THE DEVELOPMENTALLY DISABLED ELDERLY IN CANADA: ACCESS TO HEALTH CARE AND SOCIAL SERVICES

DISSERTATION

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By

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The accessibility, predictors, and use of health care and social services among developmentally disabled elderly adults in Canada were examined using a nationally representative social survey. Data were obtained from a household survey of 184,500 persons. The primary dependent variables included measures of respondents' use of physicians and hospitals in the past year. Secondary dependent variables include respondents' utilization of social services in the past year. Predictors included illness or need variables (self-assessed health status, activity limitations, activities of daily living, and functional limitations); enabling variables (employment or retirement status, family income, receipt of income supplements for low-income developmentally disabled elderly, and urban/rural residence); and predisposing variables (age, gender, marital status, and race/ethnicity). The first research hypothesis is that the independent variables will contribute significantly to the prediction of the dependent variables. A second hypothesis is that the slope of any given independent variable will not equal zero. The results of this research show that the illness (need) variables are

the most predictive correlate of the utilization of health care and social services. The predisposing variables have secondary explanatory power, with the enabling variables accounting for the least amount of variance. The hypotheses were tested by step-wise multiple regression analysis using SPSS-X.

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INTRODUCTION

The Developmentally Disabled Elderly

A society's commitment to health care reflects its fundamental attitudes about what it is to be a human being. Society has a moral burden to assure impartial access to health care for all its citizens.

A particularly fascinating aspect of investigating the health care delivery system of a particular nation is the insight such a probe provides into the nature of that society. As Donald Light (1986) has pointed out, medical care and health services are functions of political philosophy; therefore, social and political values underlie the options chosen, the institutions developed, and the quantity of funding given. A nation's approach to health care is based upon its historical background, culture and religion, monetary resources, political ideology, social structure, level of education, standard of living, and perspectives of welfare and the role of the government.

It is necessary to address some of the issues faced by the increasing population of elderly developmentally disabled individuals in Canada and the need for the various helping professions, educational disciplines, and public policy agencies to understand this special population. Research data and findings associated with aging among the developmentally disabled must be reviewed and some of the program and policy implications discussed, keeping in mind that those who influence policy decisions in the United States can be informed by studies of the Canadian health care system.

By definition, a developmental disability is an administrative designation used by the federal government to refer to certain individuals. According to Public Law 98-527 of the Developmental Disabilities Act of 1984, a developmental disability is a severe chronic disability of a person which:

1. is attributable to a physical or mental impairment (or combination of impairments);
2. is manifest before age 22;
3. is likely to continue indefinitely;
4. results in substantial functional limitations in three or more of the following areas: self care, receptive and expressive language, learning, mobility, self direction, capacity for independent living or economic self-sufficiency; and
5. reflects the need for a combination and sequence of special, interdisciplinary, or generic care, treatment, or other services which are (a) of lifelong or extended duration and are (b) individually planned and coordinated (Walz, Harper, & Wilson, 1986:623).

This means that a developmentally disabled person is one with mental retardation, cerebral palsy, Down's Syndrome, epilepsy, autism, or dyslexia manifested prior to age 22. The most prevalent developmental disability is mental retardation. Mental retardation is defined as: "subaverage intellectual functioning along with deficits in adaptive behavior that occur first in childhood and are carried over into adulthood" (Rose & Janicki, 1986:1).

The literature reveals that the life expectancy for all developmentally disabled groups has increased. Walz et al. (1986) compared documents showing mortality of the developmentally disabled over a widely separated interval of time. In 1932, 28% of persons with mental retardation (studied at age 10) survived to age 60. In a 1976 study, however, 46% survived to age 60. This figure is still lower than that of the general population (Carter & Jancar, 1983). Within the developmentally disabled population, women, ambulatory persons, non-Down's Syndrome, the less severely mentally retarded, and those who have remained in their home communities have the greatest life expectancies (Jacobson, Sutton, & Janicki, 1985).

According to the Association of Retarded Citizens, approximately 3% of the United States population, or 6 million persons, have mental retardation. The United Cerebral Palsy Association estimates the number of persons with cerebral palsy at 750,000, and the Epilepsy Foundation of America claims close to one million epileptics, while the National Society for Children and Adults with Autism estimates approximately 80,000 autistic Americans (Lippman & Loberg, 1985).

In a major research study of Ohio, Indiana, Illinois, Michigan, Wisconsin, and Minnesota, Sweeney (1980) found that over 10% of the developmentally disabled population for this region were over the age of 65. Based on current estimates from a number of sources, Walz et al. (1986) state that there are a quarter of a million elderly developmentally disabled in the United States aged 65 and over. If age 55 were used for the estimation, the number would be 1,380,000 (Seltzer & Seltzer, 1984). It is obvious that with extended life expectancy the subpopulation of developmentally disabled elderly will continue to increase in the coming years. Demographers have estimated that the elderly population in the United States will double in the next thirty years (Rose & Janicki, 1986). It is safe to assume that there will be a comparable increase in the number of adults with developmental disabilities.

Issues

Drug Interactions

There are several problem areas at issue for those who deal with the developmentally disabled elderly. For one thing, when they are prescribed medications for geriatric illnesses, they may experience drug interactions with medicines previously prescribed to help control seizures, depression, or other effects of their primary disability.

Communication Problems

Secondly, a common result of a developmental disability is impairment of the ability to communicate. This tends to interfere with the identification, diagnosis, and treatment of chronic illnesses, since physicians rely heavily upon patients' verbal descriptions of their ailments. For this reason, researchers have found that chronic conditions often persist or recur over prolonged periods of time among the developmentally disabled (Nelson & Crocker, 1979).

Competition for Resources

A third issue is competition for limited health and welfare resources. The disability agencies are already heavily weighted toward the needs of children and young adults and the aging network is heavily oriented toward the needs of the general aging population. "In any intergenerational 'battle,' aging MR/DD people are unlikely to do very well. This subgroup is...without an organized advocacy group" (Walz et al., 1986:627). The charge has jointly been blatantly made by the Director of Planning at the New York State Office of Mental Retardation and Developmental Disabilities and the Co-director of the Aging and Developmental Disabilities Research and Planning

Project at the Center for Aging at the University of Maryland at College Park:

> There have been many instances where disabled individuals have been denied services by local aging agencies even though they were entitled to such services due to their eligibility under the Older Americans Act. The barriers that have been set in place are often times insurmountable without extraordinary interventions (Rose & Janicki, 1986:14).

Many times such barriers are financial in nature. Limited funds are allocated to area agencies on aging and priorities are set to help the greatest number of people. The needs of the developmentally disabled, whose conditions often require more constant and expensive assistance, are therefore not considered. Sometimes the barriers may be due to "handicapism" on the part of those officials who simply do not wish to deal with the "distasteful" aspects of developmentally disabled behavior.

Changes in characterizing mental retardation from a medical problem to a social problem have served to shift the focus of professional attention from the medical practitioner to the professional educator and social worker (Kelly, Larson, & Groeneweg, 1988). Consequently, in some cases, either important health care needs have gone undetected by these professionals because of their lack of specialized training in health care (Weinberg, 1977), or the health care technologists who have been called in to deal with these individuals have been reluctant or unable to provide adequate service because of their unfamiliarity with developmental disability (Kelly et al., 1988).

