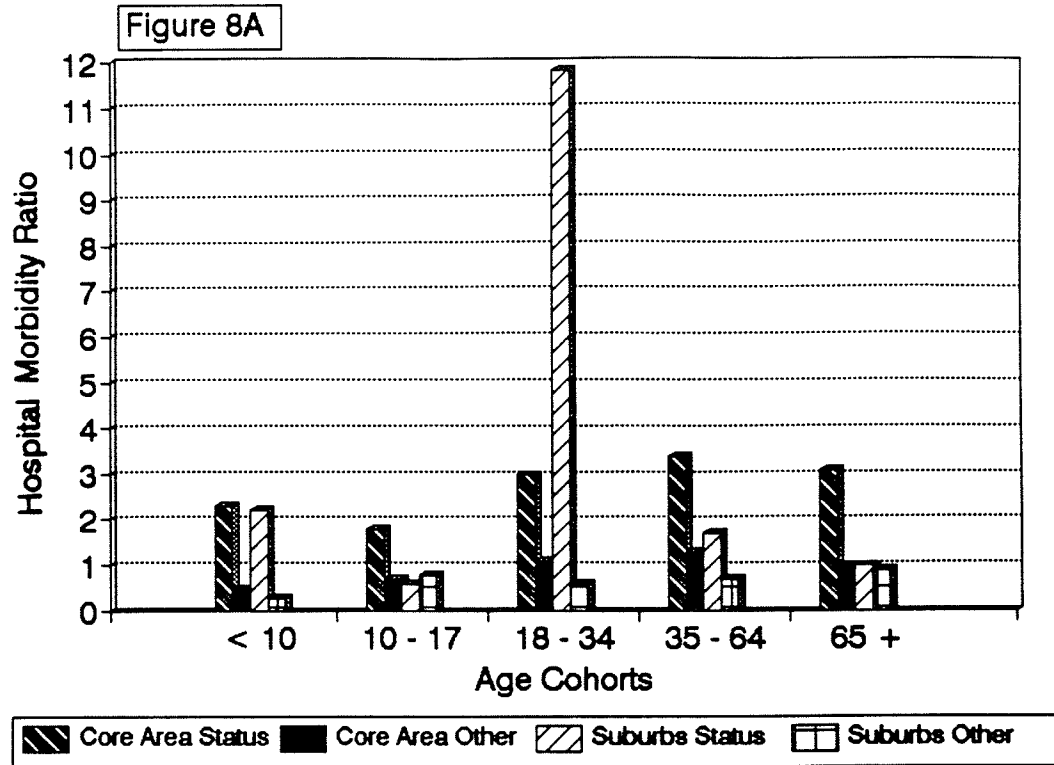


TABLE 8A: SELECTED HOSPITAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

Diseases of the Respiratory System

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	HOSPITAL DAYS	711	1030	201	2428
	AVERAGE STAY	5.1	2.8	3.9	2.5
	DAYS/1000 POP.	244	55	234	37
	EXPECTED DAYS	316	2015	93	7211
	HOSPITAL M.R.	2.3	0.5	2.2	0.3
10 - 17	POPULATION	1436	11722	483	52801
	HOSPITAL DAYS	61	184	7	930
	AVERAGE STAY	3.6	2	1.8	2.3
	DAYS/1000 POP.	42	16	14	18
	EXPECTED DAYS	35	285	12	1286
	HOSPITAL M.R.	1.8	0.7	0.6	0.8
18 - 34	POPULATION	3164	44718	1120	144324
	HOSPITAL DAYS	171	894	237	1495
	AVERAGE STAY	4	4.5	33.9	2.8
	DAYS/1000 POP.	54	20	212	10
	EXPECTED DAYS	57	802	20	2587
	HOSPITAL M.R.	3.0	1.1	11.8	0.6
35 - 64	POPULATION	1520	41994	478	172777
	HOSPITAL DAYS	251	2626	40	5679
	AVERAGE STAY	5.6	8.7	4	8.4
	DAYS/1000 POP.	165	63	84	33
	EXPECTED DAYS	74	2041	23	8396
	HOSPITAL M.R.	3.4	1.3	1.7	0.7
65 +	POPULATION	163	22269	28	59281
	HOSPITAL DAYS	281	12574	15	28522
	AVERAGE STAY	8.3	20.7	5	22.3
	DAYS/1000 POP.	1724	565	536	481
	EXPECTED DAYS	90	12236	15	32574
	HOSPITAL M.R.	3.1	1.0	1.0	0.9
ALL AGES	POPULATION	9199	139281	2969	495655
	HOSPITAL DAYS	1475	17308	500	39054
	AVERAGE STAY	5.3	11.1	6.6	10.1
	DAYS/1000 POP.	160	124	168	79
	AGE ADJUSTED DAYS	572	17379	163	52054
	HOSPITAL M.R.	2.6	1.0	3.1	0.8

TABLE 8B: SELECTED MEDICAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

Diseases of the Respiratory System

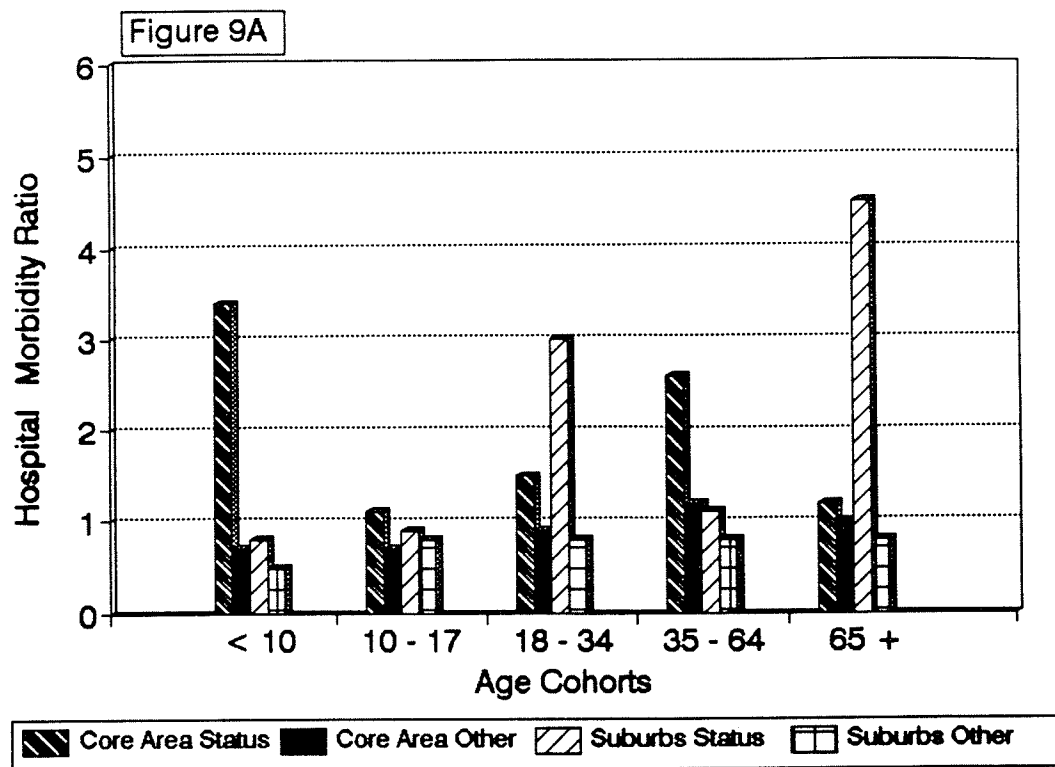
AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	MEDICAL COST	113843	654077	44796	2.42E6
	PER CAPITA COST	39.04	35.21	52.09	36.36
	EXPECTED PER CAPITA	33.65	33.65	33.65	33.65
	MEDICAL P.C.R.	1.2	1.1	1.6	1.1
10 - 17	POPULATION	1436	11722	483	52801
	MEDICAL COST	26685	219720	11638	1.23E6
	PER CAPITA COST	18.58	18.74	24.10	23.27
	EXPECTED PER CAPITA	19.41	19.41	19.41	19.41
	MEDICAL P.C.R.	1.0	1.0	1.2	1.2
18 - 34	POPULATION	3164	44718	1120	144324
	MEDICAL COST	72243	658479	26690	2.42E6
	PER CAPITA COST	22.83	14.73	23.83	16.74
	EXPECTED PER CAPITA	15.10	15.10	15.10	15.10
	MEDICAL P.C.R.	1.5	1.0	1.6	1.1
35 - 64	POPULATION	1520	41994	478	172777
	MEDICAL COST	62149	810577	22557	3.1E6
	PER CAPITA COST	40.89	19.30	47.19	17.91
	EXPECTED PER CAPITA	16.67	16.67	16.67	16.67
	MEDICAL P.C.R.	2.5	1.2	2.8	1.1
65 +	POPULATION	163	22269	28	59281
	MEDICAL COST	11582	632534	1910	1.83E6
	PER CAPITA COST	71.06	28.40	68.21	30.84
	EXPECTED PER CAPITA	28.55	28.55	28.55	28.55
	MEDICAL P.C.R.	2.5	1.0	2.4	1.1
ALL AGES	POPULATION	9199	139281	2969	495655
	MEDICAL COST	286502	2.98E6	107591	1.1E7
	PER CAPITA COST	31.14	21.36	36.24	22.16
	ADJUSTED PER CAPITA	22.15	20.56	21.55	20.20
	MEDICAL P.C.R.	1.4	1.0	1.7	1.1

Diagnosis No. 9: Diseases of the Digestive System

Hospital utilization for Diseases of the Digestive System indicated high utilization (above 2.0 morbidity ratio) for Core Area Status Indians in two age cohorts: ages <10 (3.4 M.R.) and ages 35 to 64 (2.6 M.R.). Other high utilization included Suburbs Status Indians: ages 18 to 34 (3.0 M.R.) and ages 65+ (4.5 M.R.). The last finding, ages 65+, is somewhat questionable because the population in the data cell was only 28. Both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 hospital morbidity ratio.

Medical utilization for Diseases of the Digestive System indicated high utilization (above 2.0 per capita ratio) for Core Area Status Indians in only one age cohort, ages 35 to 64 (2.0 P.C.R.). Other high utilization included Suburbs Status, ages 65+ (4.5 P.C.R.). This finding, however, is somewhat questionable because the population in the data cell was only 28. Both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 annual medical per capita ratio.

Diseases of the Digestive System



Disease of the Digestive System

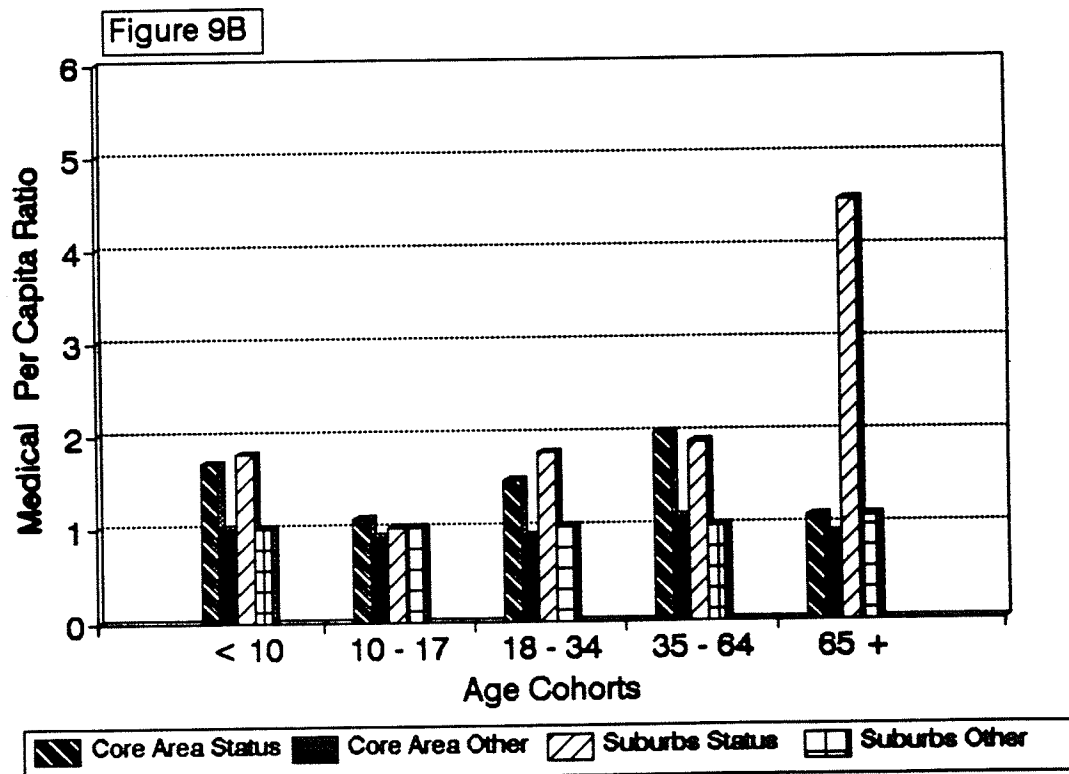


TABLE 9A: SELECTED HOSPITAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

Diseases of the Digestive System

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	HOSPITAL DAYS	240	313	17	829
	AVERAGE STAY	6	4.2	3.4	3.8
	DAYS/1000 POP.	82	17	20	12
	EXPECTED DAYS	70	449	21	1605
	HOSPITAL M.R.	3.4	0.7	0.8	0.5
10 - 17	POPULATION	1436	11722	483	52801
	HOSPITAL DAYS	38	185	10	1050
	AVERAGE STAY	4.2	5.1	3.3	4.4
	DAYS/1000 POP.	26	16	21	20
	EXPECTED DAYS	34	278	11	1250
	HOSPITAL M.R.	1.1	0.7	0.9	0.8
18 - 34	POPULATION	3164	44718	1120	144324
	HOSPITAL DAYS	222	1838	156	5454
	AVERAGE STAY	4.9	5.1	5	5.5
	DAYS/1000 POP.	70	41	139	38
	EXPECTED DAYS	149	2110	53	6809
	HOSPITAL M.R.	1.5	0.9	3.0	0.8
35 - 64	POPULATION	1520	41994	478	172777
	HOSPITAL DAYS	430	5593	58	14765
	AVERAGE STAY	7.7	8.4	6.4	7.1
	DAYS/1000 POP.	283	133	121	85
	EXPECTED DAYS	162	4483	51	18446
	HOSPITAL M.R.	2.6	1.2	1.1	0.8
65 +	POPULATION	163	22269	28	59281
	HOSPITAL DAYS	73	8733	47	18567
	AVERAGE STAY	6.7	13.6	9.4	11.3
	DAYS/1000 POP.	448	392	1679	313
	EXPECTED DAYS	61	8370	11	22280
	HOSPITAL M.R.	1.2	1.0	4.5	0.8
ALL AGES	POPULATION	9199	139281	2969	495655
	HOSPITAL DAYS	1003	16662	288	40665
	AVERAGE STAY	6.2	9.4	5.4	7.9
	DAYS/1000 POP.	109	120	97	82
	AGE ADJUSTED DAYS	476	15690	147	50390
	HOSPITAL M.R.	2.1	1.1	2.0	0.8

TABLE 9B: SELECTED MEDICAL UTILIZATION
 OF WINNIPEG RESIDENTS, 1990/91

Diseases of the Digestive System

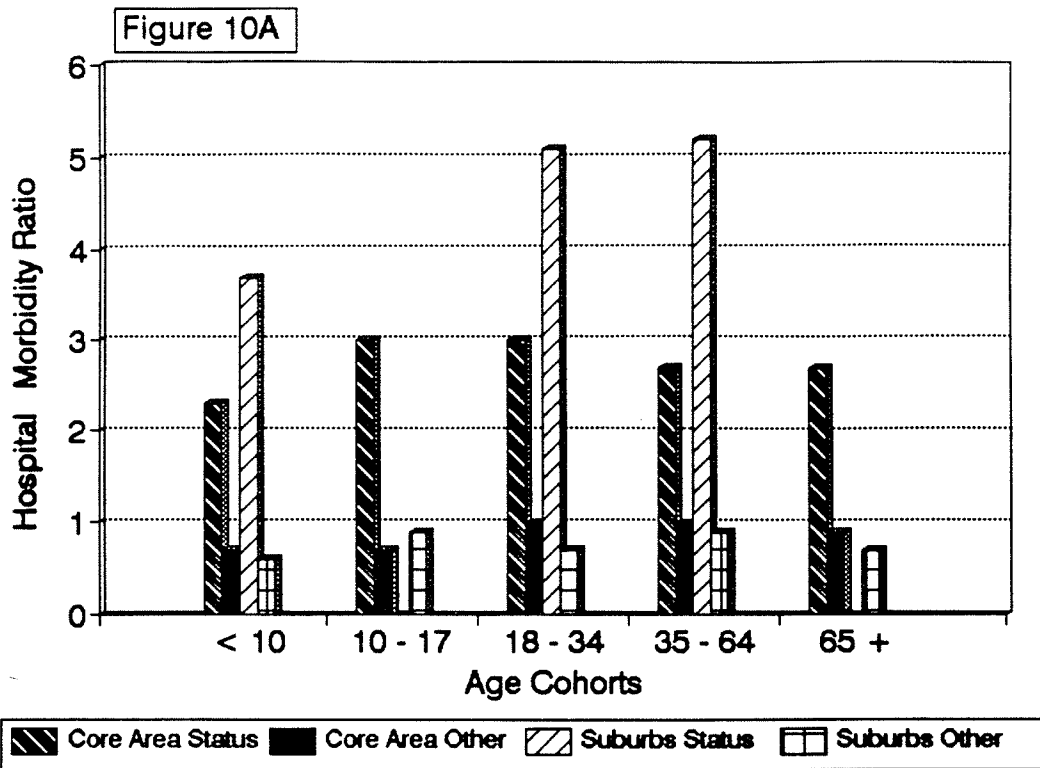
AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	MEDICAL COST	33594	132117	10611	434316
	PER CAPITA COST	11.52	7.11	12.34	6.53
	EXPECTED PER CAPITA	6.86	6.86	6.86	6.86
	MEDICAL P.C.R.	1.7	1.0	1.8	1.0
10 - 17	POPULATION	1436	11722	483	52801
	MEDICAL COST	6031	38901	1874	201891
	PER CAPITA COST	4.20	3.32	3.88	3.82
	EXPECTED PER CAPITA	3.76	3.76	3.76	3.76
	MEDICAL CHI 2	0.820	0.820	0.951	0.975
	MEDICAL P.C.R.	1.1	0.9	1.0	1.0
18 - 34	POPULATION	3164	44718	1120	144324
	MEDICAL COST	47376	395825	19491	1.42E6
	PER CAPITA COST	14.97	8.85	17.40	9.82
	EXPECTED PER CAPITA	9.96	9.96	9.96	9.96
	MEDICAL P.C.R.	1.5	0.9	1.8	1.0
35 - 64	POPULATION	1520	41994	478	172777
	MEDICAL COST	50322	725999	14941	2.77E6
	PER CAPITA COST	33.11	17.29	31.26	16.02
	EXPECTED PER CAPITA	16.26	16.26	16.26	16.26
	MEDICAL P.C.R.	2.0	1.1	1.9	1.0
65 +	POPULATION	163	22269	28	59281
	MEDICAL COST	5888	682539	4120	2.06E6
	PER CAPITA COST	36.12	30.65	147.14	34.74
	EXPECTED PER CAPITA	32.84	32.84	32.84	32.84
	MEDICAL P.C.R.	1.1	0.9	4.5	1.1
ALL AGES	POPULATION	9199	139281	2969	495655
	MEDICAL COST	143211	1.98E6	51036	6.88E6
	PER CAPITA COST	15.57	14.18	17.19	13.88
	ADJUSTED PER CAPITA	9.46	14.58	9.28	13.82
	MEDICAL P.C.R.	1.7	1.0	1.9	1.0

Diagnosis No. 10: Diseases of the Genitourinary System

Hospital utilization for Diseases of the Genitourinary System indicated high utilization (above 2.0 morbidity ratio) for Core Area Status Indians in all five age cohorts: ages <10 (2.3 M.R.), ages 10 to 17 (3.0 M.R.), ages 18 to 34 (3.0 M.R.), ages 35 to 64 (2.7 M.R.), and ages 65+ (2.7 M.R.). Other high utilization included Suburbs Status Indians for three age cohorts: ages <10 (3.7 M.R.), ages 18 to 34 (5.1 M.R.) and ages 35 to 64 (5.2 M.R.). Both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 hospital morbidity ratio.

Medical utilization for Diseases of Genitourinary System indicated high utilization (above 2.0 per capita ratio) for Core Area Status Indians in three age cohorts: ages 10 to 17 (3.3 P.C.R.), ages 35 to 64 (2.5 P.C.R.), and ages 65+ (4.8 P.C.R.). Confidence in the last finding, age 65+, is limited because the population in the data cell was 163. Other high utilization included Suburbs Status Indians in two age cohorts: ages 35 to 64 (2.8 P.C.R) and ages 65+ (9.2 P.C.R.). Confidence in the last finding, age 65+, is limited because the population in the data cell was 28. Both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 annual medical per capita ratio.

Diseases of the Genitourinary System



Disease of the Genitourinary System

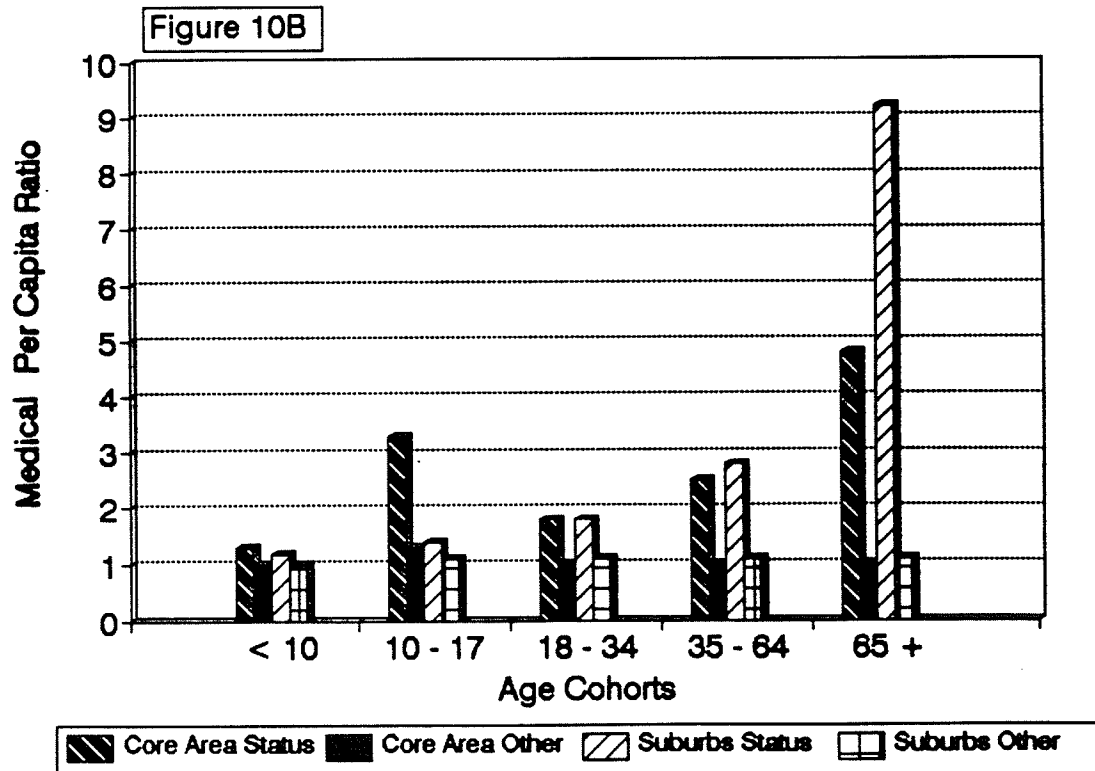


TABLE 10A: SELECTED HOSPITAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

Diseases of the Genitourinary System

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	HOSPITAL DAYS	61	111	28	348
	AVERAGE STAY	4.7	3.8	14	4.8
	DAYS/1000 POP.	21	6	33	5
	EXPECTED DAYS	25	159	7	569
	HOSPITAL M.R.	2.3	0.7	3.7	0.6
10 - 17	POPULATION	1436	11722	483	52801
	HOSPITAL DAYS	39	69	0	426
	AVERAGE STAY	3.3	3.1	0	4.2
	DAYS/1000 POP.	27	6	0	8
	EXPECTED DAYS	13	108	4	487
	HOSPITAL M.R.	3.0	0.7	0.0	0.9
18 - 34	POPULATION	3164	44718	1120	144324
	HOSPITAL DAYS	218	1019	132	2454
	AVERAGE STAY	4.2	4.5	12	4.1
	DAYS/1000 POP.	69	23	118	17
	EXPECTED DAYS	71	1008	25	3254
	HOSPITAL M.R.	3.0	1.0	5.1	0.7
35 - 64	POPULATION	1520	41994	478	172777
	HOSPITAL DAYS	222	2264	135	8054
	AVERAGE STAY	7.7	6.5	6.8	5.6
	DAYS/1000 POP.	146	54	282	47
	EXPECTED DAYS	82	2258	26	9290
	HOSPITAL M.R.	2.7	1.0	5.2	0.9
65 +	POPULATION	163	22269	28	59281
	HOSPITAL DAYS	92	4143	0	9098
	AVERAGE STAY	11.5	10.4	0	8.9
	DAYS/1000 POP.	564	186	0	153
	EXPECTED DAYS	35	4728	6	12585
	HOSPITAL M.R.	2.7	0.9	0.0	0.7
ALL AGES	POPULATION	9199	139281	2969	495655
	HOSPITAL DAYS	632	7606	295	20380
	AVERAGE STAY	5.5	7.4	8.9	6.3
	DAYS/1000 POP.	69	55	99	41
	AGE ADJUSTED DAYS	226	8261	68	26185
	HOSPITAL M.R.	2.8	0.9	4.3	0.8

