INCOME, INSURANCE, AND UTILIZATION OF HEALTH CARE SERVICES IN THE UNITED STATES

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Income, Insurance, and Utilization of Health Services in the United States

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ABSTRACT

Utilization of and access to health care services is a central theme in Medical Geography. Studies have repeatedly shown that income has a substantial influence upon utilization of health care services. Not only is income influential in rates of utilization, but it is also strongly related to levels of health status; compared with the higher income groups, the poor have significantly higher levels of morbidity and shorter life expectancies. Thus, people from the lower income groups not only have the greatest need for health care but also are less likely to be able to purchase health care. In Canada, public health insurance covers virtually one hundred percent of the population and eliminates financial barriers to health care, but in the U.S., which has a free market health care system, an estimated 37 million persons are without health insurance and another 20 million are under-insured. The Canadian situation is, however, not without its problems; fiscal crises, reduced transfer payments to the provinces, and the potential demise of federalism make the future of health insurance in Canada uncertain. In light of these realities, it may be prudent to examine the U.S. experience regarding financial barriers to health service utilization.

This thesis examines the 1986 U.S. National Mortality Followback Survey and presents discussion surrounding issues related to accessibility and utilization of health care services, specifically, the influence of income and insurance mode.

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> "Therefore we do not lose heart. Though outwardly we are wasting away, yet inwardly we are being renewed day by day ... So we fix our eyes not on what is seen, but what is unseen. For what is seen is temporary, but what is unseen is eternal." (2 Corinthians 4:16,18)

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1.1 INTRODUCTION

Access to and utilization of health care services, central themes in medical geography, have proven to be among the most important political and social issues of our time. Canada's publicly-funded health care system provides universal coverage to virtually all Canadians in an effort to reduce, if not eliminate, financial barriers to service utilization. However, the future of the Canadian health care system is in jeopardy. Canada's huge national debt, increasing numbers of elderly persons, the current recession, and the neo-conservative agenda of privatization of the welfare state are reasons given as to why Canadians will have to rethink the future of health care. The Canadian government has recently passed legislation (Bill C69) to reduce, and eventually eliminate, transfer payments to the provinces for health care. This legislation puts the future of the national public health insurance program very much in doubt, for without federal economic pressure, the provinces will have no incentive to participate in the national health care system. Moreover, increased provincial powers (a trend that has taken on considerable momentum throughout the 1980's) will render meaningless such federal legislation as the Canada Health Act, the very Act that covers public health insurance. While the Federal government has given assurances that other levers will be used to ensure compliance with the Canada Health Act, most critics argue that attempts to use 'other levers' (such as transfer payments for agriculture, environment, and other areas of public funding), will be deemed unconstitutional, and will not survive a challenge in the courts.

Thus, in 1992, questions that were seemingly put to rest by the introduction of universal health insurance appear once again on Canada's social agenda. Among these are:

(i) What is the influence of income upon access to and utilization of health care services; and

(ii) What is the influence of insurance mode upon access to and utilization of health care services?

Given that the health care system in the U.S. currently consists of a combination of public and private insurance programs (as opposed to a system of universal public health insurance), and given general similarities in the cultural/social fabric of the two countries, analysis of the patterns of health service utilization in the U.S. ought to provide information of relevance to Canadian health care policy. This thesis will analyze information obtained through the National Mortality Followback Survey, conducted by the U.S. National Center for Health Statistics, in order to address these two questions concerning access to and utilization of health care services in the last year of life.

The remainder of this chapter will situate this thesis within the literature of medical geography. Chapter two provides an overview of the literature on issues of access to and utilization of health care services, as well as a brief description of the organization of the health care systems in Canada and the U.S. The National Mortality Followback Survey is described in chapter three and analyses of that survey with regard to service utilization are presented in chapter four. Chapter five contains concluding remarks and suggestions for further research.

1.2 MEDICAL GEOGRAPHY

Since its inception in the late eighteenth century, medical geography has become a well established subdiscipline in geography. Jacques May, perhaps one of the most influential medical geographers (Mayer, 1982) defined medical geography as the study of the relationship between pathological factors (disease, vectors, hosts) and geographical factors (physical, human/social, biological) (May, 1950). His definition of medical geography was:

> Today we recognize that disease is a multiple phenomenon which occurs only if various factors coincide in time and space. The focus of interest widens to encompass the relationship between the various factors of this complex and their respective geographical environments. This is called 'Medical Geography'. (May, 1977, reprinted)

This definition of medical geography as a study of disease ecology reflects the deterministic perspective of human geography of that time. More recently, however, medical geography has been defined as that geographical work which deals with "health, disease, mortality and access to and location of health facilities" (Mohan, 1989, p. 166). As can be seen by this definition, medical geography research has expanded considerably from the disease ecology emphasis to issues of health care delivery and health policy.

However, the term medical geography has proven to be somewhat elusive;

> "... no single, comprehensive definition of the term 'medical geography' has withstood the test of time. Rather, conceptual trends have evolved over the past twenty-five years in a manner analogous to the discipline of human geography" (Pyle, 1977).

Discussion has also been raised as to a more appropriate label which would better reflect the interests of researchers concerned with geography, health and health care. For example, the Canadian Association of Geographers Medical Geography subgroup has recently been considering alternative titles for their research group (Hayes, 1990-91; Barrett, 1991-92).

It would not be unfair to suggest that medical geography is what medical geographers do. The definition of medical geography reflects, to some degree, the research activities of medical geographers (people who concern themselves with issues around space and patterns of health and health care). Pyle (1977) outlines eight areas of activity within the realm of medical geography: disease ecology, disease mapping, associative analysis, spatio-epidemiology, patient travel, cultural-ecology, diet-nutrition, and behaviour. Each of these approaches may be performed on various geographic scales, from the level of the individual to the international. Paul (1985) identifies a somewhat different taxonomy of research interests: disease diffusion, disease mapping, nutrition, associative analyses, disease ecology, ethnomedicine and medical pluralism, and health care geography. He emphasizes that, although there are several approaches listed, they are all interrelated and thus are not mutually exclusive. Mayer (1982), however, suggests that all of these research approaches may be divided into two major streams: disease ecology and health services delivery (health services planning and provision). Although both research areas relate to space and location, and despite past discussions regarding the synthesis of the two streams, Mayer contends that the strength of medical geography lies in its eclectic nature.

This thesis pertains to the health services stream of medical geography research. The majority of work done in this stream to date concerns the interrelated themes of: location of service facilities, formulation and evaluation of health policy, and access to and utilization of health services.

1.2.1) Locational Studies

The intent of the majority of locational studies is the enhancement of the understanding of the spatial distribution of health care services and the determination of the optimal location of health facilities (these studies typically employ assumptions regarding need, consumer choice, travel distance, routes, etc). Descriptions and interpretations of spatial distributions of health care personnel, facilities and the quality of services have been made (Shannon and Dever, 1974). Other locational research has branched into investigations of more personal reasons for physician distribution, such as stage in life course, specialty choice, and sources of personal support (Ernst and Yett, 1985; Rosenberg, 1984). Analytical techniques within locational research typically include algorithms and multivariate analyses. This is particularly true for location-allocation models which attempt to predict optimal sites for health care facilities with respect to the population at risk (Mohan, 1983; Bennett, 1981). The purpose of the optimization is to minimize distance and time to obtain health services. However, other studies provide evidence to suggest that need for care may serve as an impetus to overcome potential temporal and spatial inhibitors (Mayer, 1983; Daniels 1983).

A tangent of locational research concerns the location of services and housing for the mentally ill (Taylor et al, 1989; Dear and Taylor, 1982) and, lately, for the homeless (Dear and Wolch, 1989). Deinstitutionalization, community perceptions and reactions, and the ghettoization of the mentally ill are all geographic concerns which relate not only to the accommodation of these persons, but also to their resulting satisfaction and subsequent coping abilities within the community.

The results of these types of locational research may provide evidence to support or to modify the planning and siting of health service facilities, including implications for the role of the state and the formulation of health policy.

1.2.2) Health Policy

In recent history, medical geographers have become increasingly interested in the spatial aspects of health policy. Spatial patterns of access and social deprivation have been shown to exist and, as Knox (1979) suggests, intervention of health policy is needed to reduce the observed socio-spatial inequalities. Numerous investigations have been performed regarding the impact of space on political structure, ideologies, health policies, and perceptions of illness, as well as subsequent patterns of interaction with the health care system (Eyles, 1990; Eyles and Donovan, 1990; Eyles and Woods, 1983). Although the impact of space may or may not be significant, Eyles and his colleagues affirm that the influence of the spatial must not be ignored. In addition, they emphasize that, because the provision of health care is inherently political, health care reform requires more than locational 'tinkering'. However, sustantial reform may be difficult to achieve due to limitations embedded in historical, social, and professional contexts.

The function, role and meaning of space in health care and health policy have become increasingly more important. The concept of space has begun to shift from its traditionally descriptive role to one which embraces the meaning and utility of space in order to enhance understanding of health policy (Moon, 1990). Hayes and Manson Willms (1990) emphasize the importance of space in the implementation of local health policy; they have done some evaluations of the Canadian Healthy Communities Project, a response to the health promotion initiatives of the federal government. The Project's intention is "to improve the health and well-being of Canadians by ensuring that enhanced health and well-being is an explicit consideration in policies, plans, and programs of Canadian municipalities" (p. 161 Hayes & Manson Willms, 1990). The nature of the Project requires the use of locally-scaled initiatives and locally-defined health indicators. Space has been found to play a significant and potentially problematic role in the definition of community and in the differentiation of health indicators.

Another approach to health policy initiatives and their implications for local health care delivery is found in studies using the risk approach (Taylor et al, 1990; Hayes, 1991), a framework for selective provision of health care services advocated by the World Health Organization. The framework is meant to assist in the assessment of populations at risk in order to ensure efficient delivery of effective interventions. However, recent research has encountered problems with the accuracy and reliability of this technique (Taylor et al, 1990). Also, epistemological, methodological and ideological aspects of the framework have been questioned (Hayes, 1991, 1992).

These examples of research done within medical geography that are related to the issues of space and health policy illustrate the expansion of the concept of space and its implications for health policy.

An example of the blend of spatial and political elements of medical geography is the response of Canadian medical geographers to the World Health Organization's "Achieving Health for all by the Year 2000" directive and the Canadian government's subsequent initiative for health promotion (Epp, 1986). Canadian medical geographers have outlined areas in which the context of medical geography research is particularly suited to this mandate (Rosenberg, 1990). The framework for health promotion provides evidence of the convergence of geography and health as the concept of health shifts from an emphasis on the individual to a broader environmental and ecological perspective (S.M. Taylor, 1990; Rootman and Munson, 1990). However, medical geographers have also cautioned that health promotion initiatives need to be culturally and contextually sensitive in order to be successful in their construction and implementation (Dyck, 1990; Eyles 1990b; Moon, 1990). This work challenges Canadian medical geographers to be active participants in the implementation, evaluation and formulation of health policy.

Health policy determines the structure of the health care system and its effectiveness in serving the needs of the population. Inherent within health care delivery are the concepts of access to and utilization of health services.

1.2.3) Accessibility and Utilization

Considerable attention has been paid to issues of access and utilization of health care services. Joseph and Phillips (1984), for example, discuss health care planning and health care structures in light of accessibility and utilization characteristics of particular health care systems. Health care planning is influenced by space, local strategies, quality and costs of care, as well as the need for planning initiatives for special-needs groups. The challenge facing medical geographers is three-fold: examine trends in access, understand behaviour of health care providers, and contribute to the formulation of health care policy (Rosenberg, 1983). In light of these challenges, our understanding of health and access to health care is enhanced by an awareness of the socioeconomic, ideological, and spatial context. Rosenberg (1983) concedes that not all of these areas are traditionally directly related to geography, but geography plays a role in all. Access is generally seen to be a product of the socio-political context within which the health care system lies (Roemer, 1988). On a more personal level, access is also influenced by the socioeconomic status of individuals (Aday and Andersen, 1984; Rehr, 1981), which is particularly relevant to certain less privileged segments of the population, such as the elderly (James, 1992; Roos et al, 1987).

Medical geographers have also focussed on issues of utilization of health care, particularly in reference to the location of services and distance decay (Joseph and Boeckh, 1981; Wan, 1974), and to social inequalities in utilization rates (Kasper, 1986; Greenley, 1980; Thomas and Phillips, 1978). These types of studies (delivery of services, distance decay, influence of personal and social characteristics) have also been performed in less developed countries (Phillips, 1986; Bailey and Phillips, 1990; Poland et al, 1990). However, some cautionary comments have been made regarding the accuracy and reliability of third world utilization surveys (Hayes et al, 1990).

In summary, medical geography has contributed substantially to our understanding of health and health care, particularly since World War II. The role of space in health care research has evolved from description to conceptual frameworks regarding the spatial differentiation of health, health care delivery and health policy. This thesis follows the path of research in accessibility to and utilization of health services, and it does so by investigating the influence of income and insurance mode on accessibility and utilization within the context of the U.S. health care system. Applications of the evidence obtained in the study will be used to outline the potential implications for health policy in Canada.

2.1 Introduction

In the past 250 years, the world population has increased exponentially. Further, in the western world, life expectancy has increased from around 45 years to approximately 75 years. Health care has long been credited with the improvement and maintenance of health (Hadley, 1982; Fuchs, 1972). However, increasingly researchers argue that health care does not necessarily equal health status (Smith & Bueschinq, 1985; Levine, 1983; Newhouse & Friedlander, 1980; Glazer, 1971). Some even argue that health care may be detrimental to health status (Illich, 1976; Edginton, 1989). Although the relationship between health and health care is ambiguous, there are striking disparities between certain social groups both in their levels of relative health status (measured in terms of mortality, morbidity, and self-assessed health status) and their levels of service utilization.

2.2 Inequalities in Health Status between Social Groups

2.2.1) Mortality

There have been numerous reports published on the relationship between various measures of socioeconomic status and corresponding levels of mortality. The Black Report refers again and again to the differential mortality rates for all major causes of death between social class groups in Great Britain (Townsend and Davidson, 1982) (see table 2.1).

Table 2.1: Standardized Mortality Rates by sex and social/occupational class (15-64 years) (standardized mortality rates/1000 population, England and Wales 1971)

social/occupational class	males	females
I (professional)	3.98	2.15
II (intermediate)	5.54	2.85
III (skilled non-manual)	5.80	2.76
III (skilled manual)	6.08	3.41
IV (partly skilled)	7.96	4.27
V (unskilled)	9.88	5.31
Ratio(V/I)	2.5	2.5

(source: Townsend and Davidson, 1982)

There is a clear gradient in standardized mortality rates, which are lowest among social classes 1 and 2 (professional and managerial classes) and highest for social class 5 (unskilled labour). In all classes, the men experience higher mortality than the women. In addition, although the ratio between the lowest and the highest classes is the same for both genders, the range of the difference between classes is much greater for the males than for the females (a difference of 5.90 for the men and only 3.16 for the women).

Negative correlations between mortality rates and social class were also reported by the Department of International Economic and Social Affairs of the United Nations (1988) for the Federal Republic of Germany, the Netherlands, New Zealand, and Finland.

Researchers in Canada have also found similar discrepancies in mortality rates between socioeconomic classes (Wigle and Mao, 1980; Wilkins et al, 1990) (see table 2.2).

Table 2.2: Infant Mortality Rates (*1000 live births) by Income Quintile, Urban Canada

Income Quintile	1971	1986	86-71
Quintile 1	10.2	5.8	-4.4
Quintile 2	12.4	5.7	-6.7
Quintile 3	15.2	7.7	-7.5
Quintile 4	16.6	8.0	-8.6
Quintile 5	20.0	10.5	-9.5
Average	15.0	7.5	-7.5
Difference (5-1)	9.8	4.8	-5.0

(source: Wilkins et al, 1990)

The lower income quintiles (quintiles 4 and 5) experienced higher infant mortality rates than the higher income quintiles (quintiles 1 and 2). In 1971 quintile 5 (the lowest income quintile) experienced twice the infant mortality as quintile 1. Although the ratio between the highest and lowest income groups was not as severe in 1986, the gradient between the classes still existed.

Inequalities between income groups are also evident in measures of life expectancy (table 2.3).

Table 2.3: Life Expectancy at Birth (in years) by Income Quintile, Urban Canada

Income Quintile	1971	1986	86-71
Quintile 1	76.6	78.5	1.9
Quintile 2	75.9	78.1	2.1
Quintile 3	74.6	77.5	3.0
Quintile 4	74.4	76.9	2.5
Quintile 5	72.0	74.8	2.8
Average	74.5	77.1	2.6
Difference (1-5)	4.6	3.7	-0.9

(source: Wilkins et al, 1990)

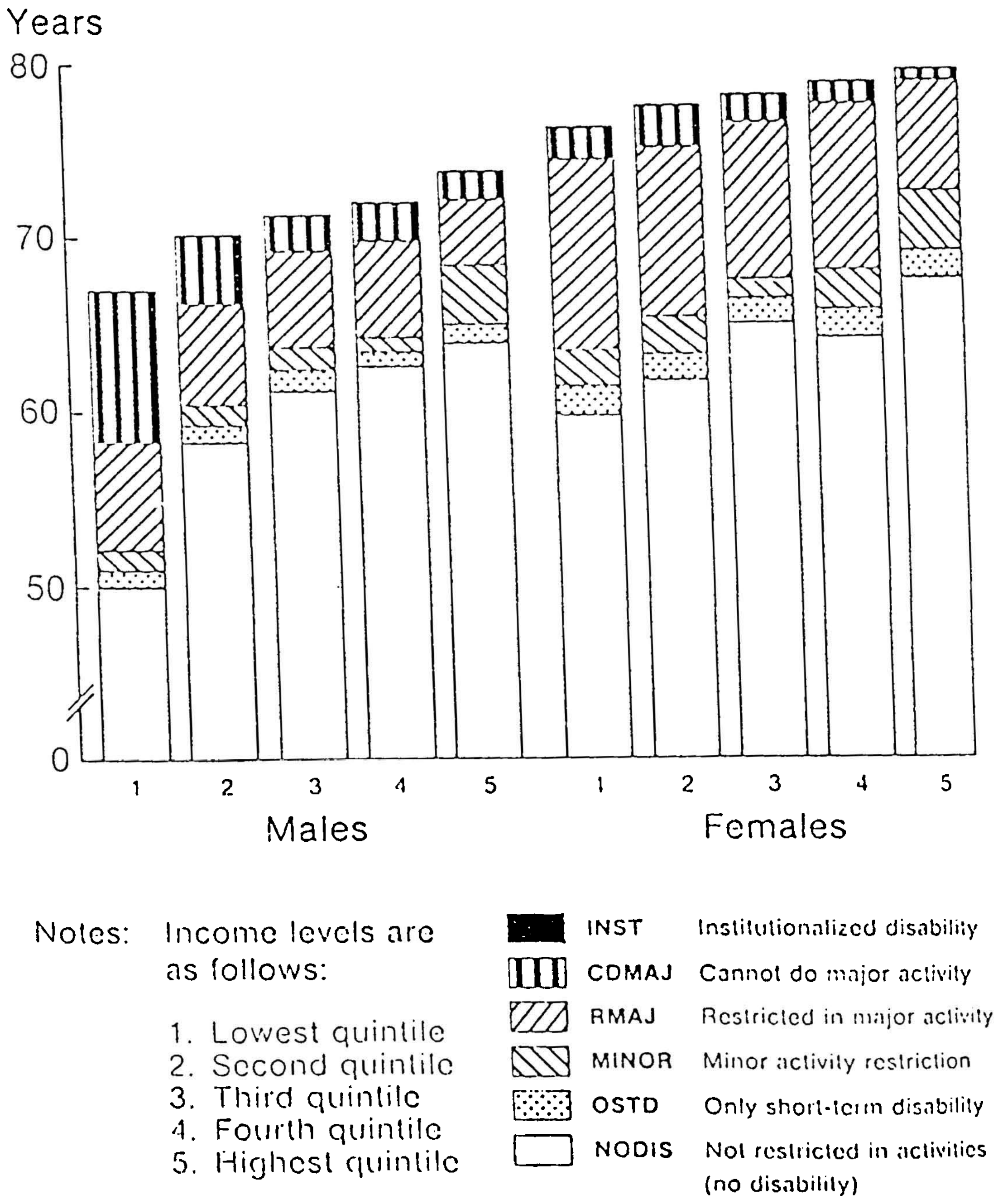
The lower income quintiles (quintiles 4 and 5) have shorter life expectancies than the higher income quintiles (quintiles 1 and 2). Although the average life expectancy increased between 1971 and 1986, the ratio between the highest and the lowest income quintiles decreased only slightly (4.6 in 1971 to 3.7 in 1986). Wilkins et al (1990) indicate that the lowest income groups have the lowest probability (57.3%) of surviving to age 75 compared with that of the highest income group (69.6%) (a difference of 12.3%).

2.2.2) Morbidity

Illness and disease are said to be negatively correlated with socioeconomic class (Edginton, 1989). The lower the class, the greater the morbidities experienced. This increase in ill-health is for both acute and chronic illness. These conditions have been attributed to the 'culture of poverty': It is the lifestyle, environment (living and working conditions), and attitudes of the people that contribute to their well-being (Dutton, 1986; Lundberg, 1991). The influence of economic factors should not be overlooked, however, as they are inextricably linked with levels of health in all nations, particularly in countries like the U.S. where the level of income may be equated to the ability to purchase health care.

Wilkins and Adams (1983) outline the relationship that income has with measures of morbidity and life expectancy (see figure 2.1). "Health expectancy" is a combination of life expectancy and morbidity levels. As can be seen in Figure 2.1, not only is the life expectancy significantly lower for the lower income groups than for the higher income groups, but the time spent in varying degrees of morbidity is much greater for the lower income groups. For example, the amount of time that the lower income groups spend in states of health that inhibit their major activity is much greater than that for higher income groups.

Figure 2.1: Health Expectancy by Income Level, by Sex, Canada, 1978



(source: Wilkins and Adams, 1983)

2.2.3) Self Assessed Health Status

Table 2.4 contains 1986 data from the U.S. Department of Health and Human Services regarding the self-assessed health status of Americans and their respective ages and income groups. It is important to note the steady increase from the lowest to the highest income group in the percentage of people who assess their health status as 'excellent'. For all ages in the lowest income group (<$10,000 per year) only 26.6 percent consider themselves as being in 'excellent' health compared to 50.8 percent in the highest income group (>$35,000 per year). At the other end of the scale, 7.2 percent of the lowest income group rate themselves to be in 'poor' health, but only 0.9 percent of the highest income group rate themselves in the same category. This trend is consistent across the income groups for each age group. For the age group 45 to 64 years, the disparities are greatest: 10.3% of the lowest income group versus 37.4% of the highest income group consider themselves to be in 'excellent' health, and 21.5% compared to 1.6% in the 'poor' health category. In general, the higher income groups rate themselves to be in 'very good' or 'excellent' health more often than the lower income groups, and less often in the 'fair' or 'poor' health categories. These data are not only statistically significant, but also morally and socially compelling.

Table 2.4: Number of Persons and Percent Distribution by Respondent-Assessed Health Status, According to Sociodemographic Characteristics, U.S., 1986

CHARACTERISTIC	ALL PERSONS[1]	ALL HEALTH STATUSES[2]	RESPONDENT-ASSESSED HEALTH STATUS EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
FAMILY INCOME AND AGE	NUMBER IN THOUSANDS	PERCENT DISTRIBUTION					
UNDER $10,000							
ALL AGES	33,486	100.0	26.6	22.6	29.2	14.4	7.2
UNDER 5 YEARS	2,935	100.0	40.9	26.2	29.2	2.9	*0.8
5-17 YEARS	6,106	100.0	38.1	24.0	32.5	4.8	*0.6
18-24 YEARS	5,870	100.0	37.6	32.2	25.3	3.9	*0.9
25-44 YEARS	7,013	100.0	27.1	23.1	30.3	14.9	4.5
45-64 YEARS	4,407	100.0	10.3	14.0	26.2	27.9	21.5
65 YEARS AND OVER	7,154	100.0	11.2	16.7	30.4	27.0	14.6
$10,000-$19,999							
ALL AGES	45,033	100.0	32.0	26.7	27.6	9.8	3.9
UNDER 5 YEARS	3,812	100.0	51.0	26.0	18.5	3.6	*1.0
5-17 YEARS	8,056	100.0	43.2	30.2	22.7	3.5	*0.4
18-24 YEARS	5,232	100.0	39.4	30.4	25.2	4.6	*0.5
25-44 YEARS	13,003	100.0	35.0	29.4	26.7	6.9	2.0
45-64 YEARS	7,343	100.0	17.1	21.9	32.9	18.6	9.5
65 YEARS AND OVER	7,587	100.0	15.2	20.9	35.2	19.6	9.1
$20,000-$34,999							
ALL AGES	62,620	100.0	43.1	28.7	21.5	5.3	1.3
UNDER 5 YEARS	5,314	100.0	56.9	27.8	13.3	1.6	*0.4
5-17 YEARS	12,410	100.0	56.6	26.3	15.4	1.4	*0.3
18-24 YEARS	6,169	100.0	48.3	29.7	19.3	2.5	*0.2
25-44 YEARS	22,513	100.0	43.4	32.0	19.9	4.1	0.6
45-64 YEARS	11,187	100.0	27.3	26.5	32.0	11.0	3.1
65 YEARS AND OVER	5,027	100.0	23.2	24.5	32.1	14.9	5.2
$35,000 OR MORE							
ALL AGES	63,722	100.0	50.8	29.0	16.6	2.7	0.9
UNDER 5 YEARS	4,260	100.0	63.9	25.3	9.3	*1.0	*0.5
5-17 YEARS	13,068	100.0	62.9	26.5	9.6	0.8	*0.2
18-24 YEARS	5,948	100.0	55.4	27.5	15.3	*1.2	*0.6
25-44 YEARS	23,267	100.0	51.8	30.4	15.3	2.1	0.4
45-64 YEARS	14,538	100.0	37.4	31.6	24.4	5.0	1.6
65 YEARS AND OVER	2,642	100.0	25.6	23.8	33.0	11.7	5.9

(source: U.S. Department of Health and Human Services, 1986)

2.3 Inequalities in Access and Utilization between Social Groups

The Black Report found that, when comparisons are made between income groups on their utilization of health care services, the lower income groups use health care services more than higher income groups, but if their respective levels of health are taken into account the poor actually use health care services less than the non-poor (Townsend and Davidson, 1982). Studies done in the U.S. show similar results (Newacheck, 1988; Patrick et al, 1988). Given that utilization of health care services typically requires some out-of-pocket expense in the U.S., these differences suggest relative underutilization of health care by the poor, not over-utilization by the non-poor.

Health insurance appears to alter the effect that income has on service utilization. Newacheck (1988) compared the use of physician services between the poor and the non-poor in the U.S. He found that, for people below the poverty level, those who had Medicaid insurance used physician services 26% more than those who did not, representing a pattern of utilization similar to that of people above the poverty level. However, not everyone below the government-set poverty level is eligible for Medicaid coverage because Medicaid sets its own criteria for eligibility which may vary between states (on average, only those people with incomes less than 47% of the poverty level are eligible (Rowland et al, 1988)). Thus, a large percentage of the poor are not covered by Medicaid. In addition, the marginally poor, who also have relatively low levels of health, are likely to experience financial difficulties in obtaining health services due to their ineligibility for public health insurance and their inability to purchase private insurance. Income groups in the U.S. vary greatly in their ability to enroll in the multitude of insurance schemes offered in the health care system. So, even though, as Newacheck suggests, health care insurance appears to adjust (to some degree) for differences in income, health care insurance is not effectively available to all those who need it, thereby reducing levels of accessibility. Even when universal public health care insurance is available, as is the case in Canada and Great Britain, inequalities in health status between income groups continue to persist (Edginton, 1989; Wilkins and Adams, 1983, 1987; Townsend and Davidson, 1982; Wigle and Mao, 1980). Thus the relationship between income, insurance, accessibility, utilization, and consequent health status appears to be very complex.

2.4 Discussion re: Differential Health Status between Social Groups

The issue of the effectiveness of health care services to improve or maintain health status has been of considerable debate in recent times. Does the medical care provided make a difference to health status? The answer to this question is most likely for some conditions, yes, and for others, no.

Historically speaking, improvements in health status have occurred as a result of a variety of changing conditions. McKeown (1965) explains that the increase in health since around 1770 was due to the rise of the standard of living. About a century later, improvements in health were attributed to better sanitary measures. Only in the 1900's does McKeown attribute increases in health to medical intervention. McKeown contends that personal health behaviours and environmental factors are the main determinants of health, and medical care plays a lesser, but necessary, role in the maintenance of well-being.

Hadley (1982) supports this proposition with his argument that medical care is beneficial in reducing mortality rates. However, he cautions that, in light of increasing costs, medical care is not necessarily the most economical or the most "socially intelligent" way to achieve these lower mortality rates; the resources would be better used in preventive measures.

Fuchs (1972) contends that medical care makes an enormous 'total contribution' to health status (i.e. if no health care services were available there would be a substantial negative impact on the health of the population). He does not question the benefits of basic health services, but the effects of additional increments of health care (the 'marginal contribution' of health care). Fuchs advises that generalizations regarding the types of health outcomes from various medical therapies are not possible. Health care is effective in some treatments, not in others. For example, there has been great success in the treatment and prevention of infectious diseases (some of the success is attributable to positive changes in the environment, but medical care does play a substantive role), but more mixed results in the treatment of non-infectious illness. Nervous disorders, most cancers, and cardiovascular disease are a few of the most notable conditions still apparently unaffected by medical treatment.

Other researchers expand on this concept of marginal health care benefits. Some emphasize that beyond basic medical care, personal health behaviour has a greater impact on health status than does additional medical treatment. Glazer (1971) for example, states that as medicine eliminates concerns over traditional major causes of death and disease, personal behaviour and psychological factors become increasingly more important in determining health status.

