

THE UTILIZATION OF HEALTH CARE FACILITIES BY CHILDREN
IN GRENADA, WEST INDIES

~~URBAN DOCUMENTATION CENTRE
RESEARCH UNIT FOR URBAN STUDIES
McMASTER UNIVERSITY
HAMILTON, ONTARIO~~

BY

MANTA ZAHOS

A Research Paper

Submitted to the Department of Geography

in fulfilment of the Requirements of

Geography 4C6

McMaster University

April 1990

~~008190~~

ABSTRACT

Given that there are many variables which influence health services utilization, this paper focuses on the effects of factors related to the home environment. The home is seen as providing a socio-geographic focus where disease can be transmitted and health behaviour can be learned. The effects of home-related factors on use of health care facilities by children less than eight years old in Grenada, West Indies are examined.

The data set which informs this study comes from a study called the McMaster-Grenada Child Health Project. Specific information on health care utilization was obtained on a study group in five communities in Grenada. A census, survey and utilization records comprise the data set. Bivariate analyses were conducted between utilization measures and a variety of proposed household 'determinants'. These determinants were classified under the headings of household residential composition, household physical environment, household behavioural environment and distance related factors. The same analyses were conducted for the children's older counterparts, aged 16-59 because it was felt that the comparison of results would prove insightful and perhaps aid in explaining some of the relationships found in the children's group.

The results of the analysis indeed showed that home-related factors are significantly related to the children's use of health care facilities. Elements from all four dimensions of the home significantly influenced service use by these children.

This study recommends that further studies be conducted on the determinants of children's utilization of health care facilities in developing nations since many previous studies have mainly focused on the developed world.

ACKNOWLEDGEMENTS

The completion of this paper is in large part due to the guidance of Dr. Martin Taylor. I would like to thank him for his encouraging words and his patience with my many questions. I would also like to thank Blake Poland for his advice and for explaining some of the finer details of his masters' thesis to me.

I cannot end this portion of my university career without acknowledging the support my parents have given me over the past four years. Their love and understanding was my greatest source of strength.

TABLE OF CONTENTS

LIST OF TABLES
LIST OF FIGURES
ACKNOWLEDGEMENTS

	page
CHAPTER 1	INTRODUCTION
1.1	Introduction..... 1
1.2	Report Organization..... 2
CHAPTER 2	LITERATURE REVIEW
2.1	Introduction..... 5
2.2	Medical Geography..... 5
2.3	Medical Geography and the Third World..... 7
2.4	Models of Health Care Utilization..... 10
2.5	Demand Side Factors Influencing the Utilization of Health Services..... 13
2.5.1	Predisposing Variables..... 13
2.5.2	Enabling Variables..... 14
2.5.3	Need..... 14
2.5.4	The Home Environment..... 15
2.6	Supply Side Factors..... 16
2.7	The McMaster-Grenada Child Health Project.... 17
2.8	Conclusion..... 19
CHAPTER 3	DESCRIPTION AND STATISTICAL METHODS
3.1	Introduction..... 21
3.2	The Grenadan Health Care System..... 21
3.3	The Census..... 24
3.4	The Survey..... 25
3.5	Utilization Data..... 26
3.6	Distance..... 26
3.7	Variables Used in Bivariate Analysis..... 27
3.8	Statistical Methods..... 31
3.9	Conclusions..... 31
CHAPTER 4	ANALYSIS
4.1	Introduction..... 33
4.2	Utilization Measure Distributions..... 33
4.3	Relationships Between Utilization and Determinants for Children..... 35
4.3.1	Effects of Household Size and Composition. 35
4.3.2	Effects of Household Environmental Factors 37

4.3.3	Effects of Distance.....	39
4.3.4	Comparison of Effects by Utilization Variables.....	40
4.3.5	Multivariate Analysis for Water Handling Practices.....	42
4.4	Relationships Between Utilization and Determinants for Older Individuals.....	43
4.4.1	Effects of Household Size and Composition.	43
4.4.2	Effects of Household Environmental Factors	45
4.4.3	Effects of Distance.....	46
4.4.4	Comparison of Effects by Utilization Variables.....	46
4.5	Comparisons of Relationships.....	48
4.6	Conclusions.....	51

CHAPTER 5 DISCUSSION AND CONCLUSIONS

5.1	Discussion and Conclusion.....	54
5.2	Recommendations for Further Research.....	56

REFERENCES
APPENDICES

LIST OF TABLES

	page
Table 1 List of Variables.....	28
Table 2 Frequencies for Utilization Measures.....	34
Table 3 The Role of Household Composition, Household Environment, and Accessibility in Service Use - Children.....	36
Table 4 The Role of Household Composition, Household Environment, and Accessibility in Service Use - Older Individuals.....	44
Table 5 Comparison of Relationships.....	49

LIST OF FIGURES

	page
Figure 1 Grenada in the West Indies.....	2
Figure 2 A Socio-Ecological Model of Utilization.....	18
Figure 3 Distribution of Health Care Facilities.....	22
Figure 4 The Western Health District.....	23

CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION

The utilization of health care facilities is a subject which has increasingly commanded the attention of professionals from a wide variety of disciplines. If for no other reason, it has become an important focus because of societal norms which have determined access to health care facilities an inalienable right. Given that there are many variables which influence health services utilization, this research focuses on the effects of factors related to the home environment.

The home provides a socio-geographic focus where disease can be transmitted and health behaviour can be learned. The home is seen as the source of a complex set of interactions which affect the utilization of health care facilities of its members. It is precisely this premise which provides the theoretical framework for this thesis.

The present study will focus on an analysis of health care services utilization by children less than eight years old in Grenada, West Indies (figure 1). Grenada is a small developing nation found in the Caribbean whose birth rate is high compared to North American standards. The data used for this analysis will come from a study called the McMaster-Grenada Child Health Project which centred on the

Figure 1 GRENADA IN THE WEST INDIES



analysis and reduction of childhood morbidity in Grenada. From this larger project specific information on health care facility utilization was obtained on a study group of five communities in Grenada.

The aim of this paper was to conduct statistical analyses on this data set to determine the effects of home-related factors on children's use of health care facilities by considering aspects of the household composition, household physical and behavioural environment, and accessibility to facilities. The utilization measures represent use for specific morbidities which are infectious in nature, thereby providing an obvious link to the household environment. Moreover, they are considered common childhood morbidities.

1.2 REPORT ORGANIZATION

The thesis is organized in five chapters. Chapter 2 discusses the context for the present study by reviewing some of the relevant literature. The purpose of the third chapter is to document the collection of the data and the statistical methods used for the analysis. Chapter 4 explains the results of a bivariate analysis between utilization measures and the group of household and accessibility factors representing the prospective 'determinants' of use. The final chapter puts the results of the analysis into the context of similar studies on

determinants of children's utilization of health services.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The purpose of this chapter is to provide the context for the study contained in this paper by reviewing some of the relevant literature in this field. The chapter begins with a discussion of the evolving nature of medical geography and then focuses on the concerns which many medical geographers have regarding studies in the 'Third World'. Following this is a review of some important models which have attempted to determine and predict the utilization of health care facilities. Some of the common factors found in these models will then be discussed in view of their relevance to utilization. The chapter will end by providing the rationale for the current study which is part of the larger McMaster-Grenada Child Health Project. An attempt will be made to put the study into perspective given the review of the literature.

2.2 MEDICAL GEOGRAPHY

Medical geography has been variously defined. This is in large part due to the evolving nature of this discipline, particularly in the last two decades. Pyle (1979) attributes this to the fact that the discipline of geography itself has been receiving continued influence from

a variety of approaches utilized by many scientific disciplines. He defines medical geography as "the spatial analysis of most aspects of human health problems"(p.9). The current debate regarding the nature and scope of medical geography is of fundamental importance due to the fact that competing concepts and definitions being presented lead to diverging viewpoints which ultimately lead to different outcomes in the field.

In a review of the genesis of contemporary medical geography, most papers make specific reference to the work by Jacques May, a French surgeon who developed the concept of disease ecology, seeking to explain the prevalence of disease by reference to geographical environmental factors called 'geogens' (cited in Joseph & Phillips,1984; Pyle,1979; and many others). Learmonth (1978) deals in detail with the concepts of disease ecology, disease agent, host and environmental relationships and what has generally been termed 'ecological medical geography'. More recently attention has expanded to include the provision and consumption of health care, known as 'the geography of health care'. These have come to be known as the two streams or traditions within medical geography which Learmonth (1978) phrased as the 'two medical geographies'. It is obvious from the research done by many medical geographers that these twin poles have rarely been effectively co-ordinated or merged. In a subsequent book by

Learmonth (1988), he expressed his disapproval of the dichotomy in the two traditions which he perceived, and he called for a "more holistic viewpoint" (p.362).