TABLE 10B: SELECTED MEDICAL UTILIZATION
 OF WINNIPEG RESIDENTS, 1990/91

Diseases of the Genitourinary System

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	MEDICAL COST	10355	50329	2819	186829
	PER CAPITA COST	3.55	2.71	3.28	2.81
	EXPECTED PER CAPITA	2.71	2.71	2.71	2.71
	MEDICAL P.C.R.	1.3	1.0	1.2	1.0
10 - 17	POPULATION	1436	11722	483	52801
	MEDICAL COST	13843	43783	1919	164175
	PER CAPITA COST	9.64	3.74	3.97	3.11
	EXPECTED PER CAPITA	2.90	2.90	2.90	2.90
	MEDICAL P.C.R.	3.3	1.3	1.4	1.1
18 - 34	POPULATION	3164	44718	1120	144324
	MEDICAL COST	97751	736715	34620	2.67E6
	PER CAPITA COST	30.89	16.47	30.91	18.52
	EXPECTED PER CAPITA	16.93	16.93	16.93	16.93
	MEDICAL P.C.R.	1.8	1.0	1.8	1.1
35 - 64	POPULATION	1520	41994	478	172777
	MEDICAL COST	77991	843465	27455	3.95E6
	PER CAPITA COST	51.31	20.09	57.44	22.86
	EXPECTED PER CAPITA	20.42	20.42	20.42	20.42
	MEDICAL P.C.R.	2.5	1.0	2.8	1.1
65 +	POPULATION	163	22269	28	59281
	MEDICAL COST	21854	635429	7169	1.84E6
	PER CAPITA COST	134.07	28.53	256.04	31.00
	EXPECTED PER CAPITA	27.74	27.74	27.74	27.74
	MEDICAL P.C.R.	4.8	1.0	9.2	1.1
ALL AGES	POPULATION	9199	139281	2969	495655
	MEDICAL COST	221793	2.31E6	73981	8.81E6
	PER CAPITA COST	24.11	16.58	24.92	17.78
	ADJUSTED PER CAPITA	11.00	16.63	11.19	16.04
	MEDICAL P.C.R.	2.2	1.0	2.2	1.1

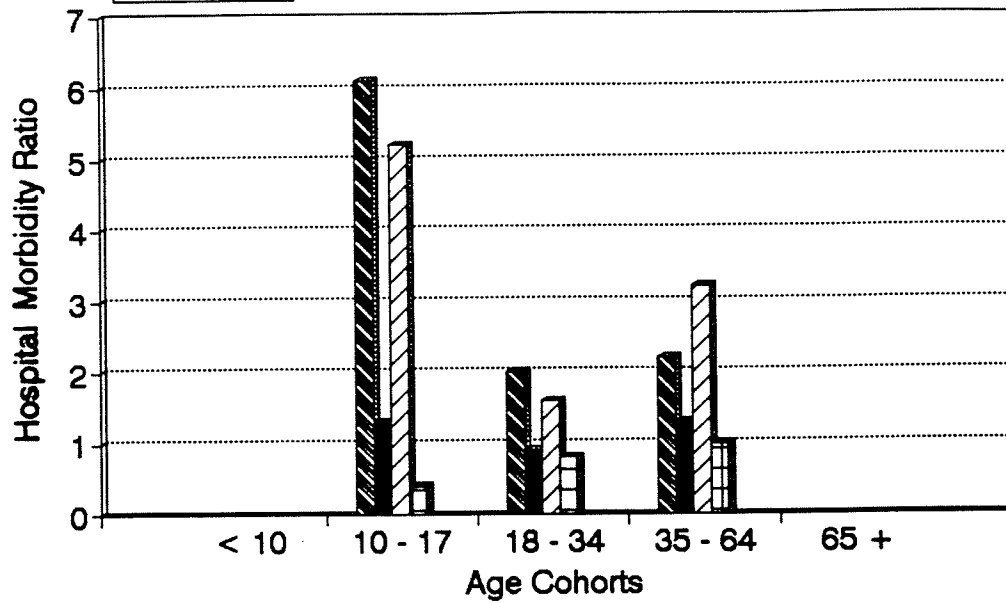
Diagnosis No. 11: Pregnancy, Childbirth, and
the Puerperium

Hospital utilization for Pregnancy, Childbirth and the Puerperium indicated high utilization (above 2.0 morbidity ratio) for Core Area Status Indians in three age cohorts: ages 10 to 17 (6.1 M.R.), ages 18 to 34 (2.0 M.R.) and ages 35 to 64 (2.2 M.R.). Other high utilization included Suburbs Status Indians in two age cohorts: ages 10 to 17 (5.2 M.R.) and ages 35 to 64 (3.2 M.R.). Both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 hospital morbidity ratio.

Medical utilization for Pregnancy, Childbirth, and the Puerperium indicated high utilization (above 2.0 per capita ratio) for Core Area Status Indians in two age cohorts: ages 10 to 17 (7.6 P.C.R.) and ages 18 to 34 (2.1 P.C.R.). Other high utilization included Suburbs Status Indians for two age cohorts: ages 10 to 17 (9.8 P.C.R.) and ages 35 to 64 (2.8 P.C.R.). Confidence in the last finding, ages 35 to 64, is limited because the population in the data cell was 259. Both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 annual medical per capita ratio.

Pregnancy, Childbirth, and the Puerperium

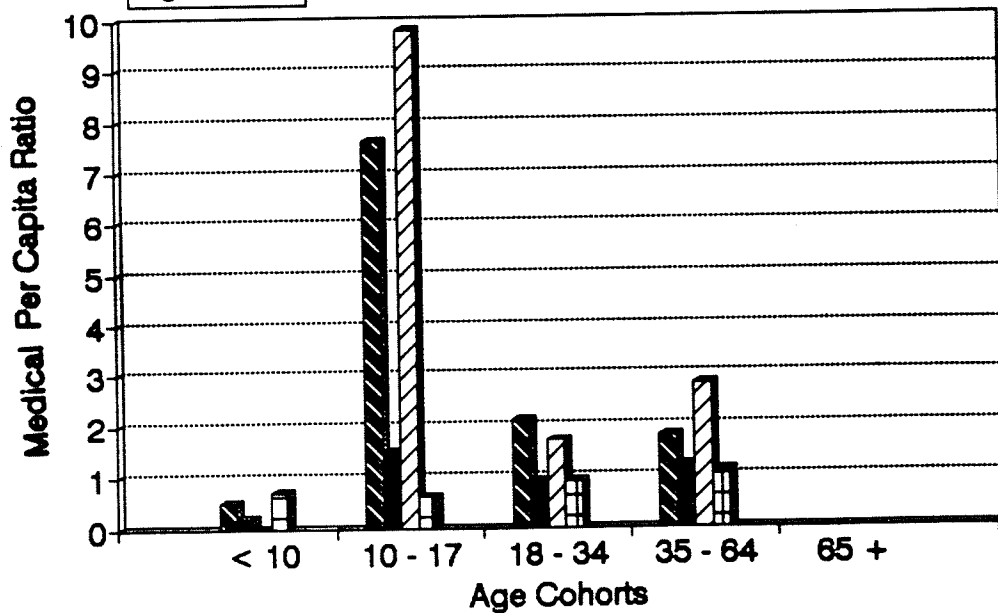
Figure 11A



Core Area Status Core Area Other Suburbs Status Suburbs Other

Pregnancy, Childbirth, and the Puerperium

Figure 11B



Core Area Status Core Area Other Suburbs Status Suburbs Other

TABLE 11A: SELECTED HOSPITAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

Pregnancy, Childbirth, and the
Puerperium

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	1379	9006	435	32502
	HOSPITAL DAYS	0	0	0	0
	AVERAGE STAY	0	0	0	0
	DAYS/1000 POP.	0	0	0	0
	EXPECTED DAYS	0	0	0	0
	HOSPITAL M.R.	-	-	-	-
10 - 17	POPULATION	692	5641	245	25702
	HOSPITAL DAYS	226	389	69	552
	AVERAGE STAY	2.9	2.5	3.5	2.4
	DAYS/1000 POP.	327	69	282	21
	EXPECTED DAYS	37	302	13	1375
	HOSPITAL M.R.	6.1	1.3	5.2	0.4
18 - 34	POPULATION	1713	21191	647	73098
	HOSPITAL DAYS	1639	9072	479	27134
	AVERAGE STAY	2.9	3.1	3.2	3.2
	DAYS/1000 POP.	957	428	740	371
	EXPECTED DAYS	811	10031	306	34603
	HOSPITAL M.R.	2.0	0.9	1.6	0.8
35 - 64	POPULATION	824	20700	259	88775
	HOSPITAL DAYS	70	1056	32	3494
	AVERAGE STAY	3.5	3.7	4.6	3.5
	DAYS/1000 POP.	85	51	124	39
	EXPECTED DAYS	32	816	10	3498
	HOSPITAL M.R.	2.2	1.3	3.2	1.0
65 +	POPULATION	89	13422	17	35956
	HOSPITAL DAYS	0	0	0	0
	AVERAGE STAY	0	0	0	0
	DAYS/1000 POP.	0	0	0	0
	EXPECTED DAYS	0	0	0	0
	HOSPITAL M.R.	-	-	-	-
ALL AGES	POPULATION	4697	69960	1603	256033
	HOSPITAL DAYS	1935	10517	580	31180
	AVERAGE STAY	2.9	3.2	3.3	3.2
	DAYS/1000 POP.	412	150	362	122
	AGE ADJUSTED DAYS	880	11149	329	39476
	HOSPITAL M.R.	2.2	0.9	1.8	0.8

TABLE 11B: SELECTED MEDICAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

Pregnancy, Childbirth, and the
Puerperium

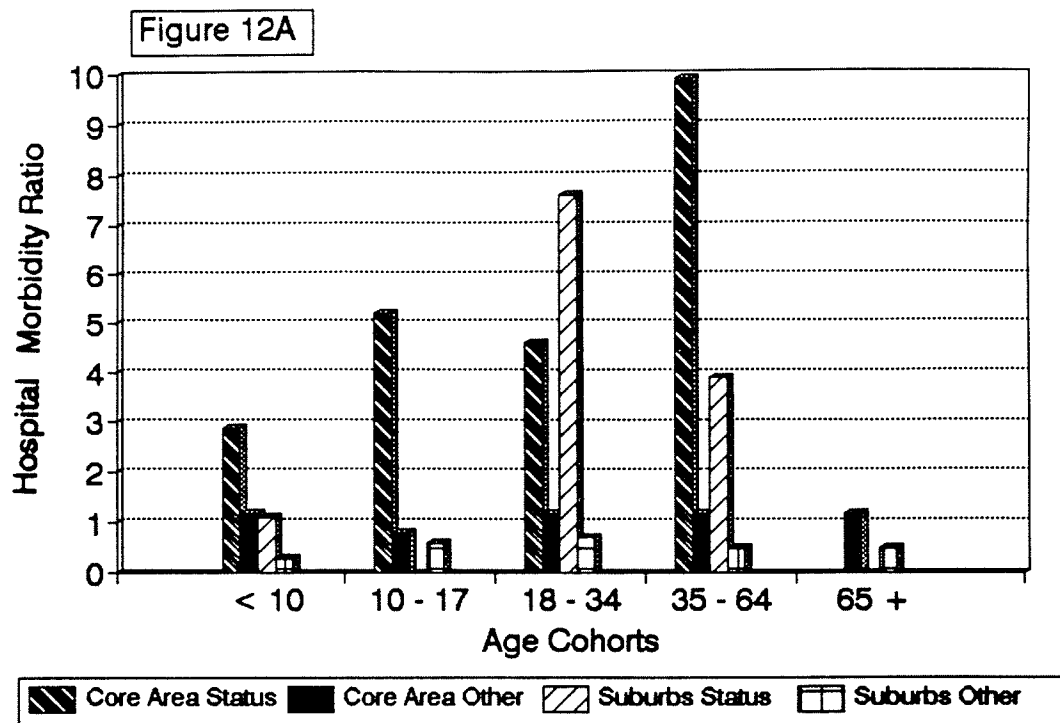
AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	1379	9006	435	32502
	MEDICAL COST	35	94	0	1317
	PER CAPITA COST	0.03	0.01	0	0.04
	EXPECTED PER CAPITA	0.06	0.06	0.06	0.06
	MEDICAL P.C.R.	0.5	0.2	0.0	0.7
10 - 17	POPULATION	692	5641	245	25702
	MEDICAL COST	10712	16952	4893	31124
	PER CAPITA COST	15.48	3.01	19.97	1.21
	EXPECTED PER CAPITA	2.03	2.03	2.03	2.03
	MEDICAL P.C.R.	7.6	1.5	9.8	0.6
18 - 34	POPULATION	1713	21191	647	73098
	MEDICAL COST	165279	822981	48496	2.88E6
	PER CAPITA COST	96.49	38.84	74.96	39.33
	EXPECTED PER CAPITA	45.47	45.47	45.47	45.47
	MEDICAL P.C.R.	2.1	0.9	1.7	0.9
35 - 64	POPULATION	824	20700	259	88775
	MEDICAL COST	9017	156555	4549	598759
	PER CAPITA COST	10.94	7.56	17.56	6.74
	EXPECTED PER CAPITA	6.20	6.20	6.20	6.20
	MEDICAL P.C.R.	1.8	1.2	2.8	1.1
65 +	POPULATION	89	13422	17	35956
	MEDICAL COST	0	90	0	1816
	PER CAPITA COST	0	0.01	0	0.05
	EXPECTED PER CAPITA	0.03	0.03	0.03	0.03
	MEDICAL P.C.R.	0.0	0.0	0.0	0.0
ALL AGES	POPULATION	4697	69960	1603	256033
	MEDICAL COST	185042	996672	57938	3.51E6
	PER CAPITA COST	39.40	14.25	36.14	13.70
	ADJUSTED PER CAPITA	17.99	15.78	19.68	15.35
	MEDICAL P.C.R.	2.2	0.9	1.8	0.9

Diagnosis No. 12: Diseases of the Skin and
Subcutaneous Tissue

Hospital utilization for Diseases of the Skin and Subcutaneous Tissue indicated high utilization (above 2.0 morbidity ratio) for Core Area Status Indians in four age cohorts: ages <10 (2.9 M.R.), ages 10 to 17 (5.2 M.R.), ages 18 to 34 (4.6 M.R.) and ages 35 to 64 (9.9 M.R.). Other high utilization included Suburbs Status Indians in two age cohorts: ages 18 to 34 (7.6 M.R.) and ages 35 to 64 (3.9 M.R.). Both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 hospital morbidity ratio.

Medical utilization for Diseases of the Skin and Subcutaneous Tissue indicated high utilization (above 2.0 per capita ratio) for all four subpopulations in all age cohorts did not show marked variance from the Manitoba norm of 1.0 annual medical per capita ratio.

Diseases of the Skin and Subcutaneous Tissue



Diseases of the Skin and Subcutaneous Tissue

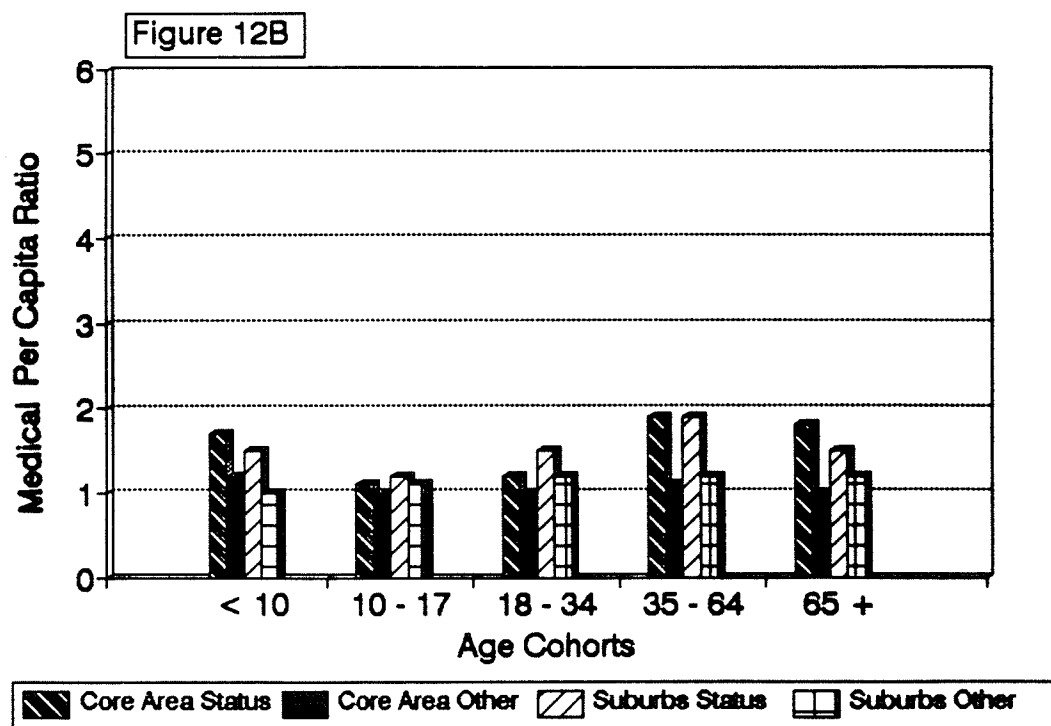


TABLE 12A: SELECTED HOSPITAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

Diseases of the Skin and
Subcutaneous Tissue

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	HOSPITAL DAYS	77	205	9	217
	AVERAGE STAY	4.5	6	9	5.1
	DAYS/1000 POP.	26	11	10	3
	EXPECTED DAYS	26	165	8	589
	HOSPITAL M.R.	2.9	1.2	1.1	0.3
10 - 17	POPULATION	1436	11722	483	52801
	HOSPITAL DAYS	37	42	0	182
	AVERAGE STAY	4.1	3.8	0	5.7
	DAYS/1000 POP.	26	4	0	3
	EXPECTED DAYS	7	59	2	264
	HOSPITAL M.R.	5.2	0.8	0.0	0.6
18 - 34	POPULATION	3164	44718	1120	144324
	HOSPITAL DAYS	130	502	76	863
	AVERAGE STAY	14.4	8.1	19	6.1
	DAYS/1000 POP.	41	11	68	6
	EXPECTED DAYS	28	393	10	1269
	HOSPITAL M.R.	4.6	1.2	7.6	0.7
35 - 64	POPULATION	1520	41994	478	172777
	HOSPITAL DAYS	226	778	28	1443
	AVERAGE STAY	18.9	12.2	9.3	10.1
	DAYS/1000 POP.	149	19	59	8
	EXPECTED DAYS	23	646	7	2660
	HOSPITAL M.R.	9.9	1.2	3.9	0.5
65 +	POPULATION	163	22269	28	59281
	HOSPITAL DAYS	0	2040	0	2210
	AVERAGE STAY	0	26.8	0	16
	DAYS/1000 POP.	0	92	0	37
	EXPECTED DAYS	12	1688	2	4494
	HOSPITAL M.R.	0.0	1.2	0.0	0.5
ALL AGES	POPULATION	9199	139281	2969	495655
	HOSPITAL DAYS	470	3567	113	4915
	AVERAGE STAY	10	14.4	14.1	9.9
	DAYS/1000 POP.	51	26	38	10
	AGE ADJUSTED DAYS	96	2951	29	9276
	HOSPITAL M.R.	4.9	1.2	3.9	0.5

TABLE 12B: SELECTED MEDICAL UTILIZATION
 OF WINNIPEG RESIDENTS, 1990/91

Diseases of the Skin and
Subcutaneous Tissue

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	MEDICAL COST	29087	126877	7630	406838
	PER CAPITA COST	9.97	6.83	8.87	6.12
	EXPECTED PER CAPITA	5.88	5.88	5.88	5.88
	MEDICAL P.C.R.	1.7	1.2	1.5	1.0
10 - 17	POPULATION	1436	11722	483	52801
	MEDICAL COST	10513	71764	3837	391702
	PER CAPITA COST	7.32	6.12	7.94	7.42
	EXPECTED PER CAPITA	6.40	6.40	6.40	6.40
	MEDICAL P.C.R.	1.1	1.0	1.2	1.1
18 - 34	POPULATION	3164	44718	1120	144324
	MEDICAL COST	31948	358236	14458	1.42E6
	PER CAPITA COST	10.10	8.01	12.91	9.81
	EXPECTED PER CAPITA	8.40	8.40	8.40	8.40
	MEDICAL P.C.R.	1.2	1.0	1.5	1.2
35 - 64	POPULATION	1520	41994	478	172777
	MEDICAL COST	23492	390059	7457	1.66E6
	PER CAPITA COST	15.46	9.29	15.60	9.62
	EXPECTED PER CAPITA	8.33	8.33	8.33	8.33
	MEDICAL P.C.R.	1.9	1.1	1.9	1.2
65 +	POPULATION	163	22269	28	59281
	MEDICAL COST	3773	291314	545	925477
	PER CAPITA COST	23.15	13.08	19.46	15.61
	EXPECTED PER CAPITA	12.99	12.99	12.99	12.99
	MEDICAL P.C.R.	1.8	1.0	1.5	1.2
ALL AGES	POPULATION	9199	139281	2969	495655
	MEDICAL COST	98813	1.24E6	33926	4.8E6
	PER CAPITA COST	10.74	8.89	11.43	9.69
	ADJUSTED PER CAPITA	7.36	8.61	7.38	8.37
	MEDICAL P.C.R.	1.5	1.0	1.6	1.2

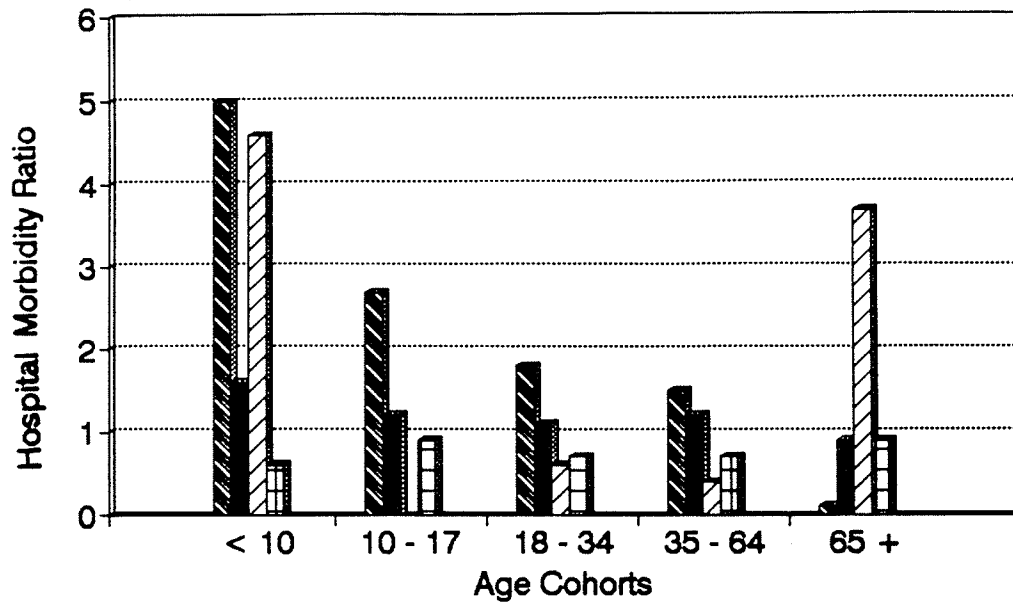
Diagnosis No. 13: Diseases of the Musculoskeletal
System and Connective Tissue

Hospital utilization for Diseases of the Musculoskeletal System and Connective Tissue indicated high utilization (above 2.0 morbidity ratio) for Core Area Status Indians in two age cohorts: ages <10 (5.0 M.R), and ages 10 to 17 (2.7 M.R.). Other high utilization included Suburbs Status Indians in two age cohorts: ages <10 (4.6 M.R.) and ages 65+ (3.7 M.R.). Confidence in the last finding, ages 65+, is limited because the population in the data cell was 28. Both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 hospital morbidity ratio.

Medical utilization for Diseases of the Musculoskeletal System and Connective Tissue indicated high utilization (above 2.0 per capita ratio) for none of the Core Area Status Indians age cohorts. The only high utilization included Suburbs Status Indians in two age cohorts: ages 35 to 64 (2.0 P.C.R.) and ages 65+ (3.6 P.C.R.). Confidence in the last finding, ages 65+, is limited because the population in the data cell was 28. Both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 annual medical per capita ratio.