Caregiving and Residence

Improvements in caregiving and residential setting can increase the longevity and life satisfaction of the developmentally disabled. Long term care, particularly in relation to the dimensions of its quality and accessibility, is probably the most important issue currently affecting the developmentally disabled elderly.

The historical pattern for developmentally disabled adults has been institutionalization in long-term care residential units. Approximately 55% of the developmentally disabled elderly reside in institutional settings, as opposed to only 5% (9% in Canada [Wasylenki, 1982]) of the non-developmentally disabled elderly. In a recent study by the International Social Security Association, the institutionalization rate of seniors in Canada was one of the highest among eighteen industrialized nations (Statistics Canada, 1989). There has been, nevertheless, an emphasis on deinstitutionalization and community-based services. In general, there is agreement that institutional care is rarely the most appropriate setting for developmentally disabled persons and that residential services should be provided in the least restrictive environment (Hauber, Rotegard, & Bruininks, 1985).

Deinstitutionalization often takes the form of small "family-sized" group housing. Many times, the older developmentally disabled person resides with parents, relatives, or foster parents (Rose & Janicki, 1986). This can result in "two-generation senior citizen families." The parents or foster care providers are often in their seventies or eighties and are becoming progressively less able to care for their aging developmentally disabled child (Rose & Janicki, 1986). In such instances, both the parents and the developmentally disabled child are in need of assistance. The family may have had their standard of living dramatically reduced due to financial obligations relating to the developmental disability. The parents should not be seen as simply resources of support for their developmentally disabled child who need to be supported and eventually replaced when they die, but they should be seen as "...individuals, facing life's last great crisis, but with the additional and tragic task of making arrangements for children who are adults, yet still dependent" (Dobrof, 1985:414).

Though remaining at home with the parents may have some drawbacks, especially where there exists a "reclusive" kind of environment, this living arrangement is nevertheless superior to some archaic mental institution or non-therapeutic nursing home. At least the developmentally disabled person at home retains communication with those with whom he has established primary relationships. Additionally, much of the deterioration and early deaths of the developmentally disabled was a direct result of poor institutional care and lack of rehabilitation (Cotton, Sison, & Starr, 1981).

The case of Harry S. provides a representative scenario:

> Harry S., a 55-year-old severely retarded man, was institutionalized at the Rosewood Center when his mother died and his 81-year-old father could no longer care for him on his own. Harry had lived his entire life at home, and had always taken part in family and community events. Now he was suddenly faced with life in a noisy institutional cottage populated by much younger men who were sometimes disruptive and assaultive. In the first months at Rosewood, Harry suffered from depression and several physical injuries, including a broken clavicle. Lawyers sought a less drastic residential alternative for him, but state workers claimed that they had none available. After months of intensive advocacy, Harry was placed in a community residence (Herr, 1985:77).

Some developmentally disabled elderly persons are now outliving their caregivers or caregiving situations. As they grow older, they face what most persons eventually confront: the death of their parents. For adult persons dependent on their parents for care, this phenomenon can be devastating. Placement in a nursing home or other care facility is the probable alternative for a disabled person who has lost his parents (Walz et al., 1986).

Many developmentally disabled elderly have a fear of institutionalization. This fear is not necessarily unfounded. Although it appears to be an obvious solution, institutionalization may result in greater problems for the individual: (a) The facility may not have a developmental orientation and not be sensitive to the person's needs; (b) the institution may not be cost effective (by providing more services than the developmentally disabled person really needs); (c) further deterioration may inadvertently result from being in an institution; and (d) the person may be subject to "transfer trauma," reactive problems caused by moving out of home and away from friends and family (Janicki, Otis, Puccio, Rettig, & Jacobson, 1985:294).

Smith and Herman (1988:116) have outlined three common adverse reactions of previously institutionalized individuals who have been placed in the community:

1. Institutional retreatism--Such persons have had the experience of being stigmatized and feel estranged from the larger society. They seek ways to return to the hospital from which they were discharged--to their "home," their secure environment where needs were met, no responsibility demanded, and where they had familiar roles and statuses.

2. Societal retreatism--This is where individuals remain in the community, but actively withdraw to its outermost fringes. By so doing, they are able to elude what

they perceive to be potentially stigmatizing reactions. The highly isolated living situations are viewed as preferable to running the risk of confronting the rejection found when they are visible to the community.

3) Capitulation--This means giving up trying to cope. This reaction may result in suicide or other self-destructive behavior.

From the client perspective, the after-care facilities in which they are placed are merely another form of institutionalization on a smaller scale. Ex-patients must comply with a set of rules and regulations, controlled by a set of authorities and the social environment that emphasizes dependency. When commenting about their boarding homes, subjects expressed a mixture of outrage, resentment, and distress regarding living conditions (Smith & Herman, 1988).

In a well-known Canadian study, researchers tested for IQ scores among elderly mentally retarded residents of an institution. The same residents were retested five years later. They found an actual gain of 5.7 points for the overall group. A major factor in the researchers' explanation was improvement in the atmosphere and custodial care provided by the institution during test and retest (Bell & Zubeck, 1960).

Several types of residential arrangements for the developmentally disabled elderly exist as alternatives to institutionalization and living at home. These may or may not be ICF/MR certified (Intermediate Care Facility for the Mentally Retarded). Six such alternatives are:

1. Foster Home--a home or apartment owned or rented by a family, with one or more retarded persons living as family members.
2. Group Home--a residence with staff who provide care, supervision, and training of one or more mentally retarded people.
3. Supervised Apartment--a residence consisting of semi-independent units or apartments with staff living in a separate unit in the same building.
4. Boarding Home--a residence that provides sleeping rooms and meals but no regular care or supervision of residents.
5. Personal Care Home--a residence in which staff people help with dressing, bathing, or other personal care, but no formal training of residents.
6. Nursing Home--usually an intermediate care facility (not an ICF/MR) or a skilled nursing facility (Hauber et al., 1985:330).

Access to Health Care

Another issue regards health care. As a group, the developmentally disabled elderly tend to need and use health services more than other elderly persons. The movement of the developmentally disabled from institutions to community settings has shifted their dependence for health care from the segregated medical services of institutions to the health care structures of communities (Janicki et al., 1985). They tend to experience, with increasing age, increases in mobility impairments, medication usage, need for special diets, and decreases in self-care skills. They must be carefully observed for adverse reactions to drugs, particularly those persons with communication disablements, who cannot readily report symptoms.

Persons with developmental disabilities tend to die of a pattern of disease somewhat different from that of the general population. Respiratory infections attributed to cerebral palsy, epilepsy, and reduced efficiency in coughing, feeding, and breathing are factors in the excess mortality among the more severely retarded individuals. The mildly mentally retarded, on the other hand, are more likely to die from a cerebrovascular or cardiovascular disease. Persons with developmental disabilities are 50% more likely to die from carcinoma or cardiac failure than is the general population (Carter & Jancar, 1983).

Secondary health problems of the developmentally disabled adult include obesity, chronic skin problems, hygiene related problems, and early aging in the forty to sixty age group (including Alzheimer's Disease). In fact, one researcher performed actual autopsies on a group of former Down's Syndrome patients who had reached at least the age of forty. He found that 100% had suffered from Alzheimer's Disease (Miniszek, 1983). Buehler, Smith, and Fifield (1985) blame many of these secondary health problems on lack of access to adequate health care due to a lack of availability, expertise, and interest in the medical community.