Levine et al (1983) also support the theory that "public health measures, social conditions, and personal health behaviour are the main determinants of health" (p. 394), but they strongly caution that:

> ... there is danger that in identifying and constantly emphasizing the importance of social and behavioural factors in producing disease, without the necessary strong caveats and cautions, we give increased justification for neglecting the health care needs of millions who suffer from poverty, chronic illness, and the infirmities which attend growing old (p. 401, 1983).

Newhouse and Friedlander (1980) also argue that behaviour has a greater impact on health status than does medical care and they add that the relationship between health care and health status does not appear to be systematic. Smith and Buesching (1985) expand this theory in a study comparing frequent and infrequent users of health care services on health outcomes (perceived health status, disability, satisfaction, and cost). They found that frequent users had higher costs but greater satisfaction from their health care experience than infrequent users, but no difference was found with respect to perceived health status or disability between the two groups. Therefore, medical care may be seen to be ineffective in any real advancements of health status beyond psychological benefits.

The ultimate critic of health care is Illich (1976). He claims that in most cases there is no evidence to prove that medical care is beneficial to health. According to Illich, the environment is the primary determinant of the state of general health of any population and the medical practices and treatments that have been claimed to improve health status really only redefine morbidity. Illich claims that some treatments actually worsen health status, for example, adverse side effects of drugs, alteration of natural bacterial flora leading to decreased resistance, incorrect diagnoses and unnecessary surgery. Illich argues that the increased medicalization of life has given too much power to the health care profession, and this has eroded our culture and values, and has had adverse effects on our health status.

Is medical care effective in maintaining health? The answer is, as yet, uncertain. Obviously there is unlikely ever to be any consensus in the health care research community as to the degree of effectiveness of medical care in maintaining levels of health, but most researchers appear to agree that a basic level of primary medical care is beneficial to the maintenance of health (although it is recognized that environmental conditions and personal health behaviours are also important determinants of health status). Given the expenditures on health care, an investigation into the persistent socioeconomic inequalities in access to and utilization of health services may have considerable implications for the structure of the health care system and the policies governing the delivery of health care.

2.5 Accessibility

It has been established in health care literature that accessibility influences the utilization of health services and that, in turn, health services aid in the promotion and maintenance of health. However, the nature of accessibility and its relationship with utilization remains unclear. Access is a multi-dimensional concept which is ultimately determined by personal and socio-political conditions.

2.5.1) Socio-Political Conditions

2.5.1.1) Geography

The availability of health care services is inherently geographical in nature (Larson, 1988; Joseph and Phillips, 1984; Daniels, 1983; Vladeck, 1983). Existing socio-political structures determine the supply and distribution of resources in a region. The resulting relative locations of place of residence and location of service determine the amount of friction the persons must overcome for health service utilization (HSU) (Joseph and Phillips, 1984). This friction of space is exhibited both in physical distance and in travel time between the individual and the health care provider, and affects the individual's perception of the availability of the health care service. If it is too costly either in time or money to overcome the distance to the health care service, accessibility is restricted and HSU is less likely to occur.

2.5.1.2) Ability to Purchase Health Care

Other investigators prefer to assess accessibility in terms of the individual's ability to purchase health care services (Morey, 1990; Mechanic, 1989; Kasper, 1986; Daniels, 1983; Vladeck, 1983). This ability is determined by an individual's income and health insurance coverage. However, the extent of the influence that income and insurance have on access is determined by the contextual structure of the health care system (Buczko, 1986; Wolinsky, 1978). Burke (1990) states that, in order to alleviate the problems related to access to health care services in the United States, the American Hospital Association must approach the problem of un- and under-insured patients through the expansion of eligibility requirements for government programs like Medicaid, and through encouraging more employer health insurance programs. Morey (1990) agrees with Burke that a stronger stance must be taken against the problems of inadequate health insurance. He suggests that, before any advances can be made with respect to accessibility, action is not only needed from the federal government and individual employers, but cooperation between all levels of government, industry, insurance carriers, the medical field, and the general public is critical. In light of some of the problems related to the social and political context of health reform, it seems unlikely that this type of cooperation and coordination between these parties will occur in the near future, if ever.

Schwartz (1983), argues against the commonly accepted theory that income has a direct relationship with access. He states that income does not affect accessibility, particularly with the present Medicaid program, and that lower income groups actually use health services more than higher income groups. This may be true for those people eligible for Medicaid, but he does not account for the people who are from the lower income groups and yet are not eligible for Medicaid. He also does not appear to account for the differences in need between the lower and the higher income groups.

2.5.2) Personal Conditions

2.5.2.1) Need for Health Care

Apart from these determinants of access which are implicitly identified with the structure of the health care system, lies the more personal issue of the need for health care. It has been established in many studies that people from the lower income groups typically have lower health status than the people from the higher income groups (Patrick et al, 1988; Wilkins & Adams, 1983; Townsend & Davidson, 1982; Kitagawa & Hauser, 1973). In addition, health status is recognized as one of the strongest predictors of HSU (Mechanic, 1989; Buczko, 1986; Greenly, 1980; Wan and Soiffer, 1974). Patrick et al (1988) examined the link between income and health status in the U.S. according to accessibility of health care services. In their analysis, increased poverty is shown to be related to increased need for health care, but it also decreases accessibility to health care which, ultimately, lowers rates of utilization and may jeopardize health status.

In spite of this report, Daniels (1983) suggests that, if the need is great enough, a person will overcome any barriers to access, using health care services even when access is very difficult. Even if this proposal is true, one must consider the long-term health consequences of late intervention: if HSU only occurs when absolutely necessary, health status may be compromised and the curative care sought will most likely require more costly and more intensive medical treatment for acute and critical health conditions. For those conditions for which early intervention is known to be effective (e.g. hypertension and breast cancer), prevention and early detection should be encouraged in order to maximize health status and economic efficiency.

2.5.2.2) Predisposing Variables

Health service utilization is also affected by "predisposing variables". These variables are characteristics of the individual: age, sex, race, ethnicity, social class, beliefs, and they affect perceptions of need for health care, and the value placed on well-being and the acceptability of the health care system (to be discussed further in chapter 3).

Although increased access does not guarantee higher rates of utilization, nor does it guarantee increased health status, it is recognized that (i) some degree of access is necessary before use can be made of a service, and (ii) health services are effective in primary health care. Ultimately, access is determined not only by individual characteristics but also by the underlying societal values and political underpinnings of health care policy, which help to structure the form of a country's health care system.

2.6 Health Care Systems

Health care systems throughout the world vary greatly in their ability to deliver health care services to the population. Although each system has as its ultimate objective the enhancement of the well-being of the population, systems differ greatly in their structure. Structures reflect the values and priorities of the society in which they have developed (Mayer, forthcoming). For example, Canada has universal public health insurance, which (in theory) eliminates financial barriers to access. There are no out-of-pocket payments required for most medical procedures, and in only two provinces (Alberta and B.C.) are premiums charged. The U.S., on the other hand, has a multi-dimensional system in which each person is responsible for his or her own health insurance coverage, with limited state support for specific groups (the aged, poor, and medically indigent).

The Canadian and U.S. systems differ not only in their basic structure, but also in the proportion of the country's GNP expended on the health care sector (table 2.5).

Table 2.5: Health Care Costs, 1988

	U.S.	Canada
Population (000)	240,856	25,625
Per Capita Health Care Costs	$1,926	$1,370
% GNP	11.1%	8.5%

(source: M. Taylor, 1990)

These differences in health care financing have the potential to translate into differences in access to health services, which in turn may influence utilization rates. An understanding of the relationship between health care policies, their influence on access and utilization (and the consequences for health status) may enable health care planners to respond more appropriately to gaps in the provision of health services. We will first look at the Canadian health care system and the policies and structures present, in order to provide the context in which this research is being performed, and to provide a basis for comparison with the U.S. system, and then go on to further discuss the impact that these policies have on access to health care, utilization of health services, and the resulting consequences for health status.

2.6.1) Canadian Health Care

The Canadian Health Care system is one of the most respected health care systems in the world, yet it has not been without its problems or controversy. The Canadian system is actually made up of twelve subsystems, each administered by one of the provinces or territories and each of which is subsidized by the federal government. Responsibility for health care was allocated to the provinces[1] originally in the British North America Act in 1867, and has remained a provincial responsibility since that time. Although responsibility for the administration of the health care system exists at the provincial and territorial level, the federal government has been responsible for setting standards for the delivery of health care in Canada and ensuring that the provinces abide by those standards, thus the potentially diverse and fragmented health care system is unified by nationally guarded values and principles.

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[1] Territories are included in any reference made to provincial jurisdiction.

During 1919 the movement for a nationally unified health care system in Canada began. The resulting progression of government initiatives included National Health Grants (1948-1953) for hospital construction (which required a fifty-fifty cost split between the federal and provincial governments), the Health Insurance Diagnostic Services Act (HIDSA, 1958) which legislated health insurance for hospital services and procedures (again, a fifty-fifty cost sharing agreement between the federal and provincial governments), and the first universal health insurance program (Medical Care Insurance Program, 1962) in Saskatchewan. This program was met by some opposition, particularly by physicians who saw it as limiting their freedom in their medical practices, but it helped to set the stage for a national program.

In 1964 a Royal Commission on Health Services (the Hall Commission) recommended, for the first time, federal-provincial cooperation on universal health care programs. The Commission suggested that the provinces be allowed to develop their own health care programs and services while maintaining accountability to federally-defined principles for the administration of these programs. The four principles recommended by the Hall Commission were:

1) Comprehensiveness - Cover all medically necessary health services performed by general practitioners and specialists.

2) Universality - Cover one hundred percent of the population on uniform terms and conditions.

3) Portability - Full transferability of benefits for people moving between provinces, or travelling outside of their home province (domestic or international travel).

4) Public Administration - Administered either by the provincial government or by some provincial non-profit agency.

The Commission's report led to the approval of the Medical Care Act in 1968, which expanded on HIDSA to include physician services.

In response to rising health care costs in the 1970's and early 1980's, many doctors and hospitals began extra-billing their patients and charging user fees. The negative impact that these additional charges had on the utilization rates of patients, particularly those from the lower income groups, moved the government to enact the Canada Health Act in 1984. The Act incorporated a fifth principle into Canadian health care: accessibility. This principle of accessibility required that all insured health services be financially accessible even to those from the lowest income groups, thus limiting provincial rights to permit extra-billing and user fees for insured health services. The federal government was given the right to deduct from its payments the same dollar amount that physicians or hospitals received through user fees or extra-billing. All provinces were in compliance by 1987.

The evolution of the Canadian health care system continues; rising medical costs, increasing numbers of elderly persons, a growing national deficit, the current recession, and the neo-conservative agenda of privatization of the welfare state are all exerting mounting pressures on the federal government and/or on the present health care system. In an attempt to limit federal expenditures, the federal government has passed legislation which will reduce, and eventually eliminate, transfer payments to the provinces for health care. Once again, concerns are raised regarding the effect that these cutbacks will have on the adherence of the provinces to the five underlying principles of the Canada Health Act. Some critics argue that the federal government has relinquished its right and its obligation to enforce compliance to the Canada Health Act and any alternate attempts to regain the authority entrusted to them may be difficult to accomplish.

In anticipation of these changes, Canadian researchers are becoming very interested in the functioning of the competitive market system in the United States.

2.6.2) United States Health Care

2.6.2.1) History

The health care system in the United States has a much different history than that of the Canadian system. The competitive system of health care financing has been allowed to operate largely without state or federal intervention in the U.S., thus a more pluralistic system, composed of many different modes of payment and insurance schemes (each requiring different levels of financial participation from the individual), has evolved.

Individual freedom and liberty are the underlying principles upheld in all U.S. legislation. These freedoms put the responsibility for obtaining necessary services (such as health care) onto the individual; failure to care for oneself is seen as a reflection of personal inadequacies or shortcomings as opposed to a fault in the structure of the American way of life.

The most significant developments in the evolution of the U.S. health care system took place after World War II, prior to which medical care had little to offer in the way of treatment of disease and illness. This fairly rapid evolution beginning around 1940 was partly due to increased personal expendable income, increased scientific legitimacy of the medical profession, increased medical technological innovations, and increased federal funding for scientific and medical research. In addition to these factors, the President of the time, Harry S. Truman, was a supporter of the movement for national health insurance (NHI) and thus the issue of health care had a national forum.

However, forces working against the movement for NHI were considerable at this time. Anti-socialist and anti-communist sentiment was strong in the U.S. and any control held by the federal government was looked on with suspicion. The new and quickly-developing American Medical Association (AMA) was a strong advocate for a competitive health care market and perceived NHI as a form of "socialized medicine" and the "enslavement of the medical profession" (Campion, 1984).

By 1950, private health insurance was the preferred method of financing for the employed and self-supporting population (in comparison to out-of-pocket payments or federal programs), although the special circumstances of the elderly, retired population began to become apparent to the AMA and the general public in the early 1950's. Steps to provide the elderly with some sort of health insurance program were not made until the mid 1960's when the search for equity in access to health care services was most fervent. Soon after this time, it became apparent that another significant portion of the population, the destitute, were in need of some assistance in accessing medical services. In 1965 the bills proposing Medicare health insurance for the elderly population and Medicaid health insurance for indigent people under 65 years of age were passed.

Although the legislation for these two programs had been approved, the regulations and details of their management had yet to be defined. The federal government, under the Johnson administration, invited the AMA to join with the governmental departments participating in these decisions. The cooperation of the federal government and the AMA not only led to the development of generally acceptable administrative regulations for Medicare and Medicaid, but it also led to the development of better understanding and more profitable relations between these two influential bodies.

2.6.2.2) Medicare

Medicare is designed to aid the elderly population in accessing health care services by reducing out-of-pocket expenses. The program reimburses institutions and individuals for costs of the care they provide to Medicare beneficiaries. In 1985 the program covered 30 million people and cost $70 billion. Medicare is composed of two different programs:

Part A) Automatic enrollment for hospital inpatient service benefits for retirees receiving social security payments (people over 65 years). According to a 1972 amendment, disabled people who have been eligible for social security cash benefits for at least 24 months are also entitled to make application for Medicare coverage. The program is financed by employer and employee payroll taxes.

Part B) Automatic enrollment (with the option to decline) for disabled and elderly people. Medicare Part B helps pay for physician services, outpatient hospital care, and home health services, but not services such as routine physical examinations. Non-retirees must apply for benefits. The program is financed by beneficiary premiums and federal government general revenue contributions. The individual is responsible for a deductible, and Medicare then pays 80% of the approved charges received.

Medicare certainly reduces financial responsibility for the elderly in need of health care, but by no means eliminates it; the enrollees are responsible for what could amount to major costs (table 2.6).

Table 2.6: Health Service Charges Applied to the Client in Medicare Insurance, Parts A and B

	Part A	Part B
premiums	$214/month	$15.50/month
deductibles	$492	$75
co-payments	up to $246/day	20% charges

(source: Fein, 1986)

In addition to the charges listed in table 2.6, clients are responsible for the differences in costs between medicare-approved and actual charges, as well as 100% of the services not covered by medicare (Fein, 1986 pp. 72-77). Some other limitations of the program are the restrictions on the length of stay in hospital and nursing homes, a considerable problem to persons over 65 years of age. Medicaid and private charities may help to cover some of the gaps in the costs of health care, but it is still not necessarily affordable for the elderly population.

2.6.2.3) Medicaid

Medicaid was designed as a federal- and state-funded program intended to meet the health care needs of the indigent under 65 years of age. In its evolution it has become a very complex program in which eligibility varies dramatically between states. The federal government sets basic national requirements for administration but within those requirements each state is free to define its own rules, eligibility, schedule of benefits, and administrative structure.

If a state elects to participate in the Medicaid program, it must provide coverage (that is, pay providers for services delivered) to all Federal cash-assistance recipients: those people receiving Supplemental Security Income (blind, disabled, aged), people receiving Aid to Families with Dependent Children (AFDC), and certain categories of pregnant women. States also have the option to include the medically needy (whose medical bills reduce real family income to below federally-defined "welfare" levels), and others who have very low incomes but do not meet the other eligibility criteria outlined above (the expenditures for these latter groups are not subsidized by federal contributions).

The federal government also requires each state to cover a minimum of services, but the states are allowed to set "reasonable" limits on utilization of these services. These services include inpatient and outpatient hospital care, nursing home and home health care services (this is especially relevant to elderly people whose long-term care needs are not met by Medicare), as well as medical testing and physician services.

The broad objective of Medicare and Medicaid was to lower, if not remove, financial barriers to medical care for the elderly and the indigent, and by the mid 1970's was seen to be successful in this endeavor (Campion, 1984): hospital admissions for the elderly increased by 25% during the ten years since the enactment of these government programs, surgical procedures for the elderly increased by 40%, and the number of hospital days per elderly person increased by 50%.

2.6.2.4) Health Care Costs and Cost Controls

Shortly after the enactment of these programs, health care costs began to increase. As financial barriers were removed for medically needy people, utilization rates increased, pushing up costs. The elderly population composed approximately 10% of the total population, but accounted for 30% of health care costs and therefore the expenditures for Medicare were substantial (Campion, 1984). These two programs were not the only contributors to escalating costs; health technologies were becoming increasingly sophisticated and more expensive, increasing numbers of physicians were specializing (leading to higher fees and fewer numbers of general practitioners available to provide primary health services), and increasing utilization rates due to decreasing cost consciousness (a result of the increased numbers of publicly and privately insured people who were no longer limited by out-of-pocket payments).

Many regulatory attempts were made to control costs, with varying levels of success. Strategies included:

1) Price and wage controls in the form of ceilings on physician fees, and hospital charges, were imposed during the Nixon Administration but, when removed in 1975, health care costs jumped to a scale that would have existed without the temporary cost controls.

2) Peer Review Program and Professional Standards Review Organizations (PSRO) endeavored to enforce checks on quality and appropriateness of care. However, differences existed between physicians and the federal government in their perspectives of the original objectives of the programs; physicians saw peer review as an opportunity to improve the quality of care and educate themselves, the federal government expected the PSRO to be more of an internal auditing process. Physicians felt threatened not only by the governmental control over the PSRO but also by the government's emphasis on cost control even at the expense of quality of care. PSRO legislation passed in 1972, but proved to be only effective in reviews of hospital admissions and lengths of stay, not nursing homes or ambulatory care (office visits) which are two major areas of expenditure. Finally admitted to be a failure, the PSRO legislation was repealed in 1981 (Campion, 1984).

3) Health Maintenance Organizations (HMO's) were established in the early 1970's. These organizations are designed to encourage cost controls through market

competition rather than through legislative controls. HMO's operate on fixed, prepaid annual fees, and are responsible for the health care needs of each of the enrollees. The physicians, therefore, are encouraged to focus on the prevention of morbidities because the cost for preventive measures is less than that of treatment costs. There are debates surrounding the effectiveness of these organizations. Some supporters suggest that this type of administration gives adequate motivation for physicians to keep costs down, while emphasizing the individual's health (Enthoven, 1980, McClure, 1983). Critics argue that costs will only be kept down if, in fact, physicians are substantially motivated by economical factors (Petchey, 1987), and there is a concern that this emphasis on cost controls may lead to lack of appropriate levels of care.

2.6.2.5) Quality, Cost and Access

Balancing the three major components of any health care system (quality, cost, and accessibility) has proven to be a never-ending challenge. Quality of health care increased dramatically after the Second World War, and for the next two decades the challenge for health care planners was to provide equitable access to health services. When the costs of this level of accessibility and quality of health care translated into a quickly growing proportion of the GNP in the 1970's and 1980's, the emphasis was shifted to cost controls, at the expense of levels of access. The 1980's were typified by a shift of administrative and jurisdictional responsibilities from the federal government to the states in an attempt to reduce federal expenditures. Health care advisors in the U.S. are now recommending that, in an attempt to defer costs from state and federal governments, the burden for financing health care be shifted back to the individual to increase cost-accountability.

The problems that some of the cost control measures and health care reform proposals have experienced in the U.S are due to the lack of a broader social perspective of the context of the existing problems and areas for potential reform. For example, it has only been relatively recently recognized that health status is affected not only by medical care but also by other factors such as lifestyle, environment, and genetics, to name a few (Lalonde, 1974). It is very difficult to implement reform within the health care system which will address all of these causal factors, let alone coordinate reform efforts across multiple social programs and government systems.

Not only has the diversity of health-related social programs created a complex environment for health care administration, but the potentially conflictual rights and liberties held by individuals also create a problem in health care administration and reform. Physicians are bound by ethical duty to perform medical services for people in need, but at the same time individuals are responsible to maintain their own health. Americans struggle with balancing the individual's right to adequate health care with the physician's right to practice medicine free of governmental interference.

How do all of these issues surrounding health care ultimately influence the ability of people to obtain health care? Given that most people are not willing to compromise the quality of care received, one must consider the level of accessibility to health care services, and how it may be modified in order to control costs. This immediately raises concerns regarding how this modification (ultimately reduction) of accessibility will differentially affect people of various income groups. If the impact of this increased financial responsibility for health care is differentially distributed across income groups, how will their mode of payment affect their decision to use health care services? If differences exist in utilization rates between income and insurance groups, what kind of effect, if any, will this have on the overall outcome in health status?

In light of the concerns that are being raised regarding the potential demise of universal public health insurance in Canada, it is appropriate that an investigation be performed on the current income- and insurance-related patterns of access and utilization within the U.S. free-market health care system.

2.7 The National Mortality Followback Survey (NMFS)

The U.S. National Mortality Followback Survey (1986) provides an opportunity to investigate further the extent of the influence that income and insurance have on health service utilization, thereby providing an indirect measure of their influence upon access. The NMFS database contains 18,733 records of people who died during 1985 in the U.S. Information for the database was obtained from mortality files (which include the death certificates) and from questionnaires completed by friends or relatives of the decedents (see Appendix I for the questionnaire). The information in the database regards:

i) care in the last year of life: use of health care services, difficulties in accessing services, and the costs of health care received in the last year of life;

ii) health status of the decedent: significant comorbidities, activities of daily living and family health history; and

iii) personal and lifestyle characteristics: occupation and financial information, race, age, and marital status.

Comparisons will be made between income groups to assess the influence of income upon utilization of health care services in the last year of life. In addition, comparisons will be attempted between insurance groups (with and without controlling for income) to assess the effect of payment mode on the utilization of health care services. Both types of comparisons will be made with respect to the types, number and duration of services used in the last year of life and problems encountered in paying medical bills. These comparisons will be made for a variety of subgroups with different racial, gender, and age characteristics.

Analysis of the follow-back survey will provide us with information concerning the impact of income and insurance upon health service utilization, and provide important preliminary information to researchers interested in issues of accessibility and utilization.

3.1 INTRODUCTION

The National Mortality Followback Survey (NMFS) was conducted by the National Center for Health Statistics (NCHS), U.S. Department of Health and Human Services. This database contains 18,733 records of U.S. residents who died in 1985 and were 25 years or older at the time of death. These records were gathered from the Current Mortality Sample (CMS). The CMS contains a systematic sample of 10% of the death certificates from each U.S. state (excluding Oregon[1]), the District of Columbia, and New York City, which is considered separately from New York State for death registration. In addition to the information yielded from the death certificates, the database also contains information regarding health and lifestyle characteristics of the decedents and circumstances surrounding their deaths obtained from a questionnaire survey of friends and relatives of the decedents. The database also contains facility abstract records which provide detailed information of the care received by the decedent in the last year of life.

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[1] Oregon is not included in the NMFS due to the state's respondent consent requirements. Oregon accounts for approximately one percent of deaths of people over 25 years of age in the U.S.

3.2 SAMPLING & WEIGHTING PROCEDURES

3.2.1) Sampling

The NMFS contains a stratified sample of the CMS to ensure the inclusion of a significant number of such individuals as: Native Americans, Inuit, Aleuts, Blacks, people under 55 years of age, and people who died of ischemic heart disease, asthma, and cancer (selected according to age, gender, and race characteristics). This sample of the CMS provided the 18,733 death certificates for the questionnaire survey.

The U.S. Bureau of the Census conducted the questionnaire survey on behalf of the NCHS. Questionnaires were mailed to the 18,733 people who had supplied information on the death certificates (see appendix 1 for a copy of the questionnaire and the cover letter). A covering letter explained the purpose and the importance of the survey, and encouraged participation from the informant. It also confirmed the confidentiality of the identity of both the decedent and the informant. Two mail outs were performed, after which non-respondents were telephoned and the questionniare administered through personal and telephone interviews.

A response rate of 89% was achieved (16,598 returned questionnaires). However, 1059 of the returned questionnaires had too many missing fields to be included in the database. Therefore, the actual useable response rate was 82.9%. Thus the database contains 18,733 records from death certificates (which offer minimal demographic information) with supplementary information on personal and lifestyle characteristics and care received in the last year of life for 15,539 of these records. Finally, facility abstract records were obtained from all health care facilities in which the decedent had spent as least one night during the last year of life. These facilities were identified from the death certificates and the informant questionnaires. Supplementary health care utilization information was obtained for 12,275 of the decedents, each of which may have up to six facility records, and up to twenty episodes of care for each facility. Information from the health care facility survey includes admission and discharge dates, as well as diagnoses made and surgical and diagnostic procedures performed during the stay.

The author has been unable to obtain further information regarding the sampling procedures employed by the Bureau of the Census or by the NCHS (e.g. timing of mail-outs and interviews, number of call backs made to informants, pilot testing, etc.) despite numerous attempts to obtain this information (two letters and a fax).

3.2.2) Weights

Because the database was constructed using a stratified sampling procedure, the sample was weighted to achieve nationally representative estimates. The database has been weighted in three different ways:

(i) sampling weight - This weight adjusts for the probability of being selected for the sample because of the over-sampling of Blacks, Native Americans, people under 55 years of age, and people who died of specified causes of death (for specific age, gender, and race cohorts).

(ii) non-response adjustment - To control for potentially different response rates between sub-populations each strata weight was adjusted for response rates. "This adjustment factor reduced non-response bias to the extent that data for a non-respondent is similar to the data for respondents in these adjustment classes" (NMFS Documentation: Statistical Design of the NMFS).

(iii) post-stratification by demographic characteristics - These weights are relative to the age, gender and racial structure of the U.S. national population (excluding Oregon) in order to mold the NMFS sample into a similar demographic structure as that of the U.S. population.

These weighting procedures attempt to correct for systematic sampling biases. However, because of their magnitude, the resulting weights may be misrepresentative of the actual underlying population; in some cases one response accounts for up to 200 or 300 persons based on a total N of less than ten responses! It may be misleading to apply all the characteristics of one person to such a large estimate based on only the cause of death, age, gender, and race. Even though individuals can be grouped together into sub-populations based on similar characteristics, one cannot generalize all characteristics across the whole sub-population. For example, one cannot assume that all people of a specific age, race, gender and cause of death shared similar lifestyles, attitudes toward health and health care, or had similar levels of insurance coverage. Neither can one make assumptions regarding health needs or even the availability of health services for all those people. These health care factors are also influenced by a person's income, education, family structure, culture and many other personal characteristics which are not accounted for directly in the NMFS weighting procedures.

3.3 THE DATABASE

3.3.1) The Questionnaire

The questionnaire consisted of a total of 158 items which were divided into four major categories: background information on the informant, care in the last year of life, lifestyle and health status of the decedent, and personal characteristics of the decedent. These major categories contained the following types of information:

3.3.1.1) Care in the Last Year of Life - services used, assistance received, and problems encountered in accessing services (waitlists for services, problems getting treatment or care from a health care professional, or problems paying medical bills) (items B1-B19 and B25-B46 in appendix 1).

3.3.1.2) Lifestyle and Health Prior to Death - general health status (existence and duration of morbidities), conditions surrounding death, female reproductive history, and general lifestyle characteristics such as diet, exercise, and use of alcohol and tobacco (items C1-C66 in appendix 1).

3.3.1.3) Personal Characteristics of the Decedent - occupation, education, income, race, health insurance coverage, marital status, pertinent spousal information, family size, and family health history (items B20-B24 and D1-D42 in appendix 1).

The questionnaire also included a few supplementary questions regarding the relation of the informant to the decedent (items A1-A4 in appendix 1).

3.3.2) Facility Abstract Records

In addition to the questionnaire, the NMFS database contains facility abstract records which were obtained from health care facilities that were used by the decedent in the last year of life. These records include admission and discharge dates, diagnoses made, and surgical and diagnostic procedures performed (see appendix II).

3.4 VARIABLES

To assess the influence of income and insurance mode on utilization, the following information from the NMFS was used:

3.4.1) Independent variables

3.4.1.1) Family Income - The income variable is based on total family income for the year prior to the decedent's death. The income categories were divided into three groups: under $11,000, $11,000 to 25,000, and $25,000 and over. The poverty level for a non-farm family of four in the U.S. in 1986 is $11,000 (U.S. Bureau of the Census, 1991). The database did not provide detailed income information for people with family incomes over $25,000.

3.4.1.2) Insurance Mode - The variable concerning health insurance in the NMFS database provides information on the sources that provided the majority of funds with which the decedent's medical bills were paid. These sources are grouped into the following categories:

- not insured (NOTINS) - self or family was major source of payment;
- government (GOVT) - medicare or medicaid;
- other government (OTHGOV) - Veteran's Administration, Indian health, social security, social security disability, welfare, or other government programs;
- private (PVT) - health maintenance organizations (HMO), privately purchased health insurance, employer provided health insurance, Federal Employees' Health Benefits Program (FEHBP), or Civilian Health and Medical Program of the Uniformed Services (CHAMPUS);
- other - philanthropy or 'other' category from the NMFS questionnaire.

3.4.2) Dependent Variables

The dependent variables are those items which concern the different forms of health service utilization (HSU). The complete list of health services used by the decedents in the last year of life and recorded in the NMFS database include:

- overnight stays in a hospital or nursing home;
- number of nights spent in hospital;
- overnight stay in a health care facility other than hospital or nursing home;
- hospice care;

- number of doctor visits;
- wait lists for, and successful entry into, nursing homes, hospice care, homemaker service, and visiting nurse services; and
- general and medical assistance at home.