Diseases of the Musculoskeletal System and Connective Tissue

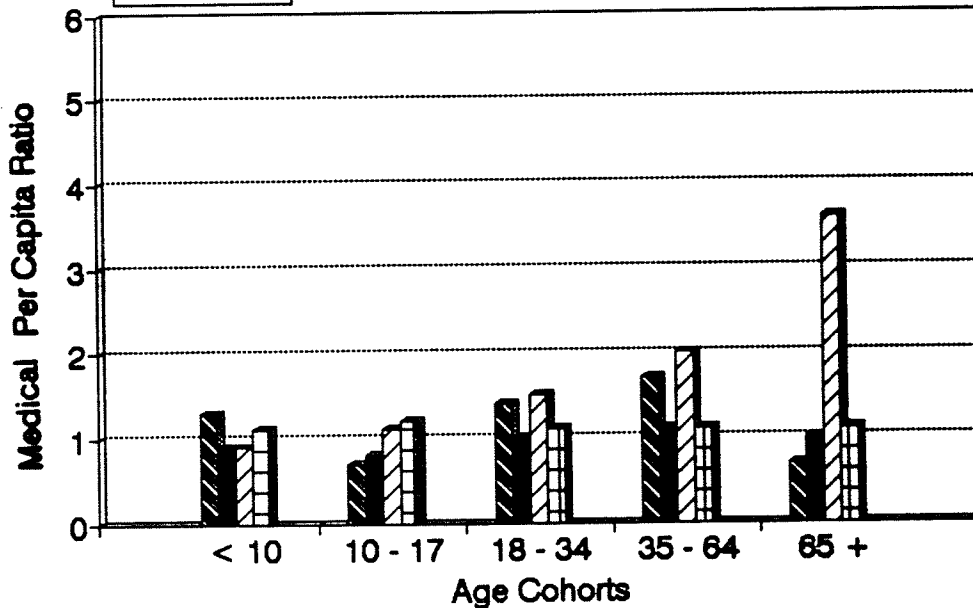
Figure 13A



Core Area Status Core Area Other Suburbs Status Suburbs Other

Diseases of the Musculoskeletal System and Connective Tissues

Figure 13B



Core Area Status Core Area Other Suburbs Status Suburbs Other

TABLE 13A: SELECTED HOSPITAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

Diseases of the Musculoskeletal
System and Connective Tissue

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	HOSPITAL DAYS	72	141	20	209
	AVERAGE STAY	10.3	8.3	6.7	4.7
	DAYS/1000 POP.	25	8	23	3
	EXPECTED DAYS	14	90	4	323
	HOSPITAL M.R.	5.0	1.6	4.6	0.6
10 - 17	POPULATION	1436	11722	483	52801
	HOSPITAL DAYS	43	157	0	509
	AVERAGE STAY	21.5	5.1	0	4.6
	DAYS/1000 POP.	30	13	0	10
	EXPECTED DAYS	16	129	5	583
	HOSPITAL M.R.	2.7	1.2	0.0	0.9
18 - 34	POPULATION	3164	44718	1120	144324
	HOSPITAL DAYS	104	855	12	1848
	AVERAGE STAY	4.2	5.5	2.4	4.2
	DAYS/1000 POP.	33	19	11	13
	EXPECTED DAYS	56	785	20	2532
	HOSPITAL M.R.	1.8	1.1	0.6	0.7
35 - 64	POPULATION	1520	41994	478	172777
	HOSPITAL DAYS	123	2557	9	6294
	AVERAGE STAY	8.8	10.8	9	8
	DAYS/1000 POP.	81	61	19	36
	EXPECTED DAYS	81	2228	25	9169
	HOSPITAL M.R.	1.5	1.2	0.4	0.7
65 +	POPULATION	163	22269	28	59281
	HOSPITAL DAYS	7	5941	32	16047
	AVERAGE STAY	3.5	29.1	16	26.6
	DAYS/1000 POP.	43	267	1143	271
	EXPECTED DAYS	51	6972	9	18561
	HOSPITAL M.R.	0.1	0.9	3.7	0.9
ALL AGES	POPULATION	9199	139281	2969	495655
	HOSPITAL DAYS	349	9651	73	24907
	AVERAGE STAY	7	15	6.6	12.6
	DAYS/1000 POP.	38	69	25	50
	AGE ADJUSTED DAYS	218	10204	63	31168
	HOSPITAL M.R.	1.6	0.9	1.2	0.8

TABLE 13B: SELECTED MEDICAL UTILIZATION
 OF WINNIPEG RESIDENTS, 1990/91

Diseases of the Musculoskeletal
System and Connective Tissues

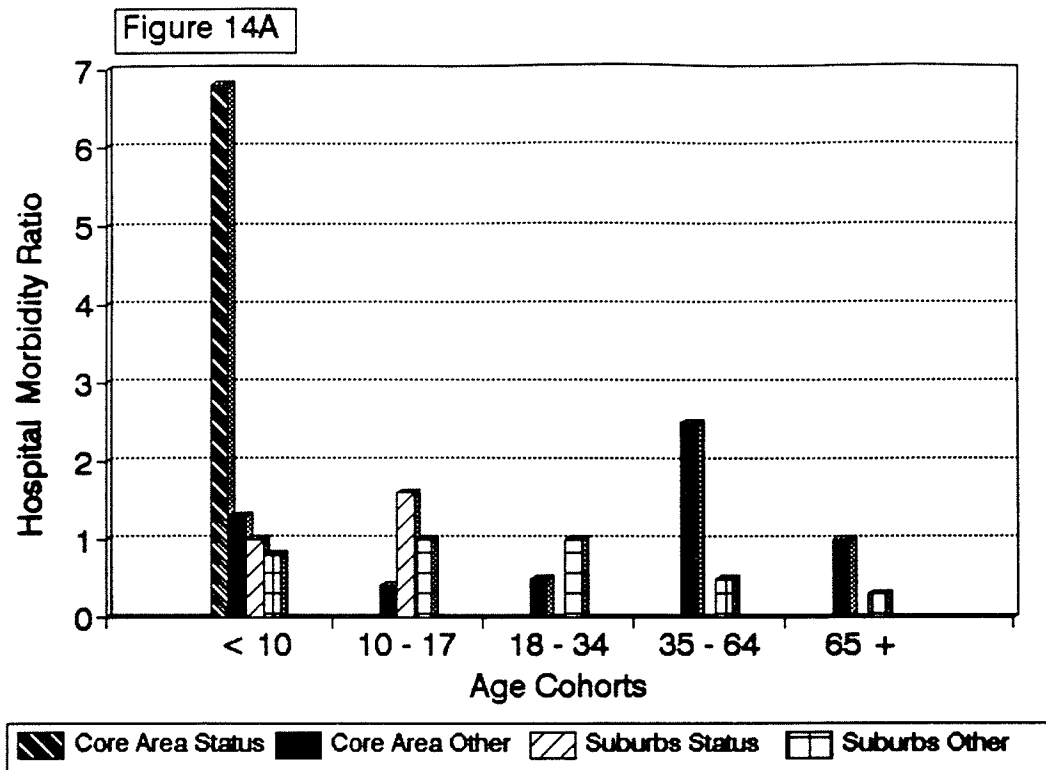
AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	MEDICAL COST	4133	16741	854	75565
	PER CAPITA COST	1.42	0.90	0.99	1.14
	EXPECTED PER CAPITA	1.06	1.06	1.06	1.06
	MEDICAL P.C.R.	1.3	0.9	0.9	1.1
10 - 17	POPULATION	1436	11722	483	52801
	MEDICAL COST	4612	46056	2570	313125
	PER CAPITA COST	3.21	3.93	5.32	5.93
	EXPECTED PER CAPITA	4.96	4.96	4.96	4.96
	MEDICAL P.C.R.	0.7	0.8	1.1	1.2
18 - 34	POPULATION	3164	44718	1120	144324
	MEDICAL COST	42202	422034	15960	1.56E6
	PER CAPITA COST	13.34	9.44	14.25	10.80
	EXPECTED PER CAPITA	9.64	9.64	9.64	9.64
	MEDICAL P.C.R.	1.4	1.0	1.5	1.1
35 - 64	POPULATION	1520	41994	478	172777
	MEDICAL COST	49201	866602	18424	3.52E6
	PER CAPITA COST	32.37	20.64	38.54	20.39
	EXPECTED PER CAPITA	18.84	18.84	18.84	18.84
	MEDICAL P.C.R.	1.7	1.1	2.0	1.1
65 +	POPULATION	163	22269	28	59281
	MEDICAL COST	3697	680374	3211	2.18E6
	PER CAPITA COST	22.68	30.55	114.68	36.85
	EXPECTED PER CAPITA	32.22	32.22	32.22	32.22
	MEDICAL P.C.R.	0.7	1.0	3.6	1.1
ALL AGES	POPULATION	9199	139281	2969	495655
	MEDICAL COST	103844	2.03E6	41020	7.66E6
	PER CAPITA COST	11.29	14.59	13.82	15.45
	ADJUSTED PER CAPITA	8.11	14.49	8.09	13.90
	MEDICAL P.C.R.	1.4	1.0	1.7	1.1

Diagnosis No. 14: Congenital Anomalies

Hospital utilization for Congenital Anomalies indicated high utilization (above 2.0 morbidity ratio) for Core Area Status Indians for one age cohort: ages <10 (6.8 M.R.). Other high utilization Core Area Other Residents, ages 35 to 64 (2.5 M.R.). Both Suburbs subpopulations, Status Indians and Other Residents, did not show marked variance from the Manitoba norm of 1.0 hospital morbidity ratio.

Medical utilization for Congenital Anomalies indicated high utilization (above 2.0 per capita ratio) for Core Area Status Indians in two age cohorts: ages 35 to 64 (3.5 P.C.R.) and ages 65+ (20.0 P.C.R.). Confidence in the last finding is limited because the population in the data cell was 163. Other high utilization included Suburbs Status Indians in two age cohorts: ages 10 to 17 (5.5 P.C.R.) and ages 65+ (11.8 P.C.R.). Confidence in the last finding is limited because the population in the data cell was 28. Both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 annual medical per capita ratio.

Congenital Anomalies



Congenital Anomalies

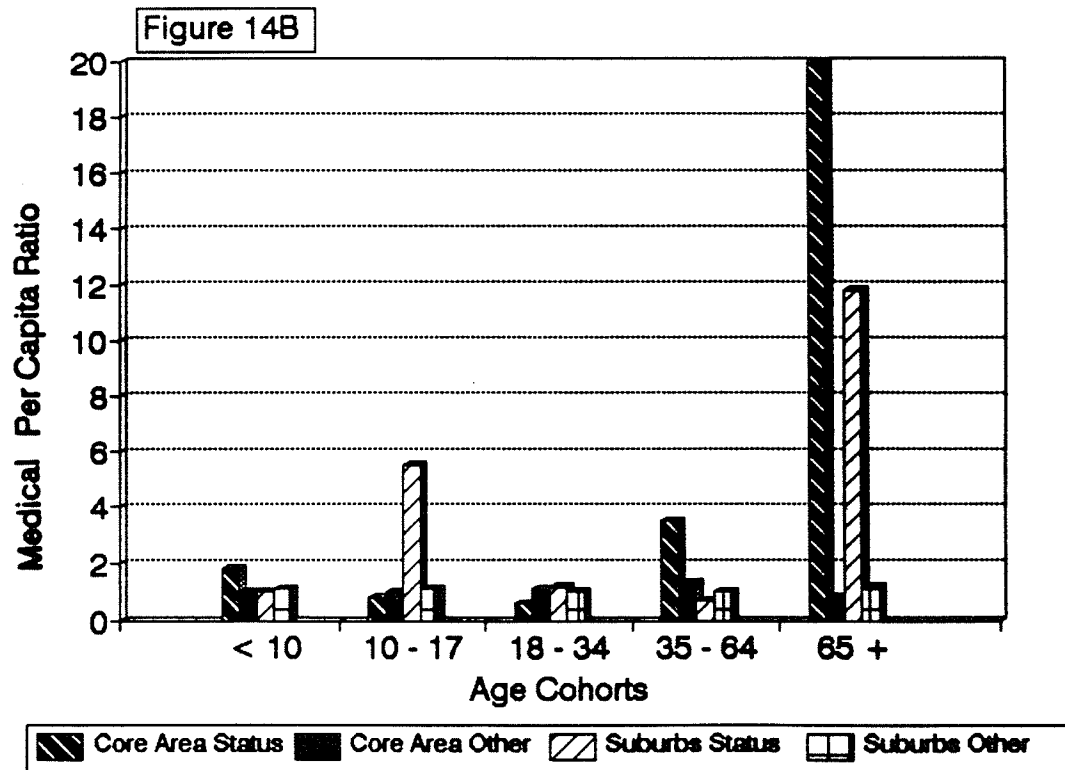


TABLE 14A: SELECTED HOSPITAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

Congenital Anomalies

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	HOSPITAL DAYS	474	572	20	1213
	AVERAGE STAY	19.7	10	5	7.1
	DAYS/1000 POP.	163	31	23	18
	EXPECTED DAYS	69	441	20	1578
	HOSPITAL M.R.	6.8	1.3	1.0	0.8
10 - 17	POPULATION	1436	11722	483	52801
	HOSPITAL DAYS	0	26	4	284
	AVERAGE STAY	0	4.3	4	9.5
	DAYS/1000 POP.	0	2	8	5
	EXPECTED DAYS	7	58	2	283
	HOSPITAL M.R.	0.0	0.4	1.6	1.0
18 - 34	POPULATION	3164	44718	1120	144324
	HOSPITAL DAYS	0	42	0	226
	AVERAGE STAY	0	3.8	0	4.8
	DAYS/1000 POP.	0	1	0	2
	EXPECTED DAYS	5	74	2	238
	HOSPITAL M.R.	0.0	0.5	0.0	1.0
35 - 64	POPULATION	1520	41994	478	172777
	HOSPITAL DAYS	0	203	0	168
	AVERAGE STAY	0	16.9	0	5.2
	DAYS/1000 POP.	0	5	0	1
	EXPECTED DAYS	3	72	1	294
	HOSPITAL M.R.	0.0	2.5	0.0	0.5
65 +	POPULATION	163	22269	28	59281
	HOSPITAL DAYS	0	56	0	45
	AVERAGE STAY	0	14	0	6.4
	DAYS/1000 POP.	0	3	0	1
	EXPECTED DAYS	1	75	4	199
	HOSPITAL M.R.	0.0	1.0	0.0	0.3
ALL AGES	POPULATION	9199	139281	2969	495655
	HOSPITAL DAYS	474	899	24	1936
	AVERAGE STAY	19.8	10	4.8	6.7
	DAYS/1000 POP.	52	6	8	4
	AGE ADJUSTED DAYS	85	720	25	2572
	HOSPITAL M.R.	5.6	1.2	1.0	0.8

TABLE 14B: SELECTED MEDICAL UTILIZATION
 OF WINNIPEG RESIDENTS, 1990/91

Congenital Anomalies

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	MEDICAL COST	32074	117051	5256	449808
	PER CAPITA COST	11.00	6.30	6.11	6.77
	EXPECTED PER CAPITA	6.20	6.20	6.20	6.20
	MEDICAL P.C.R.	1.8	1.0	1.0	1.1
10 - 17	POPULATION	1436	11722	483	52801
	MEDICAL COST	1738	18286	4232	95620
	PER CAPITA COST	1.21	1.56	8.76	1.81
	EXPECTED PER CAPITA	1.59	1.59	1.59	1.59
	MEDICAL P.C.R.	0.8	1.0	5.5	1.1
18 - 34	POPULATION	3164	44718	1120	144324
	MEDICAL COST	833	22871	603	69216
	PER CAPITA COST	0.26	0.51	0.54	0.48
	EXPECTED PER CAPITA	0.46	0.46	0.46	0.46
	MEDICAL P.C.R.	0.6	1.1	1.2	1.0
35 - 64	POPULATION	1520	41994	478	172777
	MEDICAL COST	1722	16620	108	54391
	PER CAPITA COST	1.13	0.40	0.23	0.31
	EXPECTED PER CAPITA	0.32	0.32	0.32	0.32
	MEDICAL P.C.R.	3.5	1.3	0.7	1.0
65 +	POPULATION	163	22269	28	59281
	MEDICAL COST	1207	6499	122	26283
	PER CAPITA COST	7.40	0.29	4.36	0.44
	EXPECTED PER CAPITA	0.37	0.37	0.37	0.37
	MEDICAL P.C.R.	20.0	0.8	11.8	1.2
ALL AGES	POPULATION	9199	139281	2969	495655
	MEDICAL COST	37574	181327	10320	695318
	PER CAPITA COST	4.08	1.30	3.48	1.40
	ADJUSTED PER CAPITA	2.43	1.26	2.28	1.29
	MEDICAL P.C.R.	1.7	1.0	1.5	1.1

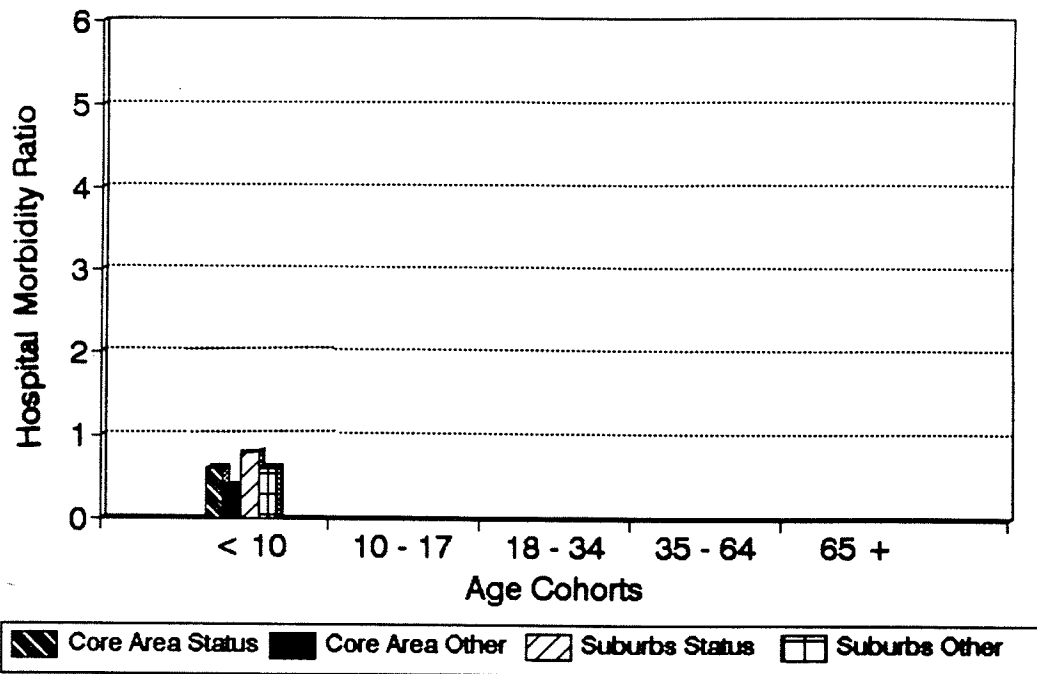
Diagnosis No. 15: Conditions Originating in the
Perinatal Period

Hospital utilization for Conditions Originating in the Perinatal Period indicated high utilization (above 2.0 morbidity ratio) for Core Area Status Indians for no age cohorts. The only high utilization included Suburbs Status Indians, ages <10 (2.1 M.R.). This finding appeared to be miscoded per the age cohort and was not represented as a high finding. Both subpopulations of Other Residents, as well as Core Area Status Indians, did not show marked variance from the Manitoba norm of 1.0 hospital morbidity ratio.

Medical utilization for Conditions Originating in the Perinatal Period indicated high utilization (above 2.0 per capita ratio) for Core Area Status Indians in two age cohorts: ages 10 to 17 (3.5 P.C.R.) and ages 65+ (15.8 P.C.R.). Confidence in the last finding is nil because the population in the data cell was 163 and this age cohort appears inappropriate for this diagnosis. Other high utilization included Suburbs Status Indians in two age cohorts: ages 10 to 17 (4.0 P.C.R.) and ages 65+ (16.5 P.C.R.). Confidence in the last finding is nil because the population in the data cell was 28 and this age cohort appears inappropriate for this diagnosis. Both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 medical per capita ratio.

Conditions Originating in the Perinatal Period

Figure 15A



Conditions Originating in the Perinatal Period

Figure 15B

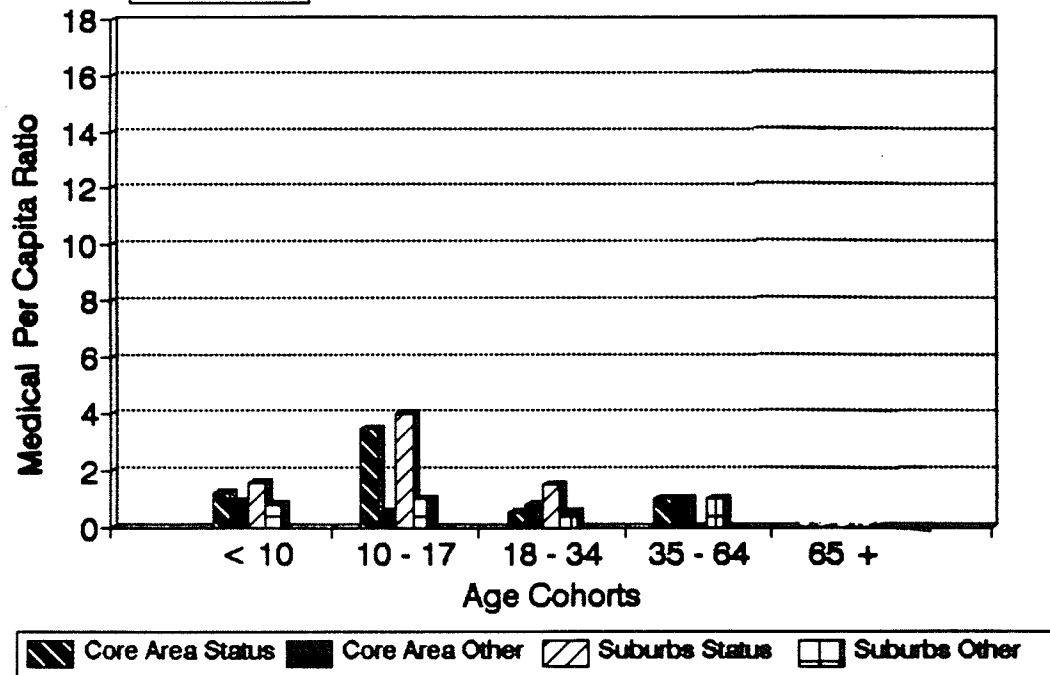


TABLE 15A:

SELECTED HOSPITAL UTILIZATION OF WINNIPEG RESIDENTS, 1990/91

161

Conditions Originating in the
Perinatal Period

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	HOSPITAL DAYS	34	145	40	903
	AVERAGE STAY	3.4	3.9	13.3	6.8
	DAYS/1000 POP.	12	8	47	14
	EXPECTED DAYS	64	410	19	1467
	HOSPITAL M.R.	0.6	0.4	2.1	0.6
10 - 17	POPULATION	1436	11722	483	52801
	HOSPITAL DAYS	0	0	0	0
	AVERAGE STAY	0	0	0	0
	DAYS/1000 POP.	0	0	0	0
	EXPECTED DAYS	0	1	0	3
	HOSPITAL M.R.	-	-	-	-
18 - 34	POPULATION	3164	44718	1120	144324
	HOSPITAL DAYS	0	0	0	0
	AVERAGE STAY	0	0	0	0
	DAYS/1000 POP.	0	0	0	0
	EXPECTED DAYS	0	0	0	0
	HOSPITAL M.R.	-	-	-	-
35 - 64	POPULATION	1520	41994	478	172777
	HOSPITAL DAYS	0	0	0	4
	AVERAGE STAY	0	0	0	4
	DAYS/1000 POP.	0	0	0	0
	EXPECTED DAYS	0	0	0	2
	HOSPITAL M.R.	-	-	-	-
65 +	POPULATION	163	22269	28	59281
	HOSPITAL DAYS	0	0	0	0
	AVERAGE STAY	0	0	0	0
	DAYS/1000 POP.	0	0	0	0
	EXPECTED DAYS	0	1	0	3
	HOSPITAL M.R.	-	-	-	-
ALL AGES	POPULATION	9199	139281	2969	495655
	HOSPITAL DAYS	34	145	40	907
	AVERAGE STAY	3.4	3.9	13.3	6.9
	DAYS/1000 POP.	4	1	13	2
	AGE ADJUSTED DAYS	64	412	19	1475
	HOSPITAL M.R.	0.5	0.4	2.1	0.6

TABLE 15B: SELECTED MEDICAL UTILIZATION
 OF WINNIPEG RESIDENTS, 1990/91

Conditions Originating in the
Perinatal Period

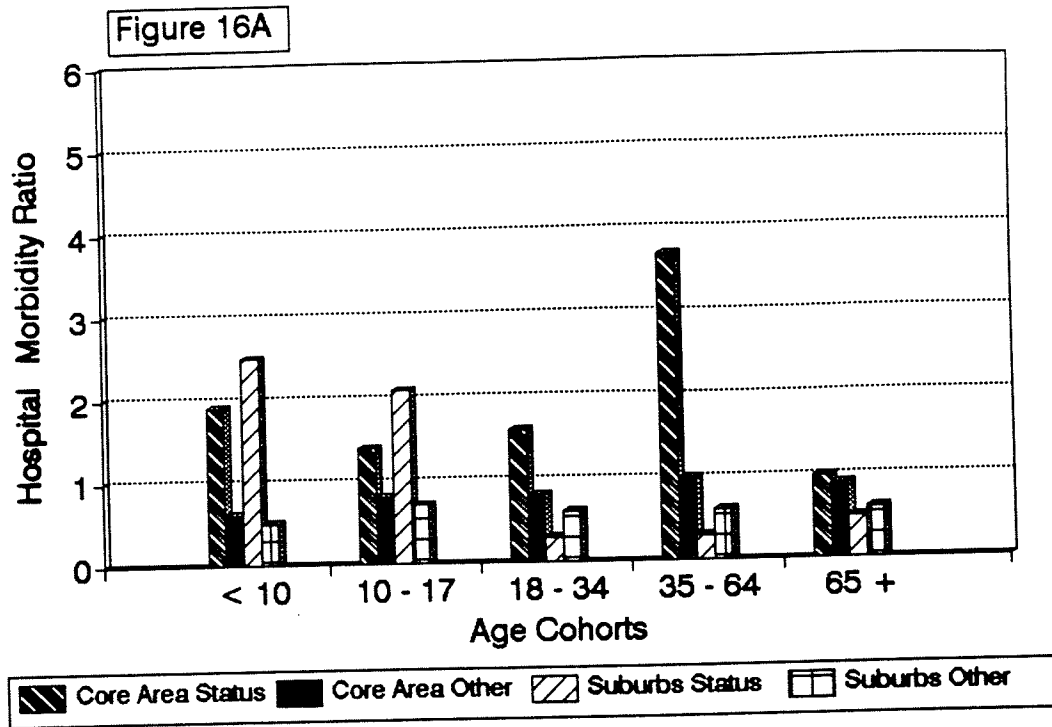
AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	MEDICAL COST	9380	46139	3692	147912
	PER CAPITA COST	3.22	2.48	4.29	2.23
	EXPECTED PER CAPITA	2.69	2.69	2.69	2.69
	MEDICAL P.C.R.	1.2	0.9	1.6	0.8
10 - 17	POPULATION	1436	11722	483	52801
	MEDICAL COST	105	97	41	797
	PER CAPITA COST	0.07	0.01	0.08	0.02
	EXPECTED PER CAPITA	0.02	0.02	0.02	0.02
	MEDICAL P.C.R.	3.5	0.5	4.0	1.0
18 - 34	POPULATION	3164	44718	1120	144324
	MEDICAL COST	78	1392	67	2996
	PER CAPITA COST	0.02	0.03	0.06	0.02
	EXPECTED PER CAPITA	0.04	0.04	0.04	0.04
	MEDICAL P.C.R.	0.5	0.8	1.5	0.5
35 - 64	POPULATION	1520	41994	478	172777
	MEDICAL COST	16	370	0	1583
	PER CAPITA COST	0.01	0.01	0	0.01
	EXPECTED PER CAPITA	0.01	0.01	0.01	0.01
	MEDICAL P.C.R.	1.0	1.0	0.0	1.0
65 +	POPULATION	163	22269	28	59281
	MEDICAL COST	410	2521	74	7003
	PER CAPITA COST	2.52	0.11	2.64	0.12
	EXPECTED PER CAPITA	0.16	0.16	0.16	0.16
	MEDICAL P.C.R.	15.8	0.7	16.5	0.8
ALL AGES	POPULATION	9199	139281	2969	495655
	MEDICAL COST	9989	50518	3875	160292
	PER CAPITA COST	1.09	0.36	1.31	0.32
	ADJUSTED PER CAPITA	0.87	0.40	0.80	0.40
	MEDICAL P.C.R.	1.3	0.9	1.6	0.8

Diagnosis No. 16: Symptoms, Signs, and Ill-Defined
Conditions

Hospital utilization for Symptoms, Signs, and Ill-Defined Conditions indicated high utilization (above 2.0 morbidity ratio) for Core Area Status Indians in one age cohort: ages 35 to 64 (3.7 M.R.). Other high utilization included Suburbs Status Indians in two age cohorts: ages <10 (2.5 M.R.) and ages 10 to 17 (2.1 M.R.). Both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 hospital morbidity ratio.