Day Services

Daytime program services for the developmentally disabled elderly are still in the embryonic stage. The programs that do exist share as their primary goals: (a) prevention of regression due to inactivity; (b) minimization of mental and physical debilitation; (c) enhancement of the quality of life for participants; and (d) prolongation of community placement (Catapano, Levy, & Levy, 1985:315). More service approaches need to be created, especially for those who are unable to travel to day programs due to medical restrictions.

Legal Concerns

As the population of developmentally disabled elderly grows older, a whole new set of legal and ethical issues must be raised. Questions regarding wills and legal guardianship must be addressed. Surely laws must be written and passed to protect the rights and dignity of these individuals as citizens. What about social security and/or retirement benefits, even though many in this category may not have contributed financially into the pool because of non-working careers?

The Need For Understanding

In most areas of the United States both an aging network to help meet the needs of the elderly and a network of agencies to serve the developmentally disabled are already in place. Why, then, have many of the developmentally disabled elderly "fallen through the cracks" of the system? Some insist that a lack of understanding on the part of both helping networks is the problem. The developmental disabilities service providers generally do not have a familiarity with the Older Americans Act, nor do many in the aging network have much knowledge concerning developmental disabilities (Rose & Janicki, 1986). Because of this situation, both the American Association on Mental Deficiency and the Gerontological Society of America now have special membership sections to address the special needs of this sub-group of older Americans (Rose & Janicki, 1986).

A clear need exists for a greater number of gerontologists, mental health professionals, physicians, policymakers, and educators to be more properly educated and trained to more adequately service the specific needs of the elderly developmentally disabled. Many persons, including some in positions of influence, carry with them myths, stereotypes, and prejudices that hinder the advancement of the developmentally disabled elderly.

Unfortunately, the business community and society in general often embrace stereotypical beliefs that the developmentally disabled person is "senile" and may be a threat to other workers or to the general population

(Robinson, 1987). Obviously, this view is distorted. A small percentage of the developmentally disabled eventually get married. Some can drive their own automobiles. Many are gainfully employed, and sometimes the employer receives tax credits for hiring them. It is to be hoped that with better education and sensitization, the general public will accept the developmentally disabled elderly with respect and understanding.

Employers often use persons' disabilities as excuses for not hiring them. In most cases, only minor adjustments or provisions are necessary for the developmentally disabled to be successful on the job. Sometimes over-protective family members prevent developmentally disabled persons from working in a competitive employment situation because they do not want them to be hurt or embarrassed. Developmentally disabled persons should be given trust and some latitude in order to develop the concept that other people have confidence in and can rely upon them, rather than their always being dependent on others (Robinson, 1987).

The developmentally disabled elderly person faces the prejudices and discriminations of society as both elderly and developmentally disabled. The person is thus the victim of both ageism and handicapism. Dobrof (1985:412) states that these persons have "...been subjected to 'systematic stereotyping and discrimination,' and are often seen as different and not identified as human beings."

Helping professionals are not immune to a reluctance to work with this group of people. In the first place, both the elderly and the developmentally disabled generally have low social status in our society. Staff persons of service providers may fear being stigmatized by their association with the clients. Secondly, in the process of dealing with this subpopulation, they are forced to come to grips with their own mortality as well as vague feelings of inadequacy because they have not achieved more even though they are not handicapped. A third conflict is the crude question of whether the scarce time and expertise spent in working with a person who may soon be dead is really worth it (Kastenbaum, 1964).

Elderly persons have the right to continue to be educated, to enhance or reduce their involvement in work, retire, relax, volunteer their time, engage in religious activities, and participate in social and recreational activities. The developmentally disabled elderly have the same rights. Service providers should therefore act as advocates for this group who cannot promote their own needs.

Policy Implications

This research has important policy implications for both Canada and the United States. The implications are particularly relevant to persons who are in positions, both private and public which influence policies concerning the developmentally disabled elderly. They will also be of concern to policymakers in both the aging and the developmentally disabled helping networks; to social planners; and to health care service providers. Researchers and educators in a whole spectrum of academic and technical disciplines, from medical technology and nursing to sociology, economics, psychology, and political science could benefit from this research.

Health Care Delivery Systems: Canada and the U.S. Compared

By 1960, all the Canadian provinces had introduced universal hospital insurance programs. These programs were supported jointly by the federal government and the individual provinces. They did not, however, pay 100% of medical costs, nor were they very comprehensive in coverage (Hatcher, Hatcher, & Hatcher, 1984).

In 1978, Saskatchewan began a program of publicly-funded health care for all citizens of the province. Services were cost-free to the patients, and included nursing home and other long-term care. Since then, all the

Canadian provinces have enacted their own free-to-the-public health care systems (Kane & Kane, 1990). Every Canadian now has, therefore, government-funded access to hospitalization and physician services.

In the strictest sense, the Canadian system is not a case of socialized medicine, since physicians operate privately, rather than as government employees, as in Great Britain. Furthermore, they are allowed to work entirely outside the government-funded system, charging whatever fees they desire to patients willing to utilize their services privately. Few physicians operate privately, however, since the government pays all fees for all citizens (Macionis, 1989).

The federal government pays one third and each province pays two thirds of the costs of health care in Canada. Health care is thus almost entirely publicly funded and available to Canadians of any age (Kane & Kane, 1990).

Research in Montreal has shown that free access to physicians' offices tends to provide more care for those who need it most. Physicians reported seeing fewer patients for frivolous reasons and more persons with serious complaints following the introduction of cost-free medical care (Hatcher et al., 1984).

Canada provides equal service for rich and poor alike. It is not a two-class health care system.

The health care delivery system in the United States is primarily a private, profit-making industry in which more money buys better care. The system itself is called a direct-fee system. This refers to a medical system in which patients pay directly for services provided by physicians and hospitals.

Due to the inherent inequalities of the American class structure, poor Americans have far less access to health care than do other Americans. The result is that wealthier Americans enjoy much better physical, mental, and emotional health than do those without abundant financial resources. This pattern remains evident throughout the life cycle (Macionis, 1989).

There are a number of reasons why a national health care program has not been adopted in the United States. First, the American Medical Association and the medical insurance industry have effectively opposed such a development (Starr, 1982). This is largely due to the fact that wherever medicine is socialized--to whatever extent--the medical profession loses power, prestige, and income, and private insurance is no longer needed.

Secondly, Americans have traditionally opposed government intervention into the economy and into matters presumed to be personal, such as health. There is strong resistance to the idea that there is any societal responsibility for meeting basic human needs in health, income, housing, or welfare (Wallace & Estes, 1989). Clark C. Havighurst, in Deregulating the Health Care Industry: Planning for Competition (1982), proposes elimination of direct federal involvement in most major health and welfare programs, including Medicare, Social Security, and even the National Institute of Health. He states that "...an intensely personal matter such as what to do about disease should be kept within the realm of private choice." Similarly, physician George Shrady, editor of the Medical Record, said, "...the poor obtain vastly more medical attention than they have a right to expect...Vast sums of money are wasted yearly on worthless and undeserving persons" (Starr, 1982:182). The profession of social worker originated in the United States because of charges that the poor are "parasites" and that investigation is necessary to make certain that any recipient of government aid is genuinely destitute (Starr, 1982).