Besides the apparent division within medical geography into the two streams, one can also recognize several approaches which medical geographers use. Jones and Moon (1987), in a review of recent literature, acknowledge five basic approaches. The cartographic approach concerns itself with the mapping of spatial data, while the modelling approach attempts to determine relationships between variables. The behavioural emphasizes the importance of individual decision making. The welfare approach addresses questions about equality and reform movements and finally the structuralist perspective emphasizes the need to consider phenomena in relation to the totality of society. It must be made clear that it is very common to find individual researchers who use several approaches simultaneously.

2.3 MEDICAL GEOGRAPHY AND THE THIRD WORLD

The focus of the slogan 'health for all by the year 2000', the representative catch phrase of the Alma-Ata conference in 1978, is that of the developing world. At this conference health was declared to be a fundamental right. In keeping with the World Health Organization definition of health (WHO,1948), "a state of complete

physical, mental and social well being and not merely the absence of disease or infirmity" a challenge was made to achieve universal health care which would have medical, socio-economic and political implications.

Gesler (1984) points out the fact that access to Western medicine is unlikely for the majority of the world's population living in less developed countries, considering the availability of local, traditional practitioners. However, many governments have sought to increase the availability of 'modern medicine' amongst a largely poor often rural population in the context of varying local beliefs and traditions about illness and its treatment. This, along with the high cost of introducing and maintaining a Western medical system have made many LDC governments uncertain about most appropriate directions for improving health care delivery.

It was a push towards access to primary health care facilities that the Alma-Ata conference was concerned with. However, there are several perspectives from which health care can be viewed. Gesler identifies four perspectives, of which primary health care is one. The other three are medical pluralism, holism and multidisciplinary perspectives. Medical pluralism looks at the world as a source of a wide range of choices for its people in obtaining health care. The most striking example is the pluralism of modern and folk treatment still being practiced

in many of the LDC's. Differing degrees of development as well as social differences have had bearing on medical training as well as approaches to understanding medical geography (Pyle,1979). Holism sees health problems as having different dimensions. Science often leads to reductionism, or the investigation of parts of a complex system in isolation. Although knowledge can be advanced in this way, causes and effects are felt throughout entire systems, therefore there can be no single cause and effect relationship. Similarly, we should not conceive illness in terms of specific diseases caused by specific agents. The situation is far more complicated. Critics of medical care are saying that disease and health care must be seen in a much wider context than usually viewed (Litman,1974). One must consider such things as cultural traits, economic situations and government policies. Gesler (1984) warns, however, that if at extreme the focus of the exercise becomes too large, the relationships become fuzzy. He therefore calls for a middle approach that concentrates on part of a system in depth. The idea of a multi-disciplinary approach is similar to that of the holistic perspective. It asserts that every discipline has insight to offer.

In carrying out scientific research in a developing nation, Gesler (1984) reiterates three common concerns facing an investigator. The first concern deals with

ethics. The days are gone when one could simply arrived in a LDC and conduct any type of investigation they wish. Today's research requires permission and co-operation from local governments as well as collaborative efforts with native scholars. The investigator must be sensitive to the rights and needs of populations studied. The second concern deals with epistemology. An extremely important issue is how a social scientist working in another country can throw off cultural bias and ethnocentrism. This problem should always be in the researchers mind as the work is planned, carried out and analyzed. The final concern deals with methodology. This concern brings about many issues which must be confronted by the researcher. The researcher must decide if techniques used in MDC can be applied in LDC and if one can insure cross-national comparability among studies. Another important methodological question is whether the researcher should be a passive observer or if he should interfere. This a particularly important question in LDC given prevailing political climates.

2.4 MODELS OF HEALTH CARE UTILIZATION

There are many studies within geography and other social sciences in which models have been used to describe, determine and predict utilization of health care facilities. For the geographer, models represent an attempt to specify the nature of the utilization question by means of

highlighting variables which may be influential (Phillips,1986). Models differ, however, in the importance which they attach to variables. Many authors in their review of early models of utilization cite a study done in the mid-1960's by R.L. Morrill and others from the urban-social analytical school under the auspices of the Chicago Regional Hospital (cited in Phillips 1986; Meade et al.,1988 and others). This study became important in that it was one of the first models to quantify how factors such as hospital type, size and location could influence utilization and what distance people would be prepared to travel to get to them. A model by R.A. Anderson developed in 1968 and redefined in a later work in 1980 (cited in Phillips,1986;Joseph and Phillips,1984 and others) has emphasized family life-cycle and behavioural determinants of utilization. These can be summarized as a set of factors which may 'predispose' towards utilization such as a family's size, composition and health beliefs. Certain other factors would 'enable' the utilization of facilities, such as the family's or community's health resources which may enhance or frustrate utilization in spite of predisposition to use. Finally, the family or community would require the stimulus of 'need', which would depend upon the 'predisposing' and 'enabling' factors acting together. This is a common-sense model and makes the useful observation that health behaviour is not necessarily voluntary, since it is either directed or

influenced by the professional medical practitioner and therefore these factors also warrant inclusion (Phillips, 1986).

A more sophisticated model was presented by Gross (1972). He incorporated behavioural components as major determinants of utilization. This model includes accessibility which was a factor not generally considered in earlier models. This model is represented by the equation:

$$U = f(E, P, A, H, X) + e, \text{ where}$$

- U = utilization of various services reported by the individual or family
- E = enabling factors such as income, family size, education
- P = predisposing factors such as attitudes to health care, knowledge of sources of care
- A = accessibility factors such as distance and/or time from facility and service availability
- H = perceived health level
- X = individual and area-wide exogenous variables
- e = residual error term

Although this model is conceptually and mathematically sophisticated since it incorporates a wide range of variables, it has been very difficult to put it into practice for precisely this reason. Joseph and Phillips (1984) believe that it would be difficult to gather data with which to measure the variables sufficiently precisely and there would also be problems with multicollinearity and reverse causality.

In a review of the literature on access and utilization of health care, Fiedler (1981) grouped the 'determinants' of the various models into demand-side and

supply-side factors. In the following section several of these 'determinants' will be discussed with regard to their theoretical influence on health care service utilization. The sources for the discussion of the demand side variables come from Fiedler (1981) and Joseph and Phillips (1984) who have reviewed the research done on these variables.

2.5 DEMAND SIDE FACTORS INFLUENCING THE UTILIZATION OF HEALTH SERVICES

2.5.1 Predisposing Variables

The relationship between age and utilization of medical facilities is non-linear and tends to be u-shaped. This implies a tendency towards greater use of health facilities by children and the elderly. The relationship between sex and utilization is not as consistent. Among children, boys have a higher incidence of utilization while for adults the reverse is true. These relationships however, do not always hold when controlling for health status. It is suggested that perhaps women use services more than men simply because they have more knowledge about health matters. It has been found that there is a positive relationship between education and health status. However, the association between levels of education and levels of utilization is mixed. Education has been linked to the type of service used. As far as the relationship between occupation and health facility utilization, it was simply

found that certain jobs are more physically demanding than others and have records of higher accident rates which predispose their holders to more ill-health and subsequently greater utilization. In an attempt to link income to utilization it has been suggested that income only indirectly affects utilization. For example high costs of medical care and low incomes appear to force some groups to change their venues of health care. Similarly, some lower income regions are poorly provided with medical services.

2.5.2 Enabling Variables

Income is characterized not only as a predisposing factor but as the most important enabling factor. Income gives one the means to actually enter the health care market. For reasons discussed above a family with low income is likely to have a low health status. More recently, however, most countries will provide some sort of subsidization for the poor in the hope of equalizing access on the basis of need rather than ability to pay.

2.5.3 Need

One would tend to believe that, other things remaining constant, the greater the need the greater the utilization. Because need is difficult to determine, this relationship does not always hold. Need can be measured in a variety of ways such as number of symptoms or frequency of

pain. In recent years many studies measuring the degree of equality in access and utilization have incorporated the concept of need.

2.5.4 The Home Environment

In considering demand side factors of health care utilization it is important to discuss the role that the home environment plays. This area has not been researched to any great extent, however Litman (1974) argues that the family is a primary unit in health because it provides a social context within which illness occurs and is resolved. In a review of past studies on the family environment, Litman maintains that many of these studies support the fact that the family exhibits characteristic patterns of utilization of medical facilities, among other things. Yet it has only been in recent years that a significant number of studies have investigated the role the family plays in the decision making of health practices. It is obvious that due to the family's spatial clustering, it provides a source for the transmission of infectious disease. Unfortunately, there have not been any significant investigations into the psycho-social role which the family plays with regard to its individual members utilizing health care facilities (Poland, 1988).