Medical utilization for Symptoms, Signs, and Ill-Defined Conditions indicated high utilization (above 2.0 per capita ratio) for Core Area Status Indians in one age cohort: ages 35 to 64 (2.2 P.C.R.). Other high utilization included Suburbs Status Indians in two age cohorts: ages 35 to 64 (2.2 P.C.R.) and ages 65+ (2.2 P.C.R.). Confidence in the last finding, however, is limited because the population in the data cell was 28. Both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 annual medical per capita ratio.

Symptoms, Signs, and III - Defined Conditions



Symtoms, Signs, and III - Defined Conditions

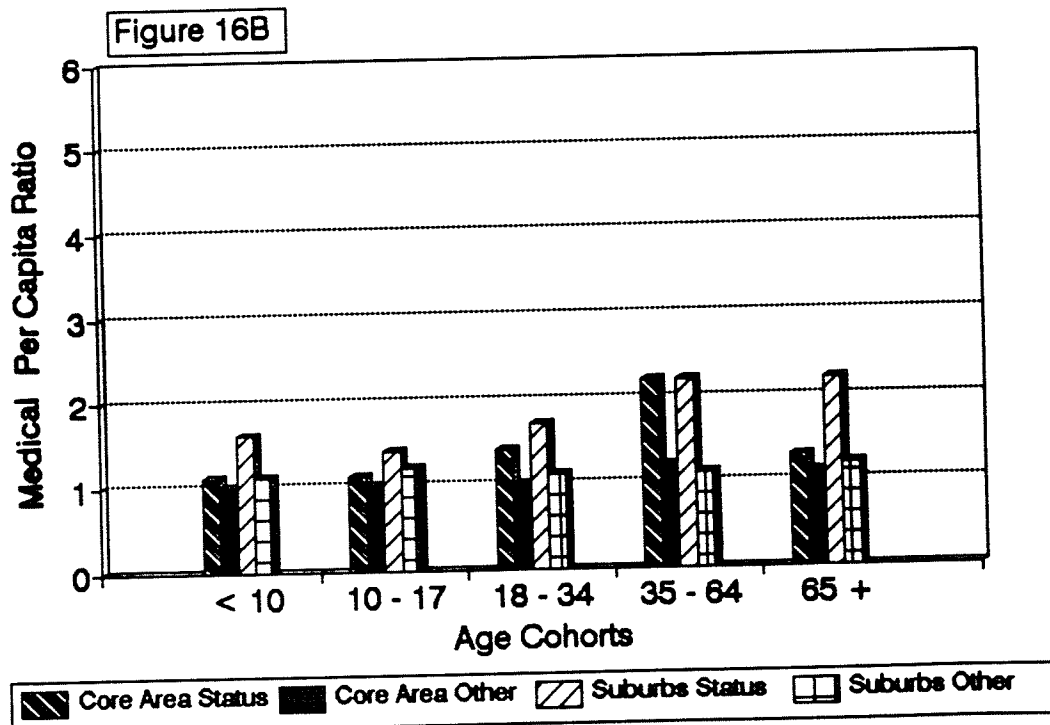


TABLE 16A: SELECTED HOSPITAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

Symptoms, Signs, and
Ill-Defined Conditions

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	HOSPITAL DAYS	113	225	45	753
	AVERAGE STAY	4.9	3.1	3.4	3.7
	DAYS/1000 POP.	39	12	52	11
	EXPECTED DAYS	62	397	18	1421
	HOSPITAL M.R.	1.9	0.6	2.5	0.5
10 - 17	POPULATION	1436	11722	483	52801
	HOSPITAL DAYS	18	84	9	322
	AVERAGE STAY	2	2.5	3	3
	DAYS/1000 POP.	13	7	19	6
	EXPECTED DAYS	13	106	4	477
	HOSPITAL M.R.	1.4	0.8	2.1	0.7
18 - 34	POPULATION	3164	44718	1120	144324
	HOSPITAL DAYS	55	406	3	809
	AVERAGE STAY	2.6	3.5	1.5	3.3
	DAYS/1000 POP.	17	9	3	6
	EXPECTED DAYS	34	478	12	1541
	HOSPITAL M.R.	1.6	0.8	0.3	0.6
35 - 64	POPULATION	1520	41994	478	172777
	HOSPITAL DAYS	141	1044	4	2518
	AVERAGE STAY	5	5.1	2	4.8
	DAYS/1000 POP.	93	25	8	15
	EXPECTED DAYS	38	1060	12	4359
	HOSPITAL M.R.	3.7	1.0	0.3	0.6
65 +	POPULATION	163	22269	28	59281
	HOSPITAL DAYS	46	5532	4	10203
	AVERAGE STAY	5.1	20.6	4	17.3
	DAYS/1000 POP.	282	248	143	172
	EXPECTED DAYS	44	6051	8	16108
	HOSPITAL M.R.	1.0	0.9	0.5	0.6
ALL AGES	POPULATION	9199	139281	2969	495655
	HOSPITAL DAYS	373	7291	65	14605
	AVERAGE STAY	4.1	10.6	3.1	8.8
	DAYS/1000 POP.	41	52	22	29
	AGE ADJUSTED DAYS	191	8092	54	23906
	HOSPITAL M.R.	2.0	0.9	1.2	0.6

TABLE 16B: SELECTED MEDICAL UTILIZATION
 OF WINNIPEG RESIDENTS, 1990/91

Symptoms, Signs, and
Ill-Defined Conditions

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	MEDICAL COST	31929	189950	13771	737001
	PER CAPITA COST	10.95	10.22	16.01	11.09
	EXPECTED PER CAPITA	10.01	10.01	10.01	10.01
	MEDICAL P.C.R.	1.1	1.0	1.6	1.1
10 - 17	POPULATION	1436	11722	483	52801
	MEDICAL COST	11049	79056	4807	426883
	PER CAPITA COST	7.69	6.74	9.95	8.08
	EXPECTED PER CAPITA	6.99	6.99	6.99	6.99
	MEDICAL P.C.R.	1.1	1.0	1.4	1.2
18 - 34	POPULATION	3164	44718	1120	144324
	MEDICAL COST	47174	503181	21104	1.69E6
	PER CAPITA COST	14.91	11.25	18.84	11.73
	EXPECTED PER CAPITA	10.78	10.78	10.78	10.78
	MEDICAL P.C.R.	1.4	1.0	1.7	1.1
35 - 64	POPULATION	1520	41994	478	172777
	MEDICAL COST	56268	826248	17860	3.18E6
	PER CAPITA COST	37.02	19.68	37.36	18.38
	EXPECTED PER CAPITA	16.68	16.68	16.68	16.68
	MEDICAL P.C.R.	2.2	1.2	2.2	1.1
65 +	POPULATION	163	22269	28	59281
	MEDICAL COST	6781	779031	2016	2.28E6
	PER CAPITA COST	41.60	34.98	72.00	38.48
	EXPECTED PER CAPITA	33.22	33.22	33.22	33.22
	MEDICAL P.C.R.	1.3	1.1	2.2	1.2
ALL AGES	POPULATION	9199	139281	2969	495655
	MEDICAL COST	153202	2.38E6	59558	8.31E6
	PER CAPITA COST	16.65	17.07	20.06	16.77
	ADJUSTED PER CAPITA	11.32	15.73	11.10	15.01
	MEDICAL P.C.R.	1.5	1.1	1.8	1.1

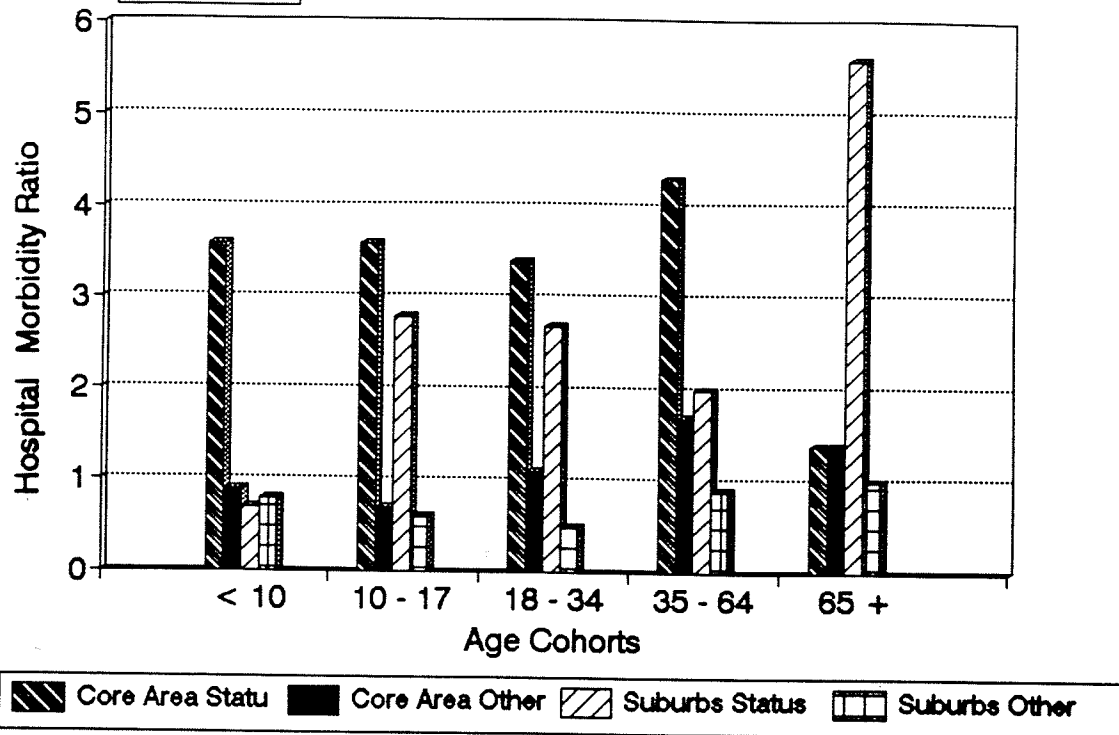
Diagnosis No. 17: Injury and Poisoning

Hospital utilization for Injury and Poisoning indicated high utilization (above 2.0 morbidity ratio) for Core Area Status Indians in four age cohorts: ages <10 (3.6 M.R.), ages 10 to 17 (3.6 M.R.), ages 18 to 34 (3.4 M.R.) and ages 35 to 64 (4.3 M.R.). Other high utilization included Suburbs Status Indians in four age cohorts: ages 10 to 17 (2.8 M.R.), ages 18 to 34 (2.7 M.R.), ages 35 to 64 (2.0 M.R.) and ages 65+ (5.6 M.R.). Confidence in the last finding is limited because the population in the data cell was 28. Both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 hospital morbidity ratio.

Medical utilization for Injury and Poisoning indicated high utilization (above 2.0 per capita ratio) for Core Area Status Indians in two age cohorts: ages 18 to 34 (2.4 P.C.R.) and ages 35 to 64 (3.1 P.C.R.). Other high utilization included Suburbs Status Indians in the same two age cohorts: ages 18 to 34 (2.2 P.C.R.) and ages 35 to 64 (2.4 P.C.R.). Both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 annual medical per capita ratio.

Injury and Poisoning

Figure 17A



Injury and Poisoning

Figure 17B

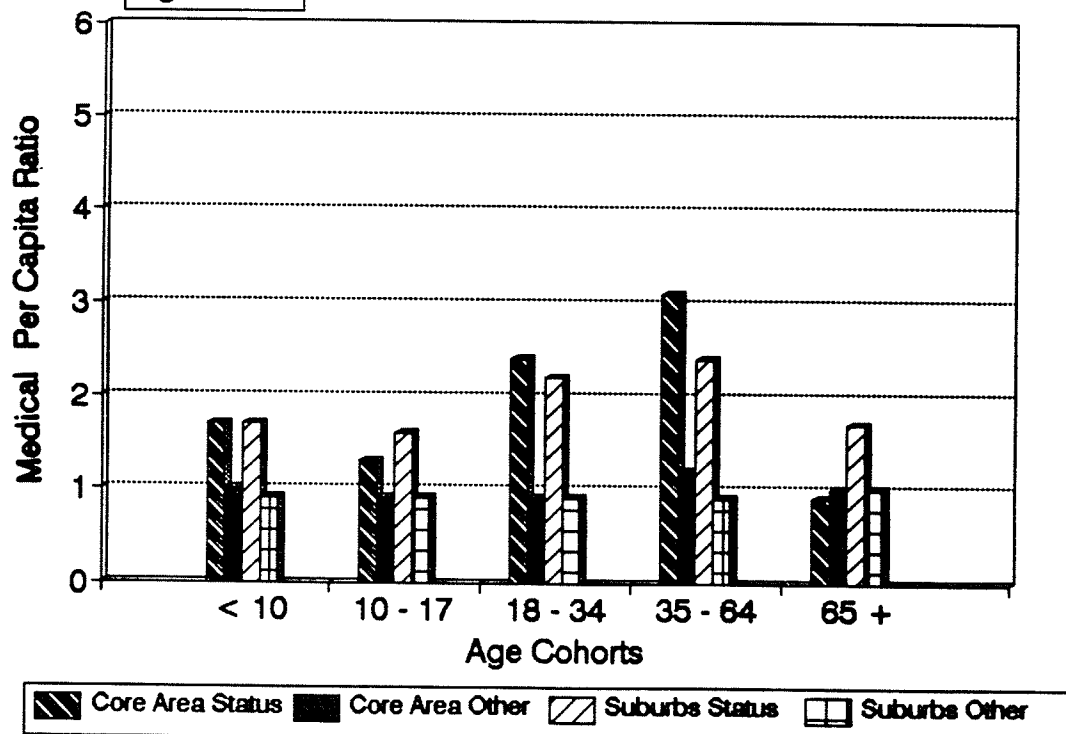


TABLE 17A: SELECTED HOSPITAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

Injury and Poisoning

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	HOSPITAL DAYS	405	659	22	1984
	AVERAGE STAY	7	4.7	2.4	5.5
	DAYS/1000 POP.	139	35	26	30
	EXPECTED DAYS	113	722	33	2583
	HOSPITAL M.R.	3.6	0.9	0.7	0.8
10 - 17	POPULATION	1436	11722	483	52801
	HOSPITAL DAYS	197	295	51	1269
	AVERAGE STAY	5.1	3.4	5.1	4.3
	DAYS/1000 POP.	137	25	106	24
	EXPECTED DAYS	55	447	18	2013
	HOSPITAL M.R.	3.6	0.7	2.8	0.6
18 - 34	POPULATION	3164	44718	1120	144324
	HOSPITAL DAYS	619	2907	175	4529
	AVERAGE STAY	4.8	6.6	8	6.3
	DAYS/1000 POP.	196	65	156	31
	EXPECTED DAYS	179	2530	63	8165
	HOSPITAL M.R.	3.4	1.1	2.7	0.5
35 - 64	POPULATION	1520	41994	478	172777
	HOSPITAL DAYS	607	6649	90	15029
	AVERAGE STAY	9.7	15.2	8.2	16.2
	DAYS/1000 POP.	399	158	188	87
	EXPECTED DAYS	142	3922	45	16138
	HOSPITAL M.R.	4.3	1.7	2.0	0.9
65 +	POPULATION	163	22269	28	59281
	HOSPITAL DAYS	149	21167	104	39816
	AVERAGE STAY	13.5	41.9	34.7	31.4
	DAYS/1000 POP.	914	951	3714	672
	EXPECTED DAYS	108	14815	19	39438
	HOSPITAL M.R.	1.4	1.4	5.6	1.0
ALL AGES	POPULATION	9199	139281	2969	495655
	HOSPITAL DAYS	1977	31677	442	62627
	AVERAGE STAY	6.6	19.6	8	17.5
	DAYS/1000 POP.	215	227	149	126
	AGE ADJUSTED DAYS	597	22436	178	68337
	HOSPITAL M.R.	3.3	1.4	2.5	0.9

TABLE 17B:

SELECTED MEDICAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

170

Injury and Poisoning

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	MEDICAL COST	52639	187855	14913	626983
	PER CAPITA COST	18.05	10.11	17.34	9.43
	EXPECTED PER CAPITA	10.54	10.54	10.54	10.54
	MEDICAL P.C.R.	1.7	1.0	1.7	0.9
10 - 17	POPULATION	1436	11722	483	52801
	MEDICAL COST	30166	160575	12848	790159
	PER CAPITA COST	21.01	13.70	26.60	14.96
	EXPECTED PER CAPITA	16.14	16.14	16.14	16.14
	MEDICAL P.C.R.	1.3	0.9	1.6	0.9
18 - 34	POPULATION	3164	44718	1120	144324
	MEDICAL COST	128223	710626	41636	2.17E6
	PER CAPITA COST	40.53	15.89	37.18	15.04
	EXPECTED PER CAPITA	16.74	16.74	16.74	16.74
	MEDICAL P.C.R.	2.4	0.9	2.2	0.9
35 - 64	POPULATION	1520	41994	478	172777
	MEDICAL COST	64141	661985	15214	2.19E6
	PER CAPITA COST	42.20	15.76	31.83	12.66
	EXPECTED PER CAPITA	13.42	13.42	13.42	13.42
	MEDICAL P.C.R.	3.1	1.2	2.4	0.9
65 +	POPULATION	163	22269	28	59281
	MEDICAL COST	3408	480203	1044	1.39E6
	PER CAPITA COST	20.91	21.56	37.29	23.37
	EXPECTED PER CAPITA	22.55	22.55	22.55	22.55
	MEDICAL P.C.R.	0.9	1.0	1.7	1.0
ALL AGES	POPULATION	9199	139281	2969	495655
	MEDICAL COST	278576	2.2E6	85656	7.16E6
	PER CAPITA COST	30.28	15.80	28.85	14.45
	ADJUSTED PER CAPITA	14.24	15.79	14.37	15.38
	MEDICAL P.C.R.	2.1	1.0	2.0	0.9

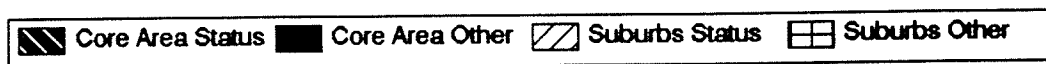
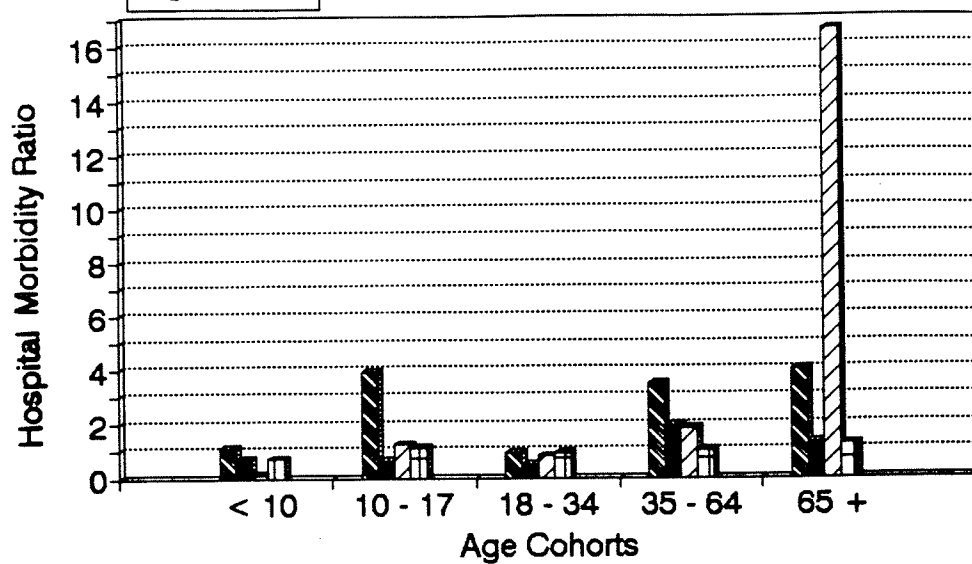
Diagnosis No. 18: Factors Influencing Health Status and
Contact with Health Services

Hospital utilization for Factors Influencing Health Status and Contact with Health Services indicated high utilization (above 2.0 morbidity ratio) for Core Area Status Indians in three age cohorts: ages 10 to 17 (3.9 M.R.), ages 35 to 64 (3.5 M.R.) and ages 65+ (4.0 M.R.). Confidence in the last finding, however, is limited because the population in the data cell was 163. Other high utilization included Suburbs Status Indians in one age cohort, ages 65+ (16.6 M.R.). Confidence in the last finding, however, is limited because the population in the data cell was 28. Both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 hospital morbidity ratio.

Medical utilization for Factors Influencing Health Status and Contact with Health Services indicated high utilization (above 2.0 per capita ratio) for Suburbs Status Indians in only one age cohort, ages 65+ (2.0 P.C.R.). Confidence in this finding, however, is limited because the population in the data cell was 28. Core Area Status Indians and both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 annual medical per capita ratio.