Thirdly, there have been no persistent organized social movements promoting a national health program in the United States. Instead, workers, through labor unions, have attempted to win access to health care through group insurance plans. Though they have met with some success, such a system allows many workers and others to "fall through the cracks," having no or little medical coverage. From 50 to 77 million Americans under age 65 are not covered by any health insurance and therefore face either serious financial burdens or barriers in seeking medical care (Butler, 1988). In addition, another 60 million Americans under age 65 have some insurance coverage that is grossly inadequate (Butler, 1988). The extreme inequality of the situation is accentuated by the fact that 87 to 89% of the uninsured are attached to the workplace (Butler, 1988). Half the uninsured are adult workers whose employers do not provide insurance coverage. These workers have dependents who are likewise not covered. Many workers who are themselves covered by group insurance policies cannot afford the extra premiums to include their spouses and children in their coverage. Children under age 18 are the largest category among the uninsured (Butler, 1988).

The elderly tend to suffer from chronic conditions, while younger patients tend to experience shorter-duration acute illnesses. Older Americans therefore typically have longer stays in the hospital than younger persons and account for a greater proportion of nursing home expenditures. Insurance coverage and existing federal assistance programs, such as Medicare, provide reimbursement for not quite half of all medical costs (Schaefer, 1989).

In 1965, during the Johnson Administration's years of the "War on Poverty," the United States Congress passed an amendment called the Social Security Act. It was a tripartite program.

First was Medicare Part A. This was hospital insurance for the elderly, financed by Social Security payroll taxes. This provision paid approximately 80% of many major hospital expenses for the aged.

Second was Medicare Part B. This was supplementary medical insurance for the aged to help pay for physician care. Again, 80/20 coinsurance was the rule, and several important items, such as prescription drugs, were excluded from coverage. The elderly beneficiary paid premiums for Medicare Part B. The remainder of the cost was paid from general federal revenues.

The third part of the 1965 Act was called Medicaid, designed to pay for health care for the elderly poor and other low-income people. Medicaid was jointly financed by each of the 50 states and matching federal revenues. Medicaid was administered by each of the several states. Under Medicaid, the states provided health care to at least all their welfare recipient groups. This generally meant those with incomes below the "poverty level." In 1988, the poverty level for a family of four was $10,989 annual income (Macionis, 1989). There were great disparities in the way various states administer Medicaid. For instance, only 24% of people under the federal poverty level are covered in Alabama, while in California the figure is 83% (Butler, 1988).

One has only to look at who is excluded from Medicaid eligibility to see the extent of health care inaccessibility in the United States. Excluded are single adults who are not elderly nor totally disabled, most childless couples, most non-pregnant parents in two-parent families, and older children. Eligibility also changes with employment status and slight changes in income. In addition, only a minority of practicing physicians accept Medicaid patients.

The quality of health care in Canada is similar to that of the United States and Great Britain. The major emphasis is upon general practitioners rather than specialists, and there are twice as many general practitioners per capita in Canada than in the United States (Hatcher et al., 1984). Cockerham (1989:295) states, "The health profile of Canadians with respect to infant mortality and life expectancy is somewhat better than for Americans."

The nurses who function in the extreme northern areas of Canada are very well trained. They are quick to refer serious problems to regular physicians. In addition to providing competent care, the "nurse-practitioner" system is an effective means of extending the reach of the formally trained physicians (Smith & Herman, 1988).

At first few lamented the passing of the mental hospitals, but soon there were problems. Patients were too often discharged without adequate services. Some landed in jails or ghettoes (Lehman, Ward, & Linn, 1982; Committee of Enquiry, 1984; Borzecki & Wormith, 1985). Despite many problems, the outcome of deinstitutionalization has been less unfavorable in Canada than in the United States. J. A. Talbott, a past president of the American Psychiatric Association, evaluated the mental health services in Saskatchewan as superior to those throughout most of the United States (Smith & Herman, 1988).

The infant mortality rate (per 1,000 live births) in Canada is the third lowest in the world at 7.2 (Hatcher et al., 1984). This is substantially lower than both Great Britain and the United States, at 9.4 and 10.5, respectively (Schaefer, 1989).

The Canadian health care system shares to some extent a problem inherent in most contemporary industrial societies. Emphasis on a narrow curative model in medicine results in looking only at the microcausal approach to disease. This approach states that disease results from microorganisms. Also known as "germ theory," this perspective tends to ignore the macrocausal social model which shows how the social and economic environment gives rise to specific diseases and shapes the spread of many diseases across social classes and income groups (Hollingsworth, 1986).

By 1960, the United States had become the world's leading country in regard to research in the biomedical sciences and by 1970, the National Institute of Health had the world's largest and most diversified concentration of biomedical investigators (Hollingsworth, 1986). Of the three nations under consideration, the United States is definitely the leader in this area. It has many more research centers with established standards of excellence, more research dollars to work with, and greater liberty to pursue the work.

Based on the facts in the preceding paragraph one might be led to think that the health care system in the United States should be regarded as the world's finest. In some respects, however, the health of Americans is worse than that of Europeans. For example, the infant mortality rate is higher in the U. S. than in any Western European society, and the death rate for men age 45 is twice as high as it is in Sweden (United Nations, 1983). It is estimated that infant mortality in some poor U. S. innercity areas exceeds 30 per 1,000 live births, the highest anywhere in the industrialized world (Schaefer, 1989). More than twenty nations have infant mortality rates lower than the overall rate of the United States, among them, Singapore with 9.3 deaths per 1,000 live births, Iceland with 5.3 deaths per 1,000 live births, and Norway with 4.3 deaths per 1,000 live births (Haub & Kent, 1987).

The profit motive of some medical doctors leads them to sometimes assert power and knowledge in ways that may be medically dangerous. For example, coronary bypass surgery, a serious and expensive procedure, has proliferated to the point where its benefits are being overstated to some patients (Schaefer, 1989). Other abuses include performance of unnecessary tests and overprescribing certain drugs (Kaplan, 1985). Many drugs prescribed are addictive and others may cause a variety of adverse reactions. Approximately one million Americans enter a hospital each year because of an adverse reaction to a medical drug (Macionis, 1989).

Growing evidence suggests that the decision to perform surgery reflects the interests of surgeons and hospitals as well as the needs of patients (Macionis, 1989). It is estimated that at least 10% of all elective surgery in the United States could safely be refused or deferred, thus saving consumers well over one billion dollars each annum. Furthermore, approximately one in every 200 cases of elective surgery results in the death of the patient. Therefore, perhaps 13,000 lives could be saved each year by stricter controls on physician behavior (Sidel & Sidel, 1982).

Despite the equality and generosity of its health care program, Canada is one of the few countries that has held the cost of all health care to a constant proportion of the Gross National Product for the past ten years (Hatcher et al., 1984). Per capita health care costs in Canada are only half those in the United States, even though most hospitals are privately owned and most physicians are in independent private practice (Hatcher et al., 1984).

For acute-level conditions, each province pays two thirds of the cost of care and the Canadian federal government pays one third. For long-term chronic conditions, the federal government pays 100%. Only 1.5% is spent on administrative costs, making the Canadian system possibly the most efficient in the world (Hatcher et al., 1984).

Statistically, Canadians are not as likely to sue at law as Americans. Therefore, malpractice insurance is not a factor in medical costs. In addition, there is not a large insurance industry to contribute to spiraling health care costs, as in the U.S. (Kane & Kane, 1990).