Ease of access to some of these health care services was also measured by assessing the degree of difficulty the person experienced getting into nursing homes, getting treatment from a doctor, and getting help at home, as well as problems paying medical bills. In total, twenty variables related to HSU exist in the NMFS database. Of these twenty variables, the six services most commonly used were selected for the analyses. These include:

(i) DRVIS: number of doctor visits in the last year of life (all types of doctors other than visits made during overnight stays in hospital, nursing homes or other institutions);

(ii) PPAY: Problems experienced by anyone in paying the medical bills for the person;

(iii) AID: receive help at home in the last year of life from other person(s) in walking, eating, bathing, dressing, or using the toilet;

(iv) AIDMED: received nursing care or other help at home during last year of life in giving medicines, pills, shots, injections, or in changing bandages;

(v) HP: overnight patient in hospital or resident in a nursing home in the last year of life; and

(vi) HPNIGHT: If yes to HP question, number of total nights in hospital in the last year of life.

3.5 DATA QUALITY

Before proceeding to the analysis, a number of potential shortcomings of the data must be mentioned. Results are dependent upon the quality of the data used.

3.5.1) Proxy Reporting

Secondary information sources, such as the NMFS database, need special consideration in terms of the dependability of the informant and the resulting quality of responses (Babbie, 1989). The most obvious problem is the potential for insufficient or inaccurate knowledge on the part of the informant. Incomplete knowledge may be accounted for by the depth of the relationship between the informant and the decedent. If the informant had limited contact with the decedent, such as a relative who had not seen the decedent for some time prior to death, the quality of information provided might be suspect. Even informants who had regular contact with the decedent but were not privy to information about the person's health or financial situation might provide erroneous information. Further, an informant might have been deliberately misled by the decedent about personal information regarding his or her physical condition or financial status.

Thus, for whatever reason, the informant may not be able to give accurate information. Lower income groups are particularly susceptible to the limitations inherent in proxy reporting. Income in the NMFS database is measured as family income. The lowest income groups are more likely to contain persons who lived alone and therefore are less likely to have knowledgeable informants than are people with higher family incomes. Lower income people (particularly people with annual incomes of less than $11,000) tend to have higher rates of homelessness and less stable or shorter term residences and may, therefore, be less likely to have as many intimate relationships as persons in higher income groups. The existence and availability of knowledgeable informants may also vary according to racial or cultural familial practices and relationships, or education level (especially with regard to comprehension of health conditions and medical diagnoses and treatments).

3.5.2) Non-response

The strength of the database is potentially weakened by the refusals to respond to the questionnaire. As discussed previously, 2135 people did not respond to the questionnaire (11.4% of 18,733) and another 1059 (6.4% of 16,598) failed the final edit of the questionnaire. The remaining 15,539 records have varying response rates to each individual question in the survey. The non-responses to the individual questionnaire items are divided into five categories:

DK	Informant does not know the answer
NA	Not ascertainable (illegible entries, blanks, and other non-codeable answers)
OU	Out-of-universe: decedents for whom no questionnaire was completed (2135) and decedents involved in skip patterns of a given item
REF	Informant refused to answer the question
MULT	More than one response made for one question

For most of these categories the issue of comprehension plays a major role in determining response rates to the questionnaire. People who cannot understand English (due to illiteracy or because of a language barrier) are more likely to have lower response rates than those people who have no comprehension difficulties. Lower income groups and racial minorities tend to have such language barriers and, as a result, may have lower response rates than groups with higher incomes or with English as their first language.

3.5.3) Questionnaire Items

3.5.3.1) Reliability

The issues of reliability and validity arise in the analysis of any questionnaire. Reliability refers to the ability of an instrument to produce consistent results. The reliability of this particular instrument is difficult to estimate due to the lack of knowledge regarding the formulation of the questionnaire and the testing procedures (pilot test, revisions and retests) performed prior to the final survey. It is known that another NMFS was performed during 1966-68, but it is not known whether the 1986 NMFS used the same questionnaire items as this previous survey. Furthermore, the results of the 1966-68 survey and the consistency with which it measured levels of health status and rates of utilization are unknown. Although difficulties regarding the reliability of interview surveys have been documented (Babbie 1989), information regarding the training procedures for the interviewers of the 1986 NMFS and the consistency with which they led their interviews is also unknown. In spite of such ambiguities, these factors are not known. One of the strengths of the NMFS database is that it retains information from all sources, even if it requires the duplication of some questions like age at death, race, or cause of death. This duplication allows for comparisons to be made between the responses from these different sources on some of the items within the database, and thus allows for some assessment of the reliability of the questionnaire.

3.5.3.2) Validity

Some of the items in the questionnaire appear not to have content validity because two or more different ideas are combined into one. Does the questionnaire actually gather the information it purports to measure? The discussion that follows identifies some caveats with which to consider the validity of the NMFS questionnaire.

(i) The nature of the information requested by the NMFS is of a sensitive nature and the grief that the informants might feel may influence the accuracy of their response; for example, they may be more apt to forget details of health care services received in an attempt to forget the pain associated with the decedent's condition.

(ii) Activities of Daily Living - "Did the decedent receive help in or use special equipment to do the following activities: walking, eating, bathing, dressing, and using the toilet?" (Appendix I, items B25-B34). This question measures the number of people who received assistance to do these activities, not necessarily the people who needed the assistance, thereby reflecting the ability to pay for equipment or services, not the underlying need for the assistance. For example, people of lower income may require assistance in their activities, but may not be able to afford it, whereas people from higher income groups with the same needs are able to afford the special services. Therefore higher income groups are more likely to be measured by this questionnaire item as being in greater "need". In addition, the special equipment is not defined, limiting the question's ability to determine the extent of the disability. The question regarding walking does, however, provide examples of special equipment: canes, walkers, wheelchairs, handlebars, etc. However, the type and duration of disability varies greatly among these types of assistance, which makes interpretation of the level of need very difficult.

(iii) Morbidity Measurement - The only questions addressing levels of morbidity ask whether the decedent had any of the twelve morbidities defined by the NMFS (high blood pressure, heart attack, angina, stroke, alzheimer's disease, diabetes, mental problems, diabetes, cancer, asthma, other lung conditions, and cirrhosis of the liver), and how long before death had the condition been diagnosed (Appendix I, items B1-B26). There may be conditions that contributed to mortality other than these twelve conditions and there also may be conditions that were undetected or undiagnosed. Apart from the comprehensiveness of the questionnaire, the accuracy of reporting the morbidities is dependent on the decedent's and the informant's ability to understand (and to remember) diagnoses of health conditions. Quality and accuracy of the reports is therefore influenced by education, language, culture and income (relationships discussed regarding response rates).

(iv) Definition of Accessibility "Problems" - Causal factors for problems experienced in getting treatment from a doctor, in getting aid at home, or in getting into nursing homes are not necessarily limited to financial difficulties in paying for the services, but may also be due to other factors such as the availability of health services, or even the acceptability of the service or provider. Income may influence the perception of difficulties in access: for example, lower income people may have more problems with transportation to the health care provider, less flexibility in time off from work or time apart from children, or different priorities regarding health. All these factors may influence the decision to use health services. Thus, lower income people may be less likely to attempt to access health care services (as discussed in chapter two). People who did not try to access these services are recorded in the "no problem" category, along with those people who were able to get the care they needed without any difficulty, thus the "no problem" category potentially carries more than one type of response.

Again, problems in paying medical bills may not be related to financial difficulties, but to administrative 'red tape' and other processes that act to hinder access to health care services. This may be particularly true for low income people whose income level may fluctuate (e.g. due to periods of employment and unemployment), resulting in changes in their eligibility for government programs like Medicaid. Ability to negotiate the paper work required by insurance companies will also vary with personal characteristics (income, education, language, and culture), thereby making it more difficult for some people to acquire the means by which to pay their medical bills.

(v) Waitlists - The presence of waitlists for nursing homes, hospice care, homemaker service, and for visiting nurses indicates that the supply of these services does not meet the demand for them. People of different sub-populations may have different reasons for being on waiting lists including: the health status of the person requiring professional care; inability to support the ill or disabled person at home (logistically, financially, or physically); and inability to afford full time professional care in higher level institutions (e.g. acute care hospitals).

Because the lower income groups suffer from higher levels of morbidity, they require proportionately more care. They typically cannot afford to take care of friends or family members at home, let alone afford high level health care, and thus these in-home and nursing home services may be their best compromise for health care (although without some form of health insurance, the poor are unlikely to be able to afford any level of professional health care).

(vi) Last Year of Life Recall - Recall of HSU in the last year of life becomes particularly difficult when death has been sudden, as is typically the case for young people and persons not chronically ill. There is no significant start date for the last year of life for most deaths (deaths occurring Christmas Day, on a birthday, or some other special occasion may prove the exception), and episodes of care unrelated directly to the cause of death are likely to be missed.

3.6 SUMMARY

Given this outline of the type of information included in the NMFS database, the sampling and weighting procedures used by the NCHS, and some of the caveats we must consider in the analysis, we now turn to the results of the investigation.

4.1 INTRODUCTION

To analyze the NMFS data, the sample of decedents was initially divided into homogeneous subgroups, each containing a unique combination of people with similar personal characteristics (specifically: age, race, gender, and health status). These subgroups were created to control confounding variables that might also influence utilization of health services. The utilization patterns of the people from various income and insurance groups within these homogeneous subgroups were then compared. Analysis of individual homogeneous subgroups allowed for the use of the unweighted data, which was felt to be advantageous in light of the discussion above (Chapter 3).

4.2 METHOD OF ANALYSIS

4.2.1) Identification of Confounding Variables

Ideally, analysis of the NMFS database would simultaneously control for the following potentially confounding variables: number of morbidities, activities of daily living, cause of death, age, gender, race, and location of residence. These characteristics are known to be associated with levels of health service utilization. Therefore, failure to simultaneously control for these variables could lead to erroneous conclusions concerning the influence of income and insurance mode upon health service utilization (HSU). The rationale for controlling each of these factors is outlined below.

(i) Health status: number of morbidities and activities of daily living (ADL)

Obviously, health status has an effect on HSU. Health status is a major determinant of the need for health care. The greater the need, the more likely the person is to seek health care (if the services are available and affordable to the person in need). Certainly this is likely to be true both for persons with no morbidities, for they would only require care for infrequently occurring transient episodes of acute, self-limiting morbidity, and for persons with chronic morbidities requiring regular clinical management (e.g. diabetes and hypertension).

Limitations in activities of daily living (walking, eating, bathing, dressing, and using the toilet) may be used as proxy measures of relative health status. The assumption here is that persons with activity limitations are more likely to require health care services than those with no activity limitations.

People in the U.S. with extreme health care needs (severe, debilitating illnesses or disabilities) may be covered by some form(s) of public assistance which are intended to enhance their ability to purchase the necessary health care. Thus, health status not only increases the need for health care, but also may increase the ability to purchase health services through some form of public assistance for the medically indigent.

(ii) Cause of death: Depending on the cause of death, the types of services used and the duration of use may vary. Persons with chronic, long-term illnesses require distinctly different services than persons with sudden or traumatic illnesses and deaths. Because cause of death is not uniform across all income groups, it is assumed that the demand for health services in the last year of life related to cause of death is also not uniform.

(iii) Age: Older adults typically have lower levels of health status and comparatively more activity limitations (in duration, severity, and number of restrictions) than younger adults (Wilkins and Adams, 1987; Roos et al, 1987; U.S. Department of Health and Human Services, 1986). They are also potentially more susceptible to higher levels of supplier-induced demand (Evans et al, 1988).

Type of insurance coverage varies with age as well, which may influence the use of health care services. Persons over 65 in the U.S. are eligible for medicare insurance whereas people under 65 years are required to finance their health care needs through other resources (out-of-pocket payments at time of service, private health insurance, medicaid, Veteran's Administration, etc) which vary greatly in affordability and eligibility.

(iv) Gender: Women and men differ with respect to activity restriction, levels of morbidity, life expectancy and medical experiences. Life expectancy is greater for women, but so too is the average duration of morbidity and level of activity limitation (Edginton, 1989; Wigle and Mao, 1988; Wilkins and Adams, 1987; Townsend and Davidson, 1982). Women also tend to use health care services more than men (Edginton, 1989, Townsend & Davidson, 1982).

(v) Race: Blacks in the U.S. have poorer health status than whites. This discrepancy is reflected in higher levels of morbidity, shorter life expectancies, and higher rates of mortality (Andersen et al, 1987; Edginton, 1989). As can be seen by table 4.1, blacks are also reported to be less likely to have private health insurance (23% less than whites), and 21% of blacks under 65 years are uninsured compared with only 14% of whites of the same age cohort.

Table 4.1: Insurance Coverage of Whites and Blacks in the U.S., 1987

Race	Insured	Not Ins.	Private Ins.
White	88%	12%	80%
<65	86	14	80
65+	99	1	77
Black	80%	20%	57%
<65	79	21	58
65+	98	2	42

(source: p. 138 Andersen et al, 1987)

It is believed that most minority groups in the U.S. experience similar patterns of health status and health insurance coverage as blacks. Because there are very few people in the NMFS database of racial minority other than blacks, they have been grouped together with Blacks into a "Non-White" category for the purposes of this research.

(vi) Location: Levels of morbidity and mortality vary spatially, whether it be on a local, regional, national, or international scale. Local variations in activity limitation and mortality rates have been observed respectively in Montreal (Wilkins and Adams, 1987) and Hamilton (Liaw et al, 1987). There are also spatial variations in the availability of health care services. Physical access to these services may vary according to their location and to the availability and affordability of transportation.

4.2.2) Creation of Homogeneous Subgroups

Ideally, the following analysis would simultaneously account for all potential confounders. However, each of the personal attributes intended as control criterion contain multiple levels of measurement: five levels of morbidity (from no morbidity to complete); six different types of activity limitations (none to total); sixteen causes of death; three age groups; two genders; two race categories; and fifty-eight locations of residence (all U.S. states except Oregon, New York City, District of Columbia, Mexico, Puerto Rico, Virgin Islands, Canada, Cuba, Guam). Simultaneous control of each category for all potential combinations of these personal characteristics would result in over 300,000 subgroups! An analysis of such detail is beyond the capacity of the database which contains complete information for only 15,539 persons. There is an inherent tension between the need to maintain specific subgroup categories (to minimize distortion in the analysis) and the number of observations required in each subgroup for meaningful analysis.

The need to reduce the potential number of homogeneous subgroups for analysis forces a retreat from the ideal analysis described above. The two variables containing the greatest number of categories are cause of death and state of residence. State of residence is a poor indicator of location because the context in which the individual lives can vary greatly within each state, from highly urbanized to remote settings. Therefore, exclusion of this control variable is unlikely to introduce much distortion into the analysis beyond that which is inherent in the database. Eliminating control for the cause of death potentially introduces greater levels of distortion into the analysis. The magnitude of potential error of interpretation arising from this source is likely to be differentially distributed across the remaining subgroups, being more pronounced among younger age groups than older ones, and having greater effect among males than females.

Even without controlling for these two variables, 360 potential subgroups remain. If the total sample of 15,539 was distributed evenly throughout these subgroups, the average number of persons per subgroup would be approximately 43. Given that there are three income groups and between two and four categories for each of the HSU variables, tables would consist of between six and twelve cells. With an average of 43 people per subgroup, each cell in the income-HSU table would contain only between three and seven observations (if observations were equally distributed among the cells). This scenario would be even more extreme for the insurance variable which has five categories.

To further enlarge the size of the subgroups, the variables which measured reported morbidities and limitations in activities of daily living (ADL) were each collapsed into three categories, representing levels of good, fair and poor health status. Reported morbidity was grouped into categories of (i) none reported, (ii) one or two reported, and (iii) more than two reported. Activities of daily living was collapsed into categories of (i) none reported, (ii) one or two reported, and (iii) three to five reported. With these modifications, the number of the potential subgroups for analysis was 108 (2 race, 2 gender, 3 age, 3 morbidity, and 3 ADL), and the average number of persons per subgroup increases to about 144 (15,539/108).

Analysis of all these potential subgroups is beyond the scope of the thesis. Some of the cell sizes for each possible subgroup will still be too small to analyze. Instead of systematically analyzing all subgroups that might be large enough, the following strategy was adopted. One health status cell (i.e. combination of reported morbidity and ADL) was chosen for each of the twelve possible race, gender, and age combinations. One exception to this rule was the subgroup of non-white women under 45 years, which had fewer than 95 persons in all health status cells, a number too small to analyze. The subgroups were selected, in part, because the cell sizes would be large enough to analyze across the various dimensions of HSU, and partly to allow for comparisons between like groups. For example, white males and white females over the age of 65 were chosen with the same levels of health status (3-5 ADL and 1-2 morbidities) to facilitate comparisons between gender for the same race. The non-white male and female subgroups were chosen with the same level of health status (3-5 ADL and 1-2 morbidities) to facilitate comparisons between race, as well as comparisons between the two genders within racial categories. The specific groups chosen for analysis are listed in figure 4.1. The actual distributions of observations across each of the nine cells of health status for each of the twelve race-gender-age subgroups appear in Appendix III.

Ideally, the effect that mode of payment had upon utilization would be investigated for each income group, so as to control for income. However, at the level of subgroup aggregation used in this analysis it is very unlikely that the projected numbers in each of the race-gender-age-health status subgroup will be able to sustain such an analysis, as this would further divide observations across five insurance by three income cells. The analysis will involve the use of tables with the levels of income or mode of insurance on one axis and on of the HSU variables on the other (doctor visits, problems paying medical bills, general assistance at home, medical assistance at home, overnight stays in hospital or nursing home, and number of nights in hospital in the last year of life). In each of the analyses

Figure 4.1: Subgroups Selected for Analysis

	No Morbidities	Some Morbidities (1-2)
No ADL	**Subset 1:** White Men <45 (568) White Women <45 (172) Non-White Men <45 (209)	**Subset 2:** Non-White Women 45-64 (124) Non-White Men 45-64 (214)
Some ADL (1-2)		
Lots ADL (3-5)		**Subset 3:** White Women 45-64 (164) White Men 45-64 (213) **Subset 4:** White Women 65+ (1040) White Men 65+ (739) Non-White Women 65+ (361) Non-White Men 65+ (303)

presented below, the three income groups refer to annual family incomes of (i) under \$11,000, (ii) \$11,000 to \$24,999 and (iii) \$25,000 or more.

4.3 ANALYSIS OF THE DATA

4.3.1) White and Non-white Men and Women Under 45

The first three subgroups analyzed were all under 45 years of age with no morbidities and no limitations in activities of daily living.

4.3.1.1) White Men Under 45

(i) Income - The first subgroup in this set of analyses was white men under 45 years of age with no morbidities and no activity limitations (N = 568, resid = 148)[1]. No discernible patterns were observed across income levels in the number of doctor visits reported (table 4.2.1.1) as might be expected in a relatively young and healthy population when need for health services typically arises only periodically with short term ailments. However, the income groups varied in the numbers reporting problems paying their medical bills (table 4.2.1.2); the lowest income group reported significantly more problems paying than did the higher income groups (x^2 = 8.791; p = .0123)[2]

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[1] All 'resid' (non-response) values listed are averages of the residual values for the utilization variables in each of the relevant subgroups.

[2] All analyses used a chi-square test for significance and thus all 'p' values refer to the chi-square contingency table.

Table 4.2.1.1

White Males <45 0 morb, 0 ADL
Doctor Visits by Income

Chi-Square= 7.22 p=.3006

Observed Frequency Table

	0 visits	1 visit	2-9 visits	10+ visits	Total
<$11,000	55	17	37	6	115
$11-24,999	58	33	54	8	153
$25,000+	64	28	38	13	143
Total	177	78	129	27	411

Expected Values

	0 visits	1 visit	2-9 visits	10+ visits	Total
<$11,000	49.53	21.82	36.09	7.55	115
$11-24,999	65.89	29.04	48.02	10.05	153
$25,000+	61.58	27.14	44 88	9.39	143
Total	177	78	129	27	411

Table 4.2.1.2

White Males <45 0 morb, 0 ADL
Problems Paying Medical Bills by Income

Chi-Square= 8.791 p=.0123

Observed Frequency Table

	no problem	some problem	Total
<$11,000	102	11	113
$11-24,999	149	6	155
$25,000+	145	3	148
Total	396	20	416

Expected Values

	no problem	some problem	Total
<$11,000	107.57	5.43	113
$11-24,999	147.55	7.45	155
$25,000+	140.88	7.12	148
Total	396	20	416

This pattern is consistent with our understanding of the influence of income on the ability to pay for health care; lower income groups are likely to have more difficulties paying for care due to their typically more restricted financial resources. Very few of the informants for these white men reported that the men received general or medical assistance at home (tables 4.2.1.3 and 4.2.1.4), which would correspond with the fact that they had no morbidities or limitations in activities of daily living.[3] The lowest income group also had fewer reports of overnight stays in hospital and nursing home (hp/nh) than the higher income groups (table 4.2.1.5) and shorter lengths of stay in hospital (table 4.2.1.6) although there is no consistent pattern. Again, these results are in concordance with our understanding of the relationship between income and ability to purchase health services.

(ii) Insurance - This subgroup of white men under 45 was also analyzed as to the influence of insurance mode on utilization of health services (N = 568, resid = 230). The insurance variable indicates the major source of payment used by the decedent in paying his or her medical bills: personal funds, government insurance, privately purchased insurance and other sources, such as philanthropy.

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3 'General aid' includes help received from another person in performing the activities of daily living, thus when no ADL are reported, the person is unlikely to need this type of assistance.

Table 4.2.1.3: Aid at Home by Income.
White Males, <45, 0 Morb, 0 ADL

	No	Yes	Total
<11	122	0	122
11-25	153	1	154
25+	147	1	148
Total	422	2	424

Table 4.2.1.4: Medical Aid at Home by Income.
White Males, <45, 0 Morb, 0 ADL

	No	Yes	Total
<11	121	1	122
11-25	151	5	156
25+	144	3	147
Total	416	9	425

Table 4.2.1.5

White Males <45 0 morb, 0 ADL
Overnight in Hospital or Nursing Home by Income

Chi-Square= 2.6 p=.2725

Observed Frequency Table

	not overnight	overnight	Total
<$11,000	105	17	122
$11-24,999	136	23	159
$25,000+	118	30	148
Total	359	70	429

Expected Values

	not overnight	overnight	Total
<$11,000	102.09	19.91	122
$11-24,999	133.06	25.94	159
$25,000+	123.85	24.15	148
Total	359	70	429

Table 4.2.1.6

White Males <45 0 morb, 0 ADL
Number of Nights in Hospital by Income

Chi-Square= 1.325 p=.8571

Observed Frequency Table

	1-7 days	1-4 weeks	1-12 months	Total
<$11,000	8	2	4	14
$11-24,999	9	6	8	23
$25,000+	13	7	10	30
Total	30	15	22	67

Expected Values

	1-7 days	1-4 weeks	1-12 months	Total
<$11,000	6.27	3.13	4.6	14
$11-24,999	10.3	5.15	7.55	23
$25,000+	13.43	6.72	9.85	30
Total	30	15	22	67

The people paying out of pocket reported significantly fewer doctor visits than the expected value in the contingency table. This is particularly evident in the category of 10+ doctor visits where there were fewer people then expected from the not insured group and more reports than expected from the government and privately insured groups (p = .0218) (table 4.2.2.1). In addition, the people paying out of pocket were over-represented in the 'one' and 'two to nine' categories and the government and private insurance groups were slightly underrepresented. Theoretically, people who report paying the majority of their health care costs from personal sources may be less likely to make use of health services than people who have some type of health insurance. However, the people with different modes of payment did not differ significantly from one another in the percentages reporting problems paying medical bills (table 4.2.2.2). This may be due either to the possibility that out of pocket payers do not make attempts at utilization (thus no reported problem paying), or they actually have incomes that allow them to purchase health services without insurance and without significant financial burdens (once again, likely to report no problems paying).

Very few of these men reported having general or medical assistance at home. However, there was a highly significant difference in reported overnight stays in hospital or nursing home (hp/nh) between the people paying from personal sources to all others with some other mode of payment (p = .0001) (table 4.2.2.5), but this chi-square value is suspect due to the numbers of expected values under the value of 5.0. All insured groups had greater reports of overnight stays in hp/nh than expected, according to the contingency table. However, the small numbers of people in this subgroup reporting stays in hospital make analysis of the duration of their stays impossible (table 4.2.2.6). There may be many factors contributing to the higher rates of overnight stays in hp/nh for the insured population; insurance coverage may aid in the financial accessibility of health services, or people of the higher income groups, who may likely have some health insurance, may be able to afford better health care services than people with no reported health insurance.

It is unknown what influence income has in this relationship, but due to the problems already experienced with low cell counts, the analysis cannot go on to investigate insurance while controlling for income. In addition, this subgroup has a very high residual response for the payment mode used by the decedent (41% residual). The highest income group reported the smallest proportion of non-responses (35%) compared with the lower income groups (approximately 42% residual). This large non-response may be due to the fact that people with relatively fair health status may be unlikely to make public the type

Table 4.2.2.1

White Males <45 0 morb, 0 ADL
Doctor Visits by Major Source of Payment

Chi-Square= 19.432 p=.0218

Observed Frequency Table

	0 visits	1 visit	2-9 visits	10+ visits	Total
Personal	21	28	39	2	90
Government	7	6	14	8	35
Private	41	37	63	22	163
Other	4	1	5	4	14
Total	73	72	121	36	302

Expected Values

	0 visits	1 visit	2-9 visits	10+ visits	Total
Personal	21.75	21.46	36.06	10.73	90
Government	8.46	8.34	14.02	4.17	35
Private	39.4	38.86	65.31	19.43	163
Other	3.38	3.34	5.61	1.67	14
Total	73	72	121	36	302

Table 4.2.2.2

White Males <45 0 morb, 0 ADL
Problems Paying Medical Bills by Major Source of Payment

Chi-Square= 2.7 p=.4403

Observed Frequency Table

	no problem	some problem	Total
Personal	86	9	95
Government	43	2	45
Private	163	8	171
Other	14	1	15
Total	306	20	326

Expected Values

	no problem	some problem	Total
Personal	89.17	5.83	95
Government	42.24	2.76	45
Private	160.51	10.49	171
Other	14.08	0.92	15
Total	306	20	326

Table 4.2.2.3: Aid at Home by Major Source of Payment. White Males, <45, 0 Morb, 0 ADL)

	No	Yes	Total
Personal	95	0	95
Govt	44	1	45
Private	166	2	168
Other	15	0	15
Total	320	3	323

Table 4.2.2.4: Medical Aid at Home by Mode of Insurance. White Males, <45, 0 Morb, 0 ADL

	No	Yes	Total
Personal	94	1	95
Govt	40	5	45
Private	163	6	169
Other	14	1	15
Total	311	13	324

Table 4.2.2.5

White Males <45 0 morb, 0 ADL
Overnight in Hospital or Nursing Home by Major Source of Payment

Chi-Square= 24.744 p=.0001

Observed Frequency Table

	not overnight	overnight	Total
Personal	84	10	94
Government	24	22	46
Private	120	52	172
Other	9	6	15
Total	237	90	327

Expected Values

	not overnight	overnight	Total
Personal	68.13	25.87	94
Government	33.34	12.66	46
Private	124.66	47.34	172
Other	10.87	4.13	15
Total	237	90	327

Table 4.2.2.6

White Males <45 0 morb, 0 ADL
Number of Nights in Hospital by Major Source of Payment

Chi-Square= 9.097 p=.1682

Observed Frequency Table

	1-7 days	1-4 weeks	1-12 months	Total
Personal	7	3	0	10
Government	8	3	7	18
Private	15	16	20	51
Other	2	1	1	4
Total	32	23	28	83

Expected Values

	1-7 days	1-4 weeks	1-12 months	Total
Personal	3.86	2.77	3.37	10
Government	6.94	4.99	6.07	18
Private	19.66	14.13	17.2	51
Other	1.54	1.11	1.35	4
Total	32	23	28	83

of health insurance they have, or perhaps the proxy informants were not privileged to that information. The greater number of non-responses made by the lower income groups may be due to fewer people in the household, and therefore potentially fewer people contributing to the family income as well as fewer available knowledgeable informants. Regardless of the reason for the high residual (regarding insurance mode), the size of the subgroup outside of the residual category (302) is too small to perform a fair analysis of the influence of insurance upon the various HSU variables.

Most of the other ten subgroups are made up of less than 300 persons. The exceptions are white women and white men over 65 years of age with 1-2 morbidities and 3-5 ADL (N = 1040 and N = 739, respectively). Because of the problems with cell sizes experienced with this young male subgroup, the influence of insurance mode will only be analyzed for the largest subgroup.

4.3.1.2) White Women Under 45

The second subgroup in this set of analyses was similar to the first, but contained white women under 45 years with no morbidities and no activity limitations (N = 172). Again, the lowest income group had fewer doctor visits than the higher income groups (table 4.3.1), but this relationship was not found to be statistically significant

Table 4.3.1

White Females <45 0 morb, 0 ADL
Doctor Visits by Income

Chi-Square= 2.53 p=.6393

Observed Frequency Table

	0 or 1 visit	2-9 visits	10+ visits	Total
<$11,000	14	14	5	33
$11-24,999	14	20	9	43
$25,000+	13	24	12	49
Total	41	58	26	125

Expected Values

	0 or 1 visit	2-9 visits	10+ visits	Total
<$11,000	10.82	15.31	6.86	33
$11-24,999	14.1	19.95	8.94	43
$25,000+	16.07	22.74	10.19	49
Total	41	58	26	125

Table 4.3.2: Problems Paying by Income.
White Females, <45, 0 Morb, 0 ADL

	None	Some	Total
<11	32	1	33
11-25	36	5	41
25+	50	2	52
Total	118	8	126

Table 4.3.3: Aid at Home by Income.
White Females, <45, 0 Morb, 0 ADL

	No	Yes	Total
<11	31	0	31
11-25	42	2	44
25+	49	3	52
Total	122	5	127

Table 4.3.4: Medical Aid at Home by Income.
White Females, <45, 0 Morb, 0 ADL

	No	Yes	Total
<11	30	1	31
11-25	39	5	44
25+	45	7	52
Total	114	13	127

Table 4.3.5

White Females <45 0 morb, 0 ADL
Overnight in Hospital or Nursing Home by Income

Chi-Square= .536 p=.7651

Observed Frequency Table

	not overnight	overnight	Total
<$11,000	24	10	34
$11-24,999	27	16	43
$25,000+	35	17	52
Total	86	43	129

Expected Values

	not overnight	overnight	Total
<$11,000	22.67	11.33	34
$11-24,999	28.67	14.33	43
$25,000+	34.67	17.33	52
Total	86	43	129

Table 4.3.6: Number of Nights in Hospital by Income. White Females, <45, 0 Morb, 0 ADL

	1-7days	1-4wks	1-12mos	Total
<11	4	3	3	10
11-25	3	5	6	14
25+	5	11	1	17
Total	12	19	10	41

(p = .6393). Most of the informants for these women reported no difficulties in paying their medical bills (table 4.3.2). This lack of problems may have been due to the fact that these women were young (under 45 years of age) and had no reported morbidities or activity limitations and therefore had little need for health services.