2.6 SUPPLY SIDE FACTORS INFLUENCING THE UTILIZATION OF HEALTH CARE FACILITIES

Fiedler (1981) believes that access to medical care, the primary supply side influence, is best understood as the interaction of the individual or family and the health care delivery system. Joseph and Phillips (1984) make the distinction between 'potential' accessibility which is influenced by the socio-economic and organizational features of a society and its health care system and 'revealed' accessibility, the actual utilization of a service that is measured in terms of frequency of attendance.

Many studies have found that physical proximity plays an important role in accessibility. The negative relationship between distance and utilization has often been called 'Jarvis' Law' after the 19th century researcher who was studying the occurrence of lunacy in the United States. Meade et al. (1988) assert that distance decay or friction of distance is useful in determining central place hierarchies. They believe that for a certain level of health care facility, if the friction of distance is high then this indicates the need to decentralize the facility and make it more accessible. Therefore, higher order services such as specialty doctors are not as sensitive to distance.

Meade et al. (1988) also differentiate different types of distance. Physical distance is not the only way to

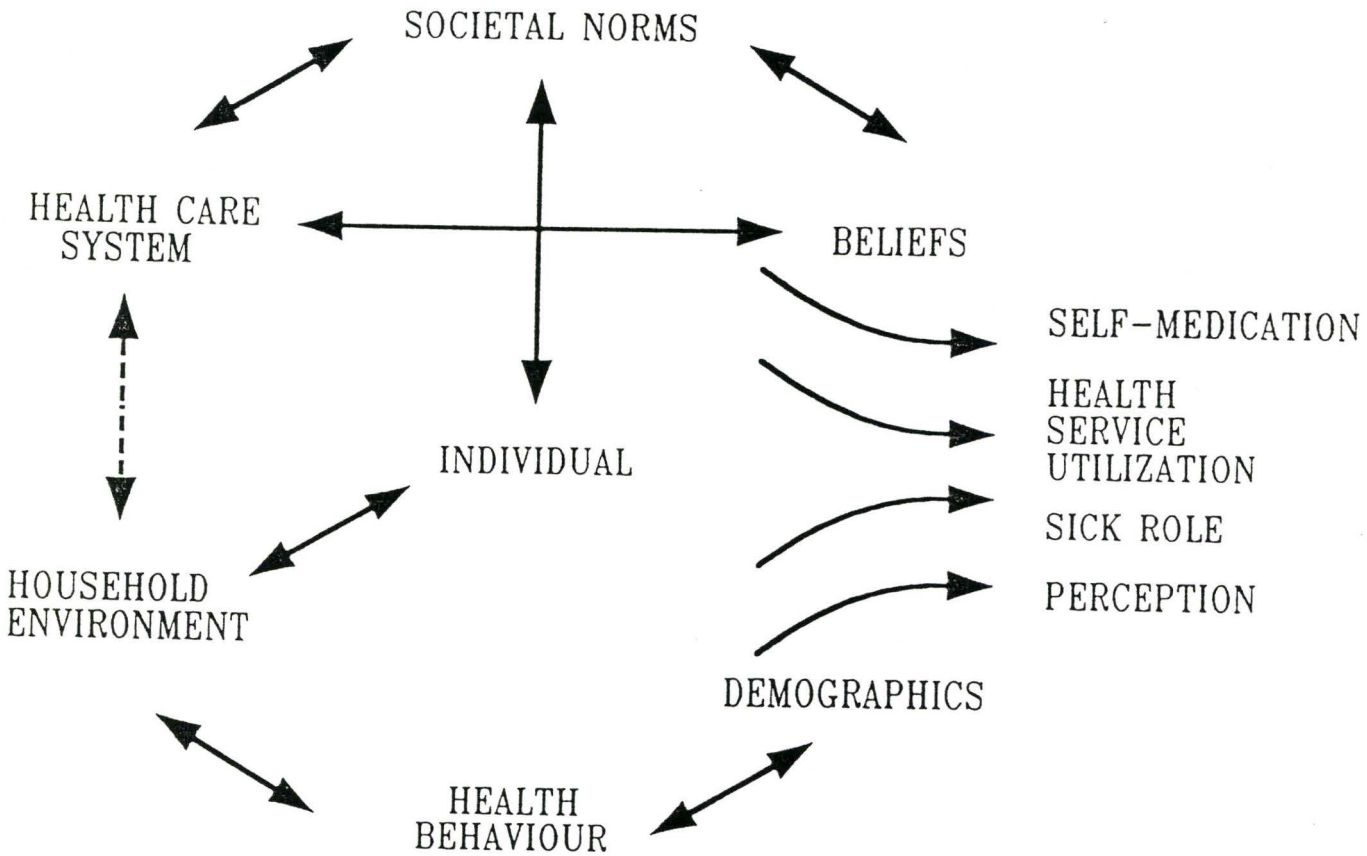
measure accessibility. There is also time distance which takes into account physical barriers, and cognitive distance which takes into account the patient's perceptions. Socio-economic distance is a form of measuring distance which does not take geographical distance into account. Social distance is the gap between consumer and provider expressed in terms of social status and illness beliefs. The ability to pay for services is economic distance.

From this account, it is clear that questions of allocative efficiency in providing health care should not take into account only raw distance measures.

2.7 THE MCMASTER-GRENADA CHILD HEALTH PROJECT

The research data for the following study on the utilization of health services in Grenada comes from a study called the McMaster-Grenada Child Health Project which centred on the analysis and reduction of childhood morbidity in Grenada. This project was funded by the Pan American Health Organization (PAHO). One of the researchers, Blake Poland, collected specific information on health facility utilization. His focus was on the influence that the home environment has on health and health service use. In an effort to provide a more representative model of health care utilization, Poland (1988) developed a dynamic, non-linear socio-ecological model of health (figure 2) based upon a generic socio-ecological model of health. Although

Figure 2 A SOCIO-ECOLOGICAL MODEL OF UTILIZATION



Note: The links illustrated above are purely hypothetical and are in fact considerably more complex than suggested here.

Poland focuses on the relationship between the household environment and health services utilization he acknowledges the fact this type of research appears to contradict the holistic approach on which most geographers base their research. However, just as Gesler (1984) pointed out, the study of a subsystem within a larger system can be warranted. Poland agrees on this point and further justifies this type of research given two provisos. First, the research must help to clarify the nature of the subsystem and the interrelationships of its constituent parts, and second, the researcher must be sensitive to the open-ended nature of the focus with respect to the larger environmental context (Poland, 1988).

2.8 CONCLUSION

This chapter has provided a brief review of the literature which puts the present study into perspective. The topic of the present study is the utilization of health care facilities by children. It focuses on aspects of the household environment which influence children's propensity to use health care facilities. As such, it is based upon the socio-ecological model of health which follows from the holistic approach. Aspects of the home environment, it is anticipated, reflect both demand and supply-side factors. The following two chapters explain the data collection, statistical methods, the analysis and their interpretation.

CHAPTER THREE

DATA DESCRIPTION AND STATISTICAL METHODS

3.1 INTRODUCTION

It is the purpose of this chapter to explain the information sets and statistical methods which were used to assess the role of the household environment on health services utilization by children. The chapter begins with a discussion of the Grenadan health care system and the situation of the five study communities within it.

3.2 THE GRENADAN HEALTH CARE SYSTEM

In Grenada health care is provided free of charge. The distribution of state operated health care facilities appears in figure 3. Primary health care is organized by district which for the most part correspond to parish boundaries. In all, there are five health care districts in Grenada, St. Mark's divided between St. John's and St. Patrick's, representing the Western and Northern Health Districts respectively. Figure 4 shows the five study communities within the western district.