The costs of general hospital and physicians' services are shared roughly 50:50 by provincial and federal governments. However, mental hospitals are not cost-shared, and this has virtually sealed their doom. The Canada Assistance Plan, initiated in 1966, is a cost-sharing venture in the fields of welfare and rehabilitation, and this has made it easier to discharge long-term patients without means into the community. Approved homes are simply private residences subject to government regulations regarding standards and are supposed to provide a more family-like atmosphere for patients (Smith & Herman, 1988).

The dollar cost of medical care in the United States has increased faster than inflation (Butler, 1988). The health care system accounts for more than one tenth of the GNP, approximately $600 billion.

According to a recent marketing research survey, U. S. hospitals spent $1.1 billion on marketing in 1986 (Schaefer, 1989). Advertising for hospitals now routinely appears, offering such amenities as candlelight dinners for new parents, gourmet menus, and stylish furniture for private patients.

The growth of the American Medical Association in income, power, and prestige has contributed to the perpetuation of increasing medical costs. The average physician with membership in the A.M.A. in 1985 had an income of $120,000, the highest average of any profession (Macionis, 1989). The A.M.A. itself controls licensing, thus restricting the supply of physicians. The A.M.A. has determinedly opposed equal access to health care in the United States.

Surely there is much to gain from a study of the Canadian health care delivery system as it applies to the developmentally disabled elderly. Having empirical information on variables that differentiate and characterize (and are potentially modifiable via social policy) those elderly respondents prone to use services will enable policymakers and program developers to structure or restructure the service delivery system in ways that will effectively meet the needs of the developmentally disabled. Policy implications will be discussed again after the data has been analyzed.

CHAPTER II

REVIEW OF THE LITERATURE

Theoretical Orientations Toward Health Care Utilization

A number of theories and models propose to explain the seeking and utilization of health care services. Several of these have been considered for the theoretical framework of this research.

Mechanic's Theory of Help Seeking

David Mechanic (1978) takes a social psychological approach to the study of health care delivery systems. The foundation for his theory of health care seeking makes the individual's "definition of the situation" and her/his ability to cope with the situation the most significant factor (Wolinsky, 1988). The sick role concept developed by Parsons (1951) and subsequently extended by Freidson (1970) serves for Mechanic as the basic framework for understanding how and why people respond to illness.

The most blatant weakness in the sick role idea is the presumption that the sick role would be universally and consistently embraced by all Americans. This is simply not true, since not everyone reacts to the same malady in the same way. As a result of this and other criticisms of the sick role, several sociologists set out to elaborate and develop the sick role so that it would better illuminate illness-related behavior. Two of the most noteworthy of these efforts are Mechanic's (1968, 1978) general theory of help seeking and Suchman's (1965b) model of the stages in the illness and medical care process.

Mechanic's (1978) general theory of help seeking places an emphasis on two factors: (a) The understanding by the individual (or by the individual's significant others) of the circumstances and; (b) the ability of the person (or of the person's significant others) to handle that situation. Mechanic uses these two factors to illuminate why "one person will hardly acknowledge a condition and refuse to allow it to alter his life, [while] another with a milder form of the same condition will display profound social and psychological disabilities" (Mechanic, 1978:266). Mechanic is interested in explaining the diversity of illness behavior, which he defines as behavior relevant to "any condition that causes or might usefully cause an individual to concern himself with his symptoms and to seek help" (Mechanic, 1978:249). One step toward understanding how people react to illness is determining how they obtained the illness in the first place. This is the "etiology of disease" question. A second step involves determining the factors that explain the variations in recognizing illness symptoms, associating these symptoms with one's illness and then responding to the illness. This is the "etiology of illness behavior" question. Mechanic concentrates on the second question, the etiology of illness behavior.

In concentrating on the etiology of illness behavior, Mechanic (1978) delineates a number of variables that affect the individual's reaction to illness. While recognizing that there is some overlap among some of these factors and that a few variables which affect illness behavior may not have been measured, Mechanic (1978:268-269) lists ten determinants of illness behavior:

1. Visibility, recognizability, or perceptual salience of deviant signs and symptoms.
2. The extent to which the symptoms are perceived as serious (that is, the person's estimate of the present and future possibilities of danger).
3. The extent to which symptoms disrupt family, work, and other social activities.
4. The frequency of the appearance of the deviant signs or symptoms, their persistence, or their frequency of recurrence.
5. The tolerance threshold of those who are exposed to and evaluate the deviant signs and symptoms.
6. Available information, knowledge, and cultural assumptions and understandings of the evaluator.
7. Basic needs that can lead to denial.
8. Needs competing with illness responses.
9. Competing possible interpretations that can be assigned to the symptoms once they are recognized.
10. Availability of treatment resources, physical proximity, and psychological and monetary costs of taking action (included are not only physical distance and costs of time, money, and effort, but also such costs as stigma, social distance, and feelings of humiliation).

These ten determinants may be classified into four broad categories (Wolinsky, 1988). Determinants 1, 2, and 6 concern the perception and importance of symptoms that will be largely determined by the medical orientation and sociocultural history of the person. Individuals who have been socialized to recognize symptoms and who have been socialized to cope with those symptoms will respond to symptoms differently from those who have not. Determinants 3, 4, and 5 are concerned with the disruptive and persistent nature of the symptoms. In other words, this category of determinants focuses on the observable nature of the functional limitations imposed by the illness symptoms. Determinants 7, 8, and 9 are concerned with competing individual needs and alternative rationales for interpreting the observed disruptive symptoms. Finally, determinant 10 is a residual category that encompasses the effects of all nonsocial psychological factors in the response to illness. The fact that Mechanic relegates all nonsocial psychological factors to one of the ten determinants reflects his social psychological orientation.

In addition to identifying the ten determinants of illness behavior, Mechanic (1978) identifies two levels of analysis on which the determinants operate. The first level is called the "other-defined level" and refers to the process by which persons other than the individual recognize the ill individual's symptoms and attempt to define her or him as ill and in need of seeking professional care. This "other-defined level" of illness is most frequently used with psychotic conditions, although it also applies to the illness behavior of children and to somatic conditions denied by adults. At the "self-defined level," the individual recognizes his or her symptoms and ascertains the need for help seeking independently. The major differentiation between the "self-defined" and "other-defined" levels of analysis is that "...in the latter the person tends to resist the definition that others are attempting to impose on him, and it may be necessary to bring him into treatment under great pressure and perhaps even involuntarily" (Mechanic, 1978:274). For the most part, the effects of the ten determinants of illness behavior are similar for both the "self-defined" and "other-defined" illness circumstances, as well as for psychotic and somatic illness situations.

A central theme that underlies all ten determinants of illness behavior at both levels of analysis is that illness behavior is a culturally and socially learned response pattern. Each time the individual (or the individual's evaluators) are confronted with illness symptoms, those symptoms will be perceived, evaluated, and either acted upon or not acted upon on the basis of the individual's (or the individual's evaluators') "definition of the situation." The individual's definition of the situation is largely determined by his or her sociocultural heritage and socialization patterns. Therefore, individuals from the same sociocultural heritage should perceive, evaluate, and respond to illness symptoms in a similar pattern, while individuals from different sociocultural heritages will react to symptoms differently (Wolinsky, 1988).