In addition, very few received general or medical assistance at home. Again, because they had no morbidities or limitations in activities of daily living, they may have been unlikely to need assistance at home. However, the higher income groups account for proportionately more people receiving general or medical assistance than the lowest income group (not statistically significant). Most women (>62%) reported no overnight stays in hp/nh (table 4.3.3). Because so few had overnight stays, it was not possible to compare the income groups in the lengths of stay.

4.3.1.3) Comparison of White Men and Women Under 45

The utilization patterns across income groups in the subgroup of white men were quite different from the patterns in the female subgroup, except for the fact that both subgroups had very few people with general or medical assistance at home (due to the absence of limitations in ADL in these subgroups).

On average, the women used physician services more than the men (73.5% of women had more than two doctor visits compared with only 35.7% of men), but the women with higher incomes had higher proportions of their population with more visits than the lower income women (not statistically significant) and more than the average white male population (no significant difference across income groups in the male subgroup). Given that these two subgroups have no reported morbidities or activity limitations, this increased use by the higher income women may have been due to higher occurrences of ailments undetected by the NMFS, greater use of preventive services, or higher rates of elective procedures.

Another difference between these men and women is in their reported problems paying medical bills. The lower income men had significantly more problems than the men in the higher income groups (p = .0123), but very few of the informants for the women reported any problems paying medical bills. It is not apparent whether the lack of problems experienced by the women is due to different levels of demand made of health services by the women, different modes of payment, or differential comprehensiveness of insurance schemes held by women. Because the women had such smaller population size than the men (172 women versus 568 men), the numbers do not allow for proper analysis of hp/nh overnights or lengths of stay in hospital, thus we cannot make comparisons with patterns seen in the male subgroup.

4.3.1.4) Non-white Men Under 45

The third and final subgroup in this first set of analyses was non-white men under 45 with no morbidities and no activity limitations (N = 209, resid = 80). A large proportion of these non-white men had no doctor visits in the last year of life (greater than 40%) (table 4.4.1). Most of the informants for the men reported no difficulties in paying medical bills (table 4.4.2), and very few received general or medical assistance at home (tables 4.4.3 and 4.4.4). These patterns reflect either a population with little need for health services, or one that makes no use (or attempts at use) of health services.

The lowest income group had more overnight stays in hospital and nursing home than the higher income groups (table 4.4.5), although this difference was not statistically significant ($p = .6398$). The numbers of non-white men staying overnight in hospital were too small to analyze their lengths of stay in hospital (table 4.4.6).

Almost 40% of this subgroup had non-responses for the income variable and, given the relationship between the income variable and family status (or size of household), the people of low incomes may be more likely to offer non-responses (see chapter 3 discussion). Thus, the patterns observed in the utilization variables may be misrepresentative of the true utilization of the low income group.

Table 4.4.1

Non-White Males <45 0 morb, 0 ADL
Doctor Visits by Income

Chi-Square= 7.71 p=.2603

Observed Frequency Table

	0 visits	1 visit	2-9 visits	10+ visits	Total
<$11,000	34	9	25	8	76
$11-24,999	14	5	8	2	29
$25,000+	10	1	13	0	24
Total	58	15	46	10	129

Expected Values

	0 visits	1 visit	2-9 visits	10+ visits	Total
<$11,000	34.17	8.84	27.1	5.89	76
$11-24,999	13.04	3.37	10.34	2.25	29
$25,000+	10.79	2.79	8.56	1.86	24
Total	58	15	46	10	129

Table 4.4.2: Problems Paying by Income.
Non-White Males, <45, 0 Morb, 0 ADL

	None	Some	Total
<11	74	0	74
11-25	32	1	33
25+	26	0	26
Total	132	1	133

Table 4.4.3: Aid at Home by Income.
Non-White Males, <45, 0 Morb, 0 ADL

	No	Yes	Total
<11	79	0	79
11-25	33	1	34
25+	25	0	25
Total	137	1	138

Table 4.4.4: Medical Aid at Home by Income.
Non-White Males, <45, 0 Morb, 0 ADL

	No	Yes	Total
<11	79	0	79
11-25	34	0	34
25+	25	0	25
Total	138	0	138

Table 4.4.5

Non-White Males <45 0 morb, 0 ADL
Overnight in Hospital or Nursing Home by Income

Chi-Square= .893 p=.6398

Observed Frequency Table

	not overnight	overnight	Total
<$11,000	55	22	77
$11-24,999	27	7	34
$25,000+	20	6	26
Total	102	35	137

Expected Values

	not overnight	overnight	Total
<$11,000	57.33	19.67	77
$11-24,999	25.31	8.69	34
$25,000+	19.36	6.64	26
Total	102	35	137

Table 4.4.6: Number of Nights in Hospital.
Non-White Males, <45, 0 Morb, 0 ADL

	1-7days	1-4wks	1-12mos	Total
<11	12	7	2	21
11-25	2	4	0	6
25+	2	2	1	5
Total	16	13	3	32

4.3.1.5) Comparison of White and Non-white Men Under 45

Both male subgroups showed no consistent patterns in the number of doctor visits reported by the various income groups. In addition, very few of these men received general or medical assistance at home or reported any overnight stays in hp/nh. An interesting difference between the white and non-white male subgroups is that the low income white men had the lowest proportions with overnight stays in hp/nh, whereas the low income non-white men had the highest proportions with overnight stays. However, neither of these relationships was statistically significant, and the non-white income groups differed only slightly in the proportions of the population with overnight stays.

Another interesting difference between the white and non-white men is that the non-white subgroup had very few reports of problems paying medical bills, whereas the white men with low incomes had significantly more problems paying than the white men with higher incomes. This difference between the white and non-white male subgroups may be due to a number of factors: the low numbers for the non-whites mask actual differences between the income groups; the non-white subgroup has access to some form of health care-related financial assistance not available to whites; or the non-white subgroup did not attempt to access or use health services and therefore had no reported problems.

4.3.2) Non-white Men and Women Ages 45 to 64

The second set of analyses consisted of non-white men and women between 45 and 64 years of age with 1-2 morbidities and no activity limitations.

4.3.2.1) Non-white Women 45-64

The first subgroup in this set of analyses was non-white women (N = 124, resid = 35). There was no discernible pattern in the number of doctor visits reported by the various income groups (table 4.5.1). The lowest income group reported the most difficulties paying medical bills (table 4.5.2), but the numbers for this variable were too small to test the strength of this relationship. None of the informants reported that these women received any general assistance at home (largely due to the fact that the people within this subgroup had no ADL limitations) (table 4.5.3), and, although there were some reports of medical assistance at home, no difference was observed across the income groups in the proportions of people receiving this assistance (table 4.5.4). The lowest income group had a higher percentage of people reported to have overnight stays in hospital and nursing home than the higher income groups (table 4.5.5), however this relationship was not statistically significant (p = .4415) and the numbers of women with reported stays in hospital were too few to investigate the length of stays (table 4.5.6).

Table 4.5.1

Non-White Females 45-64, 1-2 morb, 0 ADL
Doctor Visits by Income

Chi-Square= 3.3 p=.5093

Observed Frequency Table

	0 or 1 visit	2-9 visits	10+ visits	Total
<$11,000	10	19	17	46
$11-24,999	8	12	9	29
$25,000+	1	4	7	12
Total	19	35	33	87

Expected Values

	0 or 1 visit	2-9 visits	10+ visits	Total
<$11,000	10.05	18.51	17.45	46
$11-24,999	6.33	11.67	11	29
$25,000+	2.62	4.83	4.55	12
Total	19	35	33	87

Table 4.5.2: Problems Paying by Income.
Non-White Females, 45-65, 1-2 Morb, 0 ADL

	None	Some	Total
<11	42	8	50
11-25	26	4	30
25+	12	1	13
Total	80	13	93

Table 4.5.3: Aid at Home by Income.
Non-White Females, 45-65, 1-2 Morb, 0 ADL

	No	Yes	Total
<11	48	0	48
11-25	30	0	30
25+	12	0	12
Total	90	0	90

Table 4.5.4: Medical Aid at Home by Income.
Non-White Females, 45-65, 1-2 Morb, 0 ADL

	No	Yes	Total
<11	44	4	48
11-25	28	2	30
25+	11	1	12
Total	83	7	90

Table 4.5.5

Non-White Females 45-64, 1-2 morb, 0 ADL Overnight in Hospital or Nursing Home by Income

Chi-Square= 1.635 p=.4415

Observed Frequency Table

	not overnight	overnight	Total
<$11,000	18	33	51
$11-24,999	13	17	30
$25,000+	7	6	13
Total	38	56	94

Expected Values

	not overnight	overnight	Total
<$11,000	20.62	30.38	51
$11-24,999	12.13	17.87	30
$25,000+	5.26	7.74	13
Total	38	56	94

Table 4.5.6: Number of Nights in Hospital by Income. Non-white Females, 45-65, 1-2 Morb, 0 ADL

	1-7days	1-4wks	1-12mos	Total
<11	13	10	7	30
11-25	7	7	3	17
25+	1	3	2	6
Total	21	20	12	53

4.3.2.2) Non-white Men 45-64

The second subgroup in the second set of analyses was non-white men, 45-64 years of age with 1-2 morbidities and no activity limitations (N = 214, resid = 65). No patterns were immediately apparent in the number of doctor visits (table 4.6.1), however, when comparing the observed and expected values, there seems to be a slight tendency towards over-reporting among the lowest income group in the 0/1 doctor visits category and under-reporting in the 10+ category. Both tendencies were not statistically significant. The lowest income group also had more problems paying medical bills than the higher income groups (p = .0818, 2 expected values <5.0) (table 4.6.2). Although very few men received general assistance at home (largely due to the lack of activity limitations) (table 4.6.3), the lower income group had a smaller percentage of people reported to have received medical assistance at home than the higher income groups (p = .0238, 2 expected values <5.0) (table 4.6.4).

Although these relationships were either not statistically significant, or one or more of the cells did not fulfill the requirements of the chi-square test, the lower income group did maintain consistently lower proportions of men with doctor visits and receiving medical aid at home as well as the greatest proportions with reported problems paying. This pattern was striking. The lowest income group had a slightly greater proportion of people reporting overnight stays in hp/nh, but this was not statistically significant (p = .5993) (table 4.6.5). In addition, the numbers of people who had reported overnight stays in hospital were too few to compare lengths of stay across income groups (table 4.6.6).

Table 4.6.1

Non-White Males 45-64, 1-2 morb, 0 ADL
Doctor Visits by Income

Chi-Square= 2.55 p=.6359

Observed Frequency Table

	0 or 1 visit	2-9 visits	10+ visits	Total
<$11,000	23	38	23	84
$11-24,999	6	15	12	33
$25,000+	9	14	6	29
Total	38	67	41	146

Expected Values

	0 or 1 visit	2-9 visits	10+ visits	Total
<$11,000	21.86	38.55	23.59	84
$11-24,999	8.59	15.14	9.27	33
$25,000+	7.55	13.31	8.14	29
Total	38	67	41	146

Table 4.6.2

Non-White Males 45-64, 1-2 morb, 0 ADL
Problems Paying Medical Bills by Income

Chi-Square= 5.007 p=.0818

Observed Frequency Table

	no problem	some problem	Total
<$11,000	71	13	84
$11-24,999	31	5	36
$25,000+	29	0	29
Total	131	18	149

Expected Values

	no problem	some problem	Total
<$11,000	73.85	10.15	84
$11-24,999	31.65	4.35	36
$25,000+	25.5	3.5	29
Total	131	18	149

Table 4.6.3

Non-White Males 45-64, 1-2 morb, 0 ADL General Aid at Home by Income

Chi-Square= 4.686 p=.096

Observed Frequency Table

	no aid	aid	Total
<$11,000	83	2	85
$11-24,999	31	4	35
$25,000+	28	1	29
Total	142	7	149

Expected Values

	no aid	aid	Total
<$11,000	81.01	3.99	85
$11-24,999	33.36	1.64	35
$25,000+	27.64	1.36	29
Total	142	7	149

Table 4.6.4

Non-White Males 45-64, 1-2 morb, 0 ADL
Medical Aid at Home by Income

Chi-Square= 7.48 p=.0238

Observed Frequency Table

	no medical aid	medical aid	Total
<$11,000	79	5	84
$11-24,999	27	8	35
$25,000+	24	5	29
Total	130	18	148

Expected Values

	no medical aid	medical aid	Total
<$11,000	73.78	10.22	84
$11-24,999	30.74	4.26	35
$25,000+	25.47	3.53	29
Total	130	18	148

Table 4.6.5

Non-White Males 45-64, 1-2 morb, 0 ADL
Overnight in Hospital or Nursing Home by Income

Chi-Square= 1.024 p=.5993

Observed Frequency Table

	not overnight	overnight	Total
<$11,000	37	49	86
$11-24,999	19	17	36
$25,000+	14	15	29
Total	70	81	151

Expected Values

	not overnight	overnight	Total
<$11,000	39.87	46.13	86
$11-24,999	16.69	19.31	36
$25,000+	13.44	15.56	29
Total	70	81	151

Table 4.6.6

Non-White Males 45-64, 1-2 morb, 0 ADL
Number of Nights in Hospital by Income

Chi-Square= .556 p=.9678

Observed Frequency Table

	1-7 days	1-4 weeks	1-12 months	Total
<$11,000	17	20	9	46
$11-24,999	8	6	3	17
$25,000+	6	6	3	15
Total	31	32	15	78

Expected Values

	1-7 days	1-4 weeks	1-12 months	Total
<$11,000	18.28	18.87	8.85	46
$11-24,999	6.76	6.97	3.27	17
$25,000+	5.96	6.15	2.88	15
Total	31	32	15	78

4.3.2.3) Comparison of Non-white Men and Women 45-64

The people of the various income groups within these two subgroups had similar utilization patterns. The lowest income groups in both subgroups had greater problems paying medical bills and more overnight stays in hp/nh than the higher income groups. In addition, very few people in either subgroup received either general or medical aid at home, and no consistent pattern was apparent in the analysis of doctor visits. However, the female and male subgroups did differ concerning the proportions of people receiving medical assistance at home. The non-white women showed no difference across the income levels in the proportions receiving medical aid, but the non-white men had a significant difference between the highest and the lowest income groups (the lowest income group had significantly fewer people receiving medical aid than the highest income group, p = .0238). The women had, on average, a smaller proportion of people receiving medical aid at home than did the men but these smaller numbers may have been inadequate to show the true picture of the effect of income on receiving medical assistance at home. In addition, although the difference across income levels in the male subgroup tested to be statistically significant, two of the expected values in the contingency tables were below 5.0, technically violating the assumptions of the statistical test.

4.3.3) White Men and Women Ages 45 to 64

The third set of analyses consists of white men and women between 45 and 64 years of age with 1-2 morbidities and 3-5 activity limitations.

4.3.3.1) White Women 45-64

The number of women in this category equals 164 (resid = 32). The lowest income group in the subgroup had fewer doctor visits (table 4.7.1) in the last year of life than the higher income groups (p = .0769, although the expected values for 0/1 visits were below 5.0). The lowest income group also experienced more problems paying their medical bills (p = .0571) (table 4.7.2). In contrast to the previous subgroups, this subgroup had, on average, 75% with general aid at home (table 4.7.3) and 68% with medical aid at home (table 4.7.4), much higher proportions than the previous subgroups (all of which had no limitations in ADL). However, in conjunction with the higher levels of activity limitations, the residual (non-response) category has increased for the questions of general and medical assistance at home. On closer inspection of this residual category it was found that two-thirds of the decedents for whom a non-response was recorded, had been in a nursing home or some other institution for the whole of the last year of life and thus the question was not applicable to them. The other one-third of the residual category consisted of some other non-response such as 'don't know' or refusal to answer the question, or gave multiple or un-ascertainable answers. The lowest income group had a smaller percentage receiving medical assistance at home than the higher income groups (p = .0299), but the low income groups also had a higher percentage in an institution for the whole of the last year of life. Thus these poorer women typically had less in-home care and greater rates of institutionalization than the wealthier women. The greater proportions of poor women in institutions may be due to a number of reasons: (i) they may have had no choice (they likely could not afford in-home care, or had no one at home to help care for them); (ii) the insurance that they may have possessed may have covered institutional care and not in-home care, or (iii) women with higher incomes may have been more likely to afford supplementary insurance to cover in-home care, rather than institutional care.

The vast majority (95%) of these women reported overnight stays in hp/nh (table 4.7.5), and more than half stayed longer than one month (table 4.7.6). This subgroup had higher rates of hp/nh, longer lengths of stay, higher rates of institutionalization and greater use of in-home care than the previous subgroups, partly due to their greater need for health care.

Table 4.7.1

White Females 45-64, 1-2 morb, 3-5 ADL
Doctor Visits by Income

Chi-Square= 8.43 p=.0769

Observed Frequency Table

	0 or 1 visit	2-9 visits	10+ visits	Total
<$11,000	3	14	25	42
$11-24,999	3	7	40	50
$25,000+	0	10	36	46
Total	6	31	101	138

Expected Values

	0 or 1 visit	2-9 visits	10+ visits	Total
<$11,000	1.83	9.43	30.74	42
$11-24,999	2.17	11.23	36.59	50
$25,000+	2	10.33	33.67	46
Total	6	31	101	138

Table 4.7.2

White Females 45-64, 1-2 morb, 3-5 ADL
Problems Paying Medical Bills by Income

Chi-Square= 5.726 p=.0571

Observed Frequency Table

	no problem	some problem	Total
<$11,000	30	14	44
$11-24,999	35	12	47
$25,000+	40	5	45
Total	105	31	136

Expected Values

	no problem	some problem	Total
<$11,000	33.97	10.03	44
$11-24,999	36.29	10.71	47
$25,000+	34.74	10.26	45
Total	105	31	136

Table 4.7.3

White Females 45-64, 1-2 morb, 3-5 ADL General Aid at Home by Income

Chi-Square= 2.646 p=.2664

Observed Frequency Table

	no aid	aid	Total
<$11,000	8	26	34
$11-24,999	6	41	47
$25,000+	5	40	45
Total	19	107	126

Expected Values

	no aid	aid	Total
<$11,000	5.13	28.87	34
$11-24,999	7.09	39.91	47
$25,000+	6379	38.21	45
Total	19	107	126

Table 4.7.4

White Females 45-64, 1-2 morb, 3-5 ADL Medical Aid at Home by Income

Chi-Square= 7.017 p=.0299

Observed Frequency Table

	no medical aid	medical aid	Total
<$11,000	12	22	34
$11-24,999	9	38	47
$25,000+	5	40	45
Total	26	100	126

Expected Values

	no medical aid	medical aid	Total
<$11,000	7.02	26.98	34
$11-24,999	9.7	37.3	47
$25,000+	9.29	35.71	45
Total	26	100	126

Table 4.7.5: Overnight in Hospital or Nursing Home by Income. White Females, 45-64, 1-2 Morb, 3-5 ADL

	No	Yes	Total
<11	3	42	45
11-25	3	47	50
25+	1	45	46
Total	7	124	141

Table 4.7.6: Number of Nights in Hospital by Income. White Females, 45-64, 1-2 Morb., 3-5 ADL

	1-7days	1-4wks	1-12mos	Total
<11	7	11	22	40
11-25	3	14	29	46
25+	1	19	23	43
Total	11	44	74	129

4.3.3.2) White Men 45-64

The second subgroup in this set of analyses is white men, age 45-64, with one to two morbidities and three to five ADL (N = 213, resid = 45). The men from the lower income groups reported fewer doctor visits (p = .092, with the category of 0 visits having expected values of less than 5.0) (table 4.8.1). The lowest income groups also reported significantly more difficulties paying their medical bills (p = .0099) (table 4.8.2) and, although no difference was observed in the proportions of people with general aid at home (table 4.8.3), the lowest income group had smaller proportions receiving medical assistance at home (table 4.8.4). On the other hand, the lowest income group reported higher proportions overnight in hospital and nursing home (p = .7445) (table 4.8.5), but the duration of their stay in hospital was slightly shorter than the higher income groups (p = .6539) (table 4.8.6).

These patterns may be a product of the relationship between income and ability to pay for health services. If experiencing difficulties paying for health care, people may be less likely to seek care unless in serious need, and then use emergency services and acute care hospitals rather than the preventive services of a physician outside of the hospital setting. This reasoning may account for the fewer doctor visits, greater reported number of overnight stays in hp/nh, and, on average, short stays in hospital reported by the lowest income group.

Table 4.8.1

White Males 45-64, 1-2 morb, 3-5 ADL
Doctor Visits by Income

Chi-Square= 7.99 p=.092

Observed Frequency Table

	0 or 1 visit	2-9 visits	10+ visits	Total
<$11,000	7	18	27	52
$11-24,999	3	20	31	54
$25,000+	3	14	46	63
Total	13	52	104	169

Expected Values

	0 or 1 visits	2-9 visits	10+ visits	Total
<$11,000	4	16	32	52
$11-24,999	4.15	16.62	33.23	54
$25,000+	4.84	19.38	38.77	63
Total	13	52	104	169

Table 4.8.2

White Males 45-64, 1-2 morb, 3-5 ADL Problems Paying Medical Bills by Income

Chi-Square= 9.222 p=.0099

Observed Frequency Table

	no problem	some problem	Total
<$11,000	32	20	52
$11-24,999	34	22	56
$25,000+	54	11	65
Total	120	53	173

Expected Values

	no problem	some problem	Total
<$11,000	36.07	15.93	52
$11-24,999	38.84	17.16	56
$25,000+	45.09	19.91	65
Total	120	53	173

Table 4.8.3

White Males 45-64, 1-2 morb, 3-5 ADL
General Aid at Home by Income

Chi-Square= .596 p=.7422

Observed Frequency Table

	no aid	aid	Total
<$11,000	7	43	80
$11-24,999	8	47	55
$25,000+	12	52	64
Total	27	142	169

Expected Values

	no aid	aid	Total
<$11,000	7.99	42.01	50
$11-24,999	8.79	46.21	55
$25,000+	10.22	53.78	64
Total	27	142	169

Table 4.8.4

White Males 45-64, 1-2 morb, 3-5 ADL
Medical Aid at Home by Income

Chi-Square= 2.553 p=.279

Observed Frequency Table

	no medical aid	medical aid	Total
<$11,000	12	38	50
$11-24,999	10	45	55
$25,000+	8	56	64
Total	30	139	169

Expected Values

	no medical aid	medical aid	Total
<$11,000	8.88	41.12	50
$11-24,999	9.76	45.24	55
$25,000+	11.36	52.64	64
Total	30	139	169

Table 4.8.5

White Males 45-64, 1-2 morb, 3-5 ADL
Overnight in Hospital or Nursing Home by Income

Chi-Square= .59 p=.7445

Observed Frequency Table

	not overnight	overnight	Total
<$11,000	3	50	53
$11-24,999	5	51	56
$25,000+	6	59	64
Total	14	160	174

Expected Values

	not overnight	overnight	Total
<$11,000	4.26	48.74	53
$11-24,999	4.51	51.49	56
$25,000+	5.23	59.77	65
Total	14	160	174

Table 4.8.6

White Males 45-64, 1-2 morb, 3-5 ADL
Number of Nights in Hospital by Income

Chi-Square= 2.449 p=.6539

Observed Frequency Table

	1-7 days	1-4 weeks	1-12 months	Total
<$11,000	3	13	30	46
$11-24,999	6	19	25	50
$25,000+	5	19	33	57
Total	14	51	88	153

Expected Values

	1-7 days	1-4 weeks	1-12 months	Total
<$11,000	4.21	15.33	26.46	46
$11-24,999	4.58	16.67	28.76	50
$25,000+	5.22	19	32.78	57
Total	12	51	88	153

4.3.3.3) Comparison of White Men and Women 45-64

These white men and women shared some income-related utilization patterns: the men and women with the lowest incomes had fewer doctor visits, experienced greater problems paying their medical bills, had smaller proportions receiving medical aid at home, and had slightly shorter stays in hospital than the people from the higher income groups. In addition, some discrepancies were observed between the two gender subgroups regarding the proportions of people reporting overnight stays in hp/nh and the proportions receiving general assistance at home, however, these differences were not statistically significant.

4.3.4) White and Non-white Men and Women Over 65

The final set of analyses consists of four subgroups: white and non-white men and women over 65 years of age with 1-2 morbidities and 3-5 activity limitations.

4.3.4.1) White Women Over 65

(i) Income - The first subgroup in this set of analyses consists of 1040 white women (resid = 185). Two health service utilization patterns within this subgroup proved to be highly statistically significant: the lowest income group had significantly fewer doctor visits than the higher income groups ($p = .005$, one expected value under 5.0) (table 4.9.1.1), but on the other hand, had significantly higher proportions of its population reporting overnight stays in hospital and nursing home in the last year of life (p = .0103) (table 4.9.1.5). However, the lowest income groups also reported shorter lengths of stay in hospital than the higher income groups (p = .2551) (table 4.9.1.6). The lowest income group also reported more problems paying medical bills then the higher income groups (p = .1545) (table 4.9.1.2).

All income groups had high proportions (approximately 35%) of their populations with non-responses for the general and medical aid variable. On average, 88% of these residuals were a result of the people being in institutions for the whole of their last year of life (table 4.9.1.3). The lowest income groups had the lowest proportion receiving general assistance (p = .0792) (table 4.9.1.3) and medical assistance at home (p = .0604) (table 4.9.1.4) but they also had the largest proportion in institutions. Most of the people in this subgroup had medicare insurance, but the people with higher incomes may have been able to afford additional, supplemental health insurance which may have covered in-home care.

Table 4.9.1.1

White Females 65+, 1-2 morb, 3-5 ADL
Doctor Visits by Income

Chi-Square= 18.56 p=.005

Observed Frequency Table

	0 visits	1 visit	2-9 visits	10+ visits	Total
<$11,000	119	14	156	215	504
$11-24,999	29	3	69	94	195
$25,000+	10	4	43	60	117
Total	158	21	268	369	816

Expected Values

	0 visits	1 visit	2-9 visits	10+ visits	Total
<$11,000	97.59	12.97	165.53	227.91	504
$11-24,999	37.76	5.02	64.04	88.18	195
$25,000+	22.65	3.01	38.43	52.91	117
Total	158	21	268	369	816

Table 4.9.1.2

White Females 65+, 1-2 morb, 3-5 ADL Problems Paying Medical Bills by Income

Chi-Square= 3.736 p=.1545

Observed Frequency Table

	no problem	some problem	Total
<$11,000	453	74	524
$11-24,999	175	26	201
$25,000+	111	9	120
Total	739	109	848

Expected Values

	no problem	some problem	Total
<$11,000	459.26	67.74	527
$11-24,999	175.16	25.84	201
$25,000+	104.58	15.42	120
Total	739	109	848

Table 4.9.1.3

White Females 65+, 1-2 morb, 3-5 ADL
General Aid at Home by Income

Chi-Square= 4.662 p=.0972

Observed Frequency Table

	no aid	aid	Total
<$11,000	59	221	280
$11-24,999	26	121	147
$25,000+	12	92	104
Total	97	434	531

Expected Values

	no aid	aid	Total
<$11,000	51.15	228.85	280
$11-24,999	26.85	120.15	147
$25,000+	19	85	104
Total	97	434	531

Table 4.9.1.4

White Females 65+, 1-2 morb, 3-5 ADL
Medical Aid at Home by Income

Chi-Square= 5.614 p=.0604

Observed Frequency Table

	no medical aid	medical aid	Total
<$11,000	77	203	280
$11-24,999	32	111	143
$25,000+	17	88	105
Total	126	402	528

Expected Values

	no medical aid	medical aid	Total
<$11,000	66.82	213.18	280
$11-24,999	34.12	108.88	143
$25,000+	25.06	79.94	105
Total	126	402	528

Table 4.9.1.5

White Females 65+, 1-2 morb, 3-5 ADL
Overnight in Hospital or Nursing Home by Income

Chi-Square= 9.15 p=.0103

Observed Frequency Table

	not overnight	overnight	Total
<$11,000	23	509	532
$11-24,999	17	184	201
$25,000+	13	109	122
Total	53	802	855

Expected Values

	not overnight	overnight	Total
<$11,000	32.98	499.02	532
$11-24,999	12.46	188.54	201
$25,000+	7.56	114.44	122
Total	53	802	855

Table 4.9.1.6

White Females 65+, 1-2 morb, 3-5 ADL
Number of Nights in Hospital by Income

Chi-Square= 5.329 p=.2551

Observed Frequency Table

	1-7 days	1-4 weeks	1-12 months	Total
<$11,000	90	166	134	390
$11-24,999	26	67	63	156
$25,000+	15	43	40	98
Total	131	276	237	644

Expected Values

	1-7 days	1-4 weeks	1-12 months	Total
<$11,000	79.33	167.14	143.52	390
$11-24,999	31.73	66.86	57.41	156
$25,000+	19.93	42	36.07	98
Total	131	276	237	644

(ii) Insurance - The analysis of the influence of insurance on HSU in the subgroup of white men under 45 encountered problems related to small numbers which would not allow for an analysis of payment mode while controlling for income. Subsequent difficulties were encountered in the interpretation of the results of the analysis. The subgroup of white women over 65 with 1-2 morbidities and 3-5 ADL is the largest of all 108 potential subgroups (N=1040, resid= 185) and may provide the best opportunity to investigate the influence of insurance mode on utilization of health services while controlling for income[4]. It was intended that comparisons would be made within each income group independently, however the two higher income groups had less than approximately 200 persons each. These numbers were too small to allow for comparisons across insurance mode, especially when these numbers were reduced due to non-responses in the insurance variable (the number of people with incomes between $11,000 and $24,999 was reduced from 122 to 106, and people with incomes greater than $25,000 from 202 to 168). The problem of these small numbers are compounded by the clustering of the population in the government insurance category, and is again compounded when income is simultaneously controlled. The majority of the subgroup had low incomes (n=533, 51% of the total subgroup) (table 4.9.2) and so the lowest income subgroup was

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[4] Insurance mode refers to the source of funds which paid the majority of the decedent's health care costs during the last year of life.