Factors Influencing Health Status and Contact with Health Services

Figure 18A



Factors Influencing Health Status and Contact with Health Services

Figure 18B

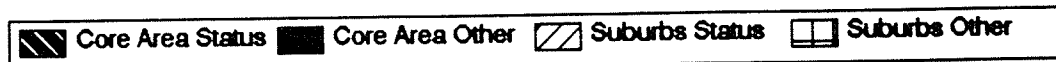
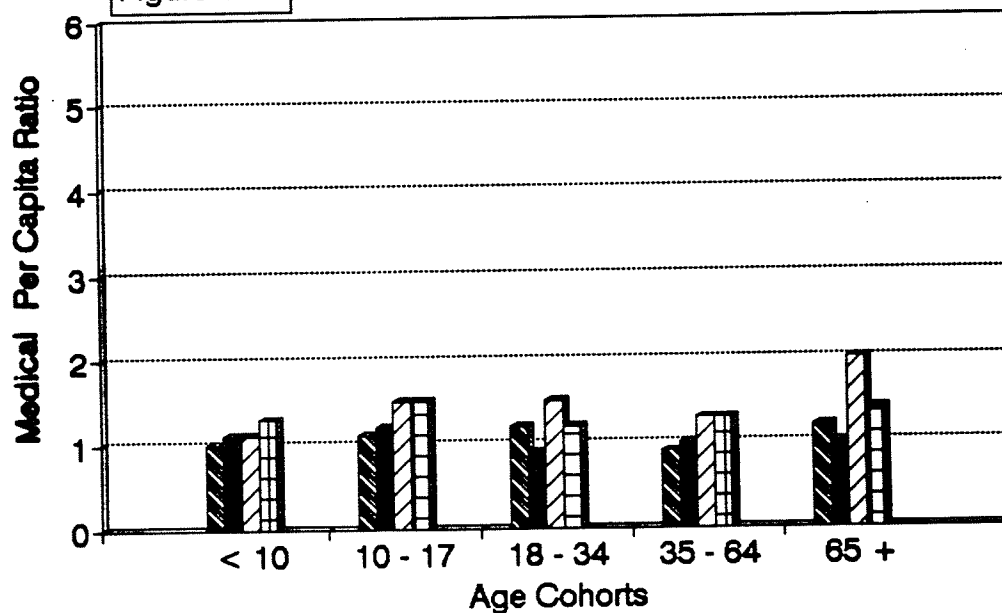


TABLE 18A: SELECTED HOSPITAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

Factors Influencing Health Status
and Contact with Health Services

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	HOSPITAL DAYS	50	204	1	638
	AVERAGE STAY	7.2	4	1	4
	DAYS/1000 POP.	17	11	1	10
	EXPECTED DAYS	45	288	13	1030
	HOSPITAL M.R.	1.1	0.7	0.1	0.7
10 - 17	POPULATION	1436	11722	483	52801
	HOSPITAL DAYS	79	109	8	788
	AVERAGE STAY	15.8	5.5	8	12.9
	DAYS/1000 POP.	55	9	17	15
	EXPECTED DAYS	20	164	7	737
	HOSPITAL M.R.	3.9	0.6	1.2	1.1
18 - 34	POPULATION	3164	44718	1120	144324
	HOSPITAL DAYS	57	504	18	2648
	AVERAGE STAY	3.2	2.9	3.6	6.7
	DAYS/1000 POP.	18	11	16	18
	EXPECTED DAYS	67	944	24	3047
	HOSPITAL M.R.	0.9	0.5	0.8	0.9
35 - 64	POPULATION	1520	41994	478	172777
	HOSPITAL DAYS	398	6085	64	12884
	AVERAGE STAY	22.1	29.2	21.3	16.3
	DAYS/1000 POP.	262	145	134	75
	EXPECTED DAYS	115	3175	36	13065
	HOSPITAL M.R.	3.5	1.9	1.8	1.0
65 +	POPULATION	163	22269	28	59281
	HOSPITAL DAYS	622	26664	439	64630
	AVERAGE STAY	56.6	54.7	62.7	58.1
	DAYS/1000 POP.	3816	1197	15679	1090
	EXPECTED DAYS	154	21047	26	56028
	HOSPITAL M.R.	4.0	1.3	16.6	1.2
ALL AGES	POPULATION	9199	139281	2969	495655
	HOSPITAL DAYS	1206	33566	530	81588
	AVERAGE STAY	20.4	35.7	31.2	32.4
	DAYS/1000 POP.	131	241	179	165
	AGE ADJUSTED DAYS	401	25618	106	73907
	HOSPITAL M.R.	3.0	1.3	5.0	1.1

TABLE 18B:

SELECTED MEDICAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

174

Factors Influencing Health Status
and Contact with Health Services

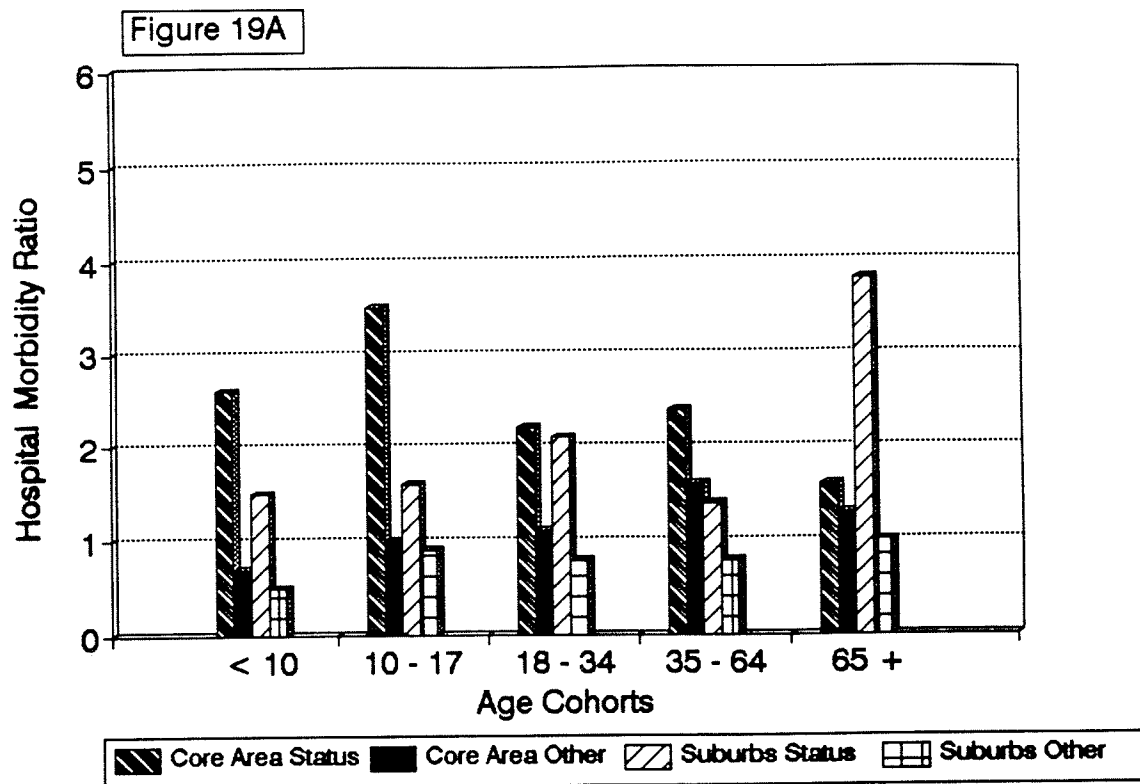
AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	MEDICAL COST	78328	579550	27229	2.42E6
	PER CAPITA COST	26.86	31.20	31.66	36.34
	EXPECTED PER CAPITA	28.00	28.00	28.00	28.00
	MEDICAL P.C.R.	1.0	1.1	1.1	1.3
10 - 17	POPULATION	1436	11722	483	52801
	MEDICAL COST	20589	192312	9792	1.04E6
	PER CAPITA COST	14.34	16.41	20.27	19.63
	EXPECTED PER CAPITA	13.47	13.47	13.47	13.47
	MEDICAL P.C.R.	1.1	1.2	1.5	1.5
18 - 34	POPULATION	3164	44718	1120	144324
	MEDICAL COST	123822	1.38E6	54632	5.73E6
	PER CAPITA COST	39.13	30.97	48.78	39.69
	EXPECTED PER CAPITA	33.45	33.45	33.45	33.45
	MEDICAL P.C.R.	1.2	0.9	1.5	1.2
35 - 64	POPULATION	1520	41994	478	172777
	MEDICAL COST	53064	1.53E6	22969	8.52E6
	PER CAPITA COST	34.91	36.49	48.05	49.32
	EXPECTED PER CAPITA	37.47	37.47	37.47	37.47
	MEDICAL P.C.R.	0.9	1.0	1.3	1.3
65 +	POPULATION	163	22269	28	59281
	MEDICAL COST	9565	1.15E6	2816	4.02E6
	PER CAPITA COST	58.68	51.80	100.57	67.81
	EXPECTED PER CAPITA	49.95	49.95	49.95	49.95
	MEDICAL P.C.R.	1.2	1.0	2.0	1.4
ALL AGES	POPULATION	9199	139281	2969	495655
	MEDICAL COST	285368	4.84E6	117438	2.17E7
	PER CAPITA COST	31.02	34.77	39.55	43.82
	ADJUSTED PER CAPITA	29.56	34.89	29.42	33.97
	MEDICAL P.C.R.	1.1	1.0	1.3	1.3

No. 19: All Diagnoses

Hospital utilization for All Diagnoses indicated high utilization (above 2.0 morbidity ratio) for Core Area Status Indians in four age cohorts: ages <10 (2.6 M.R.), ages 10 to 17 (3.5 M.R.), ages 18 to 34 (2.2 M.R.) and ages 35 to 64 (2.4 M.R.). Other high utilization included Suburbs Status Indians in two age cohorts: ages 18 to 34 (2.1 M.R.) and ages 65+ (3.8 M.R.). Confidence in this finding, however, is limited because the population in the data cell was 28. Both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 hospital morbidity ratio.

Medical utilization for All Diagnoses indicated high utilization (above 2.0 per capita ratio) for Suburbs Status Indians in only one age cohort, ages 65+ (2.5 P.C.R.). Confidence in this finding, however, is limited because the population in the data cell was 28. Core Area Status Indians and both subpopulations of Other Residents did not show marked variance from the Manitoba norm of 1.0 annual medical per capita ratio.

All Diagnoses



All Diagnoses

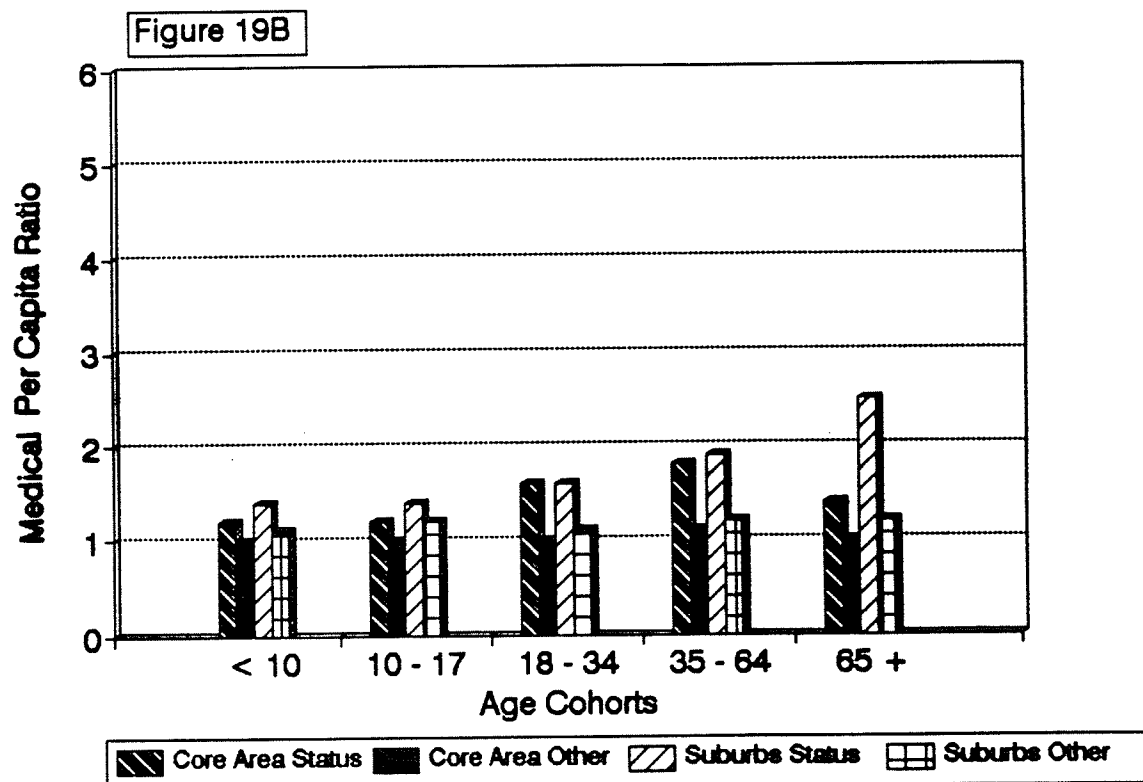


TABLE 19A: SELECTED HOSPITAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

All Diagnoses

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OT
< 10	POPULATION	2916	18578	860	66472
	HOSPITAL DAYS	2547	4446	440	11361
	AVERAGE STAY	6.7	4.4	4.2	4.1
	DAYS/1000 POP.	873	239	512	171
	EXPECTED DAYS	986	6282	291	22476
	HOSPITAL M.R.	2.6	0.7	1.5	0.5
10 - 17	POPULATION	1436	11722	483	52801
	HOSPITAL DAYS	1384	3171	215	13511
	AVERAGE STAY	6.9	5.6	4.7	7.1
	DAYS/1000 POP.	964	271	445	256
	EXPECTED DAYS	391	3192	132	14379
	HOSPITAL M.R.	3.5	1.0	1.6	0.9
18 - 34	POPULATION	3164	44718	1120	144324
	HOSPITAL DAYS	4191	30846	1402	73283
	AVERAGE STAY	4.2	5.7	5.6	5.3
	DAYS/1000 POP.	1325	690	1252	508
	EXPECTED DAYS	1898	26830	672	86592
	HOSPITAL M.R.	2.2	1.1	2.1	0.8
35 - 64	POPULATION	1520	41994	478	172777
	HOSPITAL DAYS	3438	62905	610	136175
	AVERAGE STAY	8.2	13.9	6.3	10.3
	DAYS/1000 POP.	2262	1498	1276	788
	EXPECTED DAYS	1430	39514	450	162575
	HOSPITAL M.R.	2.4	1.6	1.4	0.8
65 +	POPULATION	163	22269	28	59281
	HOSPITAL DAYS	1870	197088	756	398827
	AVERAGE STAY	15.3	31.0	24.4	26.2
	DAYS/1000 POP.	11472	8850	27000	6728
	EXPECTED DAYS	1145	156374	197	416273
	HOSPITAL M.R.	1.6	1.3	3.8	1.0
ALL AGES	POPULATION	9199	139281	2969	495655
	HOSPITAL DAYS	13430	298456	3423	633157
	AVERAGE STAY	6.3	16.7	6.5	13.5
	DAYS/1000 POP.	1460	2143	1153	1277
	AGE ADJUSTED DAYS	5850	232192	1742	702295
	HOSPITAL M.R.	2.3	1.3	2.0	0.9

TABLE 19B: SELECTED MEDICAL UTILIZATION
OF WINNIPEG RESIDENTS, 1990/91

178

All Diagnoses

AGE COHORT	MEASURES	CORE STATUS	CORE OTHER	SUBURBS STATUS	SUBURBS OTHER
< 10	POPULATION	2916	18578	860	66472
	MEDICAL COST	508815	2.7E6	172887	1.04E7
	PER CAPITA COST	174.49	145.19	201.03	156.68
	EXPECTED PER CAPITA	140.15	140.15	140.15	140.15
	MEDICAL P.C.R.	1.2	1.0	1.4	1.1
10 - 17	POPULATION	1436	11722	483	52801
	MEDICAL COST	172497	1.13E6	68004	6.23E6
	PER CAPITA COST	120.12	96.22	140.80	118.07
	EXPECTED PER CAPITA	98.77	98.77	98.77	98.77
	MEDICAL P.C.R.	1.2	1.0	1.4	1.2
18 - 34	POPULATION	3164	44718	1120	144324
	MEDICAL COST	900840	7.98E6	330027	2.89E7
	PER CAPITA COST	284.72	178.47	294.67	200.50
	EXPECTED PER CAPITA	182.29	182.29	182.29	182.29
	MEDICAL P.C.R.	1.6	1.0	1.6	1.1
35 - 64	POPULATION	1520	41994	478	172777
	MEDICAL COST	633886	1.1E7	213673	4.74E7
	PER CAPITA COST	417.03	262.45	447.01	274.48
	EXPECTED PER CAPITA	237.63	237.63	237.63	237.63
	MEDICAL P.C.R.	1.8	1.1	1.9	1.2
65 +	POPULATION	163	22269	28	59281
	MEDICAL COST	102772	1.04E7	32817	3.2E7
	PER CAPITA COST	630.50	469.12	1172.0	540.64
	EXPECTED PER CAPITA	462.15	462.15	462.15	462.15
	MEDICAL P.C.R.	1.4	1.0	2.5	1.2
ALL AGES	POPULATION	9199	139281	2969	495655
	MEDICAL COST	2.32E6	3.33E7	817408	1.25E8
	PER CAPITA COST	252.07	238.90	275.31	252.31
	ADJUSTED PER CAPITA	170.00	231.07	168.05	220.50
	MEDICAL P.C.R.	1.5	1.0	1.6	1.1

DISCUSSION AND RECOMMENDATIONS

5.1 INTRODUCTION:

The purpose of this study was to compare urban health care service utilization between Winnipeg Status Indians and Other Winnipeg Residents. This study distinguished between a downtown Core Area (low income) and the Suburbs (higher income) of Winnipeg, Manitoba. The Core Area was selected as a proxy for poverty. Detailed health utilization was documented for Winnipeg Status Indians (Core Area and Suburbs) and for Other Residents (Core Area and Suburbs) for five separate age cohorts. Findings have provided descriptive comparisons to Manitoba norms specified for each of 18 major diagnostic categories. All 18 major diagnostic codes (ICD-9-CM) were examined, providing comparisons among five age cohorts and four subpopulations defined by geography (Core Area or Suburbs) and by ethnicity (Status Indians or Other Residents).

Assumptions exist among health care workers and administrators that urban Aboriginal people use health care services more than other urban residents. The scant literature about urban Aboriginal health care supports this belief of differential health care service utilization between urban aboriginals and other urban residents. Poverty is a fact of life for many of

the urban Aboriginals, in addition to ongoing acculturation stress, for third, fourth and fifth generations of urban Aboriginals.

The absence of reliable urban population statistics for Status Indians in Canada underlies the dearth of information on urban Aboriginal health care utilization. Previous studies have only assumed what critical factors may be at play. Such studies have either been limited by sample size ($N < 300$), or have alluded to "a large concentration" of Aboriginals within an urban setting (e.g., Core Area Winnipeg Study, 1985). These previous approaches each cautioned that no generalizations could be drawn from the findings due to the limitations of each study.

To date, the health status and delivery of health care services to urban Aboriginals has not been the subject of extensive research, either in quantity or quality. The urban Aboriginal health care literature has been described as being limited in volume, with few statistical sources to document morbidity patterns.

Several Canadian studies suggest associations between low socioeconomic status, stresses of urban acculturation, and high health care service utilization by Aboriginals throughout Canada. Sampling approaches used by Canadian researchers (Postl, 1985, and Waldram and Layman, 1989) concluded that the urban Aboriginal

populations (Winnipeg and Saskatoon) rated poorly on all socioeconomic indicators. In the current study, Winnipeg's Core Area is characterized by many conditions of poverty.

A summary of urban Aboriginal health care by McClure et al. (1991), concluded that information about urban Aboriginals' health status suggests that they have many unmet needs, but this information is fragmented, lacks quantifiable data, and is seldom readily available or cited in a manner that can be retrieved from usual literature sources. To date, no such collection of information or analysis has been undertaken in North America. The literature review in Chapter 2 indicates that the paucity of such information required new baseline data on the urban Aboriginal population distribution, as well as on their health care service utilization.

The current study has moved beyond the previous limited findings through its use of utilization statistics for all (100%) of Winnipeg's population. It identifies the Winnipeg Status Indian subpopulations (Core Area, N = 9,199 and Suburbs, N = 2,969) as well as Other Residents (Core Area, N = 139,281 and Suburbs, N = 495, 655). It also describes the health care service utilization of all four subpopulations. This study used Manitoba's insured hospital data file as

well as its insured medical services file to generate the findings. It has been argued that small area analysis, which focuses on hospital admissions per capita, is the most suitable method for understanding the overall variation in total days spent in hospital (Roos and Roos, 1989).

The design of this descriptive, comparative study incorporates small area analysis. The objective for this analysis is to identify the factors influencing small area variation. For small area analysis, information about individuals is aggregated and used to create a profile of the community's characteristics. It is a technique which incorporates large administrative data bases to secure population based measures of service utilization and resource consumption. This approach documents the number of occurrences of a health care event in an area, within a defined time frame, and the resulting data is divided by that area's total population.

The current research, using this small area analysis technique, has attempted to ascertain whether variations in health care utilization were associated with income level (Core Area or Suburbs) or ethnicity (Status Indian or Other Residents). In the current study, all observations of hospital in-patient days and annual medical services expenses of all resident

subpopulations, rather than population samples, constitute this small area analysis approach. Status Indians, as a component of the Aboriginal population, were selected for the study because their health care service utilization data could be extracted from existing insured health service data files maintained by the Manitoba Health Services Commission.

5.2 SUMMARY OF HYPOTHESES:

General assumptions of this author were that differences in health care service utilization among specified subpopulations are based upon the premise that health care service utilization is inversely proportional to income levels (e.g., poverty = high health care service utilization) if service access is constant for all subpopulations. It was assumed that the question of service access within Winnipeg does not constitute a problem for any of the subpopulations.

Hypotheses of this author were that the health care service utilization of the four Winnipeg subpopulations would adhere to a rank order based upon factors of poverty and urban acculturation stress. The predicted levels of utilization were as follows:

- 1) Core Area Status Indians - Highest Utilization
- 2) Core Area Other Residents - High Utilization
- 3) Suburbs Status Indians - Above Average Utilization
- 4) Suburbs Other Residents - Average Utilization

In each case, these hypotheses are based upon the premise that health care service utilization is inversely proportional to socioeconomic status if service access is constant for all subpopulations. In other words, if there are differential patterns of utilization, these are associated more with socioeconomic status (Poverty or Higher Median Incomes) than with ethnicity (Status Indian or Other Residents). The data tests these hypotheses with the methodology of small area analysis. Section 5 in this Chapter links this study's hypotheses and the findings of actual health care service utilization for each of the four subpopulations.

5.3 PRODUCTS OF THE STUDY:

This study has produced three separate products for the comparison of four Winnipeg subpopulations (Core Area Status Indian, Core Area Other, Suburbs Status Indian and Suburbs Other). Each product was required to test the study's hypotheses. Specification of each subpopulation was a necessary prerequisite for calculating health care service utilization ratios (i.e., hospital in-patient days per 1,000 population, and annual per capita medical expenses). These utilization ratios were contrasted with the Manitoba

ratio (norm per diagnosis and per age cohort) to determine each morbidity ratio. These products include:

Product #1: Population profile by age cohort.

Product #2: Hospital in-patient morbidity ratios.

Product #3: Medical services (physician only)
annual per capita ratios.

5.4 PRODUCT #1: POPULATION PROFILES BY AGE COHORT

The absence of reliable urban population statistics for Status Indians in Canada underlies the dearth of information on urban Aboriginal health care service utilization.

The study's data run produced a demographic profile of the four Winnipeg subpopulations and five age cohorts. Such population detail was a necessary prerequisite for calculating the utilization ratios (i.e., hospital in-patient days per 1,000 population and annual medical per capita ratio for each data cell). Each utilization ratio was then compared to the Manitoba utilization ratio, the norm for the same diagnosis and same age cohort, to derive the morbidity ratio. The methodology of small area analysis was used to contrast all utilization ratios for each diagnostic category for hospital in-patient utilization as well as for annual medical services per capita costs.

Research questions which were posed in Chapter 1 about the Status Indian population in Winnipeg were answered by the population statistics provided by the study's data run from Manitoba's insured population registry. Winnipeg's total population was subdivided (Core Area or Suburbs) as well as identified by age cohort for each subpopulation (Status Indian or Other Residents). Details of the demographic profile were quantified in Chapter 4, Section 2, Table OB, and illustrated in Figures OC, OD, OE and OF.

This Table and these Figures illustrate the age distribution within each of the four subpopulations as well as the differences between them. The study noted that the Status Indian (Core Area and Suburbs) age distributions were skewed towards the younger age groups, where 46% of the Status Indians were ages 17 and under, as compared with the Other Residents (Core Area and Suburbs) age distributions, where approximately 25% of both subpopulations were ages 17 and under. The Core Area Other Residents age distributions were skewed towards the elderly, with 16% ages 65 and over, as compared with 12% for the Manitoba population.

The totals (all ages) of each subpopulation were as follows:

Subpopulation	N
Core Area Status Indians	9,199
Core Area Other Residents	139,281
Suburbs Status Indians	2,969
Suburbs Other Residents	495,655
Winnipeg Status Indians	12,168
Winnipeg Other Residents	634,936
Winnipeg Total Residents	647,104

5.5 PRODUCT #2: HOSPITAL MORBIDITY RATIOS

and

PRODUCT #3: MEDICAL SERVICES PER CAPITA RATIOS

Each morbidity ratio (hospital in-patient or medical services data linked to the population base) provides a comparison of the subpopulation by age cohort for a specific diagnosis to the Manitoba ratio for the same age cohort and diagnosis. Thus, the norm (Manitoba utilization ratio) for each age related diagnosis is unique to the age cohort as well as to the specific diagnosis. Each of the four subpopulations was compared to the Manitoba utilization ratio, which was the norm for a specific age cohort and a specific diagnosis. This comparison of each Winnipeg subpopulation's utilization ratio to the Manitoba utilization ratio produced a morbidity ratio for

hospital in-patient utilization and for annual medical services per capita expenses (observed utilization compared to the norm).

The hospital morbidity ratio (M.R) illustrates the scale or magnitude of variance from the Manitoba days per 1000 population for each diagnosis as well as for each age cohort. In a similar fashion, the annual medical services per capita ratio (P.C.R.) illustrates the scale or magnitude of the variance from the Manitoba observed per capita cost specific to each diagnosis as well as each age cohort. A ratio of 1.0 indicates that no difference exists between the small area's health care utilization and the provincial utilization for the same diagnosis and same age cohort. A ratio of 0.5 indicates a rate half of the provincial utilization rate, and a ratio of 2.0 indicates a rate double that of the provincial utilization rate for a specific diagnosis and age cohort. The methodology provides a crude age adjustment for all comparisons, which is vital for adjusting for the different population age distributions of Status Indians (skewed towards younger age cohorts) relative to the general population.

The comparisons of this study focused upon morbidity ratios of 2.0 or greater as a threshold to indicate "high utilization". Utilization of twice or

greater the Manitoba norm (specific to each diagnosis and each age cohort) was felt to be important by this author. It graphically illustrates large differences in health care service utilization between the four subpopulations within this study. Such variation for each data cell (per age cohort and per diagnosis) for all observations for each of the four subpopulations is illustrated by Figures 1A to 19A (hospital in-patient utilization) and Figures 1B to 19B (annual medical services/expense utilization) in Chapter 4, Findings. In this Chapter, the frequency and magnitude of such high utilization which is greater than 2.0 M.R. or P.C.R. is described. The following tables and figures focus only upon such high utilization morbidity ratios. Findings less than 2.0 M.R. or P.C.R. are omitted from this discussion of highlights. This reexamination of the total findings illustrates the highlights, or frequencies, of all high health care utilization by each subpopulation as well as by each age cohort.

Questions of significance for this study's findings (over 2.0 M.R or P.C.R.) may arise in a few instances where the population of the data cell is less than 1,000. This circumstance occurs 4 times for the Status Indians Suburbs age cohorts as well as once for the Core Area Status Indians (ages 65+). Such small

population numbers may indicate wide variation from the norm, given small differences in the observed utilization.

This study set out to test the relationship between poverty and acculturation stress for four Winnipeg subpopulations. The basic premise of the study was that health care service utilization is expected to be inversely proportional to socioeconomic status. Existing literature indicated that the poor utilize higher levels of health care services when barriers to access (e.g., premiums and user fees) are eliminated. Other literature also suggested that Status Indians, regardless of residence, may be subject to greater acculturation stress than the general population.

These factors directed this author to formulate hypotheses to predict health care service utilization for each of the four Winnipeg subpopulations. Chapters 1 and 2 provide further explanation of the contributing factors to justify the rationale for such predictions.