The ten determinants in Mechanic's (1978) general theory of help seeking represent the criteria on which each illness symptom or condition is evaluated by the individual or by the individual's evaluators. In other words, the ten determinants of illness behavior represent the major decisions that are involved in the process of seeking or not seeking health care. Although it may appear that the ten determinants represent distinct and ordered stages in the decision making process, Mechanic states that they are not independent, and quite often interact with each other. The specific nature of their interdependence, however, has yet to be explicitly described.

Suchman's Model of Illness Behavior

In his model of illness behavior, Suchman (1965b) identified four factors that he thought were the principal elements underlying the patterns of illness behavior: the "content," the "sequence," the "spacing," and the "variability" of illness behavior. By combining various aspects of these principal components, Suchman developed five useful concepts with which to analyze illness behavior:

1. "shopping," the process of seeking out several different sources of medical care, for one reason or another, although the purpose was usually to find a medical practitioner whose diagnosis and treatment were more in line with the ill individual's expectations;
2. "fragmentation," the process of being treated by several medical practitioners, all at the same location;
3. "procrastination," the process of putting off the seeking of care once the illness symptoms are recognized;
4. "self-medication," the process of home remedies and self-treatment;
5. "discontinuity," the process of interrupting the treatment regimen (Suchman, 1965b:114).

Suchman (1965b:114) divided the sequence of events into five stages. These stages are: (a) The symptom experience stage; (b) the assumption of the sick role stage; (c) the medical care contact stage; (d) the dependent-patient role stage; (e) the recovery or rehabilitation stage.

Suchman also drew freely from Parsons' (1951) conception of the sick role, as well as Kadushin's (1958) description of the stages involved in the decision to seek psychotherapy. Suchman hypothesized (1965a) that individuals who hold popular orientations toward medicine would be more likely to place their confidence in the lay referral system. He further expected that they would linger in the first two stages of illness behavior. On the other hand, individuals from cosmopolitan social groups who held "scientific" orientations toward medicine were expected to move through the first two stages quite rapidly. The results of a replication of Suchman's research by Geersten, Klauber, Rindflesh, Kane, and Gray (1975), however, contradicted Suchman's hypotheses.

The Health Belief Model

The health belief model is one of the most widely-publicized models of health services utilization (Becker & Maiman, 1983). Based on the "field theory" of Kurt Lewin (1951), this approach assumes an understanding of life in which each individual lives in his or her own "social life space." Within this life space there are positively and negatively valued regions or "valences." It is presumed that persons are attracted or pulled to positive regions, while being repelled or pushed away from negative regions. When the Lewinian field theory was applied to health problems, it was assumed that illness and disease were negative valences, while health was a positive valence (Becker & Maimon, 1983). Four key factors were theorized to be involved in an individual's decision to take action against an infirmity: (a) The perceived susceptibility of the individual to the disease; (b) the perceived seriousness of the disease; (c) the perceived benefits and barriers of taking action against the disease; (d) the cues that motivate the action process in the individual (Wolinsky, 1988:129).

In an extensive examination of the health belief model, Berkanovik and Telesky (1982) were not able to identify any generalizable health beliefs that were predictive of health behaviors. Therefore, the pragmatic utility of the health belief model appears to be rather limited, although its theoretical appeal is rather powerful.

Young's Choice-making Model of Health Services Utilization

Young (1981), an anthropologist, has presented a model which represents a revision of the health belief model, expanding its applicability to encompass the type of health services utilized. Young's approach is based on four considerations central to the individual's choice-making process, which he has called "gravity," "knowledge of a home remedy," "faith in the chosen remedy," and "accessibility" (Young, 1981).

In cultivating and evaluating the model, Young used data he accumulated in Pichataro, a small Mexican locale. Pichataro culture included several levels of both folk remedy and medical care providers. The choice-making model was fabricated by estimating whether or not professional treatment was sought for a specific malady and, if so, which level of professional assistance was chosen. The model accurately predicted 94.7% of the treatment choices (Young, 1981). Though it is still in the formation stage and needs to be reformulated into Western medical nomenclature for more explicit application in the United States and Canada, Young's treatment-choice model promises to offer significant potential as an explanatory model for understanding why people use which health services.

Andersen's Conceptual Framework of Health Care Utilization

The most widely adopted and empirically assessed model of health services utilization is Andersen's (1968) behavioral model. This model has been expanded, modified, and used extensively by Andersen and other health services researchers in the 1970s and 1980s; it is likely to be the dominant model in the 1990s (Wolinsky, 1988).

This model aims to be a simplified representation of empirical reality portraying the causal process of health services utilization. Andersen and Anderson (1979:384) suggest that this model of health services utilization may serve any one or more of the following purposes:

1. to illustrate the interrelationships among the determinants of health services utilization;
2. to facilitate the prediction of future health services needs;
3. to determine whether or not the distribution of health services is equitable;
4. to suggest ways to manipulate policy relevant variables in order to bring about desired changes;
5. to evaluate the impact of new health care delivery programs or projects.

The original model developed by Andersen (1968) and expanded by Andersen and Newman (1973) has been empirically assessed in a number of regional and national studies with considerable success. (Andersen, 1968; Andersen & Newman, 1973; Wan & Soifer, 1974; Andersen et al., 1975, 1976; Berki & Kobashigawa, 1976; Wolinsky, 1976, 1978; Eve & Friedsam, 1980; Eve, Watson, & Reis, 1980; Aday, Andersen, & Fleming, 1980; Eve, 1982; Wolinsky, Coe, Miller, Prendergrast, Creel, & Chavez, 1983; Eve, 1984; Wolinsky & Coe, 1984; Aday, Fleming, & Andersen, 1984; Wolinsky, Moseley, & Coe, 1986; Chappell & Blandford, 1987; Eve, 1988). "This health systems model is very useful because it provides both a conceptual and a methodological framework for the study of health services utilization. Indeed, it has become the standard framework used in health policy studies" (Wolinsky, 1988:133).

The Andersen-Newman (1973) theoretical framework has been proven to successfully explain health care and social service utilization in various settings and across a number of demographic categories. This type of research has been presented at the most prestigious professional meetings and been published in the top journals in the fields of medical sociology, social welfare, public policy, psychology, and gerontology. This particular research project is unique in its scope and purpose, though not in its methodology, and promises to be a seminal work, filling a gaping void in the current body of scientific knowledge.

Related Research that Addresses the Identified Problems

A summary of Andersen and Newman's (1973) model for explaining the utilization of health care services by the elderly appears in Figure 1. What Andersen and Newman

Figure 1.

Summary of Variables in the Andersen-Newman (1973) Model.