4.9.2: Insurance Mode by Family Income
White Females 65+, 1-2 Morb, 3-5 ADL

PAYMAJ	<11	11 to 25	25+	Resid.	Total
Personal	67	42	41	27	177
Government	314	104	51	92	561
Private	25	22	14	14	75
Other	75	19	10	16	120
Resid.	52	15	6	34	107
Total	533	202	122	183	1040

the only one chosen for the analysis of insurance mode. Because of problems associated with the low numbers of people in some of the insurance categories, the three largest insurance modes were analyzed (n=406): not insured (no insurance program paid the majority of medical bills), government insurance (medicare and/or medicaid), and private insurance. The majority (77.0%) of people in these three categories had government insurance, whereas only 16.5% reported no insurance, and 6.2% had private insurance.

The people paying the majority of their medical bills from personal sources and the people who had government insurance had fewer reported doctor visits (table 4.9.3.1) than expected in the chi-square contingency table, whereas the people with private insurance had more doctor visits than expected (p = .1156). Overall, the people paying out of pocket had the greatest proportion with less than ten doctor visits and the smallest proportion with more than ten doctor visits. Considering that all insurance groups consisted of people with annual family incomes under $11,000, people with no reported insurance may be less likely to use services unless in great need. This difference may also be due to fewer health care needs in the people paying out of pocket, requiring fewer doctor visits.

Table 4.9.3.1

White Females 65+, 1-2 morb, 3-5 ADL
Doctor Visits by Major Source of Payment

Chi-Square= 7.414 p=.1156

Observed Frequency Table

	0 or 1 visit	2-9 visits	10+ visits	Total
Personal	16	26	25	67
Government	73	94	129	296
Private	1	8	15	24
Total	90	128	169	387

Expected Values

	0 or 1 visit	2-9 visits	10+ visits	Total
Personal	15.58	22.16	29.26	67
Government	68.84	97.9	129.26	296
Private	5.58	7.94	10.48	24
Total	90	128	169	387

Table 4.9.3.2

White Females 65+, 1-2 morb, 3-5 ADL
Problems Paying Medical Bills by Major Source of Payment

Chi-Square= 2.205 p=.3321

Observed Frequency Table

	no problem	some problem	Total
Personal	59	8	67
Government	266	44	310
Private	19	6	25
Total	344	58	402

Expected Values

	no problem	some problem	Total
Personal	57.33	9.67	67
Government	265.27	44.73	310
Private	21.39	3.61	25
Total	344	58	402

Table 4.9.3.3

White Females 65+, 1-2 morb, 3-5 ADL
General Aid at Home by Major Source of Payment

Chi-Square= .832 p=.6596

Observed Frequency Table

	no aid	aid	Total
Personal	5	26	31
Government	37	139	176
Private	3	18	21
Total	45	183	228

Expected Values

	no aid	aid	Total
Personal	6.12	24.88	31
Government	34.74	141.26	176
Private	4.14	16.86	21
Total	45	183	228

Table 4.9.3.4

White Females 65+, 1-2 morb, 3-5 ADL
Medical Aid at Home by Major Source of Payment

Chi-Square= 1.22 p=.5433

Observed Frequency Table

	no medical aid	medical aid	Total
Personal	6	26	32
Government	49	126	175
Private	6	15	21
Total	61	167	228

Expected Values

	no medical aid	medical aid	Total
Personal	8.56	23.44	32
Government	46.82	128.18	175
Private	5.62	15.38	21
Total	61	167	228

Table 4.9.3.5: Overnight in Hospital or Nursing Home by Major Source of Payment. White Females 65+, 1-2 Morb, 3-5 ADL

PAYMAJ	No	Yes	Total
Notins	7	60	7
Govt	8	305	314
Private	0	25	25
Total	15	390	405

Table 4.9.3.6

White Females 65+, 1-2 morb, 3-5 ADL
Number of Nights in Hospital by Major Source of Payment

Chi-Square= 5.226 p=.2649

Observed Frequency Table

	1-7 days	1-4 weeks	1-12 months	Total
Personal	11	20	9	40
Government	45	97	94	236
Private	6	10	7	23
Total	62	127	110	299

Expected Values

	1-7 days	1-2 weeks	1-12 months	Total
Personal	8.29	16.99	14.72	40
Government	48.94	100.24	86.82	236
Private	4.77	9.77	8.46	23
Total	62	127	110	299

On average, the large majority (86%) of this subgroup of low income elderly women had no problems paying medical bills (table 4.9.3.2). The privately insured group had the most problems (more than expected in the contingency table) whereas the people paying out of pocket had fewer problems than expected. The problems reported by the informants for the government insured population did not differ significantly from expected values.

These patterns in the groups of people with private insurance and the people paying out of pocket seem contrary to what we would expect given the assumption that insurance should aid access to and utilization of health services. However, the problems experienced by the privately insured group may have been due to gaps in coverage. These people had low incomes and even though they had some form of private insurance, they may have had only very minimal coverage which may have caused problems for them when the care they needed was not covered by their private insurance plan (problems of under-insurance). The people with no major insurance source, on the other hand, may have experienced less problems than expected because (for whatever reason) they did not use health services and therefore did not need to pay for them. Unlike the previous analysis of insurance in the subgroup of white men under 45, it is known that the people paying out of pocket have low incomes and therefore are unlikely to be able to be financially capable of paying large medical bills without some financial assistance.

This subgroup of elderly women had very large non-response categories for the questions regarding general assistance (AID, table 4.9.3.3) and medical assistance (AIDMED, table 4.9.3.4). The large majority (88%) of these non-responses referred to people who were in some type of institution for the whole of the last year of life and thus the question was not applicable to their situation. For both the AID and AIDMED variables, 54% of the people paying out of pocket were non-responses and approximately 50% of that not-insured group were institutionalized for their last year of life. The government insured group had 44% with non-reponses and the privately insured had only a 16% non-response rate. The people paying out of pocket not only had higher proportions in institutions, but, for those outside of institutions, greater proportions than expected reported AID and AIDMED at home. The government insured, on the other hand, had fewer people than expected reporting AID and AIDMED (not statistically significant). The private insurance group was small; the relationships observed may be unstable, changing with even the smallest re-distribution of numbers in the categories. The greater use of services by the people paying out of pocket may be influenced by a number of factors: (i) greater use of charity or public health services; (ii) although they did not report any form of insurance as a major source of payment, they may have used a variety of sources to help pay for the health care received; and (iii) because the AID and AIDMED questions measure the services received, not necessarily the underlying need for the services, these out of pocket payers may have, in fact, had greater need for health care than the government insured population (which was not detected by the NMFS).

On average, 95% of the low income subgroup had overnight stays in hp/nh (table 4.9.3.5). The people paying out of pocket had the lowest proportion in hp/nh (89%) whereas all of the people with private insurance were reported to have had overnight stays. This lower use of hp/nh by the not-insured group may be partly due to the large proportion (50%) of them in some institutional setting for the last year of life. The people paying out of pocket also reported shorter stays in hospital than the government insurance group (p = .2649) (table 4.9.3.6).

In summary, the people paying out of pocket reported fewer doctor visits, fewer overnight stays in hp/nh and shorter lengths of stay in hospital than the government and private insured groups. On the other hand, the people paying out of pocket had greater proportions in institutions for the whole of the last year of life and greater proportions receiving general and medical assistance at home than the government insured group. Both the not-insured group and the government insured group had large majorities (87%) with no problems paying medical bills, whereas the privately insured group reported the most problems, reflecting some difficulties of under-insurance (gaps in coverage), which are particularly pertinent to low income groups.

4.3.4.2) White Men Over 65

The white men over 65 years of age (N = 739, resid = 209) had some highly significant differences across the income groups. The lowest income group had significantly fewer doctor visits than the higher income groups (p = .0018) (table 4.10.1), significantly more problems paying their medical bills (p = .0007) (table 4.10.2), and significantly shorter stays in hospital in the last year of life (p = .0316) (table 4.10.6). However, all of the income groups had similar reports of overnight stays in hp/nh (table 4.10.5). There was no consistent pattern across income groups regarding general (table 4.10.3) or medical assistance at home (table 4.10.4), but the lowest income group had greater proportions in institutions for the whole of their last year of life.

Table 4.10.1

White Males 65+, 1-2 morb, 3-5 ADL
Doctor Visits by Income

Chi-Square= 21.38 p=.0016

Observed Frequency Table

	0 visits	1 visit	2-9 visits	10+ visits	Total
<$11,000	49	12	95	106	262
$11-24,999	14	11	73	115	213
$25,000+	12	6	28	57	103
Total	75	29	196	278	578

Expected Values

	0 visits	1 visit	2-9 visits	10+ visits	Total
<$11,000	34	13.15	88.84	126.01	262
$11-24,999	27.64	10.69	72.23	102.45	213
$25,000+	13.37	5.17	34.93	49.54	103
Total	75	29	196	278	578

Table 4.10.2

White Males 65+, 1-2 morb, 3-5 ADL Problems Paying Medical Bills by Income

Chi-Square= 14.504 p=.0007

Observed Frequency Table

	no problem	some problem	Total
<$11,000	217	45	262
$11-24,999	199	21	220
$25,000+	100	4	104
Total	516	70	586

Expected Values

	no problem	some problem	Total
<$11,000	230.7	31.3	262
$11-24,999	193.72	26.28	220
$25,000+	91.58	12.42	104
Total	516	70	586

Table 4.10.3

White Males 65+, 1-2 morb, 3-5 ADL
General Aid at Home by Income

Chi-Square= 3.001 p=.223

Observed Frequency Table

	no aid	aid	Total
<$11,000	39	139	178
$11-24,999	34	169	203
$25,000+	23	70	93
Total	96	378	474

Expected Values

	no aid	aid	Total
<$11,000	36.05	141.95	178
$11-24,999	41.11	161.89	203
$25,000+	18.84	74.16	93
Total	96	378	474

Table 4.10.4

White Males 65+, 1-2 morb, 3-5 ADL
Medical Aid at Home by Income

Chi-Square= .651 p=.7223

Observed Frequency Table

	no medical aid	medical aid	Total
<$11,000	37	141	178
$11-24,999	41	162	202
$25,000+	22	70	92
Total	99	373	472

Expected Values

	no medical aid	medical aid	Total
<$11,000	37.33	140.67	178
$11-24,999	42.37	159.63	202
$25,000+	19.3	72.7	92
Total	99	373	472

Table 4.10.5

White Males 65+, 1-2 morb, 3-5 ADL
Overnight in Hospital or Nursing Home by Income

Chi-Square= .886 p=.6421

Observed Frequency Table

	not overnight	overnight	Total
<$11,000	14	258	272
$11-24,999	16	208	224
$25,000+	6	99	105
Total	36	565	601

Expected Values

	not overnight	overnight	Total
<$11,000	16.29	255.71	272
$11-24,999	13.42	210.58	224
$25,000+	6.29	98.71	105
Total	36	565	601

Table 4.10.6

White Males 65+, 1-2 morb, 3-5 ADL
Number of Nights in Hospital by Income

Chi-Square= 10.589 p=.0316

Observed Frequency Table

	1-7 days	1-4 weeks	1-12 months	Total
<$11,000	39	97	73	209
$11-24,999	23	73	97	193
$25,000+	17	39	39	95
Total	79	209	209	497

Expected Values

	1-7 days	1-4 weeks	1-12 months	Total
<$11,000	33.22	87.89	87.89	209
$11-24,999	30.68	81.16	81.16	193
$25,000+	15.1	39.95	39.95	95
Total	79	209	209	497

4.3.4.3) Non-white Women Over 65

The non-white women (N = 361, resid = 111) did not have such significant differences across the income groups as did the white subgroups, although the lowest income group again had more problems paying their medical bills (p = .0963, one expected value below 5.0) (table 4.11.2) and reported more overnight stays in hospital and nursing home than the higher income groups (p = .074, two expected values below 5.0) (table 4.11.5). The lowest income group also had greater proportions of its population institutionalized for the last year of life, although it had fewer reports of in-home care (tables 4.11.3 and 4.11.4). This subgroup exhibited no consistent pattern across the income groups in either the number of doctor visits (table 4.11.1) or the number of nights in hospital (table 4.11.6).

Table 4.11.1

Non-White Females 65+, 1-2 morb, 3-5 ADL
Doctor Visits by Income

Chi-Square= 4.53 p=.3396

Observed Frequency Table

	0 or 1 visit	2-9 visits	10+ visits	Total
<$11,000	38	73	89	200
$11-24,999	4	15	27	46
$25,000+	2	7	8	17
Total	44	95	124	263

Expected Values

	0 or 1 visit	2-9 visits	10+ visits	Total
<$11,000	33.46	72.24	94.3	200
$11-24,999	7.7	16.62	21.69	46
$25,000+	2.84	6.14	8.02	17
Total	44	95	124	263

Table 4.11.2

Non-White Females 65+, 1-2 morb, 3-5 ADL Problems Paying Medical Bills by Income

Chi-Square= 4.681 p=.0963

Observed Frequency Table

	no problem	some problem	Total
<$11,000	171	42	213
$11-24,999	41	4	45
$25,000+	16	1	17
Total	228	47	275

Expected Values

	no problem	some problem	Total
<$11,000	176.6	36.4	213
$11-24,999	37.31	7.69	45
$25,000+	14.09	2.91	17
Total	228	47	275

Table 4.11.3

Non-White Females 65+, 1-2 morb, 3-5 ADL General Aid at Home by Income

Chi-Square= 2.377 p=.3047

Observed Frequency Table

	no aid	aid	Total
<$11,000	31	137	168
$11-24,999	5	39	44
$25,000+	1	14	15
Total	37	190	227

Expected Values

	no aid	aid	Total
<$11,000	27.38	140.62	168
$11-24,999	7.17	36.83	44
$25,000+	2.44	12.56	15
Total	37	190	227

Table 4.11.4

Non-White Females 65+, 1-2 morb, 3-5 ADL
Medical Aid at Home by Income

Chi-Square= 2.389 p=.3029

Observed Frequency Table

	no medical aid	medical aid	Total
<$11,000	38	128	166
$11-24,999	6	40	46
$25,000+	4	11	15
Total	48	179	227

Expected Values

	no medical aid	medical aid	Total
<$11,000	35.1	130.9	166
$11-24,999	9.73	36.27	46
$25,000+	3.17	11.83	15
Total	48	179	227

Table 4.11.5

Non-White Females 65+, 1-2 morb, 3-5 ADL Overnight in Hospital or Nursing Home by Income

Chi-Square= 5.207 p=.074

Observed Frequency Table

	not overnight	overnight	Total
<$11,000	9	205	214
$11-24,999	6	41	47
$25,000+	1	16	16
Total	16	262	278

Expected Values

	not overnight	overnight	Total
<$11,000	12.32	201.68	214
$11-24,999	2.71	44.29	47
$25,000+	0.98	16.02	17
Total	16	262	278

Table 4.11.6

Non-White Females 65+, 1-2 morb, 3-5 ADL
Number of Nights in Hospital by Income

Chi-Square= 3.306 p=.5079

Observed Frequency Table

	1-7 days	1-4 weeks	1-12 months	Total
<$11,000	42	71	71	184
$11-24,999	10	16	11	37
$25,000+	2	4	8	14
Total	54	91	90	235

Expected Values

	1-7 days	1-4 weeks	1-12 months	Total
<$11,000	42.28	71.25	70.47	184
$11-24,999	8.5	14.33	14.17	37
$25,000+	3.22	5.42	5.36	14
Total	54	91	90	235

4.3.4.4) Non-white Men Over 65

The non-white men (n = 303, resid = 83) also did not exhibit significant differences across the income groups regarding overnight stays in hp/nh (table 4.12.5), or length of stay in hospital (table 4.12.6). However, the lowest income group reported fewer doctor visits (table 4.12.1) than the higher income groups (p =.0592, two expected values below 5.0) and greater problems paying their medical bills (p = .2294) (table 4.12.2). The lowest income group also had fewer reports of general in-home care (table 4.12.3), but somewhat greater reports of medical aid at home (table 4.12.4). Both these variables had large residuals, due to the large proportions of people in institutions for the last year of life.

Table 4.12.1

Non-White Males 65+, 1-2 morb, 3-5 ADL
Doctor Visits by Income

Chi-Square= 9.08 p=.0592

Observed Frequency Table

	0 or 1 visit	2-9 visits	10+ visits	Total
<$11,000	18	49	93	160
$11-24,999	4	28	23	55
$25,000+	1	3	10	14
Total	23	80	126	229

Expected Values

	0 or 1 visit	2-9 visits	10+ visits	Total
<$11,000	16.07	55.9	88.03	160
$11-24,999	5.52	19.21	30.26	55
$25,000+	1.41	4.89	7.7	14
Total	23	80	126	229

Table 4.12.2

Non-White Males 65+, 1-2 morb, 3-5 ADL Problems Paying Medical Bills by Income

Chi-Square= 2.945 p=.2294

Observed Frequency Table

	no problem	some problem	Total
<$11,000	119	43	162
$11-24,999	44	12	56
$25,000+	13	1	14
Total	176	56	232

Expected Values

	no problem	some problem	Total
<$11,000	122.9	39.1	162
$11-24,999	42.48	13.52	56
$25,000+	10.62	3.38	14
Total	176	56	232

Table 4.12.3

**Non-White Males 65+, 1-2 morb, 3-5 ADL
General Aid at Home by Income**

Chi-Square= .618 p=.734

Observed Frequency Table

	no aid	aid	Total
<$11,000	23	123	146
$11-24,999	6	47	53
$25,000+	2	11	13
Total	31	181	212

Expected Values

	no aid	aid	Total
<$11,000	21.35	124.65	146
$11-24,999	7.75	45.25	53
$25,000+	1.9	11.1	13
Total	31	181	212

Table 4.12.4

Non-White Males 65+, 1-2 morb, 3-5 ADL Medical Aid at Home by Income

Chi-Square=1.831 p=.4003

Observed Frequency Table

	no medical aid	medical aid	Total
<$11,000	24	123	147
$11-24,999	13	40	53
$25,000+	2	11	13
Total	39	174	213

Expected Values

	no medical aid	medical aid	Total
<$11,000	26.92	120.08	147
$11-24,999	9.7	43.3	53
$25,000+	2.38	10.62	13
Total	39	174	213

Table 4.12.5

Non-White Males 65+, 1-2 morb, 3-5 ADL Overnight in Hospital or Nursing Home by Income

Chi-Square=.332 p=.847

Observed Frequency Table

	not overnight	overnight	Total
<$11,000	11	155	166
$11-24,999	5	51	56
$25,000+	1	13	14
Total	17	219	236

Expected Values

	not overnight	overnight	Total
<$11,000	11.96	154.04	166
$11-24,999	4.13	51.97	56
$25,000+	1.01	12.99	14
Total	17	219	236

Table 4.12.6

Non-White Males 65+, 1-2 morb, 3-5 ADL
Number of Nights in Hospital by Income

Chi-Square=1.869 p=.7599

Observed Frequency Table

	1-7 days	1-4 weeks	1-12 months	Total
<$11,000	24	50	65	139
$11-24,999	6	19	25	50
$25,000+	2	3	8	13
Total	32	72	98	202

Expected Values

	1-7 days	1-4 weeks	1-12 months	Total
<$11,000	22.02	49.54	67.44	139
$11-24,999	7.92	17.82	24.26	50
$25,000+	2.06	4.63	6.31	13
Total	32	72	98	202

4.3.4.5) Comparison of White Men and Women Over 65

Both subgroups had highly significant differences across the income groups in the number of doctor visits obtained and in the problems experienced paying the medical bills. The people in the lowest income groups not only had the fewest doctor visits and the most problems paying the medical bills, but they also had higher rates of institutionalization for the whole of the last year of life, and shorter stays in hospital. However, these white men and women differ with respect to overnight stays in hp/nh. Low income women reported a significantly higher proportion of their population overnight in hp/nh than higher income women. However, no difference was observed between the income groups in the male subgroup. The greater distinction between income groups in the female subgroup may be associated with: lack of preventive care and consequently necessary acute care utilization by the lower income women; the existence of more short term acute health problems in the lower income women; or higher incidences of elderly women (who have longer average life expectancies and are likely to be predeceased by their spouse) living alone than elderly men, and thus having no one to care for them at home.

4.3.4.6) Comparison of Non-white Men and Women Over 65

The lowest income group in the two non-white subgroups reported the most difficulties in paying their medical bills and had the highest proportions of people in institution for the last year of life. No consistent income-related patterns regarding the length of stay in hospital were observed for either subgroup.

Differences in the number of doctor visits were observed between the male and female subgroups. The women had no consistent pattern of the number of doctor visits reported by the various income levels, whereas the men in the lowest income group had fewer doctor visits than men in the higher income groups (p = .0592, two expected values below 5.0). However, both subgroups had small numbers in the higher income groups, which may cause some instability in the relationships observed. For example, two of the seventeen women with incomes greater than $25,000 represented 11.8% of the female subgroup, whereas three of fourteen men with high incomes represented 21.4% of the subgroup. Therefore, although the male subgroup exhibited a significant difference across the income groups, a slightly different distribution of these men may have shown a substantially different relationship.

These non-white men and women also differed in the reported overnight stays in hp/nh. No differences in overnight stays were apparent across the male income groups. However, women from the lowest income group had a smaller percentage reporting overnight stays in hp/nh than the wealthier women (p = .074). Although the higher income women showed a slightly higher proportion reporting overnight stays, two of the expected values in the contingency tables were below 5.0, causing one to question the true statistical significance of this relationship. Thus, no significant differences in health service utilization were observed between these two subgroups, partly due to small numbers which create unstable relationships and which make it difficult to test for the statistical significance of the relationships observed.

4.3.4.7) Comparison of White and Non-white Women 65+

Comparisons may also be made between women of the two racial categories. Both white and non-white women with annual family incomes of less than $11,000 had more problems paying their medical bills compared with the higher income groups. The low income women also had the highest proportion institutionalized for the whole of the last year of life and had more reports of overnight stays in hospital and nursing home. However, these subgroups differed from each other with respect to two of these utilization variables. The white women with annual family incomes less than $11,000 had significantly fewer doctor visits than the higher income white women (p = . 005), whereas the non-white women showed no consistent pattern across income levels. However, the majority of women in both subgroups had annual family incomes less than $11,000, and very few had incomes greater than $25,000, which may have created unstable relationships among the income groups.

The non-white women also showed no consistent pattern across income levels in their reported lengths of stay in hospital in the last year of life. White women, on the other hand, had, typically, shorter stays in hospital for the lower income groups compared with lengths of stay reported for the higher income groups, although the difference was not statistically significant (p = .2551). Once again, the low numbers in the higher income groups of these subgroups may contribute to instability in the utilization patterns across income groups.

4.3.4.8) Comparison of White and Non-white Men Over 65

The final set of comparisons was between white and non-white men. These men had reported similar utilization experiences. The lowest income groups in both subgroups reported significantly fewer doctor visits than for the higher income groups, greater problems in paying their medical bills, and greater proportions in institutions for the last year of life. Both groups of men also showed no difference across the income groups in the reported overnight stays in hp/nh. However, low income white men had significantly shorter stays in hospital than the higher income white men (p = .0316). No consistent pattern of utilization was observed across the income groups in the non-white subgroup.

4.3.5) General Trends for All Subgroups

On average, the number of morbidities and limitations in activities of daily living increased as age increased, thus the older populations analyzed had greater need for health care than the younger, more healthy subgroups. Despite the over-sampling procedures employed by the National Center for Health Statistics, the non-white subgroups contained relatively few people. These low numbers caused some problems with stability of the relationships observed and some problems in testing for significance of the relationships observed.

4.3.5.1) Doctor Visits

The lowest income group consistently had fewer doctor visits than the higher income groups in all subgroups except for four, in which no patterns could be detected. Although these relationships were not always statistically significant, the pattern appears to be quite consistent. Three groups over age 65 reported significant (or borderline significant) differences among the income groups (the lowest income group having significantly fewer doctor visits than the higher income groups).

4.3.5.2) Problems Paying Medical Bills

Only two subgroups (white women under 45 and non-white men under 45) had very few informants report any problems with paying medical bills. In the remaining nine subgroups, the lowest income groups consistently experienced the most difficulties paying. This relationship was highly statistically significant for three of the subgroups and borderline significant for one other subgroup. Again, although not all of the subgroups showed significant differences, the pattern was strikingly consistent.

4.3.5.3/4) General and Medical Assistance at Home

Typically, people with no activity limitations did not have general or medical assistance at home. On the other hand, those people with more than three activity limitations had greater proportions receiving assistance, but a large proportion of them were also reported to be in some type of institution for the whole of their last year of life. The lowest income group consistently had the greatest proportions of institutionalization. These two utilization variables appear to be highly dependent on the existence of limitations in ADL, which, in turn, appear to be strongly related to age. The older age groups generally have more activity limitations and receive more assistance at home. However, these older people also tend to have low annual family incomes and only very few have incomes greater than

$25,000, which tends to make some of the relationships observed across the income groups unstable.

4.3.5.5) Overnight Stays in Hospital or Nursing Home

The people with annual family incomes of less then $11,000 had greater proportions of informants reporting overnight stays in hospital or nursing home for most of the subgroups (only one subgroup exhibited statistically significant differences across the income levels). One subgroup (white men under 45), on the other hand, had fewer overnight stays reported for the lowest income group (not statistically significant). Three other subgroups showed no consistent patterns of overnight stays across the income groups, although all three of these groups had >93% of their populations with overnight stays in hp/nh (white women 45-64: 95% overnight hp/nh, white men 65+: 94% overnight, and non-white men 65+: 93% overnight). Many factors are likely to influence the decision to use hp/nh services: (i) mode of payment - people paying out of pocket may be more likely to use services only when necessary, and less likely to use preventive services, thus having higher rates of overnight stays in hospital; (ii) comprehensiveness of insurance programs - health services which are covered by the insurance program may be more likely to be used by the people enrolled in that program; (iii) level of need - people with a greater number of morbidities or a greater severity of illness may be more likely to use more hospital or nursing home services; and (iv) persons living alone may be less likely to have appropriate care available at home and therefore may use hp/nh services more. All of these factors are likely to vary greatly according to individual circumstances, thereby creating a somewhat variable pattern of use of hp/nh services across income, age, gender, and racial groups.

4.3.5.6) Number of Nights in Hospital

On average, the number of people who reported overnight stays in hospital was quite small, and most subgroups had too few people in hospital to investigate the influence of income on the length of stay. Of the four subgroups which had sufficient numbers to do such an analysis, it was shown that the lowest income group had shorter lengths of stay than the higher income groups. One of these subgroups (white men over 65) had reported statistically significant shorter stays for the lowest income group than for the higher income groups ($p = .0316$). This pattern is consistent with what one would expect given our understanding of the influence of income on the ability to purchase health services and its relationship with attitudes, values and priorities regarding health and health care.

5.1 CONCLUSIONS

The analysis of the NMFS database produced some strikingly consistent results regarding the influence of income on utilization in eleven subgroups of various race, gender, age and health status combinations. It was found that the lowest income group consistently reported fewer doctor visits and more problems paying their medical bills. In addition, very few people with no reported activity limitations received general or medical assistance at home. However, in the subgroups with three or more reported activity limitations, a large proportion of non-responses were recorded. These non-responses reflected the large proportion of people who were in some type of institution for the whole of their last year of life. The lowest income group constantly reported the greatest proportion of people in institutions, although the conditions contributing directly to this greater utilization are not known. The lowest income group also had consistently greater proportions reporting overnight stays in hospitals/nursing homes than the higher income groups, and, where sufficient information was available, it was observed that the low income groups had shorter stays in hospital than the higher income groups.

Although many of these observed relationships were not statistically significant, the directions of the relationships were overwhelmingly consistent, revealing that the lowest income group was typically underrepresented in the categories of "more" utilization, and overrepresented in categories of "less" utilization (except for rates of institutionalization). These patterns are consistent with our understanding of the relationship between income and health services utilization.

The analysis of the influence of insurance on health service utilization proved to be more difficult than the income-related analysis. The first subgroup analyzed (white males under 45, with no morbidities and no ADL) had a population of only 568, too small to control income for the comparisons across insurance groups. Without controlling for income, the interpretation of the pattern of utilization across the insurance groups was difficult as it could not be determined whether the differences seen were due to insurance or to income. For example, the non-insured group experienced similar levels of difficulty paying their medical bills as the insured groups, even though they paid the majority of their expenses from personal funds. It is not known whether these people were wealthy and were able to afford health care without health insurance, or whether they just did not use services very much and therefore had fewer payments to make.