In summary, this study's hypotheses are as follows:

Hypotheses in Rank Order
for Health Care Utilization

Subpopulation	Expected Utilization	Rationale
1. Core Area Status Indians	Highest	Poverty Acculturation Stress
2. Core Area Other Residents	High	Poverty
3. Suburbs Status Indians	Above Average	Higher Median Incomes Acculturation Stress
4. Suburbs Other Residents	Average	Higher Median Incomes

The findings of this study indicated 120 instances of high health care service utilization greater than 2.0 M.R. or P.C.R. Hospital in-patient utilization findings demonstrated 76 instances of high utilization, and medical service utilization demonstrated 44 instances of high utilization. Frequency (F) of instances was depicted for each of the subpopulations in Figures 20A to 25A and 20B to 25B. Core Area Status Indians (F = 63) and Suburbs Status Indians (F = 49) represented most of the documented high hospital in-patient and high medical services utilization. Core Area Other Residents (F = 8) and Suburbs Other Residents (F = 0) represented little variance from the

provincial norms per diagnosis, using a cutoff threshold of 2.0 M.R. or P.C.R.

Linkage of these striking findings to the original hypotheses confirms Core Area Status Indians as the subpopulation demonstrating the highest health care service utilization ($F = 63$). Core Area Other Residents were predicted second in rank order but were found to be third in rank order with only 8 instances of high hospital in-patient utilization and no instances of high medical service utilization. Suburbs Status Indians were predicted third in rank order but ranked second with 25 instances of high hospital in-patient utilization as well as 24 instances of high medical service utilization. Such findings were contrary to the hypotheses because Suburbs Status Indians demonstrated ($F = 49$) almost as many instances of high utilization as the Core Area Status Indians ($F = 63$).

The absence of high hospital in-patient or medical service utilization ($F = 0$) for Suburbs Other Residents matched the hypotheses because their utilization pattern most closely approximated the provincial norms per diagnosis and per age cohort. Of the four subpopulations, the Suburbs Other Residents demonstrated the "best" health since they had no high

hospital in-patient utilization and no high medical service utilization findings. The following matrix illustrates the frequency of high health care service utilization findings relative to the predicted rank order of utilization for each of the four subpopulations:

Table OC Health Care Utilization Findings:
(Frequency of High Utilization)

Subpopulation Expected Rank Order	Expected Utilization	Hospital In-patient High Use Frequency	Medical Services High Use Frequency	Total
1. Core Area Status Indians	Highest	43	20	63
2. Core Area Other Residents	High	8	0	8
3. Suburbs Status Indians	Above Average	25	24	49
4. Suburbs Other Residents	Average	0	0	0
Total		76	44	120

The high health care service utilization findings listed in Table OC represent the total frequency for each subpopulation. It is important to identify the frequency of high utilization for each age cohort for each subpopulation. Core Area Status Indians demonstrated high utilization in all five age cohorts for hospital in-patient utilization and in four age cohorts for medical services utilization. Core Area Other Residents demonstrated high in-patient hospital utilization in four age cohorts but demonstrated no high medical services utilization for any age cohort. Suburbs Status Indians demonstrated high in-patient hospital utilization and high medical services utilization in all five age cohorts. Suburbs Other Residents demonstrated no high in-patient hospital or high medical services utilization within any age cohort. Details of the frequencies of high in-patient hospital utilization and high medical services utilization by subpopulation and age cohort are listed in Tables OD and OE.

Table OD

Frequency Distribution:
High Utilization of Hospital Days
(Exceeding 2.0 Morbidity Ratio)
by Subpopulation and Age Cohort

Age Cohort	Core Area Status	Core Area Others	Suburbs Status	Suburbs Others	Total Winnipeg
<10	9	0	5 *	0	14
10 - 17	11	1	3 *	0	15
18 - 34	8	2	6	0	16
35 - 64	10	4	5 *	0	19
65+	5 *	1	6 *	0	12
Combined	43	8	25	0	76

* Caution is noted for findings due to small population (N <1,000) in the data cell.

Table OE

Frequency Distribution:
High Utilization of Medical Services
(Exceeding 2.0 Per Capita Ratio)
by Subpopulation and Age Cohort

Age Cohort	Core Area Status	Core Area Others	Suburbs Status	Suburbs Others	Total Winnipeg
<10	0	0	1 *	0	1
10 - 17	4	0	3 *	0	7
18 - 34	3	0	2	0	5
35 - 64	9	0	9 *	0	18
65+	4 *	0	9 *	0	13
Combined	20	0	24	0	44

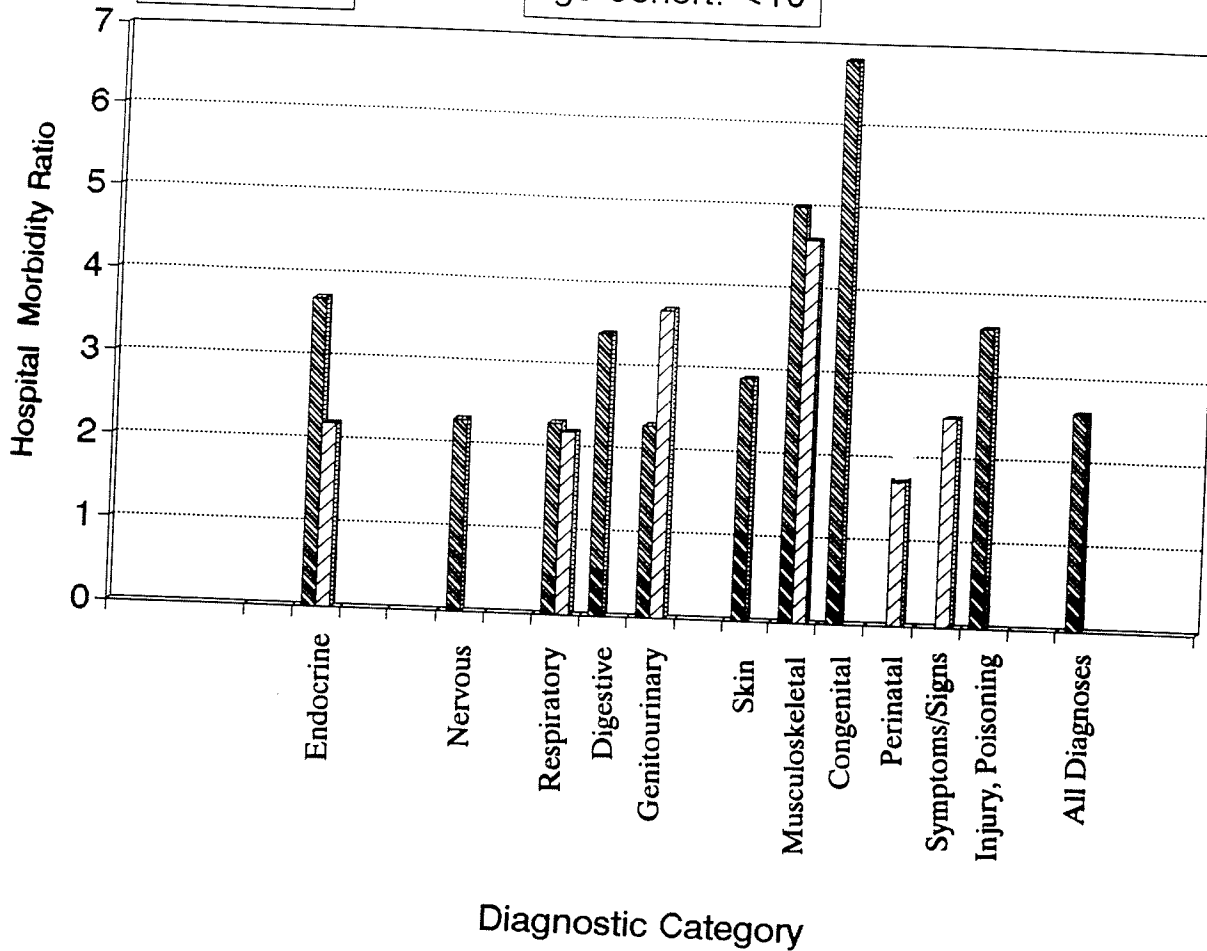
* Caution is noted for findings due to small population (N <1,000) in the data cell.

This study found 120 instances of high hospital in-patient utilization (F = 76) plus high medical services utilization (F = 44) among three of the four subpopulations. Status Indians (Core Area and Suburbs) demonstrated most of these combined high hospital in-patient and high medical services utilization (F = 63 and F = 49, respectively). Core Area Other Residents demonstrated only 8 instances of high hospital in-patient utilization, and no instances of high medical services utilization. Each of these instances is illustrated for the type of utilization (hospital in-patient or medical services) by age cohort and by subpopulation where the utilization was greater than 2.0 (double the provincial norm for each diagnosis and age cohort). All of these 120 instances of high utilization are illustrated in Figures 20A to 25A (high hospital in-patient utilization) and in Figures 20B to 25B (high medical services utilization). Diagnostic categories represent the 18 major ICD-9-CM diagnostic groups. These figures graphically portray the very high health care service utilization of Winnipeg Status Indians for both the Core Area and Suburbs.