- I. Utilization of Health Care Services
  - A. Contact
  - B. Volume of use
  - C. Frequency of Use
- II. Illness (Need) Variables
  - A. Perceived health by respondent
  - B. Evaluated health by health care professional
- III. Enabling Variables
  - A. Family level variables
    - 1. Income
    - 2. Insurance
    - 3. Access to transportation
  - B. Community level variables
    - 1. Region of residence
    - 2. Urban/rural residence
- IV. Predisposing Variables
  - A. Demographic variables
    - 1. Age
    - 2. Sex
  - B. Social structure variables
    - 1. Education
    - 2. Occupational status
    - 3. Marital status
    - 4. Race/ethnicity
  - C. Beliefs
    - 1. Health values
    - 2. Attitudes toward services
    - 3. Knowledge about disease

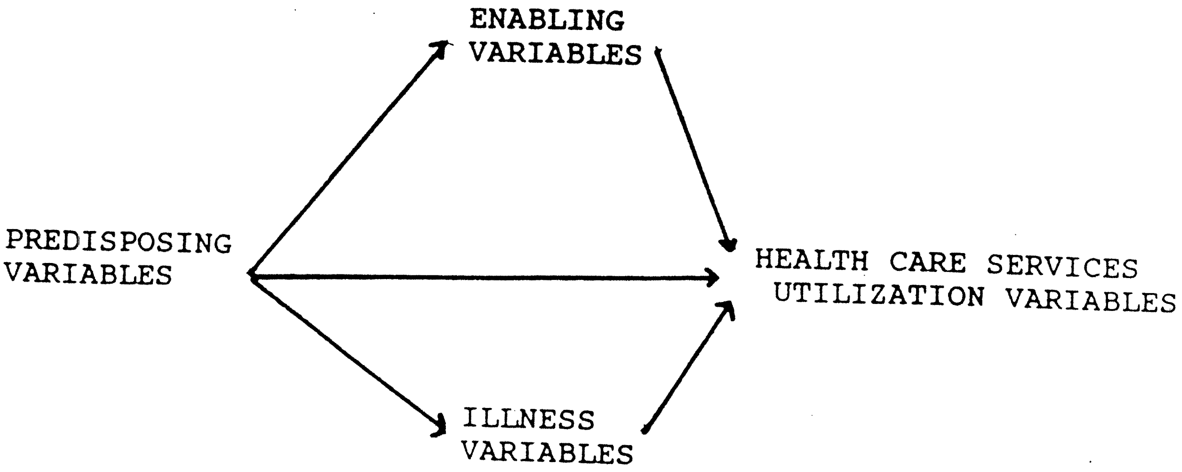
conceived as predisposing variables are characteristics which exist prior to one's illness and which may affect the need for services but may not necessarily be the cause of utilization. Predisposing factors include, for example, demographic factors such as age and sex, social structure factors such as ethnicity and education, and attitudinal factors such as attitudes and beliefs. Enabling factors may be thought of as characteristics or circumstances which can either hinder or facilitate the use of appropriate services once the need has been recognized. Examples of enabling factors include family income, health insurance, region of country, and whether residence is rural or urban. The third category, illness (need) factors, includes both the respondent's own perception of her/his health status and evaluation of the respondent's health by a health care professional. The health care utilization framework model itself is illustrated in Figure 2.

Type is the first dimension in Andersen and Newman's (1973) framework for measuring health services. It is used to separate the various health services from one another. Andersen and Newman demonstrated that there are different long-and short-term trends for the various types of services, such as hospitals, physicians, dentists, drugs, and nursing homes.

Another dimension in the framework is the unit of analysis. Three distinctions are proposed: contact,

Figure 2.

Illustration of Causal Order Among the Variables in the Health Care Services Utilization Framework.



volume, and episodes. The major argument for this distinction is that, on the one hand, the individual's characteristics might be primarily responsible for the number of illness episodes incurred, as well as whether or not a doctor was seen for any one of them. On the other hand, the characteristics of the delivery system (especially the physician) might be primarily responsible for the number of visits incurred as a result of each illness episode.

A small number of researchers has consistently used this framework to successfully analyze health care and social services utilization over a wide range of settings and for a variety of populations. This has been possible in large part because of the model's inherent flexibility. It fairly readily lends itself to having its variables operationalized in different ways. Despite variations in measurement, there has been some consistency in concluding that illness (need) is the most predictive determinant of use of physician and hospital services (Eve & Friedsam, 1980; Eve et al., 1980; Eve, 1982; Eve, 1984; Wolinsky, Moseley, & Coe, 1986; Chappell & Blandford, 1987; Eve, 1988).

When applied to the use of health services, Aday and Andersen (1981) argue that an equitable situation is one in which only medical need determines health services utilization (in addition to some vestiges of a relationship with age and sex, as proxies of biological need). Inequity is said to exist when health services are distributed on the basis of race, income, or place of residence.

Aday and her colleagues (1984) found in their 1982 survey that access problems remained for some groups. These problems were exacerbated by the recession and constraints on federal and local spending for medical care.

Mechanic (1985) suggests that access to health care for the poor, the elderly, and other disadvantaged groups has been eroding during the mid 1980s. Moreover, he considers their access to be particularly vulnerable to further declines in the face of the current budgetary crisis. At the empirical level, Berki and his colleagues (Berki, Wyszewianski, Lichtenstein, Gimotty, Bowlyow, Papke, Smith, Crane, & Bromberg, 1985, cited in Wolinski, 1988) have shown that the economic hardships of the 1980s have disenfranchised many of the unemployed and underemployed from traditional private and public health insurance programs.

Discussion of Predictor Variables

In this model three major categories of health services utilization determinants are used. These categories are predisposing characteristics, enabling characteristics, and need characteristics.

Predisposing Variables

This category is used to reflect the fact that some individuals have a greater propensity to use services than other individuals. These propensities can be predicted by various individual characteristics occuring prior to the incidence of a specific illness episode. These individual characteristics can be further classified into three groups:

1. demographic, such as age and sex; individuals with different demographic characteristics have different types and amounts of illness, resulting in different patterns of use of health services;
2. social structural, such as education, occupation, and ethnicity; individuals with different social structural characteristics have different lifestyles, resulting in different patterns of health services use;
3. health benefits, such as the belief that medical care can be helpful in treating illness; individuals believing in the efficacy of medical care are more likely to seek medical care than those who do not (Chappell & Blandford, 1987:196).

Enabling Variables

The category of enabling characteristics indicates the verity that while the person may be predisposed to use health services, she or he does not use them unless capable of doing so. An individual's ability to use health services hinges on both family (income and place of residence) and community (availability of health care facilities, including personnel) resources. If there are enough family and community resources to facilitate the individual's utilization of health services, then the person will be more apt to use them (Andersen & Newman, 1973).

Need Variables

When suitable levels of predisposing and enabling characteristics exist, the individual (or the person or persons responsible for the individual) must discern some need (such as illness or its perceived threat) for using health services (Wolinsky, 1988). In other words, need is the foremost stimulus for the use of health services when the appropriate levels of predisposing and enabling characteristics occur. Need may be broken into two categories: perceived (subjective assessments), or evaluated (clinical diagnoses) (Wolinsky, 1988).

A variety of studies have documented the mortality and morbidity rates of developmentally disabled children and young adolescents (Eyman, Chaney, Givens, Lopez, & Lee, 1986.) Others have examined the mortality trends of developmentally disabled adults in institutional settings (Richards & Suddigui, 1980), but little information is available on the morbidity of older developmentally disabled individuals in community settings (Kelly et al., 1988).

Descriptive data on the nature of the posthospital experience were gathered in different community environments regarding the stigma of mental illness, inadequate housing, lack of basic living skills, poverty, unemployment, and problems with psychiatric aftercare resources (Smith & Herman, 1988). Over 90% of these persons, upon discharge, received neither support from family nor prior friends, and the other 10 percent felt their support to be weak and inconsistent from one or two family members. A small number of patients were offered financial support and/or emotional support, but such reports were rare. Feelings of isolation, loneliness, and abandonment are common among these older men and women.