The only subgroup which had a sufficient size with which to analyze the effect of insurance on health service utilization, while controlling for income, was white women over 65 with 1-2 morbidities and 3-5 ADL (n = 1040). Only the group of people with annual family incomes under $11,000 was analyzed for comparative rates of utilization among three insurance groups (not insured, government, private). Throughout this analysis, it was seen that individuals paying out of pocket had fewer doctor visits than the government- or privately-insured people, as well as fewer reported overnight stays in hp/nh, and shorter stays in hospitals. These patterns of utilization are in accordance with our understanding of how income influences utilization. However, in the subgroups with three or more ADLs, those people paying out of pocket reported greater proportions with general and medical assistance at home, as well as greater proportions in institutions for the whole of the last year of life, compared with the government and private insurance groups. On average, most of the subgroup (85%) reported no problems paying, but the private insurance group experienced the most problems - reflecting, perhaps, the difficulties of being under-insured. None of these relationships proved to be statistically significant, but again, the consistency with which the non-insured group utilized fewer health services (except for long term institutional care and in-home care) was quite striking. In addition, the people with government insurance consistently reported greater utilization and fewer problems than the other two insurance groups. This analysis allowed for a clearer understanding of the influence of the mode of payment than that found in the analysis of the subgroup of males under 45 because questions regarding the influence of income could be studied more closely.

The greatest problem encountered in this analysis was with respect to the number of people within the subgroups. Even though the database had 15,539 records, the number of controls which were used in the analysis created a large number of homogeneous subgroups, some of which had very small populations (the non-white subgroups, for example). These small numbers made it difficult to select a variety of subgroups which would provide sufficient numbers of people for analysis. Similar problems associated with small cell counts were encountered within each subgroup (due to clustering in different income, insurance or utilization categories). The small cell sizes created problems, both when testing for relationships and when testing for the statistical significance of the relationships discovered. They also raised concerns regarding the stability of the observed relationships as a shift of only a few people from one category to another may have produced quite different results.

A potential remedy for such small subgroups would be to reduce the number of controls (or levels of control) used in the creation of the homogeneous subgroups. Although this would likely be successful in enhancing the size of the subgroups, some of the specificity of the subgroups would be lost. In other words, although an increase in the numbers of people in each subgroup would have been achieved, the number of potential confounding variables would be greater, and therefore the analysis would be limited in its ability to determine causal factors or to explain any observed patterns.

One characteristic of the database that may have caused some problems regarding the accuracy or validity of the information contained in the NMFS was the use of proxy reporting. The majority of information contained in the database was obtained from the informant questionnaires. The nature of the information requested in the questionnaire required the informant to be quite knowledgeable of the decedent and the circumstances surrounding the death and care received in the last year of life. People living on their own may have been less likely to have as knowledgeable an informant as people living with family, and thus would be more likely to be represented in the non-response (residual) categories.

The residual category was found to be problematic for questions regarding general and medical aid at home. However, the large residuals reported in these two variables were mainly due to the number of people for whom the questions were not applicable. The residual for the modes of payment used by white males under 45, on the other hand, was approximately 40%, with slightly lower residuals for the highest income group than for the lower income groups. Overall, the problems associated with accuracy of proxy reporting and its relationship with income were not found to be substantial in this analysis, although the potential for this type of misrepresentation remains.

Other caveats must be mentioned to augment our understanding of the results of the analysis. Due to the incomplete nature of the database, it was necessary to make a number of assumptions. Firstly, it was assumed that reported differences in utilization represented underutilization by the lower income groups and uninsured groups rather than overutilization by the higher income or insured groups. Physician-generated demand among those with the ability to pay for the services will undoubtedly occur, but the overall magnitude of such results is suspected to be rather small.

Secondly, because the database contained no information other than at the level of the state, we must assume that there are no geographical differences in the availability of health services. Thirdly, it was assumed that rates-of-recall bias did not vary systematically with variations in income levels. A fourth and final consideration must be taken into account. Although the database contains information pertaining to the decedents' health status prior to death and the circumstances around their deaths, no information can be obtained regarding the *effectiveness* of the type and/or duration of the treatment that they received during the last year of life.

The results of *this* research support, to some degree, the viewpoint of current health care literature: when confounding variables are controlled, lower income groups tend to have lower rates of health service utilization (with some minor exceptions), and health insurance appears to aid in the accessibility of health care services (as seen in the variations in health care utilization by the people paying out of pocket, and by the government and privately insured groups). Further research in this area is recommended in order to evaluate in more detail the influence of income and insurance on the utilization of health care services.

In order to address these problems and enhance the quality of the information obtained from other surveys of this sort, the items on the questionnaire must be examined carefully. Questions must be unambiguous, each containing only one measurable concept. Situations such as that encountered with ADL questions asking: "Did the decedent receive help...", instead of "Did the decedent need help..." would be avoided by a more careful evaluation and formulation of the questionnaire items prior to the survey.

Secondly, more detailed spatial information would be beneficial for the understanding of local and regional pattens of accessibility and utilization. A question regarding the size of the community in which the person lives would provide at least a rural/urban distinction in location, and would be more helpful in the evaluation of geographical aspects of accessibility to health services.

It is also recommended that further research of this sort be performed in prospective studies. The use of people who are still living would eliminate the need for proxies, which would then reduce the problems associated with the accuracy of reporting and its relationship with family income.

The third assumption, that rates-of-recall bias would not systematically vary with income level, has been shown to be suspect in the discussion in Chapter 3. Briefly, a possible lack of familiarity exists on the part of proxy informants which may be enhanced in situations where the reporter was not actually living with the decedent. Also, because the income variable was based on *family* income, those who lived alone may have been more likely to have been classified as "low income". Thus, it is probable that less data was available on low income decedents than on their high income counterparts, who were more likely to be living with family members who would be more knowledgeable about their conditions before their deaths.

The fourth problem, the lack of evaluation of the effectiveness of the health care received, could also be resolved by a prospective study. Rather than having all final conditions being death, regardless of the severity of illness or the types and duration of the treatment received, such a study would allow the evaluation of the effectiveness of health care. As older people have higher rates of mortality than younger persons, a large proportion of the decedent sample population were elderly, resulting in small numbers in the younger subgroups (even after the over-sampling of the younger age groups). A sample population of living persons would potentially provide a more even age distribution in the sample.

In conclusion, the consistency of the relationships between the low and high income groups provides evidence to suggest that measures to increase cost accountability in the U.S. as an attempt to reduce health care expenditures may, in fact, disproportionately burden the lower income groups. Increased disparities in utilization are likely to be the result of this "cost accountability". When these inequities in utilization are combined with the typically greater levels of need by the poor, the disparity in rates of utilization is actually greater than it first appears. Assuming some level of health care is beneficial in the maintenance and promotion of health, these lower rates of utilization may have disproportionately detrimental effects on the health status of the poor.

Although the majority of relationships observed in the analysis are not statistically significant, the overwhelming consistency of relationships calls for a new consideration of health policy based on rights of the individual and values placed on well-being rather than relying on "proven" statistical significance.

These results have important implications in terms of the Canadian health care context. Even though the federal government has recognized disparities in health across social groups and has claimed to support measures for the promotion of health and the reduction of these inequalities (Epp, 1986), the dismantling of the universal public health insurance program which is now occurring in Canada contradicts these efforts. Without accountability to the federal government, the principles of the Canada Health Act (comprehensiveness, universality, portability, public administration, and accessibility) may be eroded and perhaps eventually abandoned by the provinces. The potential implications of these changes have already raised concerns regarding the personal financial burdens of health care, discriminatory levels of access to health services, and the resulting rates of utilization, particularly as these changes will have differential implications for people of different socioeconomic conditions.

APPENDIX I

THE NATIONAL MORTALITY FOLLOWBACK SURVEY QUESTIONNAIRE

OMB No. 0937 – 0144; Approval Expires December 31, 1987

DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service
National Center for Health Statistics

FORM **NMF-1**
(5 2 86)

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
ACTING AS COLLECTING AGENT FOR THE
U.S. PUBLIC HEALTH SERVICE

1986 NATIONAL MORTALITY FOLLOWBACK SURVEY

☐☐☐

(Please correct any error in name and address including ZIP Code.)

NOTICE — Information contained on this form which would permit identification of any individual or establishment has been collected with a guarantee that it will be held in strict confidence, will be used only for purposes stated for this study, and will not be disclosed or released to others without the consent of the individual or the establishment in accordance with Section 308(d) of the Public Health Service Act (42 USC 242m).

PLEASE RETURN WITHIN 5 DAYS TO

Bureau of the Census
1201 East Tenth Street
Jeffersonville, Indiana 47132

FROM THE DIRECTOR

You can help the U.S. Public Health Service to learn more about ways to prevent illness and to improve care for sick and dying persons. You or a relative provided some of the information that was included on the death certificate for the person named above. This information is helpful in understanding about deaths from various causes. Still, we need to learn more so that we can assure the best health care for ill persons and prevent early death when possible. We are therefore having the Bureau of the Census conduct a survey for us, and have randomly selected a sample of deaths in the United States in 1985 and 1986. We ask you to complete this questionnaire about the life and death of the person named above, even if the person died from old age or an accident.

We know that this reminder of the person who died recently may be painful, but we believe that you will want to help others, and your answers will do that. Some of the questions may be difficult to answer, and you may not know the answers to all of them. Many questions may not apply to the person because we are using the same form for all persons in the study. We ask you to recall, to the best of your ability, and answer all that you can. A few general instructions appear on page 2.

All of your answers are strictly confidential. The identity of individuals will not be disclosed by either the Bureau of the Census or the Public Health Service without your written approval. We will not include any information that could identify an individual in the statistics we release. This survey is voluntary and is authorized by the Public Health Service Act (Title 42, United States Code, Section 242k). To add to our knowledge, we are requesting your authorization to secure medical information from hospitals or other health care facilities used by the person in the last year of life.

Although there are no penalties for failing to reply, each unanswered question substantially lessens the accuracy of the final data. The success of this study depends on receiving information on every questionnaire we send out. Your reply is extremely important. Please mail the completed form to the Bureau of the Census within 5 DAYS in the enclosed envelope which requires no postage. Your prompt attention to this request is appreciated.

Sincerely yours,

Manning Feinleib, M.D., Dr. P.H.

INSTRUCTIONS

1. Several items on this form refer to the person's last year of life. This means the time starting one year before the date of death and ending on the day of death. **Example:** If the date of death was January 5, 1986, the period referred to as the "last year of life" is January 5, 1985, to January 5, 1986.

2. Please answer each question to the best of your ability. In some cases you may wish to refer to records or ask other persons. Some questions ask for the amount of time before death that an event occurred, for example, the amount of time before death that the person last worked. If you do not know the exact amount of time, please give your best estimate or a range. Example: 12 to 14 years; or 2 to 3 months.

3. Since some questions will not apply in all cases, instructions for which question to answer next are printed after some of the answer categories. If there is no instruction after the answer, go to the very next question.

4. If the answer does not fit one of the printed answer categories, mark the "other" box and write in the answer. If there is no "other" category, write in the answer without marking a box.

5. If you still don't know the answer to a question, put a question mark (?) or write "Don't know" in the answer space.

6. Ignore the numbers which appear in rectangles (for example 007) and any areas marked "OFFICE USE ONLY." These are for processing purposes only.

7. We welcome any additional information you wish to provide. Use the space on the last page of the questionnaire.

PLEASE BEGIN WITH PART A BELOW.

PART A — BACKGROUND INFORMATION

1. How old was the person at the time of death?

005

__________ Age in years

2. How was the person who died related to you?

Mark (X) only one box.

006

The person was —

1 ☐ My husband or wife
2 ☐ My father or mother
3 ☐ My son or daughter
4 ☐ My brother or sister
5 ☐ My neighbor or friend
6 ☐ Someone else — *Specify*

____

3. Did you ever live in the same home with the person since the person became 25 years old?

Do not count visits at the person's home while you had a home somewhere else.

007

1 ☐ Yes — *Go to next question*
2 ☐ No — *Skip to question 1 in Part B on page 3*

4. Since the person became 25 years old, how many years ALTOGETHER did you live with him or her?

Mark (X) only one box.

008

1 ☐ Less than one year
2 ☐ 1 year to less than 5 years
3 ☐ 5 years to less than 10 years
4 ☐ 10 years to less than 20 years
5 ☐ 20 years or more

PART B — CARE IN THE LAST YEAR OF LIFE

1. During his or her entire life, was the person ever admitted to a nursing home?

009

1 ☐ Yes — *Go to next question*
2 ☐ No — *Skip to question 3*

2. What was the total amount of time the person spent in a nursing home over his or her entire lifetime?

Mark (X) only one box.

010

1 ☐ Less than 3 months
2 ☐ 3 months to less than 1 year
3 ☐ 1 year to less than 5 years
4 ☐ 5 years or more

3. AT ANY TIME DURING THE LAST YEAR OF LIFE, was the person an overnight patient in a hospital or a resident in a nursing home?

011

1 ☐ Yes — *Go to next question*
2 ☐ No — *Skip to question 6 on page 4*

4. What were the names and addresses of all hospitals and nursing homes in which the person stayed at least one night DURING THE LAST YEAR OF LIFE? *(Please give as much of the address as you can.)*

012 ☐

①
Hospital or nursing home name
Address *(Number and street)*
City or Post Office
State ZIP Code

②
Hospital or nursing home name
Address *(Number and street)*
City or Post Office
State ZIP Code

③
Hospital or nursing home name
Address *(Number and street)*
City or Post Office
State ZIP Code

④
Hospital or nursing home name
Address *(Number and street)*
City or Post Office
State ZIP Code

⑤
Hospital or nursing home name
Address *(Number and street)*
City or Post Office
State ZIP Code

⑥
Hospital or nursing home name
Address *(Number and street)*
City or Post Office
State ZIP Code

NOTE: If more room is needed to list more hospitals or nursing homes, please continue on the last page of this questionnaire.

5. DURING THE LAST YEAR OF LIFE, how many total nights did the person spend in hospitals and nursing homes?

NOTE: If you are unsure, please give your best estimate.

Number of nights during year before death

013 ________ Nights in hospital(s)

014 ________ Nights in nursing home(s)

PART B — CARE IN THE LAST YEAR OF LIFE — Continued

6. During the last year of life, did the person stay overnight in any other type of facility providing health care?

Include places known as hospices, mental hospitals, drug and alcohol treatment centers, and so forth. A hospice gives care to dying persons.

015

1 ☐ Yes — *Go to next question*
2 ☐ No — *Skip to question 9 on page 5*

7. What were the names and addresses of all these other facilities in which the person stayed during the last year of life? *(Please give as much of the address as you can.)*

016 ☐

① **Name of place**
Address *(Number and street)*
City or Post Office
State ZIP Code

② **Name of place**
Address *(Number and street)*
City or Post Office
State ZIP Code

③ Name of place
Address *(Number and street)*
City or Post Office
State ZIP Code

④ Name of place
Address *(Number and street)*
City or Post Office
State ZIP Code

⑤ Name of place
Address *(Number and street)*
City or Post Office
State ZIP Code

⑥ Name of place
Address *(Number and street)*
City or Post Office
State ZIP Code

NOTE: If more room is needed to list additional facilities, please continue on the last page of this questionnaire.

8. How many nights during the last year of life did the person spend in each of the places listed above?

NOTE: If you are unsure, please give your best estimate.

Number of nights during year before death

017 ________ Nights in first place
018 ________ Nights in second place
019 ________ Nights in third place
020 ________ Nights in fourth place
021 ________ Nights in fifth place
022 ________ Nights in sixth place

If more than 6 places, continue on last page of this questionnaire.

PART B — CARE IN THE LAST YEAR OF LIFE — *Continued*

9. **During the last year of life, did the person receive hospice care at home?** Include only care provided by an organized hospice agency, one that gives special attention to dying persons.	023	1 ☐ Yes 2 ☐ No
10. **During the last year of life, about how many times did the person see a medical doctor?** Include all types of doctors such as dermatologists, psychiatrists, and ophthalmologists, as well as general practitioners and osteopaths. Do NOT count doctors seen while an overnight patient in a hospital, nursing home, or other institution. *Mark (X) only one box.*	024	0 ☐ None 1 ☐ 1 2 ☐ 2–4 3 ☐ 5–9 4 ☐ 10–14 5 ☐ 15–24 6 ☐ 25 – 49 7 ☐ 50 or more
11. **During the last year of life, did the person see a psychiatrist, psychologist, or any other mental health professional about any personal, emotional, behavioral, or mental problem?** Do NOT count visits while an overnight patient in a hospital, nursing home, or other institution.	025	1 ☐ Yes 2 ☐ No
12. **At any time during the last year of life, was the person on a waiting list to go into a nursing home?**	026	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 14*
13. **After being on the waiting list, did the person get into a nursing home before he or she died?**	027	1 ☐ Yes 2 ☐ No
14. **During the last year of life was the person on a waiting list to get hospice care either at home or in a facility?**	028	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 16*
15. **After being on the waiting list, did the person get hospice care before he or she died?**	029	1 ☐ Yes 2 ☐ No
16. **During the last year of life, was the person on a waiting list to get homemaker service?**	030	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 18*
17. **After being on the waiting list, did the person get homemaker service before he or she died?**	031	1 ☐ Yes 2 ☐ No
18. **During the last year of life was the person on a waiting list to get visiting nurse service?**	032	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 20 on page 6*
19. **After being on the waiting list, did the person get visiting nurse service before he or she died?**	033	1 ☐ Yes 2 ☐ No

PART B — CARE IN THE LAST YEAR OF LIFE — Continued

As part of this survey we would like to learn about how much Medicare helps pay for health care.

20. Was the person covered by Medicare?

034

1☐ Yes — *Go to next question*
2☐ No — *Skip to question 22*

21. What was the person's Medicare claim number?

Provision of this number is voluntary and failure to provide the number will not have any effect on the receipt of any benefits. The information we receive will be used only for statistical purposes. Data from this survey will be linked with data supplied by the Health Care Financing Administration. This information is collected under the authority of Section 306 of the Public Health Service Act.

035

036

Medicare claim number

☐☐☐-☐☐-☐☐☐☐-☐☐

This number may be found on the person's Medicare card which is white with a red and blue stripe. The number may also be found on the Explanation of Medicare Benefits Forms that are sent after each service used.

22. During the last year of life, what sources were used to help pay for health care in hospitals, nursing homes, physician services, or care in the home?

Mark (X) all that apply.

037

1☐ The person or other family members living with the person
2☐ Family members not living with the person
3☐ Medicare
4☐ Medicaid
5☐ A prepaid health maintenance organization
6☐ Private health insurance

038

1☐ Veterans Administration
2☐ Indian Health Service
3☐ Other government program — *Specify* ↘

____

4☐ Other — *Specify* ____________________

0☐ Didn't have any payments — *Skip to question 24*

23. Which source marked in question 22 paid MOST of the costs of health care during the last year of life?

039

____
Name of source

24. What was the total amount of the person's own money that was paid for the person's medical care during the last year of life? Also include payments made by related persons living in the same household.

Include expenses for doctors, hospitals, nursing homes, dental, optical, medicines, and other health expenses.

Also include payments made TO Medicare and any other health insurance.

Do not include any amounts paid by or received from insurance, Medicare, or Medicaid.

If you are unsure, please make your best estimate.

Mark (X) only one box.

040

Person's OWN money, NOT total bill.

1☐ **Less than $200**
2☐ **$200 – $499**
3☐ **$500 – $999**
4☐ **$1,000 – $1,999**
5☐ **$2,000 – $2,999**
6☐ **$3,000 – $4,999**
7☐ **$5,000 – $9,999**
8☐ **$10,000 – $14,999**
9☐ **$15,000 – $19,999**
10☐ **$20,000 – $24,999**
11☐ **$25,000 or more**

PART B — CARE IN THE LAST YEAR OF LIFE — Continued

25. **At any time during the last year of life did the person receive help from others in WALKING OR use special equipment in WALKING?** *Mark "Yes" if the person couldn't walk.* (Special equipment includes canes, walkers, wheelchairs, handlebars, etc.)	041	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 27*
26. **How long was the person unable to walk or did the person receive help in WALKING or use equipment in WALKING during his or her entire life?** (For example, 5 years or 1 week)	042	________________ Length of time
27. **At any time during the last year of life did the person receive help from others in EATING OR use special equipment in EATING?**	043	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 29*
28. **How long did the person receive help in EATING or use special equipment in EATING during his or her entire life?** (For example, 5 years or 1 week)	044	________________ Length of time
29. **At any time during the last year of life did the person receive help from others in BATHING OR use special equipment for BATHING?**	045	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 31*
30. **How long did the person receive help in BATHING or use equipment in BATHING during his or her entire life?** (For example, 5 years or 1 week)	046	________________ Length of time
31. **At any time during the last year of life did the person receive help from others in DRESSING OR use special equipment in DRESSING?**	047	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 33*
32. **How long did the person receive help in DRESSING or use equipment in DRESSING during his or her entire life?** (For example, 5 years or 1 week)	048	________________ Length of time
33. **At any time during the last year of life did the person receive help from others in using the TOILET OR use special equipment in using the TOILET?**	049	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 35 on page 8*
34. **How long did the person receive help in using the TOILET or use equipment in using the TOILET during his or her entire life?** (For example, 5 years or 1 week)	050	________________ Length of time

PART B — CARE IN THE LAST YEAR OF LIFE — Continued

35. For how much of the last year of life was the person in a nursing home or other health facility or any other type of institution? *Mark (X) only one box.*	051	0 ☐ None — *Go to next question* 1 ☐ At least one night but less than half of the last year — *Go to next question* 2 ☐ At least half but not all of the last year — *Go to next question* 3 ☐ All of the last year — *Skip to question 39*
36. During the last year of life, did the person receive help AT HOME from other persons in walking, eating, bathing, dressing, or using the toilet?	052	1 ☐ Yes 2 ☐ No
37. During the last year of life, did anyone help the person AT HOME in giving medicines, pills, shots, injections, in changing bandages, or by providing nursing care?	053	1 ☐ Yes 2 ☐ No
If you marked No in both questions 36 AND 37, skip to question 39. **38. Who helped the person AT HOME during the last year of life?** *Mark (X) all that apply*	055	1 ☐ Husband or wife 2 ☐ Son 3 ☐ Daughter 4 ☐ Other relative — **What relation?** ________________ ________________
	056	5 ☐ Neighbor or friend 6 ☐ Visiting nurse 7 ☐ Visiting homemaker 8 ☐ Other — *Specify* ________________ ________________
39. During the last year of life, how often did the person have trouble understanding where he or she was? *Mark (X) only one box*	057	1 ☐ All or most of the time 2 ☐ Some of the time 3 ☐ Only in last few hours or days before death 4 ☐ Never or hardly ever
40. During the last year of life, how often did the person have trouble remembering what year it was? *Mark (X) only one box.*	058	1 ☐ All or most of the time 2 ☐ Some of the time 3 ☐ Only in last few hours or days before death 4 ☐ Never or hardly ever
41. During the last year of life, how often did the person have trouble recognizing family members or good friends? *Mark (X) only one box.*	059	1 ☐ All or most of the time 2 ☐ Some of the time 3 ☐ Only in last few hours or days before death 4 ☐ Never or hardly ever
42. Did the person ever sign a paper stating NOT to use life-sustaining equipment or procedures if the person was definitely dying? This paper is sometimes called a "living will."	060	1 ☐ Yes 2 ☐ No

PART B — CARE IN THE LAST YEAR OF LIFE — Continued

43. During the LAST THREE YEARS OF LIFE, did anyone have any problems in finding a nursing home for the person or getting the person into a nursing home?	061	1 ☐ Yes — Very serious problem 2 ☐ Yes — Somewhat serious problem 3 ☐ No — Not a problem or not applicable
44. During the LAST YEAR OF LIFE, did anyone have any problems in getting help to care for the person at home?	062	1 ☐ Yes — Very serious problem 2 ☐ Yes — Somewhat serious problem 3 ☐ No — Not a problem or not applicable
45. During the last year of life, did anyone have any problems in paying the medical bills for the person?	063	1 ☐ Yes — Very serious problem 2 ☐ Yes — Somewhat serious problem 3 ☐ No — Not a problem or not applicable
46. During the last year of life, did anyone have any problems in finding and getting treatment from a doctor for the person?	064	1 ☐ Yes — Very serious problem 2 ☐ Yes — Somewhat serious problem 3 ☐ No — Not a problem or not applicable

Continue with Part C on the next page.

PART C — LIFE STYLE AND HEALTH

1. **AT ANY TIME IN THE PERSON'S LIFE, did he or she ever have high blood pressure (hypertension)?**	065	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 5*
2. **How long before death was the high blood pressure (hypertension) first noticed?** (For example, 3 years or 2 weeks)	066	________________ Time before death
3. **Did a doctor prescribe medicine for the high blood pressure?**	067	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 5*
4. **On the average over the time prescribed, did the person take the medicine regularly?** (If more than one medicine was prescribed, did the person take all or most of them regularly?)	068	1 ☐ Very regularly 2 ☐ Not very regularly 3 ☐ Hardly at all or never
5. **At any time in the person's life, did he or she ever have a heart attack?**	069	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 7*
6. **How long before death did the person have the FIRST heart attack?** (For example, 3 years or 2 weeks)	070	________________ Time before death
7. **At any time in the person's life, did he or she ever have angina pectoris?**	071	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 9*
8. **How long before death was the angina pectoris first noticed?** (For example, 3 years or 2 weeks)	072	________________ Time before death
9. **At any time in his or her life, did the person have a stroke in which any resulting conditions (such as paralysis, loss of vision or speech) lasted AT LEAST ONE DAY OR LONGER?**	073	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 11*
10. **How old was the person when he or she had the first stroke in which there were resulting conditions lasting at least one day?** If not sure, give approximate age.	074	________ Age in years
11. **AT ANY TIME IN THE PERSON'S LIFE, did a doctor say that the person had Alzheimer's disease, chronic brain syndrome, dementia, senility, or any other serious memory impairment?**	075	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 13 on page 11*
12. **How long before death was this diagnosis first made?** (For example, 3 years or 2 months)	076	________________ Time before death

PART C — LIFE STYLE AND HEALTH — Continued

13. At any time in the person's life, did he or she have any OTHER mental, nervous, or emotional health problem?	077	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 15*
14. How long before death was the other mental, nervous, or emotional health problem first noticed? (For example, 3 years or 2 months)	078	________________ Time before death
15. At any time during the person's life, did he or she have diabetes?	079	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 17*
16. How long before death was the diabetes first noticed? (For example, 3 years or 2 months)	080	________________ Time before death
17. Was cancer the main condition leading to death?	081	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 19*
18. How long before death was this cancer first noticed? (For example, 3 years or 2 months)	082	________________ — *Skip to question 21* Time before death
19. At any time during the person's life, did he or she have cancer of any kind, except skin cancer?	083	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 21*
20. How long before death was cancer, except skin cancer, first noticed? (For example, 3 years or 2 months)	084	________________ Time before death
21. At any time during the person's life, did he or she have asthma ?	085	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 23*
22. How long before death was the asthma first noticed? (For example, 3 years or 2 months)	086	________________ Time before death
23. At any time during the person's life, did he or she have any other lung condition such as emphysema or bronchitis lasting 3 months or longer?	087	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 25 on page 12*
24. How long before death was the first lung condition first noticed? (For example, 3 years or 2 months)	088	________________ Time before death

PART C — LIFE STYLE AND HEALTH — Continued

25.	**At any time in the person's life, did he or she have cirrhosis of the liver?**	089	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 27*
26.	**How long before death was the cirrhosis first noticed?** (For example, 3 years or 2 months)	090	______________ Time before death
27.	**Was there ever a time in the person's life that he or she was thought to be extremely near to death but lived on?**	091	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 29*
28.	**When was this time in the person's life when he or she was thought to be extremely near to death but lived on?** (If there was more than one time, please answer for the first time.) *Mark (X) only one box.*	092	1 ☐ Less than 3 months before actual death 2 ☐ 3 months to less than a year before death 3 ☐ 1 year to less than 5 years before death 4 ☐ 5 years or more before death
29.	**Where did the person die?** *Mark (X) only one box.*	093	1 ☐ In a hospital emergency room 2 ☐ In a hospital, not in emergency room 3 ☐ On the way to a hospital 4 ☐ In a nursing home or personal care home 5 ☐ In his or her own home 6 ☐ In some other place — *Specify* ↙ ______________
30.	**At any time during the hour before death were you with the person?**	094	1 ☐ Yes 2 ☐ No
31.	**What was the person doing an hour before death?** *Mark (X) all that apply.*	095	1 ☐ Confined to bed or chair because of illness or injury 2 ☐ Working 3 ☐ Quiet recreation such as watching TV or playing cards 4 ☐ Active recreation such as yard work, exercise or sports 5 ☐ Sleeping 6 ☐ Other — *Specify* ↙ ______________
32.	**Within the hour before death, did the person start having a new or sharply increased problem such as chest pain, difficulty breathing, or fainting?**	096	1 ☐ Yes 2 ☐ No

PART C — LIFE STYLE AND HEALTH — Continued

IF THE PERSON WAS A MALE, SKIP TO QUESTION 42.

33. **Did she EVER regularly take birth control pills?**	098	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 36*
34. **Altogether, about how long did she take birth control pills?**	099	1 ☐ Less than one year 2 ☐ 1 year but less than 5 years 3 ☐ 5 years but less than 10 years 4 ☐ 10 years or longer
35. **At what age did she start taking birth control pills?** If not sure, give approximate age.	100	________ Age in years
36. **How many LIVE BIRTHS did she ever have? Please include children who died very young.**	101	________ Number of live births
37. **Did she ever have a hysterectomy?** (An operation to remove the uterus.)	102	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 40*
38. **How old was she when she had the hysterectomy?** If unsure, give approximate age.	103	________ Age in years
39. **Before the hysterectomy, had her menstrual periods already ended due to menopause or the "change of life"?**	104	1 ☐ Yes — *Skip to question 41* 2 ☐ No — *Skip to question 42*
40. **Had her menstrual periods ever ended due to menopause or the "change of life"?**	105	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 42*
41. **How old was she when her menstrual periods ended?** If unsure, give approximate age.	106	________ Age in years
ANSWER FOR BOTH MALE AND FEMALE 42. **Did the person ever have an operation to be sterilized?** (For males, a vasectomy. For females, "tubes tied" or tubal ligation.)	107	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 44 on page 14*
43. **How old was the person when he or she had an operation to be sterilized?** If unsure, give approximate age.	108	________ Age in years

PART C — LIFE STYLE AND HEALTH — Continued

In these next questions, we are interested in the person's usual practice, not in any possible recent change because of a health problem.