The co-ordination and planning of health services is the responsibility of the primary health care team leader who is typically a nurse. In the western district the team is responsible for maintaining and providing services from the Victoria, Gouyave, Grand Roy and Florida health

Figure 3 DISTRIBUTION OF HEALTH CARE FACILITIES

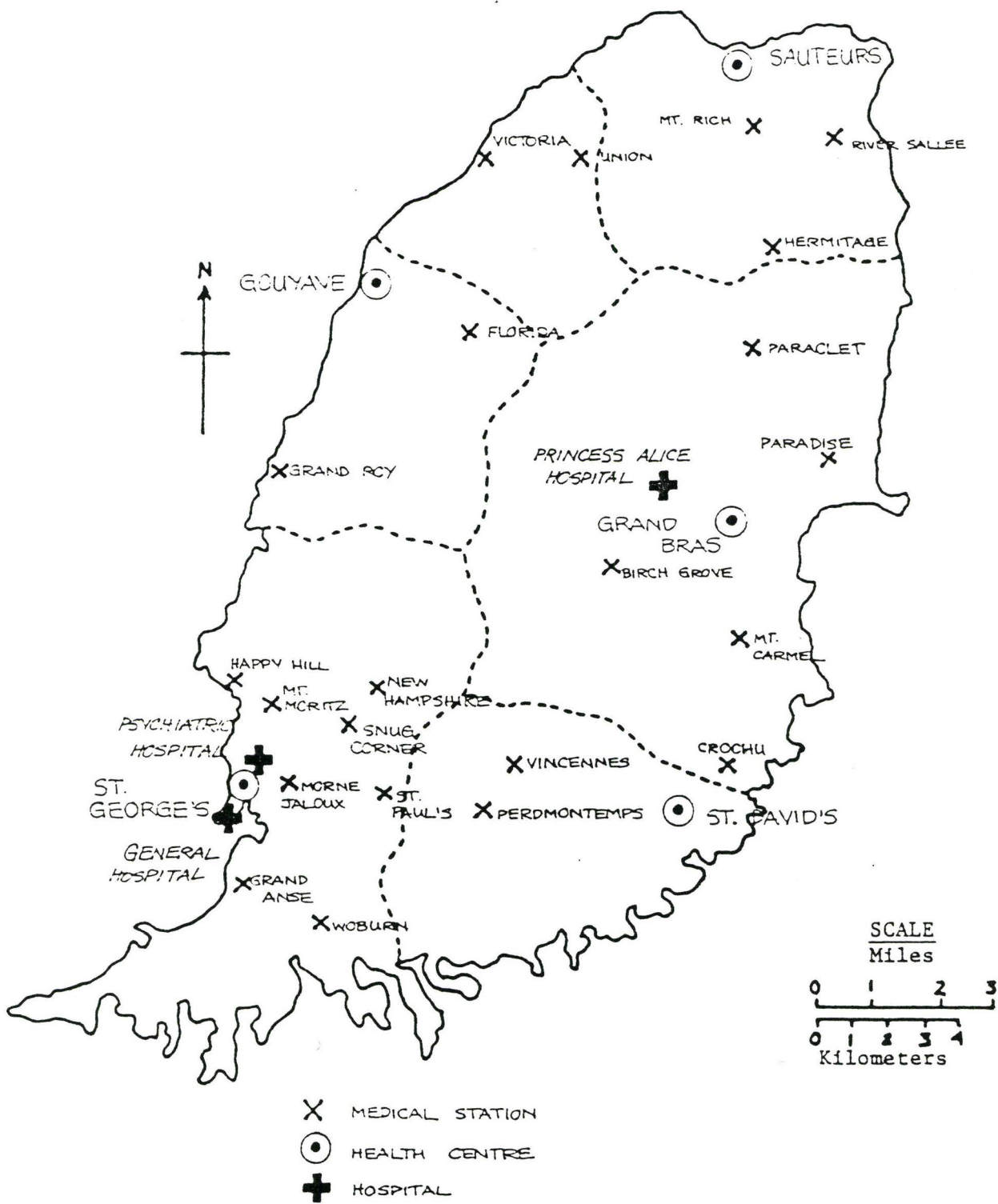
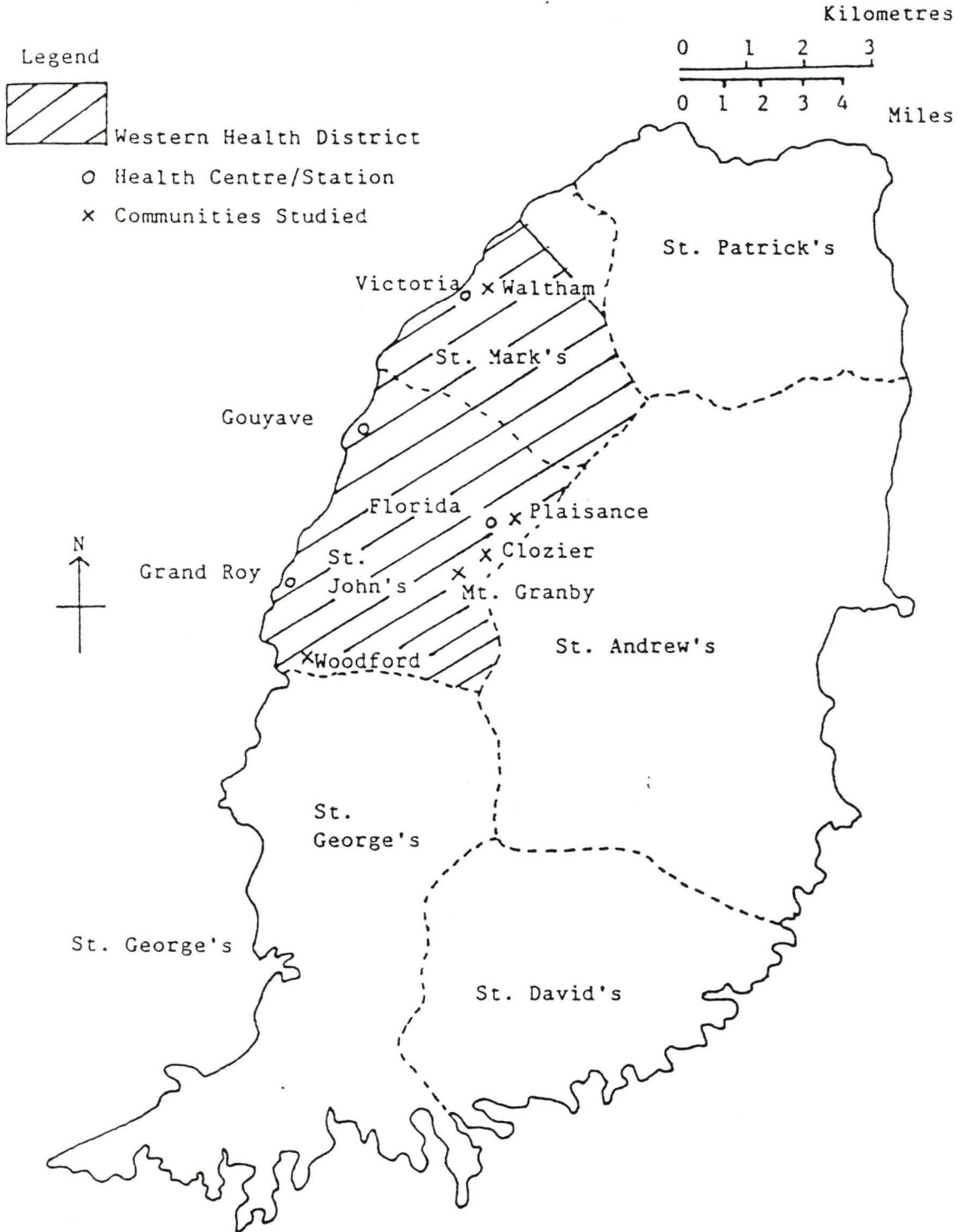


Figure 4 THE WESTERN HEALTH DISTRICT



stations. The services provided by the primary health care team include pediatric clinics and outreach programs. Physician services are also provided at these stations by the district medical officer who holds clinics at least once a week. More serious cases are referred to the general hospital in St. George's.

3.3 THE CENSUS

The study was conducted on five communities in two parishes on the western portion of the island (figure 2). The five communities are namely Waltham, Plaisance, Clozier, Mt. Granby and Woodford all within St. John's and St. Mark's parishes in the Western Health District. The census was used to establish the name, age, sex and place of residence of everyone in the five communities and to try to determine the parents of each child. Some difficulties were encountered in collecting this information primarily due to the nature of the family structure in Grenada. Families here tend to be loose knit since it is typical of a woman to have children from several fathers. It is also typical for children to live with relatives, usually aunts and grandmothers, instead of with their mother for part of the day or even part of the year. In fact, single parent, female-headed families are the most common family structure in Grenada (Hayes, 1988).

The census was conducted in August of 1986. Four

hundred twenty three households were identified comprising 2079 residents. Each household and individual was assigned a unique identifier. The unique individual identifier contained three segments. The first segment identified their community, the second segment identified their household, and the third segment identified their placement within the household.

3.4 THE SURVEY

In July and August of 1987 a detailed household survey was conducted on the five communities by two groups of researchers who were accompanied by one or two local residents. The purpose of the survey was to collect information on the nature of the household environment and elicit self reported morbidity for children in the two weeks and three months previous. The survey consisted of a verbal questionnaire (Appendix A) and visual observations (Appendix B). Appropriate steps were taken to ensure a standardization between both teams of surveyors (Poland, 1988).