High Utilization of Hospital Days for Select Winnipeg Residents, 1990/91

Figure 20A

Age Cohort: <10



Core Area Status Suburbs Status

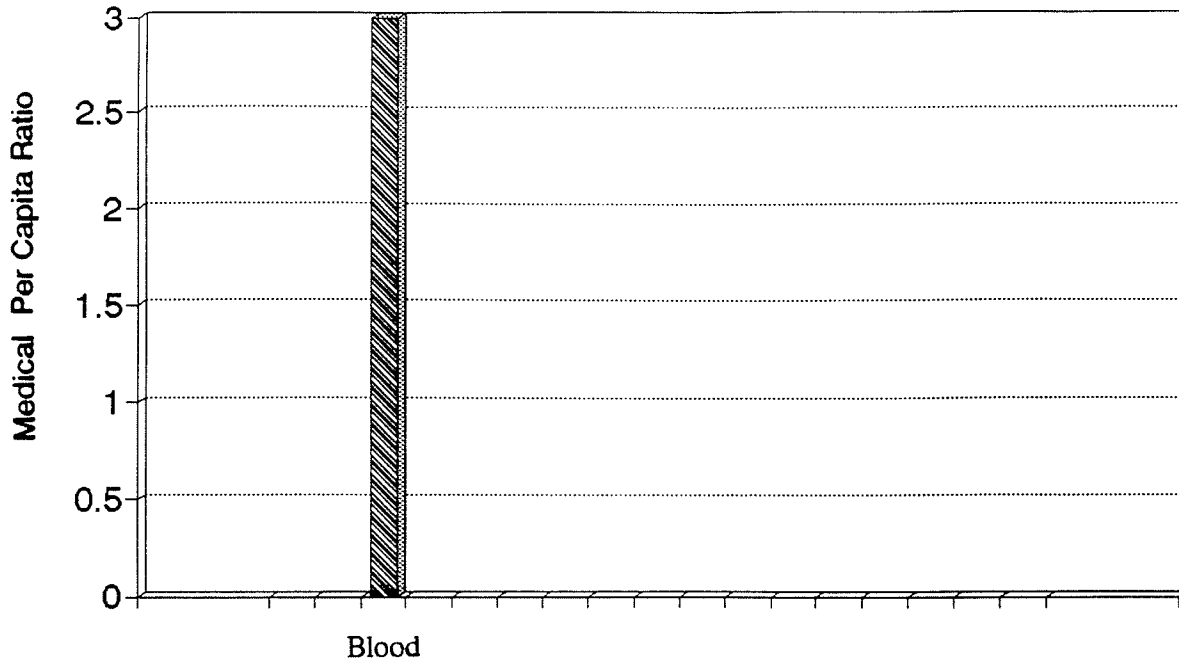
N = 2,916

N = 860

High Utilization of Medical Services for Select Winnipeg Residents, 1990/91

Figure 20B

Age Cohort: <10



Diagnostic Category

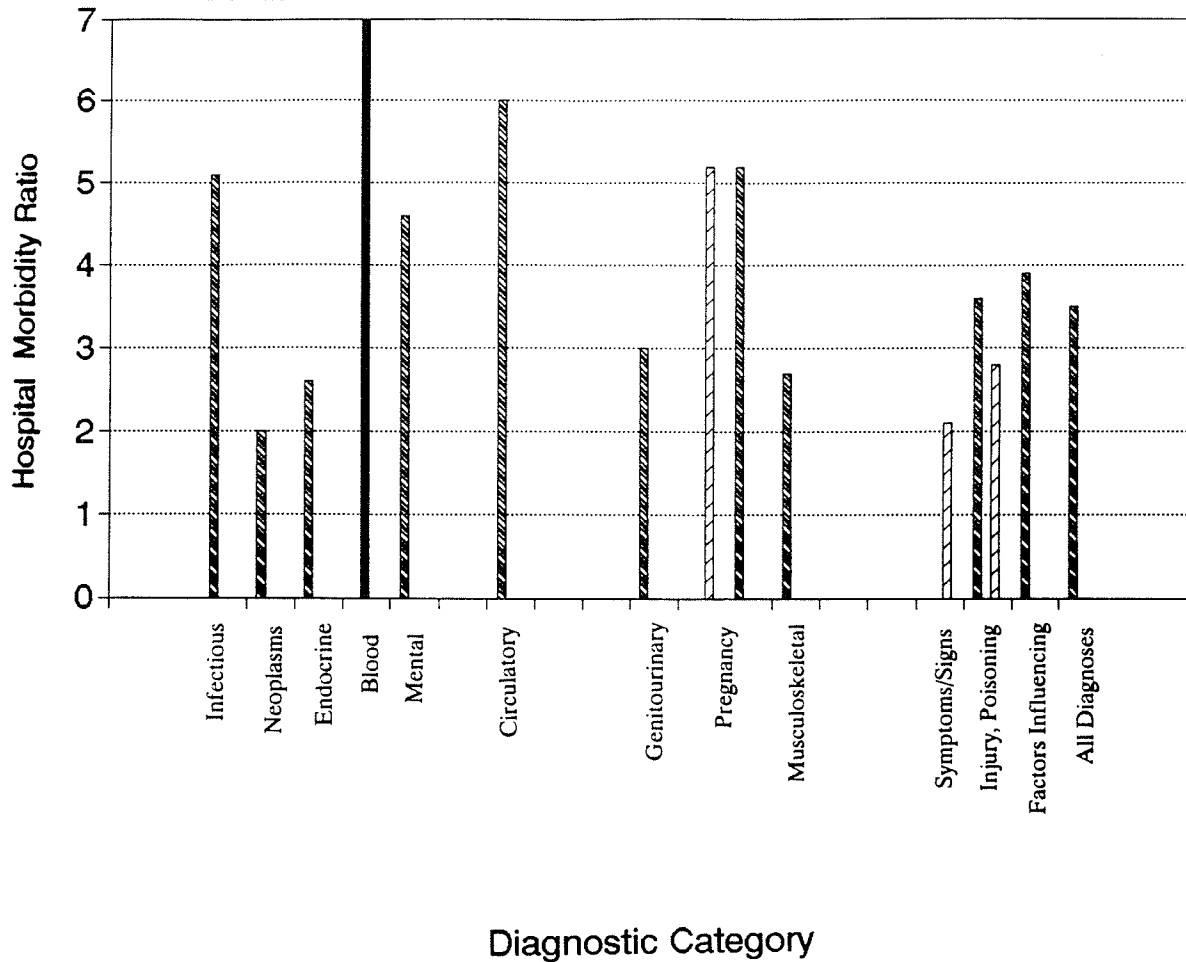
 Core Area Status

N = 860

High Utilization of Hospital Days for Select Winnipeg Residents, 1990/91

Figure 21A

Age Cohort : 10 - 17



Core Area Status
 Core Area Other
 Suburbs Status

N = 1,436

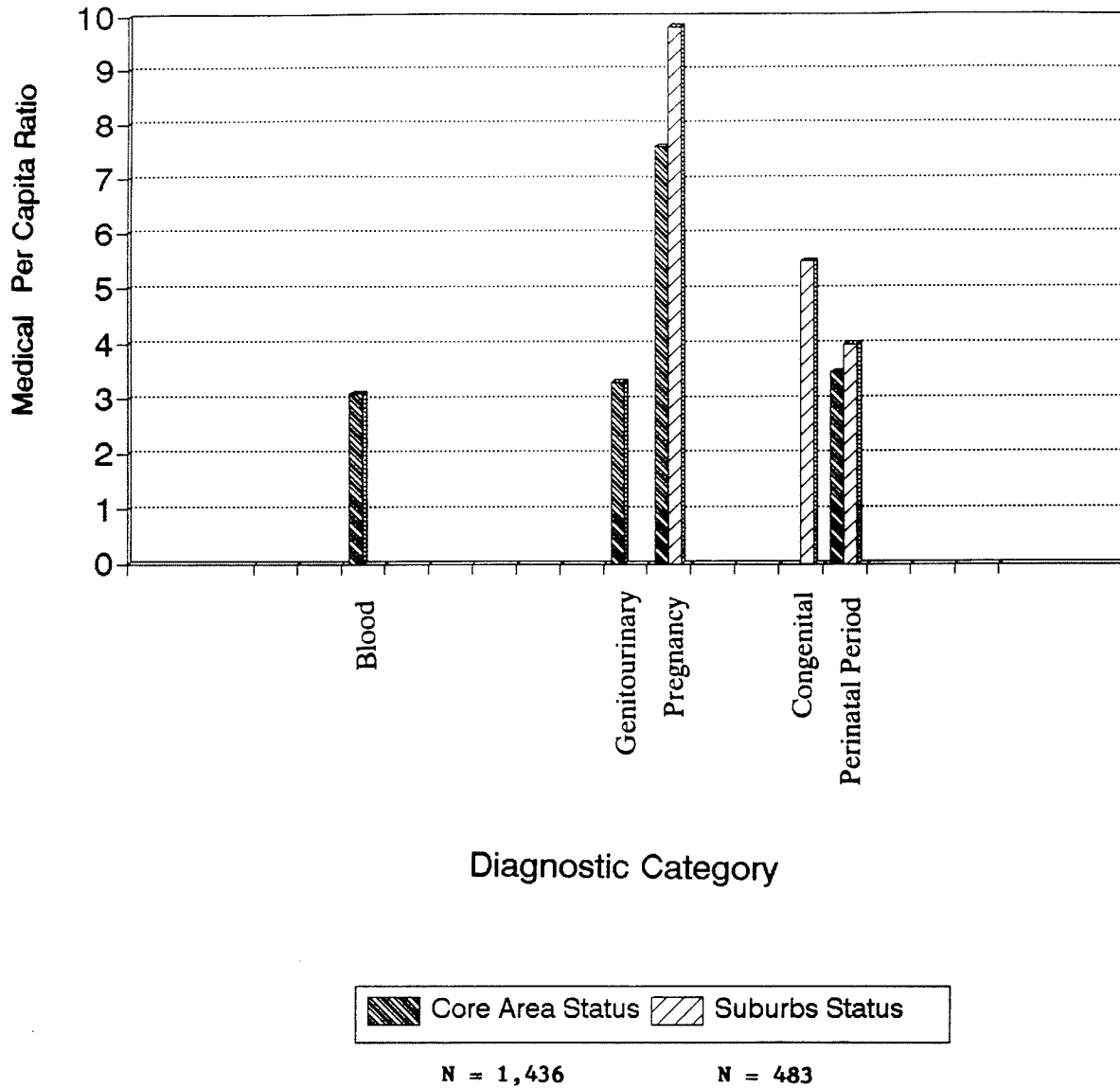
N = 11,722

N = 483

High Utilization of Medical Services for Select Winnipeg Residents, 1990/91

Figure 21B

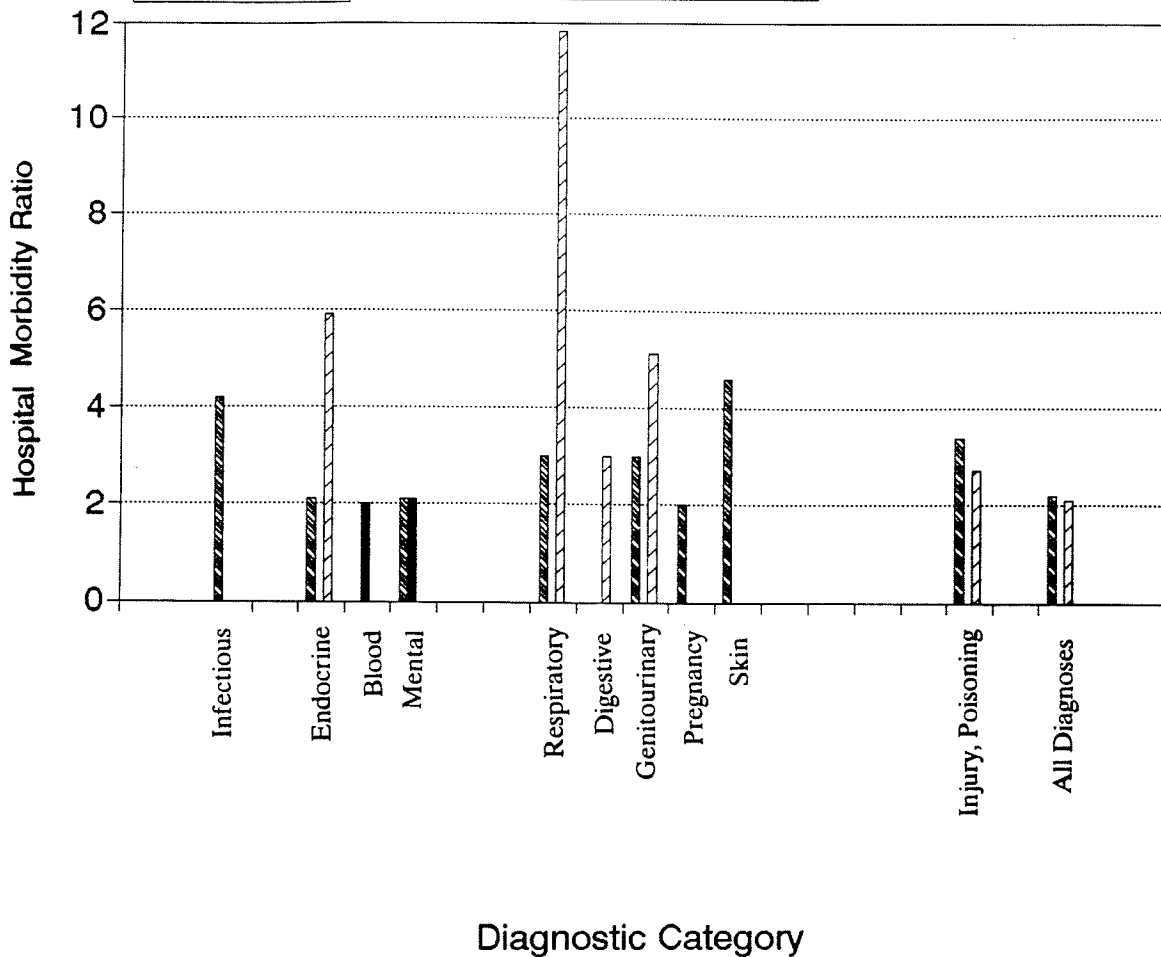
Age Cohort : 10 - 17



High Utilization of Hospital Days for Select Winnipeg Residents, 1990/91

Figure 22A

Age Cohort: 18 - 34



 Core Area Status
  Core Area Other
  Suburbs Status

N = 3,164

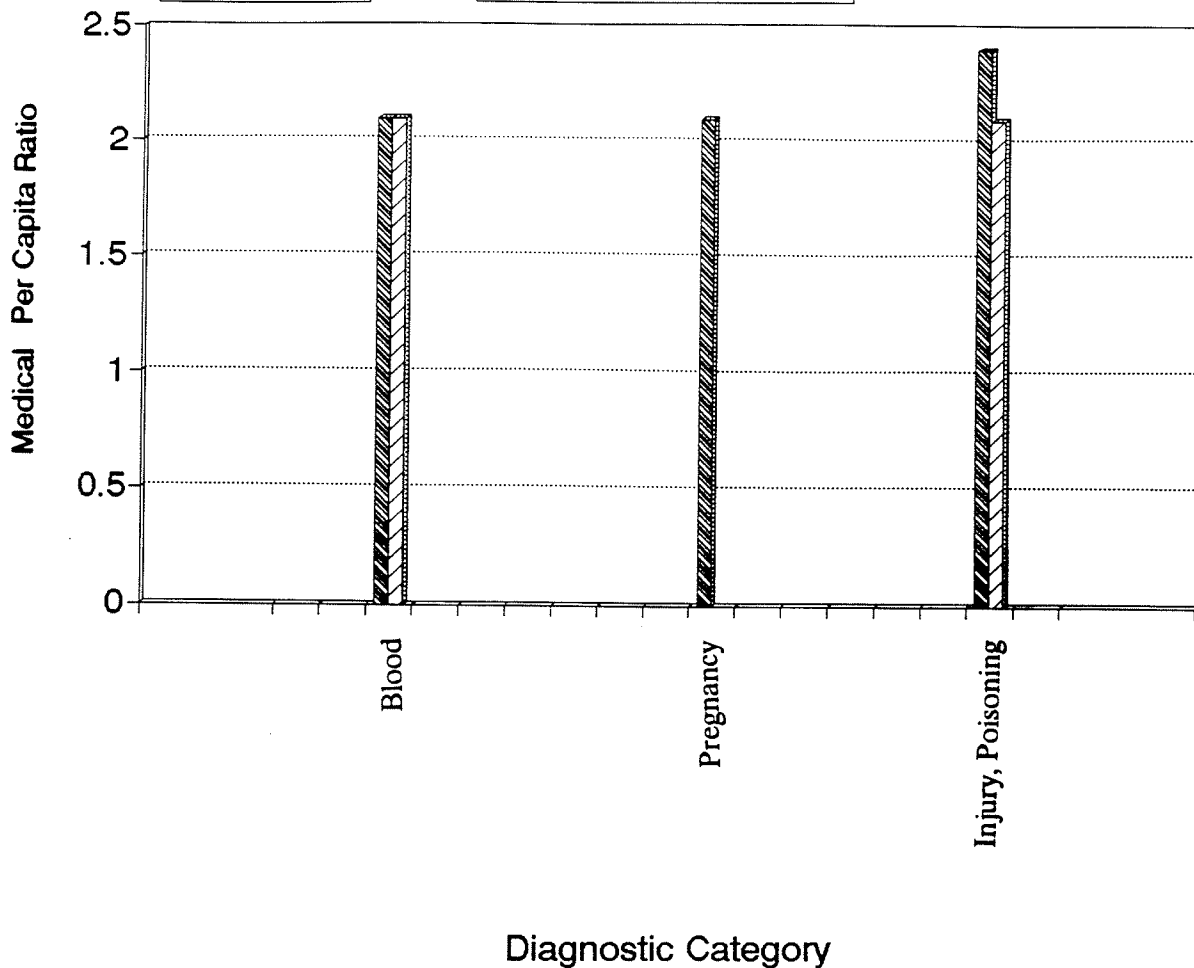
N = 44,718

N = 1,120

High Utilization of Medical Services for Select Winnipeg Residents, 1990/91

Figure 22B

Age Cohort: 18 - 34



Core Area Status Suburbs Status

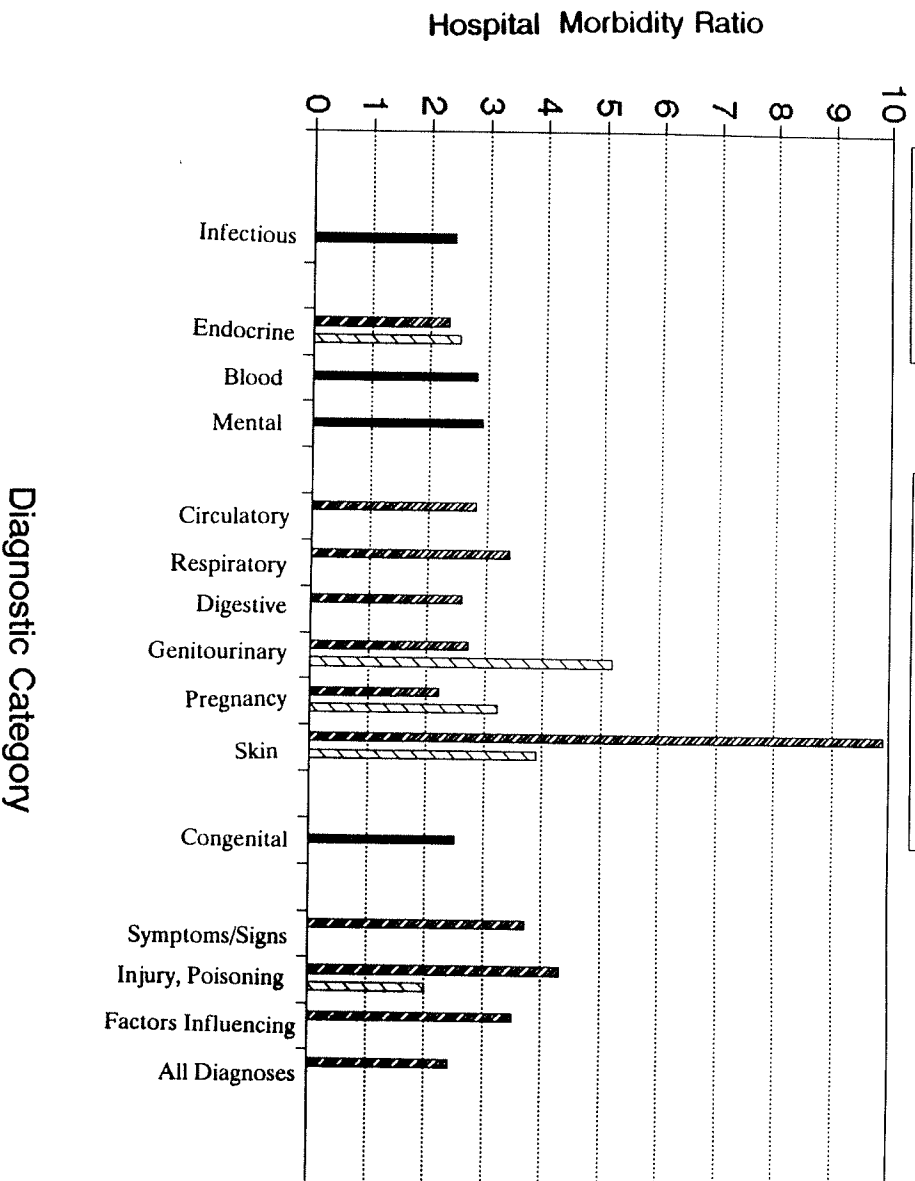
N = 3,164

N = 1,120

High Utilization of Hospital Days for Select Winnipeg Residents, 1990/91

Figure 23A

Age Cohort: 35 - 64



N = 1,520

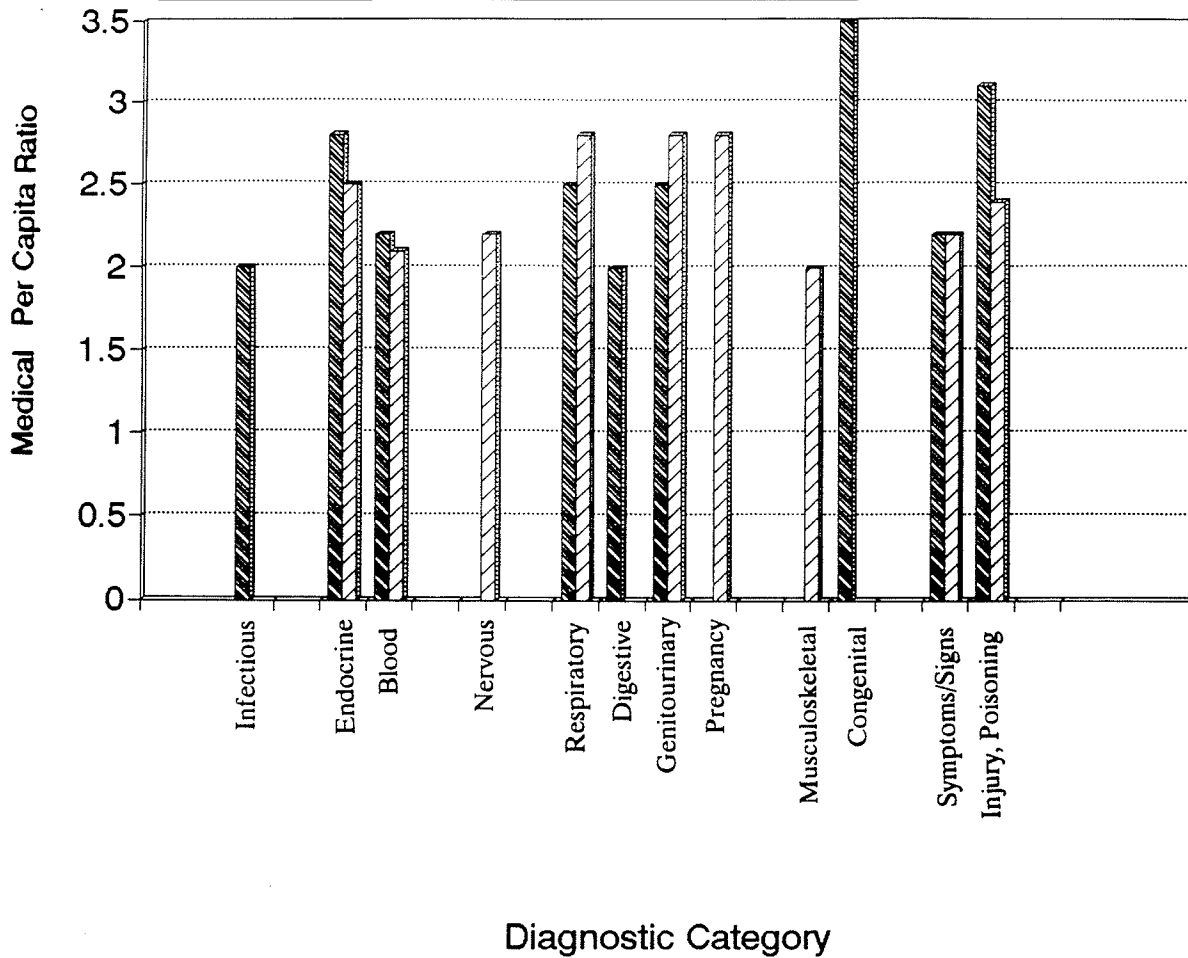
N = 41,994

N = 478

High Utilization of Medical Services for Select Winnipeg Residents, 1990/91

Figure 23B

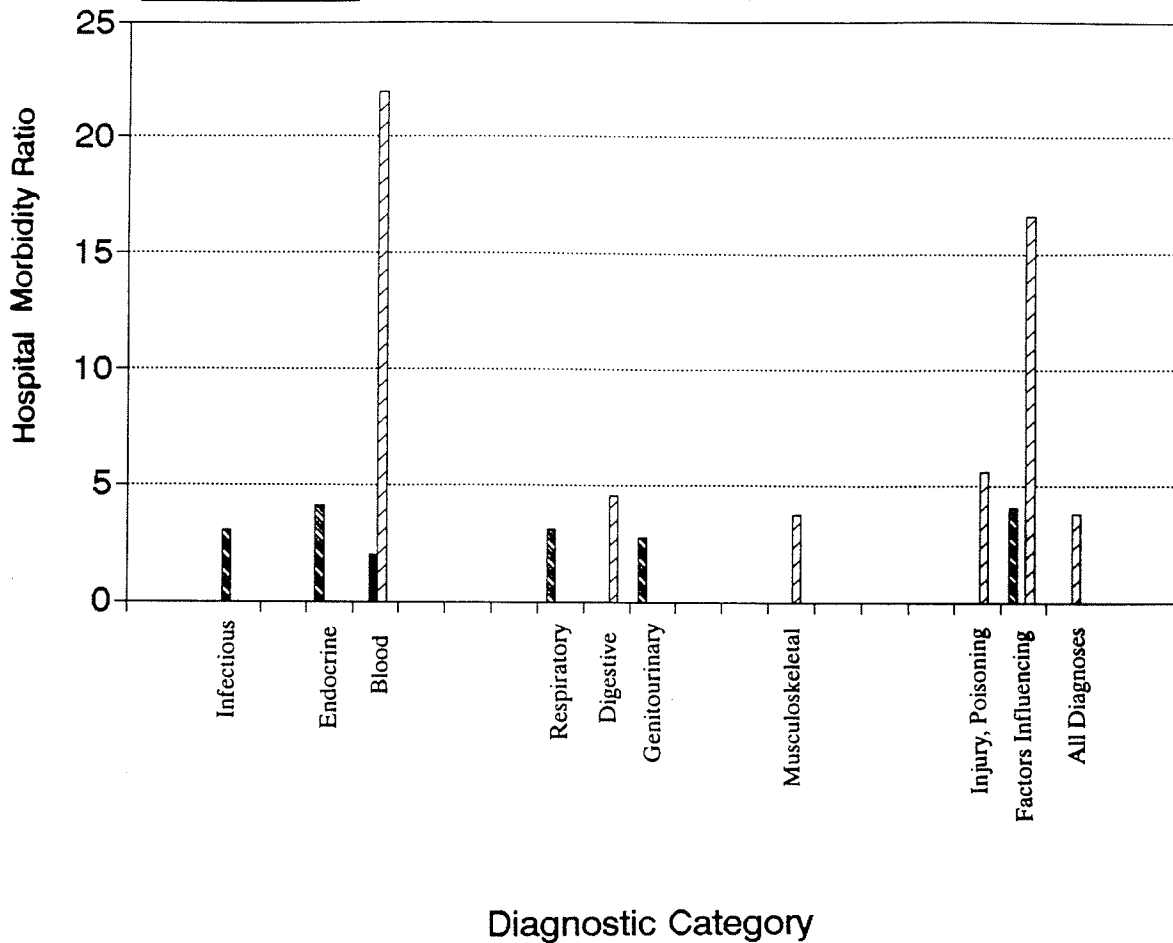
Age Cohort: 35 - 64



High Utilization of Hospital Days for Select Winnipeg Residents, 1990/91

Figure 24A

Age Cohort: 65+



 Core Area Status
  Core Area Other
  Suburbs Status

N = 163

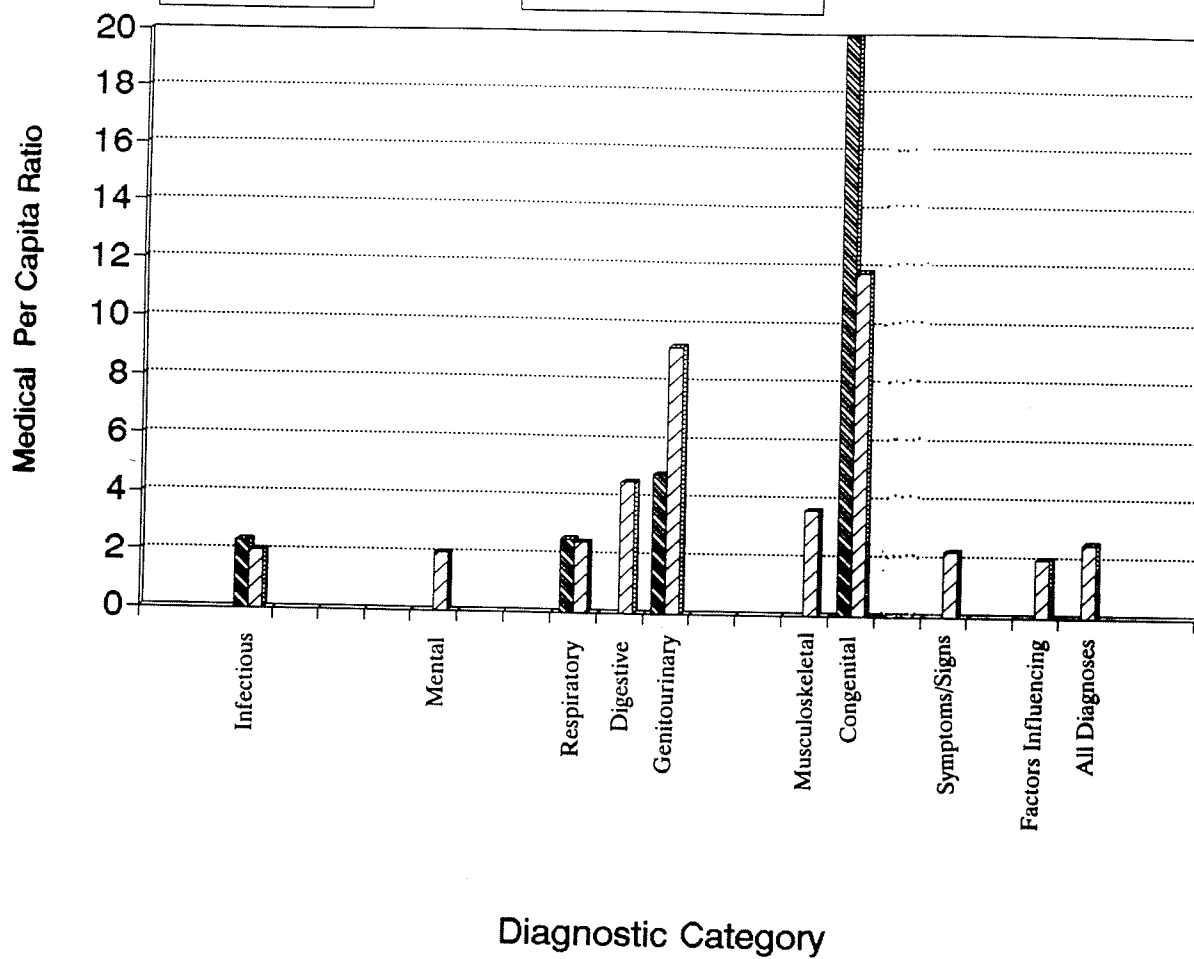
N = 22,269

N = 28

High Utilization of Medical Services for Select Winnipeg Residents, 1990/91

Figure 24B

Age Cohort: 65+



Core Area Status Suburbs Status

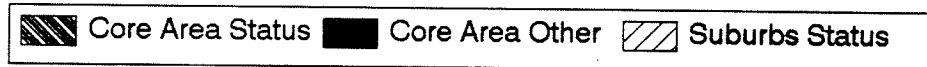
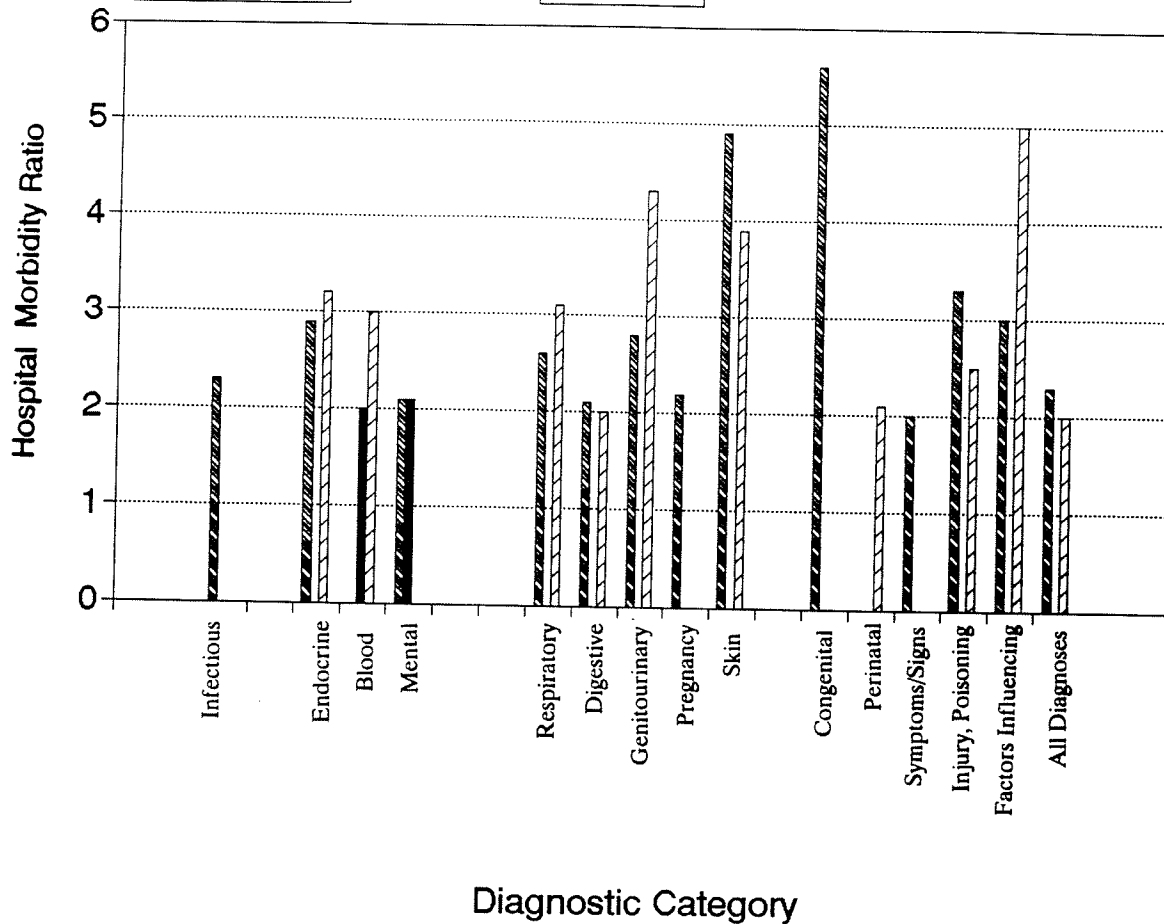
N = 163

N = 28

High Utilization of Hospital Days for Select Winnipeg Residents, 1990/91

Figure 25A

All Ages



N = 9,199

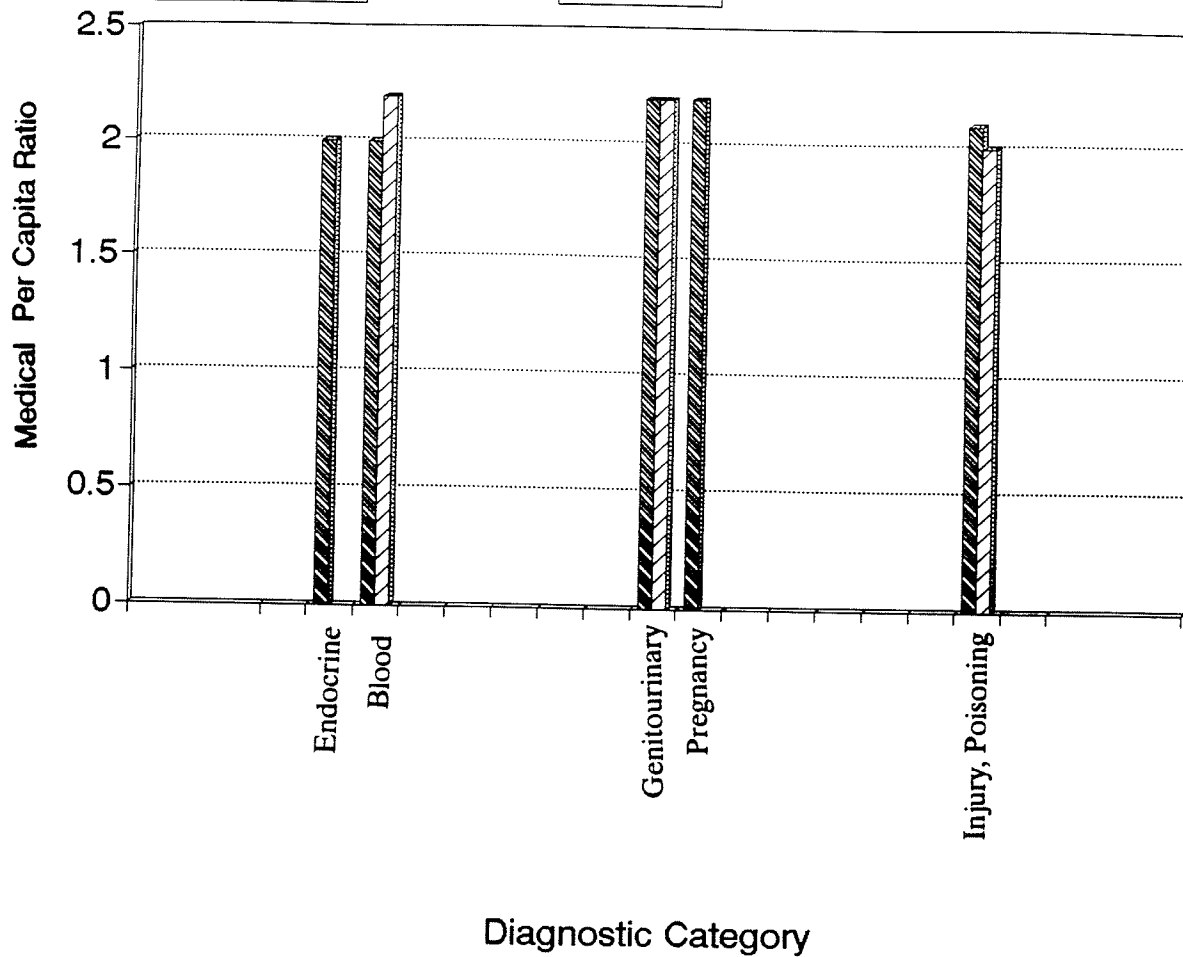
N = 139,281

N = 2,969

High Utilization of Medical Services for Select Winnipeg Residents, 1990/91

Figure 25B

All Ages



Core Area Status Suburbs Status

N = 9,199

N = 2,969

It is apparent that Status Indians' high hospital in-patient utilization illustrated in Figures 20A to 25A are greater in frequency (hospital N = 68) and greater in magnitude than the high medical service utilization illustrated in Figures 20B to 25B (medical N = 44). A limitation of this study noted in Chapter 3 that services of nurse practitioners at urban health clinics, plus services of most Winnipeg hospital emergency departments, were not included within the data base used for this research. Such alternative forms of ambulatory care, in addition to traditional Aboriginal healing techniques, would constitute other health care service utilization outside the scope of this study. Waldram and Layman (1989) described urban Natives' preference for Saskatoon inner-city health care clinics and hospital emergency departments as key sources of primary health care as opposed to physicians in private practice. In the current research, the high hospital in-patient findings (N = 68) are provided with external validation because each in-patient admission must be approved by a physician (in addition to the patient's presenting condition). The gatekeeper role of the admitting physician would discount high hospital in-patient utilization for inappropriate reasons.

Such high utilization findings for Winnipeg Status Indians are seen to be markedly different from those of the Other Residents.

Such striking findings of high hospital in-patient utilization and high medical services utilization for Status Indians (both Core Area and Suburbs) suggests that a variety of health care problems within the urban Aboriginal community need to be addressed. Status Indian high health care service utilization far outstrips even the Core Area Other Residents. At this point, it is only feasible to speculate as to the causal reasons for the wide variety of high utilization patterns. This study does not suggest either genetic or environmental causes. It has noted a cultural context of domination and control of Aboriginal people by the larger society. It has identified conditions of pervasive poverty among many Aboriginal families caught in a chronic state of economic and social dependency. It has also described the additional stress of urban acculturation for the average Aboriginal family. Such cumulative and interactive factors may influence both healthy behaviors (e.g., selecting nutritious foods, seeking proper prenatal care) and unhealthy behaviors (e.g., substance abuse, poor diet).

Mr. Phillip Fontaine, Grand Chief of the Manitoba Assembly of Chiefs, has described health care as fundamentally a political issue, interrelated to settlement of land claims and the development of local control measures. Such fundamental priorities have yet failed to address urban health care issues.

In the search for understanding as to why the urban Aboriginal health care service utilization is so high, one must separate the cultural/political context, environmental conditions (e.g., housing, employment opportunities, services access) from individual lifestyle choices (e.g., budget management, food, recreation). Such variables need to be examined through further study in the realm of urban Aboriginal health issues. A review of urban Aboriginal health care needs, along with a review of urban health care services utilization, is required to determine possible alterations to future curative and preventive health care measures. Such research must address the historical/cultural context to account for the striking variance in health care service utilization between urban Status Indians and urban Other Residents as demonstrated in this study.