DURING MOST OF HIS OR HER ADULT LIFE, on the average, how often did the person usually eat the following foods —

44. Red meat, such as beef, pork, lamb, or hamburger?

Mark (X) only one box.

109

1 ☐ Every day
2 ☐ 3 to 6 times a week
3 ☐ 1 or 2 times a week
4 ☐ 1 to 3 times a month
5 ☐ Less than once a month
6 ☐ Never

45. Eggs or dairy products, such as milk, cheese, or butter?

Mark (X) only one box.

110

1 ☐ Every day
2 ☐ 3 to 6 times a week
3 ☐ 1 or 2 times a week
4 ☐ 1 to 3 times a month
5 ☐ Less than once a month
6 ☐ Never

46. Fruit?

Mark (X) only one box.

111

1 ☐ Every day
2 ☐ 3 to 6 times a week
3 ☐ 1 or 2 times a week
4 ☐ 1 to 3 times a month
5 ☐ Less than once a month
6 ☐ Never

47. Vegetables?

Mark (X) only one box.

112

1 ☐ Every day
2 ☐ 3 to 6 times a week
3 ☐ 1 or 2 times a week
4 ☐ 1 to 3 times a month
5 ☐ Less than once a month
6 ☐ Never

48. Foods prepared by salt-curing or smoking, such as bacon, hot dogs, or smoked fish?

Mark (X) only one box.

113

1 ☐ Every day
2 ☐ 3 to 6 times a week
3 ☐ 1 or 2 times a week
4 ☐ 1 to 3 times a month
5 ☐ Less than once a month
6 ☐ Never

49. During MOST of his or her adult life, was the person overweight, underweight, or just about right?

Mark (X) only one box.

114

1 ☐ Very overweight
2 ☐ Somewhat overweight
3 ☐ Only a little overweight
4 ☐ Underweight
5 ☐ About right

50. On the average, approximately what was the person's usual adult weight?

115

__________ Pounds

51. What was the person's adult height?

Enter both feet and inches, such as "5 feet and 6 inches." If no inches, enter "0."

116

__________ Feet

AND

117

__________ Inches

PART C — LIFE STYLE AND HEALTH — Continued

52. Did the person smoke at least 100 cigarettes in his or her entire life? 118

(There are usually 20 or 25 cigarettes in a pack.)

1 ☐ Yes — *Go to next question*
2 ☐ No — *Skip to question 57*

53. How long did he or she smoke cigarettes regularly? 119

Enter years or mark (X) a box.

________ Years } *Go to next question*
x ☐ Less than 1 year } *Go to next question*
o ☐ Never smoked regularly — *Skip to question 55.*

54. During the period he or she smoked most, on the average, about how many cigarettes a day did the person usually smoke? 120

Mark (X) only one box.

1 ☐ Less than 5 cigarettes a day
2 ☐ 5–14 a day
3 ☐ 15–24 a day
4 ☐ 25–34 a day
5 ☐ 35–44 a day
6 ☐ 45 or more a day

55. Did the person stop smoking and not start again? 121

1 ☐ Yes — *Go to next question*
2 ☐ No — *Skip to question 57*

56. How long before death did the person stop smoking? 122

(For example: 3 years or 2 months)

____
Time before death

57. Did the person ever regularly use chewing tobacco? 123

1 ☐ Yes — *Go to next question*
2 ☐ No — *Skip to question 60*

58. How long did he or she regularly use chewing tobacco? 124

Enter years or mark (X) the box.

________ Years
x ☐ Less than 1 year

59. When he or she was regularly using chewing tobacco, on the average, how often did the person use it? 125

Mark (X) only one box.

1 ☐ 5 or more times a day
2 ☐ 3–4 times a day
3 ☐ 1–2 times a day
4 ☐ 3–6 times a week
5 ☐ 1 or 2 times a week
6 ☐ 1 to 3 times a month
7 ☐ Less than once a month

60. Did the person ever regularly use snuff? 126

1 ☐ Yes — *Go to next question*
2 ☐ No — *Skip to question 63 on page 16*

61. How long did he or she regularly use snuff? 127

Enter years or mark (X) the box.

________ Years
x ☐ Less than 1 year

62. When he or she was regularly using snuff, on the average, how often did the person use it? 128

Mark (X) only one box.

1 ☐ 5 or more times a day
2 ☐ 3–4 times a day
3 ☐ 1–2 times a day
4 ☐ 3–6 times a week
5 ☐ 1 or 2 times a week
6 ☐ 1 to 3 times a month
7 ☐ Less than once a month

PART C — LIFE STYLE AND HEALTH — Continued

63. In the person's entire adult life, did he or she have at least 12 drinks of any kind of alcoholic beverage, such as beer, wine, or liquor?

129

1 ☐ Yes — *Go to next question*
2 ☐ No — *Skip to question 66*

64. On the average, during adult life, how often did he or she drink any alcoholic beverages, such as beer, wine, or liquor?

Mark (X) only one box.

130

1 ☐ Every day
2 ☐ 3 to 6 times a week
3 ☐ 1 or 2 times a week
4 ☐ 1 to 3 times a month
5 ☐ Less than once a month

65. On the days that the person drank, how many drinks did he or she have on the average, per day?

Mark (X) only one box.

131

1 ☐ Twelve or more
2 ☐ Seven to eleven
3 ☐ Five or six
4 ☐ Three or four
5 ☐ Two
6 ☐ One

66. Over the last 10 years (and not counting the last illness), did the person exercise vigorously at least three times a week, for at least 20 minutes each time?

(For example: running, swimming, bicycling, walking briskly, aerobic exercise, etc.)

Mark (X) only one box.

132

1 ☐ Very regularly
2 ☐ Not very regularly
3 ☐ Hardly at all or never

PART D — CHARACTERISTICS OF PERSON

1. Did the person EVER work at a paying job or a business full or part time?

133

1 ☐ Yes — *Go to next question*
2 ☐ No — *Skip to question 8*

2. Of all the PAID jobs or businesses the person ever had, what KIND OF WORK did he or she do the longest? *(For example, electrical engineer, stock clerk, typist, farmer, in Armed Forces, etc.)*

134

____
____
____

3. For how many years did the person do this kind of work?

Mark (X) only one box.

135

1 ☐ Less than one year
2 ☐ 1 to less than 5 years
3 ☐ 5 to less than 10 years
4 ☐ 10 to less than 20 years
5 ☐ 20 to less than 30 years
6 ☐ 30 to less than 40 years
7 ☐ 40 years or more

4. In this occupation, what KIND OF BUSINESS OR INDUSTRY did he or she work in the longest? Describe the activity at the location where employed. *(For example: TV and radio manufacturing, retail shoe store, State Labor Department, farm, Armed Forces, etc.)*

136

____
____
____

5. Was the person employed at a paying job or business up until the time he or she died?

137

1 ☐ Yes — *Skip to question 8*
2 ☐ No — *Go to next question*

6. Why did the person stop working?

Mark (X) only one box.

138

1 ☐ Because of a health problem or disability
2 ☐ Because of loss of job
3 ☐ Normal retirement
4 ☐ Other reason — *Specify* ↓

____

7. How long before death was the last time the person worked at a paying job or business (full or part time)?

(For example: 3 years or 2 months)

139

____
Time before death

8. Did the person's husband or wife ever work at a paying job or business full or part time?

If married more than once, answer for most recent husband or wife.

140

1 ☐ Yes — *Go to next question*
2 ☐ No } *Skip to question 11 on page 18*
3 ☐ Never married } *Skip to question 11 on page 18*

9. Of all the PAID jobs or businesses the person's husband or wife ever had, what KIND OF WORK did the husband or wife do the longest? *(For example, electrical engineer, stock clerk, typist, farmer, in Armed Forces, etc.)*

141

____
____
____

10. In this occupation, what KIND OF BUSINESS OR INDUSTRY did the husband or wife work in the longest? Describe the activity at the location where employed. *(For example, TV and radio manufacturing, retail shoe store, State Labor Department, farm, Armed Forces, etc.)*

142

____
____
____

PART D — CHARACTERISTICS OF PERSON — Continued

11. What was the size of the family during most of 1985? (Include the person and all of his or her relatives living in the same household.) *Mark (X) only one box.*	143	0 ☐ Person lived in nursing home, other health facility, or other institution during most of 1985 1 ☐ One (Person either lived alone or with unrelated persons) 2 ☐ Two 3 ☐ Three 4 ☐ Four 5 ☐ Five 6 ☐ Six 7 ☐ Seven 8 ☐ Eight 9 ☐ Nine or more
12. What was the family's income in 1985? **(Please include the person's income and the income of all other related persons living in the same household as the person. Include money from jobs, social security, retirement income, unemployment payments, public assistance, etc. Also include income from interest, dividends, net income from business, farm, or rent, and any other money income received.)** *Mark (X) only one box.*	144	1 ☐ Less than $5,000 2 ☐ $5,000 — $6,999 3 ☐ $7,000 — $8,999 4 ☐ $9,000 — $10,999 5 ☐ $11,000 — $12,999 6 ☐ $13,000 — $14,999 7 ☐ $15,000 — $16,999 8 ☐ $17,000 — $18,999 9 ☐ $19,000 — $21,999 10 ☐ $22,000 — $24,999 11 ☐ $25,000 and over
13. Was the person ever on active duty in the U.S. Armed Forces? NOTE — *Mark "No" if all of the active duty service was related to training in the National Guard or military reserve.*	145	1 ☐ Yes — *Go to next question* 2 ☐ No — *Skip to question 15*
14. At the time of death, was the person on full-time active duty with the Armed Forces?	146	1 ☐ Yes 2 ☐ No
15. Which category BEST represents the person's race? *Mark (X) only one box.*	147	1 ☐ American Indian, Aleut, or Eskimo 2 ☐ Asian or Pacific Islander 3 ☐ Black 4 ☐ White
16. Was this person of Spanish or Hispanic origin or descent?	150	1 ☐ Yes 2 ☐ No

PART D — CHARACTERISTICS OF PERSON — Continued

17. Who did the person live with at the time of death?

(If the person was living in an institution at the time of death, who did he or she live with BEFORE entering the institution?)

If more room is needed to list additional persons, continue on the last page of this questionnaire.

151

1 ☐ Lived alone — *Go to next question*

2 ☐ Lived with other persons (List relationship for each other person below, for example, husband/wife, son, friend, etc.) ↓

	Person	Relationship
152	1	
153	2	
154	3	
155	4	
156	5	
157	6	
158	7	
159	8	

18. What was the highest grade or year of regular school the person ever completed?

Mark (X) only one box.

160

1 ☐ Less than 5 years
2 ☐ 5-7 years
3 ☐ 8 years
4 ☐ 9-11 years
5 ☐ High school graduate
6 ☐ 1-3 years of college
7 ☐ 4 years of college or more

19. At the time of his or her death, what was the marital status of the person?

161

1 ☐ Married — *Skip to question 21*
2 ☐ Widowed — *Go to next question*
3 ☐ Divorced } *Skip to question 21*
4 ☐ Separated } *Skip to question 21*
5 ☐ Never married — *Skip to question 26 on page 20*

20. About how long before the person's death did the person's husband or wife die?

(For example: 3 years or 2 months)

162

____
Time before person's death

21. Counting all marriages which the person may have had, for how many years ALTOGETHER was he or she married?

Enter number or mark (X) the box.

163

__________ Years
x ☐ Less than 1 year

22. How many different persons was he or she ever married to during his or her entire life?

164

__________ Number of different husbands or wives

23. What was the highest grade or year of regular school completed by the person's husband or wife?

If the person was married more than once, answer for the most recent husband or wife.

Mark (X) only one box.

165

1 ☐ Less than 5 years
2 ☐ 5-7 years
3 ☐ 8 years
4 ☐ 9-11 years
5 ☐ High school graduate
6 ☐ 1-3 years of college
7 ☐ 4 years of college or more

PART D — CHARACTERISTICS OF PERSON — Continued

24. While the person was married, did his or her husband or wife smoke at least 100 cigarettes?

If the person was married more than once and any of the husbands or wives smoked at least 100 cigarettes, mark "Yes".

166

1 ☐ Yes — *Go to next question*
2 ☐ No — *Skip to question 26*

25. On the average, how many cigarettes a day did the person's husband or wife smoke?

If the person was married more than once, answer for the most recent husband or wife who smoked.

167

1 ☐ Less than 5 cigarettes a day
2 ☐ 5–14 a day
3 ☐ 15–24 a day
4 ☐ 25–34 a day
5 ☐ 35–44 a day
6 ☐ 45 or more a day

26. In what year was the person's natural father born?

If unsure, please give approximate year.

168

☐☐☐☐ Year of father's birth

27. If the person's natural father has died, how old was the father when the father died?

Give age or mark (X) the box.

169

________ Father's age at death
x ☐ Still living

28. In what year was the person's natural mother born?

If unsure, please give approximate year.

170

☐☐☐☐ Year of mother's birth

29. If the person's natural mother has died, how old was the mother when the mother died?

Give age or mark (X) the box.

171

________ Mother's age at death
x ☐ Still living

30. Did the person's natural father ever have a heart attack?

172

1 ☐ Yes — *Go to next question*
2 ☐ No — *Skip to question 32*

31. About how old was the person's natural father when he had his first heart attack?

If unsure, please give approximate age.

173

________ Age of father

32. Did the person's natural mother ever have a heart attack?

174

1 ☐ Yes — *Go to next question*
2 ☐ No — *Skip to question 34 on page 21*

33. About how old was the person's natural mother when she had her first heart attack?

If unsure, please give approximate age.

175

________ Age of mother

PART D — CHARACTERISTICS OF PERSON — Continued

34. **How many brothers who lived to be 25 years old or older did the person have?**

(Do not include half, step, or adoptive brothers.)

Enter number or mark (X) the box.

176
______ Number of brothers — *Go to next question*
0 ☐ None — *Skip to question 37*

---

35. **How many of the person's brothers ever had a heart attack?**

(Count only brothers who lived to be at least 25 years old.)

Enter number or mark (X) the box.

177
______ Number who had a heart attack — *Go to next question*
0 ☐ None — *Skip to question 37*

---

36. **How old were these brothers when they had a heart attack?**

For each brother who had a heart attack, enter that brother's age when he had the first heart attack.

If unsure, give approximate ages.

178 ______ Brother's age at time of heart attack
179 ______ Brother's age at time of heart attack
180 ______ Brother's age at time of heart attack
181 ______ Brother's age at time of heart attack
182 ______ Brother's age at time of heart attack
183 ______ Brother's age at time of heart attack

---

37. **How many sisters who lived to be 25 years old or older did the person have?**

(Do not include half, step, or adoptive sisters.)

Enter number or mark (X) the box.

184
______ Number of sisters — *Go to next question*
0 ☐ None — *Skip to question 40 on page 22*

---

38. **How many of the person's sisters ever had a heart attack?**

(Count only sisters who lived to be at least 25 years old.)

Enter number or mark (X) the box.

185
______ Number who had a heart attack — *Go to next question*
0 ☐ None — *Skip to question 40 on page 22*

---

39. **How old were these sisters when they had a heart attack?**

For each sister who had a heart attack, enter that sister's age when she had the first heart attack.

If unsure, give approximate ages.

186 ______ Sister's age at time of heart attack
187 ______ Sister's age at time of heart attack
188 ______ Sister's age at time of heart attack
189 ______ Sister's age at time of heart attack
190 ______ Sister's age at time of heart attack
191 ______ Sister's age at time of heart attack

PART D — CHARACTERISTICS OF PERSON — Continued

192

40. At the time of death, what was the total value of things (including a home if any) owned by the person (and husband or wife)?

Subtract any debts and mortgages. Include cash in bank accounts, stocks, bonds, cars, jewelry, business interests, etc.

If unsure, please make your best estimate.

Mark (X) only one box.

0 ☐ Zero net worth (or loss)
1 ☐ $1 — $4,999
2 ☐ $5,000 — $24,999
3 ☐ $25,000 — $49,999
4 ☐ $50,000 — $99,999
5 ☐ $100,000 — $249,999
6 ☐ $250,000 — $499,999
7 ☐ $500,000 or more

41. Is there anyone else who might be able to add to the information you gave on this questionnaire?

☐ Yes — **What is his or her name, address, and telephone number?**

☐ No — *Go to next question*

Name

Address (Number and street)

City or Post Office

State ZIP Code

Area code ☐☐☐ Telephone number ☐☐☐ – ☐☐☐☐

☐ No telephone

42. Sometimes particular questions are not clear to the person answering them. Would you please give us your name and telephone number so that we can call you in case we have some questions?

Your name

Area code ☐☐☐ Telephone number ☐☐☐ – ☐☐☐☐

☐ No telephone

Please go to the next page, read and complete the authorization. →

193

194

195

196

197

AUTHORIZATION TO OBTAIN INFORMATION FROM MEDICAL RECORDS

I hereby give my consent for hospitals, nursing homes, and other medical sources that maintain records on the person named below to provide the required information to the National Center for Health Statistics through the U.S. Bureau of the Census. I understand that the National Center for Health Statistics will use this information only for statistical purposes and no information which identifies me, the person named below, or the medical source will ever be released or published.

________________ (Today's date)

____________________________ (Your signature)

____________________________ (Relationship to the deceased)

____________________________ (Name of the deceased. Please print)

This authorization expires one year from date of signature.

Please return this entire questionnaire to the Bureau of the Census in the envelope provided.

THANK YOU VERY MUCH FOR YOUR COOPERATION.

ADDITIONAL ANSWERS OR COMMENTS

(Continued from earlier questions. PLEASE SHOW THE PAGE AND QUESTION NUMBER TO WHICH EACH OF YOUR ENTRIES APPLIES.)

Please add any comments or suggestions that you think can help in this study.

☆ U.S. GOVERNMENT PRINTING OFFICE : 1986—646-009/40017

APPENDIX II

FACILITY ABSTRACT RECORDS

FORM **NMF-6**
(8-22-86)

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
ACTING AS COLLECTING AGENT FOR THE
DEPARTMENT OF HEALTH AND HUMAN SERVICES
U.S. PUBLIC HEALTH SERVICE
NATIONAL CENTER FOR HEALTH STATISTICS

FACILITY ABSTRACT RECORD
1986 NATIONAL MORTALITY FOLLOWBACK SURVEY

OMB No. 0937-0144: Approval Expires December 30, 1987

NOTICE — Information contained on this form which would permit identification of any individual or establishment has been collected with a guarantee that it will be held in strict confidence, will be used only for purposes stated for this study, and will not be disclosed or released to others without the consent of the individual or the establishment in accordance with Section 308(d) of the Public Health Service Act (42 USC 242m)

PLEASE COMPLETE ITEMS A—F, AS APPROPRIATE, FOR THE DECEDENT IDENTIFIED IN I—IV.

I. Name of decedent

II. Date of death

III. Date of birth

IV. Address of decedent
Number and street | City | State | ZIP Code

V. Name of hospital or institution

VI. Decedent's control number

VII. Facility control number

A. Was the person named above discharged (either dead or alive) from this hospital or institution since January 1, 1985?

1 ☐ Yes — *Go to item B* 2 ☐ No — *Skip to item D on page 4*

B. For **each** discharge, what were the admission and discharge dates, diagnoses established at the time of discharge, and surgical and diagnostic procedures? (The principal diagnosis is the condition after study, chiefly responsible for the stay; if unknown, enter first listed diagnosis. The principal procedure is the procedure most related to the principal diagnosis; if unknown, enter first listed procedure.) Continue on pages 2 and 3, if appropriate. Then go to item C on page 4.

①

a. Admission date *(Month, day, year)*

b. Discharge date *(Month, day, year)*

c. Diagnoses

	ICD-9-CM codes *(If available)*
Principal- (1) ______	
Others- (2) ______	
(3) ______	
(4) ______	
(5) ______	
(6) ______	
(7) ______	

d. Surgical and Diagnostic Procedures
(Mark "None" if there were no procedures for this stay.) ——► ☐ None

	ICD-9-CM codes *(If available)*
Principal- (1) ______	
Others- (2) ______	
(3) ______	
(4) ______	
(5) ______	

② **a.** Admission date *(Month, day, year)*

b. Discharge date *(Month, day, year)*

c. Diagnoses

ICD-9-CM codes *(If available)*

Principal-(1)

Others-(2)

(3)

(4)

(5)

(6)

(7)

d. Surgical and Diagnostic Procedures
(Mark "None" if there were no procedures for this stay.) → ☐ None

ICD-9-CM codes *(If available)*

Principal-(1)

Others-(2)

(3)

(4)

(5)

③ **a.** Admission date *(Month, day, year)*

b. Discharge date *(Month, day, year)*

c. Diagnoses

ICD-9-CM codes *(If available)*

Principal-(1)

Others-(2)

(3)

(4)

(5)

(6)

(7)

d. Surgical and Diagnostic Procedures
(Mark "None" if there were no procedures for this stay.) → ☐ None

ICD-9-CM codes *(If available)*

Principal-(1)

Others-(2)

(3)

(4)

(5)

④ **a.** Admission date *(Month, day, year)*

b. Discharge date *(Month, day, year)*

c. Diagnoses

ICD-9-CM codes *(If available)*

Principal-(1)
Others-(2)
(3)
(4)
(5)
(6)
(7)

d. Surgical and Diagnostic Procedures
(Mark "None" if there were no procedures for this stay.) → ☐ None

ICD-9-CM codes *(If available)*

Principal-(1)
Others-(2)
(3)
(4)
(5)

---

⑤ **a.** Admission date *(Month, day, year)*

b. Discharge date *(Month, day, year)*

c. Diagnoses

ICD-9-CM codes *(If available)*

Principal-(1)
Others-(2)
(3)
(4)
(5)
(6)
(7)

d. Surgical and Diagnostic Procedures
(Mark "None" if there were no procedures for this stay.) → ☐ None

ICD-9-CM codes *(If available)*

Principal-(1)
Others-(2)
(3)
(4)
(5)

Please record additional stays in the "Remarks" section on page 4.

C. Which of these categories best describes the facility or a unit of the facility in which the decedent was a patient?

1 ☐ General medical/surgical hospital
2 ☐ Alcohol or drug treatment hospital
3 ☐ Psychiatric facility
4 ☐ Other speciality, long stay hospital
5 ☐ Skilled Nursing Facility (SNF), certified under either Medicare or Medicaid
6 ☐ Intermediate Care Facility (ICF), certified under Medicaid
7 ☐ Other type of nursing or personal care home
8 ☐ Hospice
9 ☐ Other type of facility — *Specify* ↘

D. According to your records or your personal knowledge, was the decedent a patient since January 1, 1985 in any other hospital, nursing home, or institution providing medical care?

1 ☐ Yes — *Go to item E* 2 ☐ No — *Skip to item F*

E. What were the names and addresses of all other hospitals or institutions in which the decedent was a patient since January 1, 1985?

①
Name of hospital or institution
Address *(Number and street)*
City or post office | State | ZIP code

②
Name of hospital or institution
Address *(Number and street)*
City or post office | State | ZIP code

③
Name of hospital or institution
Address *(Number and street)*
City or post office | State | ZIP code

Please record additional hospital/institution stays in the "Remarks" section below.

F. In case we need to ask a question about this form, please enter the name and telephone number of the person to contact for additional information.

Name	Telephone number Area code	Number

Remarks

Please return this form in the envelope provided to:

Bureau of the Census
1201 East Tenth Street
Jeffersonville, Indiana 47132

APPENDIX III

SUBGROUP POPULATIONS: COUNTS AND PERCENTAGES

```
ACTIVE  activities of daily living  by  MORB  morbidity index
Controlling for..
AGE  A1 age at death  Value = 1  under45
SEX  gender  Value = 1  male
RACE  D15 race  Value = 1  white

                  MORB                        Page 1 of 1
          Count  |
        Row Pct  |none      1or2      3to9
        Col Pct  |                             Row
                 |      .00|     1.00|     2.00| Total
ACTIVE   --------+---------+---------+---------+
            .00  |    568  |    659  |    186  |  1413
  none           |   40.2  |   46.6  |   13.2  |  76.7
                 |   79.8  |   75.8  |   71.0  |
                 +---------+---------+---------+
           1.00  |     38  |     73  |     30  |   141
  1or2           |   27.0  |   51.8  |   21.3  |   7.7
                 |    5.3  |    8.4  |   11.5  |
                 +---------+---------+---------+
           2.00  |    106  |    137  |     46  |   289
  3to5           |   36.7  |   47.4  |   15.9  |  15.7
                 |   14.9  |   15.8  |   17.6  |
                 +---------+---------+---------+
         Column       712       869       262    1843
          Total      38.6      47.2      14.2   100.0
```

```
ACTIVE  activities of daily living  by  MORB  morbidity index
Controlling for..
AGE  A1 age at death  Value = 2  45to64
SEX  gender  Value = 1  male
RACE  D15 race  Value = 1  white

                    MORB                   Page 1 of 1
             Count |
           Row Pct |none     1or2     3to9
           Col Pct |                           Row
                   |     .00|    1.00|    2.00| Total
ACTIVE     --------+--------+--------+--------+
               .00 |   161  |   368  |   189  |   718
  none             |  22.4  |  51.3  |  26.3  |  54.6
                   |  55.1  |  56.5  |  50.7  |
                   +--------+--------+--------+
              1.00 |    35  |    70  |    64  |   169
  1or2             |  20.7  |  41.4  |  37.9  |  12.8
                   |  12.0  |  10.8  |  17.2  |
                   +--------+--------+--------+
              2.00 |    96  |   213  |   120  |   429
  3to5             |  22.4  |  49.7  |  28.0  |  32.6
                   |  32.9  |  32.7  |  32.2  |
                   +--------+--------+--------+
            Column     292      651      373     1316
             Total    22.2     49.5     28.3    100.0
```

```
File:     rec15 is first recode of data15 Jan 17,1992

ACTIVE  activities of daily living  by  MORB  morbidity index
Controlling for..
AGE  A1 age at death  Value = 3  65plus
SEX  gender  Value = 1  male
RACE  D15 race  Value = 1  white

                       MORB                      Page 1 of 1
              Count   |
            Row Pct   |none      1or2      3to9
            Col Pct   |                              Row
                      |      .00|     1.00|     2.00| Total
ACTIVE        --------+---------+---------+---------+
                 .00  |     156 |     564 |     305 |  1025
  none                |    15.2 |    55.0 |    29.8 |  35.3
                      |    40.8 |    36.3 |    31.4 |
                      +---------+---------+---------+
                1.00  |      62 |     249 |     165 |   476
  1or2                |    13.0 |    52.3 |    34.7 |  16.4
                      |    16.2 |    16.0 |    17.0 |
                      +---------+---------+---------+
                2.00  |     164 |     739 |     500 |  1403
  3to5                |    11.7 |    52.7 |    35.6 |  48.3
                      |    42.9 |    47.6 |    51.5 |
                      +---------+---------+---------+
             Column         382      1552       970    2904
              Total        13.2      53.4      33.4   100.0
```

```
File:     rec15 is first recode of data15 Jan 17,1992

ACTIVE  activities of daily living  by  MORB  morbidity index
Controlling for..
AGE  A1 age at death  Value = 1  under45
SEX  gender  Value = 2  female
RACE  D15 race  Value = 1  white

                    MORB                      Page 1 of 1
             Count |
           Row Pct |none      1or2      3to9
           Col Pct |                              Row
                   |     .00|     1.00|     2.00| Total
ACTIVE     --------+--------+--------+--------+
               .00 |   172  |   185  |    72  |   429
  none             |  40.1  |  43.1  |  16.8  |  57.7
                   |  55.3  |  56.9  |  66.7  |
                   +--------+--------+--------+
              1.00 |    32  |    29  |    14  |    75
  1or2             |  42.7  |  38.7  |  18.7  |  10.1
                   |  10.3  |   8.9  |  13.0  |
                   +--------+--------+--------+
              2.00 |   107  |   111  |    22  |   240
  3to5             |  44.6  |  46.3  |   9.2  |  32.3
                   |  34.4  |  34.2  |  20.4  |
                   +--------+--------+--------+
            Column     311      325      108      744
             Total    41.8     43.7     14.5    100.0
```

```
File:     rec15 is first recode of data15 Jan 17,1992

ACTIVE  activities of daily living  by  MORB  morbidity index
Controlling for..
AGE  A1 age at death  Value = 2  45to64
SEX  gender  Value = 2  female
RACE  D15 race  Value = 1  white

                       MORB                    Page 1 of 1
               Count  |
             Row Pct  |none     1or2     3to9
             Col Pct  |                             Row
                      |     .00|    1.00|    2.00|  Total
ACTIVE         -------+--------+--------+--------+
                  .00 |     95 |    242 |    181 |    518
  none                |   18.3 |   46.7 |   34.9 |   49.5
                      |   37.1 |   52.0 |   55.7 |
                      +--------+--------+--------+
                 1.00 |     25 |     59 |     52 |    136
  1or2                |   18.4 |   43.4 |   38.2 |   13.0
                      |    9.8 |   12.7 |   16.0 |
                      +--------+--------+--------+
                 2.00 |    136 |    164 |     92 |    392
  3to5                |   34.7 |   41.8 |   23.5 |   37.5
                      |   53.1 |   35.3 |   28.3 |
                      +--------+--------+--------+
               Column      256      465      325     1046
                Total     24.5     44.5     31.1    100.0
```

```
File:     rec15 is first recode of data15 Jan 17,1992

ACTIVE  activities of daily living  by  MORB  morbidity index
Controlling for..
AGE  A1 age at death  Value = 3  65plus
SEX  gender  Value = 2  female
RACE  D15 race  Value = 1  white

                     MORB                          Page 1 of 1
              Count |
            Row Pct |none      1or2      3to9
            Col Pct |                              Row
                    |     .00|     1.00|     2.00|  Total
ACTIVE      --------+--------+--------+--------+
               .00  |   121  |   407  |   222  |   750
  none              |  16.1  |  54.3  |  29.6  |  22.7
                    |  25.8  |  23.8  |  19.7  |
                    +--------+--------+--------+
              1.00  |    84  |   263  |   184  |   531
  1or2              |  15.8  |  49.5  |  34.7  |  16.1
                    |  17.9  |  15.4  |  16.3  |
                    +--------+--------+--------+
              2.00  |   264  |  1040  |   723  |  2027
  3to5              |  13.0  |  51.3  |  35.7  |  61.3
                    |  56.3  |  60.8  |  64.0  |
                    +--------+--------+--------+
             Column     469     1710     1129     3308
              Total    14.2     51.7     34.1    100.0
```

```
File:     rec15 is first recode of data15 Jan 17,1992

ACTIVE  activities of daily living  by  MORB  morbidity index
Controlling for..
AGE  A1 age at death  Value = 1  under45
SEX  gender  Value = 1  male
RACE  D15 race  Value = 2  nonwhite

                      MORB                    Page 1 of 1
              Count  |
            Row Pct  |none     1or2     3to9
            Col Pct  |                              Row
                     |     .00|    1.00|    2.00|  Total
ACTIVE       --------+--------+--------+--------+
                 .00 |   209  |   210  |    37  |   456
  none               |  45.8  |  46.1  |   8.1  |  79.2
                     |  85.3  |  76.6  |  64.9  |
                     +--------+--------+--------+
                1.00 |    15  |    25  |     8  |    48
  1or2               |  31.3  |  52.1  |  16.7  |   8.3
                     |   6.1  |   9.1  |  14.0  |
                     +--------+--------+--------+
                2.00 |    21  |    39  |    12  |    72
  3to5               |  29.2  |  54.2  |  16.7  |  12.5
                     |   8.6  |  14.2  |  21.1  |
                     +--------+--------+--------+
              Column     245      274       57      576
               Total    42.5     47.6      9.9    100.0
```