The household characteristics chosen for assessment in the survey relate to either the physical or behavioural environment of the home. Some aspects of the physical environment were assessed through visual observation (i.e. household construction material, condition of dwelling, cleanliness of house and yard), while other information was solicited verbally (i.e. number of bedrooms, water supply,

kitchen coverage and toilet facility). These particular characteristics were chosen because it was anticipated that they were either etiologically related to specific morbidities or they would serve as proxy measures for health behaviour and socio-economic status (Poland, 1988). Aspects of the behavioural environment were solicited verbally. Two health related practices were assessed under this heading: household water boiling and breast feeding practices.

3.5 UTILIZATION DATA

Information on the utilization of health care facilities was gathered from area medical service records for the residents of the five communities. The duration of the study period was thirty months in length from January 1985 to the end of June 1987. For each visit made by community residents, recorded was the location of the health care facility, date of visit, up to two symptoms, illnesses or complaints and the name and place of resident or user. In all, 1435 of the 2079 residents generated utilization records in the study period.

3.6 DISTANCE

Distance and accessibility were assessed at the locale scale. The establishment of these locales was based on clustering of households, distance, topography and intuition. Distance was measured as road distance from the

centroid of the locale to the nearest permanent health care facility, in kilometres.

During the study period the Florida health station was closed. As a result two distance measures were recorded. The first assumes the Florida health station to be closed. Therefore Clozier and Plaisance residents use the Gouyave health station. The second distance measure assumes the Florida station to be open.

3.7 VARIABLES USED IN BIVARIATE ANALYSIS

Although the variable list gathered for the larger health service utilization study was quite extensive, only a portion of these were used for the present bivariate analysis. Table 1 shows a breakdown of the variables used for the current analysis. Note that many of the variables in subsequent tables have been renamed to allow for easier identification. Utilization of health services for morbidities are the dependent variables. These variables represent the information gathered from the utilization data records. The first two variables relate to level of use for all causes of morbidities. The rest of the variables relate to specific morbidities and have been dichotomized for the presence or absence of use. These specific morbidities have been chosen for analysis because of their infectious nature, thereby providing an obvious link to the household environment. Primarily they have been chosen because they

Table 1 LIST OF VARIABLES

NAME	TITLE	VALUE	VALUE LABEL
<u>Individual health service utilization</u>			
PMORBX5	utilization	0	no health service use in 30 months
		1	use of health services in 30 months
PMORBX7	utilization	0	1-2 visits in 30 months
		1	≥ 3 visits in 30 months
P801X2	respiratory	0	no utilization for respiratory complaints in 30 months
		1	any utilization for respiratory complaints in 30 months
P802X	digestive	0	no utilization for digestive complaints in 30 months
		1	any utilization for digestive complaints in 30 months
P806X	skin	0	no utilization for skin-related complaints in 30 months
		1	any utilization for skin-related complaints in 30 months
P808X	diarrhea	0	no utilization for diarrhea episodes in 30 months
		1	any utilization for diarrhea episodes in 30 months
P812X	nse&sse organ	0	no utilization for nervous and sense organ complaints in 30 months
		1	any utilization for nervous and sense organ complaints in 30 months
PIDNVX	diar & vomit	0	no utilization for diarrhea and vomitting episodes in 30 months
		1	any utilization for diarrhea and vomitting episodes in 30 months
PIDNFX	diar & fever	0	no utilization for diarrhea and fever episodes in 30 months
		1	any utilization for diarrhea and fever episodes in 30 months

(cont'd)

NAME	TITLE	VALUE	VALUE LABEL
<u>Household residential composition</u>			
NRES	# of residents		Number of residents in household at time of census
NRES1	# of kids		Number of children 8 years old in household at census time
NRES2	# of teens		Number of "teenagers" (9-15y.o.)
NRES3	# of adults		Number of "adults" (16-44y.o.)
NRES4	# middle-aged		Number of "middle-aged" (45-59y.o.)
NRES5	# of elderly		Number of elderly (60+y.o.)
NOM	# of older men		Number of "adult" or "middle-aged" men
<u>Household physical and behavioural environment</u>			
HHWS1X2	water supply	1	Standpipe or piped into home
		2	Other: river, spring, roof, reservoir
HHRMS	bedrooms		Number of bedrooms in home
YCLEAN	yard clean	1	Clean
		2	Average or dirty
HHCLEAN	hh clean	1	Clean
		2	Average or dirty
HHCOND	hh condition	1	Good physical condition
		2	Average physical condition
		3	Poor physical condition
HHKITCH	kitchen	1	Covered kitchen(in home or separate)
		2	Uncovered (outdoor) kitchen
HHBOIL	boil water	0	Don't know
		1	Always boil water before drinking
		2	Sometimes boil water before drinking
		3	Never boil water before drinking

(cont'd)

NAME	TITLE	VALUE	VALUE LABEL
<u>Household physical and behavioural environment (cont'd)</u>			
HHBREAST	breast feed	1	Yes (any child breastfed)
		2	No child breastfed
TOIL	toilet type	1	Septic tank
		2	Pit latrine
HHMATLX2	hh material	1	Board, concrete board, board+galvanize, bamboo, other
		2	Concrete
<u>Locale-specific accessibility</u>			
DIST1	distance1		Distance from sub-locale to nearest "permanent" health care facility, assuming Florida health station to be closed (as it was half-way during the study period)
DIST2	distance2		Distance from sub-locale to nearest "permanent" health station to be open
ACCESS	access	1	Adequate access to health care (based on proximity to major routes, and slope of access road)
		2	Poor access to health care

are considered common childhood morbidities.

The independent variables deal with household residential characteristics, aspects of the household physical and behavioural environment, and distance and accessibility to health care facilities. These variables will also be referred to as possible 'determinants' of utilization.

3.8 STATISTICAL METHODS

Due to the fact that the data cannot be assumed to be normally distributed, non-parametric tests were employed. The scale of measurement of the variable pair determined which specific test was used. Within the confines of the statistical package employed for the bivariate analysis (SPSSX), choice among the t-test, Mann-Whitney test and Chi-Square test made allowance for scale of measurement. A significance level of 0.05 was used to establish relationships. Observations with missing values on either variable were excluded from the analysis.

3.9 CONCLUSION

In summary, the three sources of information used in this study are a census, a survey and utilization records. The utilization records were used to create the dependent variables for the bivariate analysis, while the survey and distance measurements were used to create the independent variables. The next chapter discusses the results of the bivariate analysis.

CHAPTER FOUR

ANALYSIS

4.1 INTRODUCTION

The purpose of this chapter is to discuss the relationships found in the bivariate analysis between utilization measures, and household compositional, physical and behavioural environmental and accessibility factors. Although this study is concerned with the determinants of children's utilization of health services, it was felt that a comparison with their older counterparts, adults aged 16-59, would prove insightful and perhaps aid in explaining some of the relationships found in the children's group. For both groups of individuals two perspectives were used to summarize the results of the bivariate analysis. The first perspective summarizes the utilization measures associated with each determinant, while the second perspective summarizes the determinants associated with each utilization measure.

4.2 UTILIZATION MEASURE DISTRIBUTIONS

The frequency distribution for both groups (children aged 8 and under, and adults aged 16-59) on all nine utilization measures are shown in table 2. The first two variables represent measures for all causes and immediately brings to light the fact that children in

Table 2 FREQUENCIES FOR UTILIZATION MEASURES

Variable	Value	# of visits in study period	children		older indiv.	
			f	%	f	%
presence or	0	none	141	25.0	411	37.8
absence of use	1	≥ 1	424	75.0	675	62.2
high vs. low	0	1-2	201	35.6	388	35.7
use	1	≥ 3	223	39.5	287	26.4
		missing	141	25.0	411	37.8
use for	0	none	305	54.6	911	83.9
respiratory	1	any	260	46.0	175	16.1
use for	0	none	405	71.7	900	82.9
digestive	1	any	160	28.3	186	17.1
use for	0	none	389	68.8	963	88.7
skin-related	1	any	176	31.2	123	11.3
use for	0	none	451	79.8	1047	96.4
diarrhea	1	any	114	20.2	39	3.6
use for	0	none	502	88.8	1028	94.7
ner.&sen.organ	1	any	63	11.2	58	5.3
use for	0	none	524	92.7	1079	99.4
diar.&vomit	1	any	41	7.3	7	0.6
use for	0	none	552	97.7	1084	99.8
diar&fever	1	any	13	2.3	2	0.2

general tend to use health care facilities more than older individuals. Although some individuals were not surveyed in both groups with regard to their degree of use for all causes this should not result in any significant problems for the following bivariate analyses. A comparison of use between the two groups for the seven specific morbidities shows as well that children frequented health care facilities more than their older counterparts during the study period. The proportion of users for the diarrhea related morbidities is extremely low among the older group. The only specific morbidity among children which shows extremely low usage is that of diarrhea and fever.