Questions of local control and jurisdiction (see Chapter 2, Section 8) have not yet been resolved for urban Aboriginals. Penner (1983), York (1990) and

O'Neil (1986) suggest that decades of control by the dominant society continue a paradox of high health service utilization and ongoing chronic health care problems for Aboriginal people. The etiology of poverty and health care use is strikingly different for urban Aboriginals. As a beginning, it is necessary to define the problems through quantification of health care service utilization in order to initiate discussion for possible change.

This study has provided a baseline demographic profile as well as a quantification of health care service utilization patterns for all Winnipeg residents. These baseline findings of hard data give rise to new questions. What service utilization might be reduced through preventive health care measures? How can future interventions be properly monitored for a wide variety of diagnostic categories? What specific target populations (e.g., pregnant teenagers) need to be reached in the short run? How pressing is the need for a dedicated Aboriginal Health Care Centre in Winnipeg? The following recommendations are intended to address such questions.

5.6 RECOMMENDATIONS FOR THE ABORIGINAL COMMUNITY:

Findings of this study suggest that Winnipeg Status Indians and perhaps other Winnipeg Aboriginals utilize high rates of both in-patient hospital and medical services. Core Area and Suburbs Status Indians demonstrated similar high health care service utilization patterns, regardless of location of residence within Winnipeg. This primary research is intended to result in a better understanding of urban health care service utilization and health care problems faced by Status Indians and other Aboriginals. Such information is vital for self actualization and advocacy for change by Aboriginal groups, the users of the insured health care services.

McClure et al. (1991) concluded that research on urban Aboriginal health care indicated that even very basic information had not been collected to date. The authors noted that data is lacking on the size, demographic composition and migration experience of the urban-based Aboriginal population. The authors also noted that epidemiological information describing health status and probable causes of morbidity is lacking on the estimated number of Aboriginal people living in each of Canada's cities, along with their distribution, their migration patterns and current patterns of service use.

Information can serve as a source of empowerment and a necessary tool for advocacy planning and service delivery. Within an information vacuum, health service utilization problems of the Aboriginal community cannot be properly identified or addressed with any logic or set of priorities. Many urban health care issues face Aboriginal communities. Without an accurate baseline of hard data, urban Aboriginal leaders will be constrained in discussion on their health care service issues and unable to define priorities for providing an improved quality of life for themselves. Improved information on urban Aboriginal health care service utilization is critical for the empowerment of Aboriginal people and health care program directors in order to focus limited fiscal health care resources towards the best results.

A) Insofar as these findings should be applicable to all urban Aboriginal groups, it is recommended that the Winnipeg Tribal Council, the Manitoba Assembly of Chiefs, the Manitoba Metis Federation and other Aboriginal groups examine the findings of this study to determine health topics of concern (by age cohort and by diagnosis) to be discussed with health care service providers.

B) It is also recommended that the Winnipeg Tribal Council and the Manitoba Assembly of Chiefs consider replication of this study for future years to monitor utilization trends beyond the baseline identified, which uses 1990/91 insured health care services data.

5.7 RECOMMENDATIONS FOR HEALTH PRACTITIONERS:

A) It is recommended that health care practitioners examine all high utilization categories identified in this study (see Figures 20A to 25A and 20B to 25B) for Core Area Status Indians, Suburbs Status Indians and Core Area Other Residents, because they demonstrated many categories of high health care service utilization. Such high utilization should be targetted for reduction over time. Measures are required for monitoring such reductions.

B) It is recommended that the Manitoba Medical Association and the Manitoba Association of Registered Nurses advise their members on key findings of this study and consider means for reducing high Aboriginal health care service utilization through a variety of preventive health care measures.

C) It is recommended that the University of Manitoba Faculties of Community Health Sciences and Native Studies utilize this study's baseline findings in their courses dealing with Aboriginal health care issues.

5.8 RECOMMENDATIONS FOR RESEARCH:

- A) It is recommended that the Manitoba Health Services Commission amend its population registry to identify a Winnipeg Region for Status Indians (by postal code) for future data runs so that special one time computer programming would not be required.
- B) It is recommended that the Manitoba Health Services Commission amend its Status Indian population registry to include Non-Status Indians reinstated as Status Indians according to the provisions of Federal Bill C-31 (1985). This might add approximately 8,000 to 10,000 Status Indians to the Winnipeg Region.
- C) It is recommended that this study be replicated for subsequent years by the Manitoba Centre for Health Policy to determine future trends of Winnipeg Status Indians' health care service utilization.
- D) It is recommended that the same study design be utilized by the Manitoba Centre for Health Policy Review to provide an accurate comparison between Manitoba rural (reserve) Status Indians and Winnipeg Status Indians.
- E) It is recommended that the Manitoba Health Services Commission publish summary statistics of Status Indian health care service utilization (i.e., hospital in-patient days and annual medical per capita expense per diagnosis) within its Annual Report.

F) It is recommended that these Canadian findings of urban Status Indian health care service utilization be shared with the Circumpolar Institute for Native Studies to elicit response, and to encourage similar research outside Canada for Aboriginal People.

G) It is recommended that research be undertaken to determine the degree to which high health care service utilization for Status Indians reflects:

- (1) genetic predisposition for specific illnesses;
- (2) environmental influences such as housing and crime;
- (3) lifestyle choices which increase health risks;
- (4) differential responses provided by caregivers to Status Indians; or,
- (5) differential help-seeking practices by individuals.

5.9 SUMMARY OF THE STUDY:

This study has provided a baseline demographic profile as well as a description of health care service utilization patterns by Winnipeg Status Indians. The research considered factors of poverty and urban acculturation stress which negatively impact upon Status Indians' insured health service utilization. This study utilized the Manitoba provincial health care data base to observe and analyze a total urban Status Indian population (N = 12,168), who were residents within Winnipeg, Manitoba during 1990/91.

Such findings were compared with all other Winnipeg residents (N = 634,936). As a descriptive, comparative study, the research design quantified demographic profiles and compared health care service utilization. The research methodology was small area analysis, using a large data base. This study subdivided the Winnipeg population into four subpopulations: Core Area Status Indians; Core Area Other Residents; Suburbs Status Indians and Suburbs Other Residents. Analysis focused upon observations of all hospital in-patient utilization (days per 1,000 population) and all medical service utilization (annual per capita costs) for four subpopulations by diagnosis and five age cohorts for a 12 month period, during the 1990/91 fiscal year.

Each of these utilization measures was compared to the Manitoba norm specific to each diagnosis and each age cohort. These comparisons provided a hospital morbidity ratio or an annual medical per capita ratio for each instance for all four subpopulations.

The findings of this study indicated 120 instances of high health care service utilization (more than double the provincial norm for each major diagnosis and age cohort). Findings demonstrated 76 instances of high hospital in-patient utilization and 44 instances of high medical service utilization among only three of

the four subpopulations. Core Area Status Indians (frequency = 63) and Suburbs Status Indians (frequency = 49) represented most of the documented high hospital in-patient and high medical services utilization. Core Area Other Residents (frequency = 8) and Suburbs Other Residents (frequency = 0) represented little variance from the provincial norms per diagnosis, using a cutoff threshold of 2.0 M.R. or P.C.R.

All of these 120 instances of high health care service utilization are illustrated in Figures 20A to 25A (high hospital in-patient utilization) and in Figures 20B to 25B (high medical services utilization). Diagnostic categories represent the 18 major ICD-9-CM diagnostic groups. These figures graphically portray the very high health care service utilization of Winnipeg Status Indians for both the Core Area and Suburbs as contrasted with Winnipeg's Other Residents. Such striking findings of high health care service utilization for both Core Area Status Indians and Suburbs Status Indians suggests that a variety of health care problems within the Aboriginal community need to be addressed. Core Area Status Indians demonstrated the highest combined hospital in-patient and medical services utilization of Winnipeg's four subpopulations. Suburbs Status Indians ranked second

in high health care service utilization. Core Area Other Residents ranked third, demonstrating only a few high hospital in-patient utilization findings. Suburbs Other Residents ranked fourth, demonstrating all health care service utilization rates close to the Manitoba averages.

These findings suggest that ethnicity (i.e., being a Status Indian) was a greater factor than poverty in affecting high health care service utilization in Winnipeg in 1990/91.

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APPENDIX A

Chi Square Statistical Analysis
Winnipeg Subpopulation Distribution
June 1990

Appendix A

Chi Square Statistical Analysis
Winnipeg Subpopulation Distribution, June 1990

Observed Frequency		(Expected Frequency)			
Age Cohorts	Core Area Status Indians	Core Area Other Residents	Suburbs Status Indians	Suburbs Other Residents	Winnipeg Total
< 10	31.7% 2916 (1263)	13.3% 18,578 (19,119)	29.0% 860 (407)	13.4% 66,472 (68,037)	13.7267% 88,826 (88,826)
10 - 17	15.6% 1436 (945)	8.4% 11,722 (14,300)	16.3% 483 (305)	10.6% 52,801 (50,892)	10.2676% 66,442 (66,442)
18 - 34	34.4% 3164 (2748)	32.1% 44,718 (41,611)	37.7% 1120 (887)	29.1% 144,324 (148,080)	29.8756% 193,326 (193,326)
35 - 64	16.5% 1520 (3,081)	30.2% 41,994 (46,657)	16.1% 478 (995)	34.9% 172,777 (166,036)	33.4983% 216,769 (216,769)
65 +	1.8% 163 (1162)	16.0% 22,269 (17,594)	0.9% 28 (375)	12.0% 59,281 (62,610)	12.6318% 81,741 (81,741)
All Ages	100.0% N=9,199	100.0% N=139,281	100.0% N=2,969	100.0% N=495,655	100.0% N=647,104
Subpopulations	1.4%	21.5%	0.5%	76.6%	100.0%

Source: Manitoba Health Services Commission
Population Registry, June 1990

Winnipeg Subpopulations Distribution
June 1990
Chi Square Statistical Analysis

Question: Do the observed Winnipeg Subpopulations Distribution frequencies deviate significantly from the Winnipeg population distribution? Is there a significant difference in the compared age cohorts, or are observed differences attributed to chance?

O	E	O - E	(O - E) ²	$\frac{(O - E)^2}{E}$
2,916	1,263	1653	2732409	2163.427553
1,436	945	491	241081	255.112169
3,164	2,748	416	173056	62.975254
1,520	3,081	-1561	2436721	790.886400
163	1,162	- 999	998001	858.864888
18,578	19,119	- 541	292681	15.308384
11,722	14,300	-2578	6646084	464.761118
44,718	41,611	3107	9653449	231.992718
41,994	46,657	-4663	21743569	466.030156
22,269	17,594	4675	21855625	1242.220359
860	407	453	205209	504.199017
483	305	178	31684	103.881967
1,120	887	233	54289	61.205186
478	995	- 517	267289	268.632160
28	375	- 347	120409	321.090667
66,472	68,037	-1565	2449225	35.998427
52,801	50,892	1909	3644281	71.608130
144,324	148,080	-3756	14107536	95.269692
172,777	166,036	6741	45441081	273.682099
59,281	62,610	-3329	11082241	177.004328

$$\chi^2 = 8454$$

Winnipeg Subpopulations Distribution
June 1990
Chi Square Statistical Analysis

$$\text{chi square} = \sum \frac{\frac{(O - E)^2}{E}}{\text{df}} = 8454$$

degrees of freedom = (number of columns - 1) (number of rows - 1)

$$\begin{aligned} \text{df} &= (5 - 1) (4 - 1) \\ \text{df} &= 4 \times 3 \\ \text{df} &= 12 \end{aligned}$$

Answer: A chi square value of at least 26.22 must be obtained to be significant at the .01 level of significance. As the obtained chi square value is 8454, I reject the null hypothesis of no relationship and conclude that whatever differences appear to exist in the data, they are not due to chance. The observed differences in the subpopulations distributions are statistically significant at the 1% level.

APPENDIX B

Tables 20 to 25.

Illustrating Morbidity Ratios for
In-Patient Hospital and Medical Services Utilization
for All Diagnoses, All Age Cohorts and
Four Subpopulations

TABLE 20: AGE COHORT ANALYSIS, 1990-1991
AGE GROUP: < 10

DIAGNOSTIC CATEGORY	STATUS INDIAN CORE AREA		OTHER RESIDENTS CORE AREA		STATUS INDIAN SUBURBS		OTHER RESIDENTS SUBURBS	
	Hospital M.R.	Medical P.C.R.	Hospital M.R.	Medical P.C.R.	Hospital M.R.	Medical P.C.R.	Hospital M.R.	Medical P.C.R.
Infectious/Parasitic	1.6	1.3	1.1	1.2	1.2	1.3	0.4	1.2
Neoplasms	0.0	0.8	0.3	1.2	0.0	0.2	1.0	1.1
Endocrine/Nutrition	3.7	1.0	0.3	0.8	2.2	1.3	0.5	1.0
Blood	1.0	1.9	0.2	1.1	0.6	3.0	0.4	0.9
Mental Disorders	0.0	1.4	1.0	1.4	0.0	1.5	2.0	1.4
Nervous System	2.3	1.2	0.8	0.9	0.4	1.4	0.4	1.2
Circulatory System	0.9	0.9	0.6	0.9	0.0	1.2	0.1	0.9
Respiratory System	2.3	1.2	0.5	1.1	2.2	1.6	0.3	1.1
Digestive System	3.4	1.7	0.7	1.0	0.8	0.5	1.8	1.0
Genitourinary System	2.3	1.3	0.7	1.0	3.7	1.2	0.6	1.0
Pregnancy/Childbirth	0.0	0.5	0.0	0.2	0.0	0.0	0.0	0.7
Skin	2.9	1.7	1.2	1.2	1.1	1.5	0.3	1.0
Musculoskeletal	5.0	1.3	1.6	0.9	4.6	0.9	0.6	1.1
Congenital Anomalies	6.8	1.8	1.3	1.0	1.0	1.0	0.8	1.1
Perinatal Period	0.6	1.2	0.4	0.9	2.1	1.6	0.6	0.8
Symptoms/Signs	1.9	1.1	0.6	1.0	2.5	1.6	0.5	1.1
Injury, Poisoning	3.6	1.7	0.9	1.0	0.7	1.7	0.8	0.9
Factors Influencing	1.1	1.0	0.7	1.1	0.1	1.1	0.7	1.3
All Diagnoses	2.6	1.2	0.7	1.0	1.5	1.4	0.5	1.1

TABLE 21:

AGE COHORT ANALYSIS, 1990-1991
AGE GROUP: 10 - 17

DIAGNOSTIC CATEGORY	STATUS INDIAN CORE AREA		OTHER RESIDENTS CORE AREA		STATUS INDIAN SUBURBS		OTHER RESIDENTS SUBURBS	
	Hospital M.R.	Medical P.C.R.	Hospital M.R.	Medical P.C.R.	Hospital M.R.	Medical P.C.R.	Hospital M.R.	Medical P.C.R.
Infectious/Parasitic	5.1	1.0	0.8	1.0	0.8	1.3	0.6	1.2
Neoplasms	2.0	1.7	0.6	0.5	0.0	0.2	1.6	1.4
Endocrine/Nutrition	2.6	1.3	1.0	1.2	1.2	1.0	0.7	1.2
Blood	1.0	3.1	7.0	1.2	0.0	1.7	0.0	1.2
Mental Disorders	4.6	1.1	1.4	1.0	1.3	0.8	1.4	1.7
Nervous System	1.7	1.1	1.5	0.9	0.0	0.8	1.0	1.2
Circulatory System	6.0	1.5	0.0	0.8	0.0	0.3	0.5	1.0
Respiratory System	1.8	1.0	0.7	1.0	0.6	1.2	0.8	1.2
Digestive System	1.1	1.1	0.7	0.9	0.9	1.0	0.8	1.0
Genitourinary System	3.0	3.3	0.7	1.3	0.0	1.4	0.9	1.1
Pregnancy/Childbirth	6.1	7.6	1.3	1.5	5.2	9.8	0.4	0.6
Skin	5.2	1.1	0.8	1.0	0.0	1.2	0.6	1.1
Musculoskeletal	2.7	0.7	1.2	0.8	0.0	1.1	0.9	1.2
Congenital Anomalies	0.0	0.8	0.4	1.0	1.6	5.5	1.0	1.1
Perinatal Period	0.0	3.5	0.0	0.5	0.0	4.0	0.0	1.0
Symptoms/Signs	1.4	1.1	0.8	1.0	2.1	1.4	0.7	1.2
Injury, Poisoning	3.6	1.3	0.7	0.9	2.8	1.6	0.6	0.9
Factors Influencing	3.9	1.1	0.6	1.2	1.2	1.5	1.1	1.5
All Diagnoses	3.5	1.2	1.0	1.0	1.6	1.4	0.9	1.2

Table 22:

AGE COHORT ANALYSIS, 1990-1991
AGE GROUP: 18 - 34

DIAGNOSTIC CATEGORY	STATUS INDIAN CORE AREA		OTHER RESIDENTS CORE AREA		STATUS INDIAN SUBURBS		OTHER RESIDENTS SUBURBS	
	Hospital	Medical	Hospital	Medical	Hospital	Medical	Hospital	Medical
	M.R.	P.C.R.	M.R.	P.C.R.	M.R.	P.C.R.	M.R.	P.C.R.
Infectious/Parasitic	4.2	1.4	1.3	1.1	0.0	1.4	0.8	1.2
Neoplasms	0.2	0.4	1.6	1.0	0.5	0.5	1.6	1.2
Endocrine/Nutrition	2.1	1.2	0.6	1.0	5.9	1.4	0.4	1.1
Blood	1.0	2.1	2.0	1.2	0.0	2.1	0.0	1.1
Mental Disorders	2.1	1.1	2.1	1.3	0.2	1.0	1.2	1.4
Nervous System	1.6	1.4	1.2	1.0	1.1	1.7	1.2	1.1
Circulatory System	1.2	1.2	0.8	1.0	0.7	0.9	1.2	1.1
Respiratory System	3.0	1.5	1.1	1.0	11.8	1.6	0.6	1.1
Digestive System	1.5	1.5	0.9	0.9	3.0	1.8	0.8	1.0
Genitourinary System	3.0	1.8	1.0	1.0	5.1	1.8	0.7	1.1
Pregnancy/Childbirth	2.0	2.1	0.9	0.9	1.6	1.7	0.8	0.9
Skin	4.6	1.2	1.2	1.0	7.6	1.5	0.7	1.2
Musculoskeletal	1.8	1.4	1.1	1.0	0.6	1.5	0.7	1.1
Congenital Anomalies	0.0	0.6	0.5	1.1	0.0	1.2	1.0	1.0
Perinatal Period	0.0	0.5	0.0	0.8	0.0	1.5	0.0	0.5
Symptoms/Signs	1.6	1.4	0.8	1.0	0.3	1.7	0.6	1.1
Injury, Poisoning	3.4	2.4	1.1	0.9	2.7	2.2	0.5	0.9
Factors Influencing	0.9	1.2	0.5	0.9	0.8	1.5	0.9	1.2
All Diagnoses	2.2	1.6	1.1	1.0	2.1	1.6	0.8	1.1

TABLE 23:

AGE COHORT ANALYSIS, 1990-1991
AGE GROUP: 35 - 64

DIAGNOSTIC CATEGORY	STATUS INDIAN CORE AREA		OTHER RESIDENTS CORE AREA		STATUS INDIAN SUBURBS		OTHER RESIDENTS SUBURBS	
	Hospital M.R.	Medical P.C.R.	Hospital M.R.	Medical P.C.R.	Hospital M.R.	Medical P.C.R.	Hospital M.R.	Medical P.C.R.
Infectious/Parasitic	0.7	2.0	2.4	1.2	0.0	1.8	0.6	1.2
Neoplasms	0.6	0.5	1.3	0.9	0.2	0.3	1.3	1.1
Endocrine/Nutrition	2.3	2.8	1.0	1.2	2.5	2.5	0.6	1.1
Blood	0.6	2.2	2.8	1.2	0.0	2.1	0.6	1.2
Mental Disorders	1.1	0.9	2.9	1.4	1.2	1.2	1.0	1.4
Nervous System	1.1	1.8	1.7	1.1	0.4	2.2	0.6	1.1
Circulatory System	2.8	1.5	1.3	1.0	0.5	1.5	0.9	1.1
Respiratory System	3.4	2.5	1.3	1.2	1.7	2.8	0.7	1.1
Digestive System	2.6	2.0	1.2	1.1	1.1	1.9	0.8	1.0
Genitourinary System	2.7	2.5	1.0	1.0	5.2	2.8	0.9	1.1
Pregnancy/Childbirth	2.2	1.8	1.3	1.2	3.2	2.8	1.0	1.1
Skin	9.9	1.9	1.2	1.1	3.9	1.9	0.5	1.2
Musculoskeletal	1.5	1.7	1.2	1.1	0.4	2.0	0.7	1.1
Congenital Anomalies	0.0	3.5	2.5	1.3	0.0	0.7	0.5	1.0
Perinatal Period	0.0	1.0	0.0	1.0	0.0	0.0	0.0	1.0
Symptoms/Signs	3.7	2.2	1.0	1.2	0.3	2.2	0.6	1.1
Injury, Poisoning	4.3	3.1	1.7	1.2	2.0	2.4	0.9	0.9
Factors Influencing	3.5	0.9	1.9	1.0	1.8	1.3	1.0	1.3
All Diagnoses	2.4	1.8	1.6	1.1	1.4	1.9	0.8	1.2

TABLE 24:

AGE COHORT ANALYSIS, 1990-1991
AGE GROUP: 65 +

DIAGNOSTIC CATEGORY	STATUS INDIAN CORE AREA		OTHER RESIDENTS CORE AREA		STATUS INDIAN SUBURBS		OTHER RESIDENTS SUBURBS	
	Hospital	Medical	Hospital	Medical	Hospital	Medical	Hospital	Medical
	M.R.	P.C.R.	M.R.	P.C.R.	M.R.	P.C.R.	M.R.	P.C.R.
Infectious/Parasitic	3.0	2.3	1.0	1.1	0.0	2.0	1.3	1.2
Neoplasms	0.8	0.7	1.2	1.0	0.8	1.8	1.2	1.0
Endocrine/Nutrition	4.1	1.8	1.4	1.0	1.7	1.8	0.6	1.1
Blood	0.0	1.3	2.0	1.2	21.9	0.2	0.6	1.2
Mental Disorders	1.5	0.8	1.9	1.4	1.7	2.0	1.0	1.2
Nervous System	0.0	0.6	1.2	1.0	2.0	1.6	1.2	1.2
Circulatory System	0.8	1.1	1.2	1.0	0.1	1.4	0.9	1.2
Respiratory System	3.1	2.5	1.0	1.0	1.0	2.4	0.9	1.1
Digestive System	1.2	1.1	1.0	0.9	4.5	4.5	0.8	1.1
Genitourinary System	2.7	4.8	0.9	1.0	0.0	9.2	0.7	1.1
Pregnancy/Childbirth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Skin	0.0	1.8	1.2	1.0	0.0	1.5	0.5	1.2
Musculoskeletal	0.1	0.7	0.9	1.0	3.7	3.6	0.9	1.1
Congenital Anomalies	0.0	20.0	1.0	0.8	0.0	11.8	0.3	1.2
Perinatal Period	0.0	15.8	0.0	0.7	0.0	16.5	0.0	0.8
Symptoms/Signs	1.0	1.3	0.9	1.1	0.5	2.2	0.6	1.2
Injury, Poisoning	1.4	0.9	1.4	1.0	5.6	1.7	1.0	1.0
Factors Influencing	4.0	1.2	1.3	1.0	16.6	2.0	1.2	1.4
All Diagnoses	1.6	1.4	1.3	1.0	3.8	2.5	1.0	1.2

TABLE 25:

AGE COHORT ANALYSIS, 1990-1991
AGE GROUP: ALL AGES

DIAGNOSTIC CATEGORY	STATUS INDIAN CORE AREA		OTHER RESIDENTS CORE AREA		STATUS INDIAN SUBURBS		OTHER RESIDENTS SUBURBS	
	Hospital M.R.	Medical P.C.R.	Hospital M.R.	Medical P.C.R.	Hospital M.R.	Medical P.C.R.	Hospital M.R.	Medical P.C.R.
Infectious/Parasitic	2.3	1.4	1.3	1.1	0.6	1.6	0.9	1.2
Neoplasms	0.6	0.5	1.2	0.9	0.3	0.5	1.2	1.2
Endocrine/Nutrition	2.9	2.0	1.2	1.1	3.2	1.9	0.6	1.1
Blood	0.7	2.0	2.0	1.2	3.0	2.2	0.6	1.2
Mental Disorders	2.1	1.0	2.1	1.4	0.8	1.1	1.1	1.4
Nervous System	1.1	1.3	1.3	1.0	0.7	1.6	1.0	1.2
Circulatory System	1.6	1.4	1.2	1.0	0.4	1.4	0.9	1.2
Respiratory System	2.6	1.4	1.0	1.0	3.1	1.7	0.8	1.1
Digestive System	2.1	1.7	1.1	1.0	2.0	1.9	0.8	1.0
Genitourinary System	2.8	2.2	0.9	1.0	4.3	2.2	0.8	1.1
Pregnancy/Childbirth	2.2	2.2	0.9	0.9	1.8	1.8	0.8	0.9
Skin	4.9	1.5	1.2	1.0	3.9	1.6	0.5	1.2
Musculoskeletal	1.6	1.4	0.9	1.0	1.2	1.7	0.8	1.1
Congenital Anomalies	5.6	1.7	1.2	1.0	1.0	1.5	0.8	1.1
Perinatal Period	0.5	1.3	0.4	0.9	2.1	1.6	0.6	0.8
Symptoms/Signs	2.0	1.5	0.9	1.1	1.2	1.8	0.6	1.1
Injury, Poisoning	3.3	2.1	1.4	1.0	2.5	2.0	0.9	0.9
Factors Influencing	3.0	1.1	1.3	1.0	5.0	1.3	1.1	1.3
All Diagnoses	2.3	1.5	1.3	1.0	2.0	1.6	0.9	1.1