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File:     rec15 is first recode of data15 Jan 17,1992

ACTIVE  activities of daily living  by  MORB  morbidity index
Controlling for..
AGE  A1 age at death  Value = 2  45to64
SEX  gender  Value = 1  male
RACE  D15 race  Value = 2  nonwhite

                    MORB                    Page 1 of 1
            Count  |
          Row Pct  |none     1or2     3to9
          Col Pct  |                            Row
                   |     .00|    1.00|    2.00| Total
ACTIVE     --------+--------+--------+--------+
              .00  |    73  |   214  |    88  |   375
  none             |  19.5  |  57.1  |  23.5  |  56.8
                   |  63.5  |  60.6  |  45.8  |
                   +--------+--------+--------+
             1.00  |    14  |    43  |    29  |    86
  1or2             |  16.3  |  50.0  |  33.7  |  13.0
                   |  12.2  |  12.2  |  15.1  |
                   +--------+--------+--------+
             2.00  |    28  |    96  |    75  |   199
  3to5             |  14.1  |  48.2  |  37.7  |  30.2
                   |  24.3  |  27.2  |  39.1  |
                   +--------+--------+--------+
           Column      115      353      192     660
            Total     17.4     53.5     29.1   100.0
```

```
File:     rec15 is first recode of data15 Jan 17,1992

ACTIVE  activities of daily living  by  MORB  morbidity index
Controlling for..
AGE  A1 age at death  Value = 3  65plus
SEX  gender  Value = 1  male
RACE  D15 race  Value = 2  nonwhite

                    MORB                         Page 1 of 1
               Count |
             Row Pct |none      1or2      3to9
             Col Pct |                                 Row
                     |     .00|     1.00|     2.00|  Total
ACTIVE      --------+--------+--------+--------+
                 .00 |     77 |    167 |     75 |    319
  none               |   24.1 |   52.4 |   23.5 |   29.7
                     |   39.9 |   30.0 |   23.1 |
                     +--------+--------+--------+
                1.00 |     26 |     87 |     54 |    167
  1or2               |   15.6 |   52.1 |   32.3 |   15.5
                     |   13.5 |   15.6 |   16.7 |
                     +--------+--------+--------+
                2.00 |     90 |    303 |    195 |    588
  3to5               |   15.3 |   51.5 |   33.2 |   54.7
                     |   46.6 |   54.4 |   60.2 |
                     +--------+--------+--------+
              Column     193      557      324     1074
               Total    18.0     51.9     30.2    100.0
```

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File:     rec15 is first recode of data15 Jan 17,1992

ACTIVE  activities of daily living  by  MORB  morbidity index
Controlling for..
AGE  A1 age at death  Value = 1  under45
SEX  gender  Value = 2  female
RACE  D15 race  Value = 2  nonwhite

                      MORB                       Page 1 of 1
            Count    |
           Row Pct   |none      1or2      3to9
           Col Pct   |                                Row
                     |      .00|     1.00|     2.00|  Total
ACTIVE      --------+---------+---------+---------+
               .00   |     82  |     93  |     26  |    201
  none               |   40.8  |   46.3  |   12.9  |   67.9
                     |   73.9  |   66.0  |   59.1  |
                     +---------+---------+---------+
              1.00   |      4  |     12  |      5  |     21
  1or2               |   19.0  |   57.1  |   23.8  |    7.1
                     |    3.6  |    8.5  |   11.4  |
                     +---------+---------+---------+
              2.00   |     25  |     36  |     13  |     74
  3to5               |   33.8  |   48.6  |   17.6  |   25.0
                     |   22.5  |   25.5  |   29.5  |
                     +---------+---------+---------+
             Column       111       141        44      296
              Total      37.5      47.6      14.9    100.0
```

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File:     rec15 is first recode of data15 Jan 17,1992

ACTIVE  activities of daily living  by  MORB  morbidity index
Controlling for..
AGE  A1 age at death  Value = 2  45to64
SEX  gender  Value = 2  female
RACE  D15 race  Value = 2  nonwhite

                     MORB                       Page 1 of 1
             Count  |
           Row Pct  |none     1or2     3to9
           Col Pct  |                                Row
                    |     .00|    1.00|    2.00|   Total
ACTIVE     --------+--------+--------+--------+
               .00  |     27 |    124 |     86 |    237
  none              |   11.4 |   52.3 |   36.3 |   44.5
                    |   37.5 |   49.2 |   41.3 |
                    +--------+--------+--------+
              1.00  |     11 |     34 |     41 |     86
  1or2              |   12.8 |   39.5 |   47.7 |   16.2
                    |   15.3 |   13.5 |   19.7 |
                    +--------+--------+--------+
              2.00  |     34 |     94 |     81 |    209
  3to5              |   16.3 |   45.0 |   38.8 |   39.3
                    |   47.2 |   37.3 |   38.9 |
                    +--------+--------+--------+
            Column      72      252      208      532
             Total    13.5     47.4     39.1    100.0
```

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File:     rec15 is first recode of data15 Jan 17,1992

ACTIVE  activities of daily living  by  MORB  morbidity index
Controlling for..
AGE  A1 age at death  Value = 3  65plus
SEX  gender  Value = 2  female
RACE  D15 race  Value = 2  nonwhite

                    MORB                        Page 1 of 1
            Count  |
          Row Pct  |none     1or2     3to9
          Col Pct  |                               Row
                   |     .00|    1.00|    2.00|  Total
ACTIVE     --------+--------+--------+--------+
              .00  |    47  |   180  |    77  |   304
  none             |  15.5  |  59.2  |  25.3  |  24.5
                   |  34.3  |  27.7  |  17.0  |
                   +--------+--------+--------+
             1.00  |    24  |   109  |    72  |   205
  1or2             |  11.7  |  53.2  |  35.1  |  16.5
                   |  17.5  |  16.8  |  15.9  |
                   +--------+--------+--------+
             2.00  |    66  |   361  |   304  |   731
  3to5             |   9.0  |  49.4  |  41.6  |  59.0
                   |  48.2  |  55.5  |  67.1  |
                   +--------+--------+--------+
           Column      137      650      453     1240
            Total     11.0     52.4     36.5    100.0

Number of Missing Observations:  0
```

BIBLIOGRAPHY

Aaron, Henry & William B. Schwartz, "Rationing Health Care: The Choice Before Us" Science vol 247, #4941:418-422 January 1990.

Aday, Lu-Ann & Ronald M. Andersen, "Equity of Access to Medical Care: A Conceptual and Empirical Overview" in Securing Access to Health Care: President's Commission for the Study of Ethical Problems in Medical, Biomedical and Behavioural Research, vol 3:19-54 March 1983.

Aday, Lu-Ann & Ronald M. Andersen, "The National Profile of Access to Medical Care: Where Do We Stand?" American Journal of Public Health vol 74, #12:1331-1339, 1984.

Andersen, R, M.S. Chen, L.A. Aday & L. Cornelius, "Health Status and Medical Care Utilization" Health Affairs (Millwood) vol 1, #1:136-156, 1987.

Auster, Richard, Irving Leveson, & Deborah Sarachek, "The Production of Health: an Exploratory Study" The Journal of Health Resources vol 4 #4:411-436 Fall 1969.

Bailey, W. & D. Phillips, "Spatial Patterns of the Use of Health Services in the Kingston Metropolitan Area, Jamaica" Social Science and Medicine vol 30, #1:1-12, 1990.

Babbie, Earl "The Practice of Social Research" 5th Ed. Belmont, California: Wadsworth Publishing Company, 1989.

Barrett, Frank A. Canadian Study Group in Medical Geography, Newsletter vol 14, #1, 1991-1992.

Bennett, William D., "A Location-Allocation Approach to Health Care Facility Location: A Study of the Undoctored Population in Lansing, Michigan" Social Science and Medicine vol 15D:305-312, 1981.

Blenden, R.J., R. Leitman, I. Morrison & K. Donelan, "Satisfaction with Health Systems in Ten Nations" Health Affairs, pp. 185-192, Summer 1990.

Brown, Lawrence D. "Competition and Health Care Policy: Experience and Expectations" American Academy of Political and Social Science vol 468:48-59 July 1983.

Buczko, William, "Physician Utilization and Expenditures in a Medicaid Population" Health Care Financing Review vol 8 #2:17-26 Winter 1986.

Burke, Marybeth, "Policy Makers Struggle to Define Essential Access" Hospitals, pp. 38-42, February 5, 1990.

Campion, Frank D. "The AMA and US Health Policy Since 1940" Chicago: Chicago Review Press, 1984.

Clarke, Juanne Nancarrow "Health, Illness and Medicine in Canada" Toronto: McClelland & Stewart Inc., 1990.

Daniels, Norman, "Equity of Access to Health Care: Some Conceptual and Ethical Issues" in Securing Access to Health Care: President's Commission for the Study of Ethical Problems in Medical, Biomedical and Behavioural Research, vol 2:23-49 March 1983.

Dear, M.J. & S.M. Taylor "Not On Our Street: Community Attitudes to Mental Health Care" London: Pion Ltd., 1982.

Dear, M.J. & J. Wolch "Landscapes of Despair" Princeton, New Jersey: Economic and Social Research Council, 1987.

Department of International Economic and Social Affairs of the United Nations "World Population Trends and Policies: 1987 Monitoring Report" Population Studies #103, United Nations, New York, 1988.

Dutton, Diana B. "Social Class, Health and Illness" in Applications of Social Science to Clinical Medicine and Health Policy, Linda H. Aiken and David Mechanic (Eds). New Brunswick, New Jersey: Rutgers University Press, pp. 31-62, 1986.

Dyck, Isabel, "Context, Culture and Client: Geography of the Health for All Strategy" Canadian Geographer vol 34: 338-341 Winter 1990.

Edginton, Barry "Health Disease and Medicine in Canada: A Sociological Perspective" Toronto: Butterworths Canada, Ltd, 1989.

Enthoven, Alain C. "Health Plan: The Only Practical Solution to the Soaring Cost of Medical Care" Reading, Massachusetts: Addison-Wesley Publishing Company, 1980.

Epp, John "Achieving Health for All: A Framework for Health Promotion" Government of Canada, Ministry of Supply and Services, Ottawa, 1986.

Ernst, R.L. & D.E. Yett "Physician Location and Specialty Choice" Ann Arbor, Michigan: Health Administration Press, 1985.

Evans, R.G. "Strained Mercy" Toronto: Butterworths Canada, Ltd, 1984.

Evans R.G., M.L. Barer, C. Hertzman, G.M. Anderson, I.R. Pulcins, & J. Lomas "The Long Goodbye: the Great Transformation of the B.C. Hospital System" Health Services Research vol 24, #4:435-459.

Eyles, John "The Geography of the National Health: An Essay in Welfare Geography" New Hampshire: Croom Helm Ltd, 1987.

Eyles, John, "How Significant are the Spatial Configurations of Health Care Systems" Social Science and Medicine vol 30, #1:157-164, 1990a.

Eyles, John, "The Problem of Marketing Health Promotion Strategies" Canadian Geographer vol 34, #4:341-346, 1990b.

Eyles, John & Jenny Donovan "The Social Effects of Health Policy: Experiences of Health and Health Care in Contemporary Britain" Brookfield, Vermont: Gower Publishing Company, 1990.

Eyles, John & K.J. Woods "The Social Geography of Medicine and Health" New York: St. Martin's Press, 1983.

Eyles, John, K.J. Woods & C. Weil, "The Social Geography of Medicine and Health" Association of American Geographers, Annals vol 74:344-345 June 1984.

Fein, Rashi "Medical Care, Medical Costs: The Search for a Health Care Insurance Policy" Cambridge, Massachusetts: Harvard University Press, 1986.

Finkel, Madelon Lubin and Hirsch S. Ruchlin "The Health Care Benefits of Retirees" Baltimore: The Johns Hopkins University Press, 1991.

Florin, John W. "Health Service Regionalization in the United States" in Conceptual and Methodological Issues in Medical Geography Ed: Melinda S. Meade, Department of Geography, University of North Carolina at Chapel Hill, pp. 282-298, 1980.

Fried, B.J., R.B. Deber and P. Leatt, "Corporatization and Deprivatization of Health Services in Canada" International Journal of Health Services, vol 17, #4: 567-583, 1987.

Frisof, Kenneth, "Universal Access versus Universal Insurance" Health Progress vol 71, #3:49-53, 1990.

Fry, John "Medicine in Three Societies: A Comparison of Medical Care in the USSR, USA and UK" London: Billing & Sons Ltd, 1969.

Fuchs, Victor R. "Contribution of Health Services to the American Economy" in Essays in the Economics of Health and Medical Care Ed: Victor R. Fuchs. New York: National Bureau of Economic Research, pp. 3-38, 1972.

Ginzberg, Eli "The Medical Triangle: Physicians, Politicians, and the Public" London: Harvard University Press, 1990.

Glazer, Nathan, "Paradoxes of Health Care" The Public Interest vol 22:62-77 Winter 1971.

Greenberg, M.R. & D.R. Phillips, "Activism for Medical Geographers: American, British and Canadian Viewpoints" Social Science and Medicine vol 30, #1:173-177, 1990.

Greenley, James R, "Sociocultural and Psychological Aspects of the Utilization of Health Services" in Assessing the Contribution of the Social Sciences to Health Eds: M.H. Brenner, A. Mooney, & T.J. Nagy. Boulder, Colorado: Westview Press, Inc, pp. 169-207, 1980.

Gutmann, Amy, "For and Against Equal Access to Health Care" in Securing Access to Health Care: President's Commission for the Study of Ethical Problems in Medical, Biomedical and Behavioural Research, vol 2:51-66 March 1983.

Hadley, Jack, More Medical Care, Better Health? An Economic Analysis of Mortality Rates Washington, D.C.: The Urban Institute Press, 1982.

Hayes, M.V. "On the Epistemology of Risk: Language, Logic and Social Service" Social Science and Medicine (forthcoming 1992).

Hayes, M.V. Editorial. Canadian Study Group on Medical Geography, Newsletter vol 14, #1, 1990-1991.

Hayes, M.V., "The Risk Approach: Unassailable Logic?" Social Science and Medicine vol 33, #1:55-70, 1991.

Hayes, M.V., S.M. Taylor, L.R. Bayne & B.D. Poland, "Reported versus Recorded Health Service Utilization in Grenada, West Indies" Social Science and Medicine vol 31, #4:455-460, 1990.

Hayes, M.V. & S. Manson Willms, "Healthy Community Indicators: The Perils of the Source and the Paucity of the Find" Health Promotion International vol 5, #2:161-166, 1990.

Health and Welfare Canada "Canada Health Act Annual Report 1989-1990" Minister of Supply and Services, 1990.

Health and Welfare Canada "Canada Health Act Annual Report 1988-1989" Minister of Supply and Services, 1989.

Health Insurance Association of America "Sourcebook of Health Insurance Data" Washington, D.C., 1989.

Holloman, John L.S., Jr. "Access to Health Care" in Securing Access to Health Care: President's Commission for the Study of Ethical Problems in Medical, Biomedical and Behavioural Research, vol 2:79-106 March 1983.

Illich, Ivan Medical Nemesis: The Expropriation of Health New York: Random House, Inc, 1976.

Inglehart, J.K. "Health Policy Report: Canada's Health Care System" (3 parts) Lancet, vol 315, #s3, 12, 25, 1986.

James, Amanda M. "Long Term Care Reform in Ontario: What Will the Consequences Be on Health Care Delivery to the Elderly?" Presented at the Canadian Association of Geographers' Annual Meeting, University of British Columbia, May 1992.

Jones, Kevin and Graham Moon "Health, Disease and Society: A Critical Medical Geography" London: Routledge and Kegan Paul Ltd, 1987.

Joseph, Alun E. & J.L. Boeckh, "Locational Variation in Mental Health Care Utilization Dependent Upon Diagnosis: A Canadian Example" Social Science and Medicine vol 15D, #3:395-404 August 1981.

Joseph, Alun E. and David R Phillips "Accessibility and Utilization: Geographical Perspectives on Health Care Delivery" London: Harper and Row, Publishers, 1984.

Kasper, Judith D, "Health Status and Utilization: Differences by Medicaid Coverage and Income" in Health Care Financing Review vol 7 #4:1-17 Summer 1986.

Kitagawa, A.E.M. and P.M. Hauser "Differential Mortality in the United States" Cambridge: Harvard University Press, 1973.

Knox, Paul L., "Medical Deprivation, Area Deprivation and Public Policy" Social Science and Medicine vol 13D:111-121, 1979.

Lalonde, Marc "A New Perspective on the Health of Canadians: A Working Document" Government of Canada, Ministry of Supply and Services, Ottawa 1974.

Larson, James S. "Access to Medical Care: A Secondary Analysis" Journal of Health and Human Resources Administration vol 10 #4:408-418 Spring 1988.

Levine, Sol, Jacob J. Feldman, & Jack Elinson, "Does Medical Care Do Any Good?" in Handbook of Health, Health Care, and the Health Profession Ed: David Mechanic. New York: The Free Press, pp. 394-404, 1983.

Liaw, Kao-Lee, Michael V. Hayes & Ronald G. McAuley, "Analysis of Local Mortality Variation: A Canadian Case Study" Journal of Population Studies #10:55-76 June 1987.

Lundberg, Olle, "Causal Explanations for Class Inequality in Health - An Empirical Analysis" Social Science and Medicine vol 32, #4:385-393, 1991.

May, Jacques, "Medical Geography: Its Methods and Objectives" The Geographical Review vol 40, #1:9-41, 1950 (Reprinted in Social Science and Medicine vol 11: 715-730, 1977).

Mayer, J.D., "Relations Between Two Traditions of Medical Geography: Health Systems Planning and Geographical Epidemiology" Progress in Human Geography vol 16:216-230, 1982.

Mayer, J.D., "Distance Behaviour of Hospital Patients: A Disaggregated Analysis" Social Science and Medicine, vol 17, #12:819-827, 1983.

Mayer, J.D., "International Perspectives on the Health Care Crisis in the United States" Social Science and Medicine, vol 23, #10:1059-1065, 1986.

McKeown, Thomas "Medicine in Modern Society: Medical Planning on Evaluation of Medical Achievement" New York: Hafner Publishing Company, 1965.

Meade, Melinda (Ed.) "Conceptual and Methodological Issues in Medical Geography" University of North Carolina at Chapel Hill, Department of Geography, Studies in Geography #15, 1980.

Meade, Melinda, J. Florin, & W. Gesler "Medical Geography" New York: Guilford Press, 1988.

Mechanic, David "Painful Choices: Research and Essays on Health Care" New Brunswick, New Jersey: Transaction Publishers, 1989.

Mohan, John, "Location-Allocation Models, Social Science and Health Service Planning: An Example from Northeastern England" Social Science and Medicine vol 17, #8:493-499, 1983.

Mohan, John, "Health Care Policy Issues" in Social Problems in the City: New Perspectives Eds: D.T. Herbert and D.M. Smith. New York: Oxford University Press, pp. 126-141, 1989.

Moon, G., "Conceptions of Space and Community in British Health Policy" Social Science and Medicine vol 30, #1:165-171, 1990.

Morey, Dennis A.J. "Access: Will We Nibble at the Edges or Bite the Bullet?" Virginia Medical vol 117:66-67 February 1990.

Mustard, J. Fraser "Population Health and Health Care" Proceedings of the Conference on Health in the '80s and '90s and its Impact on Health Sciences Education, Montebello, Quebec, pp.3-22, March 14-17, 1982.

Newacheck, Paul W. "Access to Ambulatory Care for Poor Persons" Health Services Research vol 23, #3:401-419 August 1988.

Newhouse, J.P., G. Anderson, and L.L. Roos "Hospital Spending in the U.S. and Canada: A Comparison" Health Affairs, pp 6-36, Winter 1988.

Newhouse, Joseph P. & Lindy J. Friedlander "The Relationship Between Medical Resources and Measures of Health: Some Additional Evidence" The Journal of Human Resources vol 15, #2:200-218 Spring 1980.

Pacione, M. (Ed.) "Progress in Medical Geography" London: Croom Helm, 1986.

Patrick, Donald L, Jane Stein, Miquel Porta, Carol Porter, & Thomas Ricketts, "Poverty, Health Services, and Health Status in Rural America" The Milbank Quarterly, 66, #1: 105-136, 1988.

Paul, Biaml Kanti "Approaches to Medical Geography: An Historical Perspective" Social Science and Medicine vol 20, #4:399-409, 1985.

Petchey, Roland, "Health Maintenance Organizations: Just What the Doctor Ordered?" *Journal of Social Policy* vol 16, #4:489-507, 1987.

Phillips, D.R. "The Demand for and Utilization of Health Services" in *Medical Geography: Progress and Prospects* Ed: M. Pacione, London: Croom Helm, pp. 200-247, 1986.

Phillips, D.R., "Primary Health Care in the Philippines: Banking on the Barangays?" *Social Science and Medicine* vol 23, #1 :1105-1117, 1986.

Pilpel, Dina, "Factors Affecting Health Services Utilization (HSU)" *Public Health Review* Parts I & II, vol 15:215-229, 231-240, 1987.

Poland, B.D., S.M. Taylor & M.V. Hayes, "The Ecology of Health Services Utilization in Grenada, West Indies" *Social Science and Medicine* vol 30, #1:13-24, 1990.

Pyle, Gerald F., "International Communication and Medical Geography" *Social Science and Medicine* vol 11:679-682, 1977.

Pyle, Gerald F. "*Applied Medical Geography*" Washington, D.C.: V.H. Winston and Sons, 1979.

Rehr, Helen "Access to Services: A Complex Dimension" in *In the Patient's Interest: Access to Hospital Care* Eds: M.D. Mailick & H. Rehr. New York: Neale Watson Academic Publications, Inc, pp. 1-16, 1981.

Relman, A.S. "American Medicine at the Crossroads: Signs from Canada" *Lancet* vol 320, #9 March 2, 1989 .

Relman, A.S. "The U.S. and Canada: Different Approaches to Health Care" *Lancet* vol 315, #25 December 18, 1986.

Retchin, Sheldon M. & Barbara Brown, "The Quality of Ambulatory Care in Medicare Health Maintenance Organizations" *American Journal of Public Health* vol 80, #4:411-415 April 1990.

Roemer, M. "*National Strategies for Health Care Organization: A World Overview*" Ann Arbor: Health Administration Press, 1985.

Roemer, M. "*An Introduction to the US Health Care System*" New York: Springer Publishing Company, 1982.

Roemer, Ruth J.D. "The Right to Health Care - Gains and Gaps" in *American Journal of Public Health* vol 78 #3:241-247 March 1988.

Roos, N.P., E. Shapiro & L.L. Roos, "Agency and the Demand for Services" in Health and Canadian Society: Sociological Perspectives 2nd Edition. Eds: David Coburn, D'Arcy, Torrance & New, Markham, Ontario: Fitzhenry and Whiteside, pp. 333-344, 1987.

Rootman, I. & P. Munson, "Strategies to Achieve Health for all Canadians" Canadian Geographer vol 34, #4:332-334, 1990.

Rosenberg, M.W., "Accessibility to Health Care: A North American Perspective" Progress in Human Geography vol 7:78-87, 1983.

Rosenberg, M.W., "Physician Location Behaviour in Metropolitan Toronto" Canadian Geographer, vol 28:156-170 Summer 1984.

Rosenberg, M.W., "Linking the Geographical, the Medical and the Political in Analyzing Health Care Delivery Systems" Social Science and Medicine, 26, #1:179-186, 1988.

Rosenberg, M.W. (Ed.) "Focus: Achieving Health For All - The Geographer's Role" Canadian Geographer vol 34, #4:331-346, 1990.

Schwartz, Harry "Access, Equity, and Equality in American Medical Care" Securing Access to Health Care: President's Commission for the Study of Ethical Problems in Medical, Biomedical and Behavioural Research, vol 2:67-78 March 1983.

Shannon, G. and A. Dever "Health Care Delivery: Spatial Perspectives" New York: McGraw-Hill, Inc. 1974.

Smith, David "Where the Grass is Greener: Geographical Perspectives on Inequality" London: Croom Helm, 1979.

Smith, Susan "Social Geography: Social Policy and the Restructuring of Welfare" Progress in Human Geography, vol 13, #1:118-128, 1989.

Smith, William G. & Don Buesching "Primary Medical Care and Health Outcome" Evaluation and the Health Professions vol 8, #3:339-348 September 1985.

Taylor, Malcolm G. "The Canadian Health Care System: After Medicare" Health and Canadian Society: Sociological Perspectives 2nd Edition. Eds: David Coburn, D'Arcy, Torrance & New. Markham, Ontario: Fitzhenry and Whiteside, pp. 36-56, 1987.

Taylor, Malcolm G. "*Insuring National Health Care: The Canadian Experience*" Chapel Hill: University of North Carolina Press, 1990.

Taylor, S.M., "Geographical Perspectives on National Health Challenges" *Canadian Geographer* vol 34, #4:334-338, 1990.

Taylor, S.M., S. Elliot & R.A. Kearns "The Housing Experience of Chronically Mentally Disabled in Hamilton, Ontario" *Canadian Geographer* vol 33:146-155 Summer 1989.

Taylor, S.M., M. Hayes, J. Frank & N. White, "The Risk Approach in Diarrheal Disease Intervention in Grenada" *Social Science and Medicine* vol 30, #10:1089-1095, 1990.

Townsend, Peter and Nick Davidson (Eds.) "*Inequalities in Health: the Black Report*" Markham, Ontario: Penguin Books Canada Ltd. 1982.

Thomas, C.J. & D.R. Phillips, "An Ecological Analysis of Child Medical Emergency Admissions to Hospitals in West Glamorgan" *Social Science and Medicine* vol 12D, #3/4:183-192, 1978.

U.S. Bureau of the Census "*Statistical Abstract of the United States: 1991*" 111th Edition, Washington, D.C., 1991.

U.S. Department of Health and Human Services "*Current Estimates from the National Health Interview Survey*" Public Health Service, National Center for Health Statistics, Series 10, #164, 1986.

U.S. Department of Health & Human Services. *Health Status of Minorities and Low Income Groups* Washington, D.C. 1985.

Vagero, Denny, "Inequality on Health - Some Theoretical and Empirical Problems" *Social Science and Medicine* vol 32, #4:367-371, 1991.

Vladeck, Bruce C., "Equity, Access and the Costs of Health Services" in *Securing Access to Health Care: President's Commission for the Study of Ethical Problems in Medical, Biomedical and Behavioural Research*, vol 3:3-17 March 1983.

Wallace, Cynthia, "Patient Outcome Data Provide A Valuable Marketing Tool for Rehabilitation Hospitals" *Modern Healthcare*, p. 86, July 3 1987.

Wan, Thomas T.H. & Scott J. Soiffer, "Determinants of Physician Utilization: A Causal Analysis" Journal of Health and Social Behaviour vol 15:100-108 June 1974.

White, Norman F. "The Health Conundrum" TVOntario, 1981.

Wigle, D.T. and Y. Mao "Mortality by Income Level in Urban Canada" Health and Welfare Canada, Health Protection Branch, Ottawa, 1980.

Wilkins, R and O. Adams, "Health Expectancy in Canada, Late 1970's: Demographic, Regional and Social Dimensions" Health and Canadian Society: Sociological Perspectives 2nd Edition. Eds: David Coburn, D'Arcy, Torrance & New. Markham, Ontario: Fitzhenry and Whiteside, pp 36-56, 1987.

Wilkins, R. and O. Adams "Healthfulness of Life" Montreal: The Institute for Research on Public Policy, 1983.

Wilkins, R, O. Adams, and A. Brancker "Changes in Mortality by Income in Urban Canada from 1971 to 1986" Health Report vol 1, #2:137-174, 1990.

Wolinsky, Fredric D. "Assessing the Effects of Predisposing, Enabling, and Illness-Morbidity Characteristics on Health Service Utilization" Journal of Health and Social Behaviour vol 19:384-396 December 1978.