Low use for these morbidities is compounded by the fact that some determinants were not assessed for each individual, thereby reducing the number of individuals actually used in the analysis. Therefore, caution must be used when determining if, in fact, sufficient data is available to deem certain relationships significant at the .05 significance level.

4.3 RELATIONSHIPS BETWEEN UTILIZATION AND DETERMINANTS FOR CHILDREN

4.3.1 Effects of Household Size and Composition

Under this heading it was found that seven out of a possible sixty three relationships were significant (table 3). It was anticipated that family size would influence the

Table 3 THE ROLE OF HOUSEHOLD COMPOSITION,
HOUSEHOLD ENVIRONMENT, AND ACCESSIBILITY
IN SERVICE USE - CHILDREN

	use/ non	high/ low	resp.	digest	skin	diar.	ner&sen organ	diar. vomit	diar. fev.
household residential composition	# of res. ¹								
	# of child. ¹								
	# of teens ¹								
	# of adults ¹								2.17 ^c
	# of mid. ¹				2.49 ^c	1.99 ^c		2.46 ^c	
	# of eld. ¹	2.55 ^c						-2.28 ^c	
	# of elmen ¹								2.01 ^c
household behavioural environment	hhboil ³		9.77 ^b			10.23 ^b			
	hhbreast ³								
	hhwater ³		3.86 ^c			5.40 ^c			
household physical environment	hhrms ¹						3.06 ^b		
	yclean ³								
	hhclean ³								
	hhcond ²					-2.45 ^c		-2.42 ^c	
	hhkitch ³								
	toilet ³		4.21 ^c		4.34 ^c				
	hhmat1 ³	6.89 ^b	5.83 ^c	6.47 ^c	5.63 ^c		5.88 ^c	5.43 ^c	
accessibility	dist1 ¹		2.16 ^c	2.08 ^c	2.46 ^c	3.57 ^a	2.52 ^c		
	dist2 ¹	2.17 ^c	3.09 ^b	4.12 ^a		3.20 ^a	2.17 ^c	2.39 ^c	
	access ³	6.49 ^c			4.06 ^c		5.04 ^c		

Notes:

1 t-test

a significance at .001 level

2 Mann-Whitney test

b significance at .01 level

3 Chi-square test

c significance at .05 level

degree of service use. However, this was not found to be the case. Relationships were shown to occur when family size was broken down into age specific categories. Children in households with large numbers of adults and older men made less frequent visits to health care facilities for diarrhea and fever episodes. This same inverse relationship occurred for skin-related complaints, diarrhea, and diarrhea and vomiting for children in households with large numbers of middle-aged individuals. The number of elderly in the home had an inverse effect on children's use for all causes and diarrhea and vomiting episodes. The number of children or teens in the household showed no bearing on facility use.

4.3.2 Effects of Household Environmental Factors

Ninety relationships were examined under this heading but only fifteen were significant. The distinction between piped (into home or standpipe) and unpiped water supply is related to children's health facility use for only respiratory complaints and diarrhea episodes. Children of households with standpipe facilities tended to be more frequent users. The reported frequency with which water is boiled before consumption was found to be associated with the same two morbidities. Contrary to what would be expected, it was found that those children of families who reported never boiling their drinking water represented the least morbid group in terms of service use. In his

assessment at the household level, Poland (1988) found that there is a socio-economic bias in household water handling practices since those who did not boil their drinking water tended to have cleaner homes and yards, septic tanks and piped in water supply. One would therefore, assume that those who did not boil their drinking water were less frequent users of health care facilities because they had a sanitary water supply. A standpipe presumably provides this sanitary water supply, yet it was shown that children of households with this type of water supply were more frequent users of health care facilities.

Children's use of facilities for diarrhea and vomiting was found to be inversely related to the number of bedrooms. This suggests that crowding plays a significant role in childhood morbidity.

As expected children of homes with a poor physical condition tended to be higher users of facilities. This relationship proved significant for diarrhea, and diarrhea and vomiting. The state of the household physical condition can be presumed to reflect the socio-economic status of a family. The same can be said for the material with which the home is built. Children from concrete homes tended to frequent medical facilities less often than those housed in structures made of wood, mixed board and concrete, board and 'galvanize', and bamboo for every morbidity except skin-related complaints, nervous and sense organ complaints, and

diarrhea and fever. It appears that a more healthy environment is provided by homes in good physical condition and made of concrete which in turn implies higher socio-economic status. Conversely a home made of board and which is in poor physical condition would tend to imply a lower socio-economic status. This type of home is related to poorer health thereby increasing the child's propensity for health services use.

For digestive complaints, children from homes with septic tanks as opposed to pit latrines had lower rates of utilization. The improved sanitary conditions provided by septic tanks over latrines would explain this relationship. Toilet type can be considered to be another indicator of socio-economic status in that a child in a household which has a septic tank would tend to be of a higher socio-economic status, thereby decreasing the child's propensity to health service use due to a healthier physical environment.

Breast feeding practices, kitchen facility closure, household cleanliness and yard cleanliness were shown to have no association to any utilization measure.

4.3.3 Effects of Distance

Distance and accessibility proved to play an important role in determining facility use. Fourteen out of a possible twenty seven relationships were significant.

Distance travelled showed an inverse relationship to facility use by children for all morbidities except skin and diarrhea and fever related disorders. A distance decay function is clearly in operation. At the household level, Poland (1988) expected an absence of distance decay for specific morbidities considering the small size of Grenada and the relatively short proximity to health care facilities. The operation of the Florida medical station did not prove to play an important role. Accessibility tended to be a significant factor in children's use of facilities for any cause, digestive complaints, and nervous and sense organ complaints.

4.3.4 Comparison of Effects by Utilization Variables

A different perspective is provided by assessing which determinants are related with use of facilities for each specific morbidity. Utilization for any cause was significantly related to the number of elderly in the home. There is a tendency for a child to be a non-user if there are many elderly in the home. Children were also less likely to use facilities if their home was constructed of concrete and they lived far away from health care facilities.

Utilization of facilities for diarrhea, and diarrhea and vomiting episodes was significantly related to at least one variable from each of the three categories of

determinants. Utilization of facilities for both types of morbidities was inversely related to the number of middle-aged individuals. The same relationship holds between utilization for diarrhea and vomiting episodes and the number of elderly in the home. Children who use facilities for diarrhea episodes were more likely to drink water that has been boiled and at the same time their home tends to have a standpipe water source. Use of facilities for both diarrhea and diarrhea and vomiting were found to decrease significantly if the child's household was in good physical condition and their house was made of entirely concrete as opposed to any other material. The effect of distance also showed to be significant to utilization for both of these morbidities. Unlike the other diarrhea-related ailments, facility use for diarrhea and fever ailments was only related to characteristics of the household composition. It was found that facility use decreased with a greater number of adults and older men in the home. However, for this morbidity, it is difficult to establish any kind of relationship with certainty since analysis is based on the use of facilities by only eleven children during the study period. For the children's group this is the only utilization measure for which a firm relationship cannot be established due to an insufficient number of users.

Use of health care facilities for respiratory and digestive complaints was significantly related to only

environmental and distance determinants. From the environmental factors, both types of water handling as well as household building material were associated with use for respiratory ailments. The nature of the relationships are the same as those previously mentioned. Use of facilities for digestive complaints was also related to type of household building material and in addition tended to decrease if the child used a septic tank instead of a pit latrine.

The only factor found to be significantly related to use for nervous and sense organ morbidities was distance while for skin related illnesses the only factor which appeared to affect use was the number of adults in the home.

4.3.5 Multivariate Analysis for Water Handling Practices

In an attempt to try and explain the relationships between health service use by children and their water handling practices an elaboration model was employed. Three-way contingency tables were generated using each utilization measure as the independent variables. In the first set, water boiling practice was used as the test variable while water supply was the independent variable. In this case the original relationship was replicated. That is, those children who use facilities for respiratory ailments and diarrhea episodes tend not to have standpipe water facilities in their home regardless of their water

boiling practices. In the second set, the independent and test variables were reversed. The original relationship was again essentially replicated. Children who use facilities for the same two morbidities tend always to drink water that has been boiled regardless of their water source facility. Basically this analysis showed that each relationship occurred independently of the other. Therefore, although both relationships are counter-intuitive, it has been shown that neither one is directly related to the other water handling practice.

4.4 RELATIONSHIPS BETWEEN UTILIZATION AND DETERMINANTS FOR OLDER INDIVIDUALS

4.4.1 Effects of Household Size and Composition

The number of relationships identified for older adults under this heading was similar to that found for children (table 4). In this case, nine relationships were significant. Family size was not shown to have any influence on service use for this older group. Similarly, the number of children in the household had no association with use. The number of teens however, was associated with use for any cause, respiratory complaints and skin related complaints. There is a direct relationship between use of facilities for these morbidities and the number of teens in the household. The number of middle-aged as well as the number of elderly in the home were inversely related to

Table 4 THE ROLE OF HOUSEHOLD COMPOSITION,
HOUSEHOLD ENVIRONMENT, AND ACCESSIBILITY
IN SERVICE USE: - OLDER INDIVIDUALS

	use/ non	high/ low	resp.	digest	skin	diar.	ner&sen organ	diar. vomit	diar. fev.
household residential composition									
# of res. ¹									
# of child. ¹									
# of teens ¹	-2.07 ^c		-2.11 ^c		-2.43 ^b				
# of adult ¹		2.02 ^c							
# of mid. ¹					2.86 ^b				
# of eld. ¹							2.36 ^c		
# of elmen ¹	3.03 ^b	2.65 ^b	3.82 ^a						
household behavioural environment									
hhboil ³							7.21 ^c		
hhbreast ³									
hhwater ³						4.94 ^c			
hhrms ¹		2.42 ^b		2.50 ^b					
hclean ³									
hhcond ²									
hhkitch ³									
toilet ³		6.66 ^b	4.46 ^a						
hhmat ¹		13.11 ^a	13.71 ^a						
household physical environment									
accessibility									
dist1 ¹									
dist2 ¹		2.50 ^b	3.52 ^c						
access ³		8.45 ^b	5.28 ^c						

Notes:

1 t-test

2 Mann-Whitney test

3 Chi-square test

a significance at .001 level

b significance at .01 level

c significance at .05 level

service use. These were for skin-related complaints, and nervous and sense organ complaints respectively. Lower use for any cause was related to a greater number of adults in the home. The number of older men in the home was a significant factor in health care facility use. This group showed an inverse association with use for respiratory complaints, use for any cause and degree of use for any cause.

4.4.2 Effects of Household Environmental Factors

Fewer relationships were significant under this heading for the older individuals compared to those found for children. In all, eight relationships were significant. The number of household bedrooms was a significant indicator of use. This environmental factor was found to be inversely related to level of use for any cause and use for digestive complaints.

The type of toilet and the building material type are both significantly related to use for respiratory complaints and level of use for all causes. In both cases the relationship indicates lower use among those individuals whose houses have septic tanks and are constructed of concrete.

Individual water handling practices of this older group is not significantly related to any one of these morbidities in particular. Individuals whose household

water source is a standpipe have lower levels of use for diarrhea episodes. Use of facilities for nervous and sense organ complaints was the only variable associated with water boiling practices. Those who boil their water before they drink it tend to use facilities less for this type of illness. Yard and household cleanliness, household physical condition, breast feeding practices and kitchen closure were not significant determinants.

4.4.3 Effects of Distance and Accessibility

Distance and accessibility were not very powerful determinants of use for this group. Only four relationships were significant. Visits made to health care facilities for respiratory ailments decreased significantly with distance and poorer accessibility. These two spatial factors were also significantly associated with lower use for any cause.

4.4.4 Comparison of Effects by Utilization Variables

In considering what determinants are significantly related to use of facilities it is important to keep the frequency of use for each morbidity in mind for this older group. Diarrhea related morbidities showed very low use, therefore it is not surprising that use of services for diarrhea and vomiting, as well as diarrhea and fever showed absolutely no relationship to any determinant. A significant relationship was established between users of

health care facilities for diarrhea episodes (number of users was 27) and type of water supply. Lower use was found among those who have standpipe facilities.

Stronger relationships were shown for the other morbidity groups. Use for any cause and skin-related complaints was related to only household composition factors. Both showed lower usage among those with fewer teens in the home. Higher usage for skin related complaints however was associated with fewer middle-aged in the home. For all causes usage was lower among those with a greater number of elderly men in the home.

The degree of usage for all causes as well as usage for respiratory complaints were both significantly associated with at least one determinant from all three groupings. Degree of usage for all causes was inversely related to the presence of adults as well as to the presence of elderly men. Use for respiratory illnesses was also inversely related to the presence of elderly men and was directly related to the number of teens in the household. Degree of use for any cause was significantly lower in households of more bedrooms while both measures indicated lower use among those who use septic tanks and whose houses were constructed of concrete. Usage also decreased with distance from facilities.

Use for digestive and nervous and sense organ complaints showed no significant relationships to any

distance effects. Use for digestive complaints only appeared inversely related to the number of bedrooms, while use for nervous and sense organ complaints decreased significantly with an increase in the number of elderly in the home and with the practice of boiling water before drinking.

4.5 COMPARISONS OF RELATIONSHIPS

Bivariate analysis was conducted on the 16-59 year age group as well in order to aid in the understanding of some of the relationships found for the children's group. Table 5 is a comparative overview of the results obtained in both analyses. In terms of household size and composition the relationships were similar. Although it was found that the number of teens in the household had no bearing on children's use of services, this factor did show to directly affect use by the older group. Both groups found that the number of residents and the number of children in the household had no effect on use. Although the direction of the relationships was identical for the remaining determinants, they were significant with different utilization measures or at least with different sets of utilization measures. From this it is clear that the number of older individuals in the household has an inverse effect on use not only by children but by older individuals as well. Therefore the relationship is not unique to children.

Table 5 COMPARISONS OF RELATIONSHIPS

		CHILDREN	OLDER INDIVIDUALS
household residential composition	# of res.	NO RELATIONSHIPS	NO RELATIONSHIPS
	# of child.	NO RELATIONSHIPS	NO RELATIONSHIPS
	# of teens	NO RELATIONSHIPS	DIRECT (1,3,5)
	# of adults	INVERSE (9)	INVERSE (2)
	# of mid.	INVERSE (5,6,8)	INVERSE (5)
	# of eld.	INVERSE (1)	INVERSE (7)
	# of elmen	INVERSE (9)	INVERSE (1,2,3)
household behavioural environment	hhboil	↑ USE AMONG THOSE WHO BOIL (3,6)	↑ USE AMONG THOSE WHO DON'T BOIL (7)
	hhbreast	NO RELATIONSHIPS	NO RELATIONSHIPS
household physical environment	hhwater	↑ USE WITH STANDPIPE (3,6)	↑ USE WITH NON-STANDPIPE (6)
	hhrms	INVERSE (8)	INVERSE (2,4)
	yclean	NO RELATIONSHIPS	NO RELATIONSHIPS
	hhclean	NO RELATIONSHIPS	NO RELATIONSHIPS
	hhcond	↑ WITH POOR CONDITION (6,8)	NO RELATIONSHIPS
	hhkitch	NO RELATIONSHIPS	NO RELATIONSHIPS
	toilet	↑ USE WITH PIT LATRINE (2,4)	↑ USE WITH PIT LATRINE (2,3)
	hhmatl	↑ USE NOT STRICTLY CONCRETE (1,2,3,4,6,8)	↑ USE NOT STRICTLY CONCRETE (2,3)
accessibility	distance	INVERSE (1,2,3,4,6,7,8)	INVERSE (2,3)
	access	↑ USE WITH ADEQUATE (1,4,7)	↑ USE WITH ADEQUATE (2,3)

Notes:

- 1 - presence or absence of use for all causes
- 2 - level of use for all causes
- 3 - use for respiratory
- 4 - use for digestive
- 5 - use for skin-related

- 6 - use for diarrhea
- 7 - use for nervous and sense organ
- 8 - use for diarrhea and vomiting
- 9 - use for diarrhea and fever

This relationship will be discussed further in the following chapter.

A comparison of the effects of household environmental factors on use indicates that yard and household cleanliness, kitchen coverage and breast feeding practices had no effect on use of health care facilities by either group. However, the number of bedrooms in the home and the type of household building material were both associated with use for both groups in the same way. The condition of the home appeared to have no bearing on use of facilities by the older group however it did prove to be a significant determinant in use for the children. This relationship seems to make sense since it is typical for children to spend more time at home than older individuals and they are thereby more directly affected by the surroundings of the home.

The effects of water supply on service use by the older group seems to support Poland's determination of a socio-economic bias with regard to water handling practices. Unfortunately this does not shed any light on why the children's relationships with regard to water handling practice is counter-intuitive.

Distance and accessibility had a much greater effect on health care facility use by children than it did on older individuals for these utilization measures.

4.6 CONCLUSIONS

This section of the chapter will summarize the results of the analysis. In terms of the effect which household compositional factors have on the utilization of health services by children, the presence of older individuals seemed to play an important role. In every case the nature of the relationship was inverse. The presence of other children in the household apparently had no effect on service use.

Only one of the two variables representing the household behavioural environment was related to health service use. The practice of boiling water prior to drinking it tended to increase service use.

With respect to the eight variables representing the household physical environment, five of these had an association with service use. Use of health care facilities by children less than eight tended to increase among those of households with a standpipe water facility, a pit latrine toilet facility, a poor physical state, a large number of bedrooms, and of homes not entirely built of concrete.

Increased distance and poor accessibility to a health care facility was related to lower use.

The nature of the relationships between utilization measures and water handling practices was contrary to what was expected. Those who did not drink water that was boiled had a lower propensity to use facilities. It would

logically follow from this that these individuals must therefore have a sanitary piped in water supply. However, in terms of the type of water supply used, the relationships signify that there is an increasing tendency to use health services among those with standpipe water facilities. An elaboration model was used to determine if the relationships between service use and both types of water handling practices were dependent upon one another. The analysis concluded that they, in fact, were not. The practice of boiling water prior to drinking it does not appear to have an underlying socio-economic effect on utilization of services by children, therefore an etiological relationship is instead possible. There is also the possibility that those children who do not drink water that has been boiled have parents who are not overly concerned with health matters. Therefore, it might follow from this that the tendency of these children to use health care facilities is reduced by their parents' apathetic attitude towards health matters. In terms of the type of water supply used by the children, the nature of the relationship could be explained by a reverse socio-economic status effect on utilization. That is, the other household environmental factors indicated that the socio-economic deprivation of children in this group increased their tendency to use health care facilities. With water supply type however, it seems that children of a higher socio-economic status tended to use

facilities more often. Why this particular household factor relates differently than the other household factors is not certain. These confounding effects with respect to water handling practices are difficult to explain without further investigation.

A comparison of the relationships between the children's group and those of their older counterparts shows that the nature of the relationships are similar except for those related to water handling practices. Those in this older group tend to increase their frequency of service use if they do not boil their water prior to drinking it and if they do not have a piped in water supply. Fewer associations were significant for this older group under the headings of household environmental and distance variables.

The concluding chapter which follows will attempt to put the results of this analysis of the determinants of children's use of health care facilities into the context of similar studies done on this subject.

CHAPTER FIVE

DISCUSSION AND CONCLUSIONS

5.1 DISCUSSION AND CONCLUSIONS

The purpose of this study was to explore the relationships between components of the home environment and health service use among children less than eight years old in the study population. Analyses indicate that elements from all four dimensions of the home significantly influence service use.

It was stated earlier in this paper, in the literature review, that it has only been in recent years that researchers have investigated the role which the family plays in the decision making of health practices. It seems appropriate at this point to review the findings of similar studies in this field in order to put the findings of the present study into their proper context.

Many studies have attempted to determine the effect of family composition on service use (Akesode, 1982; Tessler, 1980 and many others). In a study on physician use by children less than eighteen years old in the United States, Andersen and Kasper (1973) found there to be an inverse relationship between family size and use of health services. This relationship held even when controlling for such factors as income, race and residence signifying a structural influence on children's use. Similar studies

have found this same inverse relationship. Many such studies were conducted on developed nations such as the United States and Britain where the nuclear family predominates. Thus an increase in family size means a greater number of children in the household. The present study however, was conducted on a study group of children in which the extended family predominates. In this case it was concluded that the number of children in the household had no bearing on children's use of facilities. Only when accounting for the presence of older individuals in the household did a significant inverse association occur.

Very few studies have been conducted to investigate the effects of household behavioural and environmental factors on health facility use. If elements of the home environment can be taken as being representative of socio-economic status then the present study would conclude that the socio-economic deprivation of children in this study group increased their tendency to use health care facilities. The same was true of their older counterparts. The only environmental elements which counter this association were the children's water handling practices. Unfortunately the space restriction in this paper prevents a further exploration of this relationship. Two studies, one on the utilization of preschool health education and services in New Zealand (Fergusson et al., 1984), and another on physician use by families with children in Britain

(Campion et al.,1985) conflict in their results. The former showed a tendency of lower use among those children of families with a lower socio-economic status. The latter showed the exact opposite, as socio-economic deprivation clearly increased children's utilization of facilities. Once again, it should be noted that these studies were conducted on children in developed nations.

The effects of distance and accessibility on children's use of health care facilities have not been adequately studied. This study proved that these effects have a strong and direct bearing on use of services by children, more so than their older counterparts.

5.2 RECOMMENDATIONS FOR FURTHER RESEARCH

This paper has brought to light the need for further studies on the determinants of children's utilization of health care facilities in developing nations. Past studies have mainly focused on household compositional and maternal effects on children's use of services in developed nations. Although it is felt that the mother-child relationship is an important consideration, this study concerned itself with the role which the household environment plays.

It is evident that the nature of the family structure in developing nations must be kept in mind when conducting further studies into its effect on utilization. Likewise, it is necessary for further research to assess the

proxy measures of socio-economic status and health behaviour, depending upon the nature of the population studied. It would be interesting to see how stable the relationships in this study are over space and time. Finally, it is obvious that further work needs to be done on the effects of distance and accessibility on service use. Studies in this area are needed particularly in developing nations considering the lack of proper infrastructure in many of the rural areas.

At the end of this study, it is obvious that the determinants of children's use of health care facilities are highly complex. In order to further our understanding of the relationships involved, future studies would do well to keep this fact in mind.

REFERENCES

- AKESODE, F. 1982. Factors affecting the use of primary health care clinics for children. Journal of Epidemiology and Community Health. 36:310-4.
- ANDERSEN, R. and KASPER, J. 1973. The structural influence of family size on children's use of physicians services. Journal of Comparative Family Studies. 4:116-30.
- CAMPION, P. and GABRIEL, J. 1985. Illness behaviour in mothers with young children. Social Science and Medicine. 20:325-30.
- FERGUSON, D.M. et al. 1984. The utilization of preschool health and education services. Social Science and Medicine. 19:1173-80.
- FIEDLER, J. 1981. A review of the literature on access to and utilization of medical care with special emphasis on rural primary care. Social Science and Medicine. 15C:129-142.
- GESLER, W.M. 1984. Health Care in Developing Countries. Washington:Association of American Geographers.
- GROSS, P.F. 1972. Urban health disorders, spatial analysis and the economics of health facility location. International Journal of Health Services. 2:63-84.
- HAYES, M.V. 1988. The Risk Approach in Diarrhoea Disease Interventions in Grenada, West Indies. McMaster University:Ph.D. Thesis.
- JONES, K. and MOON, G. 1987. Health Disease and Society. London:Routledge & Kegan Paul.
- JOSEPH, A.E. and PHILLIPS, D.R. 1984. Accessibility and Utilization. New York:Harper & Row.
- LEARMONTH, A. 1978. Patterns of Disease and Hunger. London:David and Charles, Newton Abbott.
- LEARMONTH, A. 1988. Disease Ecology. New York:Basil Blackwell Inc.
- LITMAN, T.J. 1974. The family as a basic unit in health and medical care: a social-behavioural overview. Social Science and Medicine. 8:495-519.

- MEADE, M., FLORIN, W. and W. GESLER. 1988. Medical Geography. New York: Guilford Press.
- PHILLIPS, D.R. 1986. The demand for and utilization of health services, in Medical Geography: Progress and Prospect. ed. Michael Pacione. London: Croon Helm.
- POLAND, B. 1988. The Ecology of Health Service Utilization in Grenada, West Indies. McMaster University: Masters Thesis.
- PYLE, G.F. 1979. Applied Medical Geography. Washington: V.H. Winston & Sons.
- TESSLER, R. 1980. Birth order, family size, and children's use of physician services. Health Services Research. 15:55-62.
- WORLD HEALTH ORGANIZATION. 1948. The Constitution. Geneva: WHO.

APPENDIX A

Grenada Child Health Survey: Verbal Portion

APPENDIX B

Grenada Child Health Survey: Household Observation Sheet

GREWADA CHILD HEALTH SURVEY

- OBSERVATION SHEET -

NR# _____

_____/_____/_____
d m yr

1. CLEANLINESS OF YARD	Clean	Average	Dirty
2. CLEANLINESS OF HOUSE	Clean	Average	Dirty
3. CONSTRUCTION MATERIAL		Board	
		Concrete	
		Board & Concrete	
		Bamboo	
		Other _____	
4. CONDITION OF DWELLING	Good	Average	Poor

WEIGHT IN FIRST 4 YEARS OF LIFE
(From child's growth chart)

	Name	DOB	B	4	8	12	16	20	24	28	32	36	40	48
1.														
2.														
3.														
4.														
5.														
6.														
7.														
8.														
9.														

CHILD # _____	DIP month _____	DIP weight _____	_____
_____	_____	_____	_____
_____	_____	_____	_____