Hospital Utilization

The utilization of hospital services has shifted dramatically during the twentieth century, doubling for females and tripling for males since 1928 (Andersen & Anderson, 1979). This appears to be primarily due to two factors: (a) the growth in the number of hospital beds available; and (b) the increasingly technological nature of medicine, which is most effectively practiced by physicians in well-equipped, contemporary hospitals. The combined effect of these two factors has led to the postulation of Roemer's (1961) law, which states that as the supply of hospital beds increases, so does the demand for using that supply. While Roemer's law has been supported by some researchers, such as Harris (1975a), health services investigators have not yet been able to discover the reasons for this occurrence. According to Wolinsky (1988:139), the three most frequent explanations for the increase in hospitalization utilization are that:

1. hospitals are motivated to provide and fill more beds by an organization version of the "keeping up with the Jones's" syndrome;
2. many health insurance plans only pay for expensive services when the individual has been hospitalized, motivating patients to seek hospitalization;
3. physicians prefer to treat their patients in hospitals where they have access to the best technological equipment and support staff, and thus recommend hospitalization whenever hospital beds are available.

When the number of hospital admissions per 100 persons per year is scrutinized within categories of various demographic characteristics, two arresting patterns emerge. First, although women had conventionally used substantially more hospital services than men, this occurrence appears to no longer be valid. Much of the difference was at first thought to be predominately biological, due to women's use of obstetrical services. More recent evidence, however, suggests that most of this difference must have been to social factors, reflecting the gender role socialization process. Men were assumed by earlier researchers to be able to endure pain to a greater degree than women, and, as a result, were less likely than women to be hospitalized for the same condition (Wolinsky, 1988). The general narrowing of the gender gap in health services utilization during the 1970s and 1980s reflects the increasing social equality of the sexes, especially with regard to the increasing proportion of women in the labor force and in other fixed roles that had traditionally been dominated by men (Marcus &

Seeman, 1981a, 1981b; Marcus & Siegel, 1982; Marshall, Gregario, & Walsh, 1982).

The second interesting pattern is that, while age was once directly and positively related to hospital use--the older the individual, the greater the use of hospital services--age is now related to hospital use in a curvilinear manner. There is high but stable use among the young, and high but ever-increasing use among the elderly (Wolinsky, 1988).

While higher levels of education and being white were associated with higher hospital admission rates earlier in this century, this is no longer the case (Wolinsky, 1988). In fact, the relationship between education and hospital use had reversed itself by 1974, and racial differences (as a proxy measure for ethnicity) had reversed by 1982. Now, the lower the educational level, the higher the hospital admission rate (Wolinsky, 1988).

Physician Utilization

The utilization of physician services has escalated during the twentieth century in a way which parallels hospital use. Physician visits per person per year have almost doubled, going from 2.6 in 1930 to 4.6 in 1982 (Department of Health and Human Services, 1985). This increase may be linked to two major factors: (a) the continued increase in the number of physicians available;

and (b) the growing tendency of individuals to consult a physician for less perilous ailments that in the past might not have called for a visit to a physician doctor (Wolinsky, 1988). In other words, as the number of physicians per capita goes up, there seems to be a decrease in the severity level at which point a physician's services are sought. Thus, the number of physician visits per person per year has spiraled dramatically (Wolinsky, 1988).

Women have significantly higher levels of physician use than men, averaging one more visit per year (Andersen & Anderson, 1979). This difference, however, has been on the decline during the 1970s and 1980s (Marcus & Seeman, 1981a, 1981b; Marcus & Siegel, 1982). This is consistent with the general narrowing of gender gap socialization differences noted earlier. The relationship of age to physician utilization is much more pronounced than it was with hospital utilization. In 1928, age was positively associated with physician utilization, while by 1982 the relationship had become J-shaped, with high utilization by younger persons interrupting the remaining positive relationship (Department of Health and Human Services, 1985).

Although whites traditionally had used more health services than nonwhites, their utilization rates had become nearly identical by 1982 (Department of Health and Human

Services, 1985). Nonwhites averaged one tenth of one physician visit more per year than whites. The better educated, however, continue to use more physician services than those with poorer educational levels. This difference, however, is also decreasing (Wolinsky, 1988).

People living in urban areas have higher levels of physician utilization than those living outside such urbanized areas, although the gap is narrowing (Rushing, 1975). This gap is most likely a function of greater access to physicians in urban areas than in rural areas.

The Utilization of Social Services

Most of the findings concerning hospital and physician utilization also hold true for the utilization of social services among the elderly (Coulton & Frost, 1982; Evashwich, Rowe, Diehr, & Branch, 1984). George (1981), however, found enabling and predisposing variables more predictive of the use of social services than the illness (need) variable. Krout (1983) found awareness of the availability of social services to be the strongest predictor. Likewise, Eve and Friedsam (1980), found that illness (need) is not the single most important predictor of utilization of dental services. Rather, the predisposing and enabling variables proved stronger; most specifically: income and education.

Andersen and Newman's (1973) model, conceptualizes utilization as the end product of a complex pattern of interrelationships between predisposing, enabling, and need factors. It suggests that some individuals have a higher propensity to use social services than do others, and that this propensity can be viewed as the outcome of certain background characteristics of the individual (Starrett, Wright, Mindel, & Tran, 1989). This propensity is associated with such variables as ethnicity or race, age, sex, education, marital status, and attitudes. Starrett et al. (1989), working with the Andersen-Newman theoretical framework, found that a high of 44% of the variance in utilization was explained for Cuban elderly, 41% for Puerto Rican elderly, and a low of 35% was explained for Mexican American elderly.

Knowledge of social services (an enabling factor that represents access to services) directly affects utilization across the three groups of elderly respondents more than other variables included in the model. This is important because knowledge, when it is present, is likely to result in more efficient and effective use of formal social service systems.

Canadian Studies

With the notable exceptions of Snider's (1980) study of noninstitutionalized Canadians and Chappell and Blandford's

(1987) study of the Manitoba system, all of these studies are American. None specifically relates to the developmentally disabled elderly.

A few surveys have been conducted to attempt to determine the health care and/or social service needs of the developmentally disabled elderly in Canada. Badry, Vrbancic, Groeneweg, McDonald, and Hornick (1986), in a survey of the developmentally disabled elderly in Alberta, concluded that leisure activities represented the greatest need for this group. Similarly, Berg and Dalton (1980) and Delaney (1984) studied the needs of the developmentally disabled elderly in Ontario, as did Anglin (1981) in the metro Toronto area. None of these is national in scope and none resembles the Andersen-Newman theoretical framework.

The area of aging and developmental disabilities remains relatively unexplored in Canada. One reason for this is that this is a relatively "new" population. This is the case due to two major factors. Prior to the 1950s, the developmentally disabled were primarily institutionalized in Canada. To this day, Canada has the highest percentage of institutionalized elderly among the industrialized nations, at 9% (Wasylenki, 1982). The other factor is that the developmentally disabled did not live long lives. Neither of these is any longer the case. The developmentally disabled are aging along with the remainder of society and there are a number of issues regarding this population which must be addressed. Some of these issues (discussed in the Introduction) include drug interactions, communication problems, competition for resources, caregiving, institutionalization vs. community residence, access to health care, day services, and legal concerns. This research deals with the issues of access to health care and social services for those in community residences.

The health care needs of developmentally disabled adults who are now participating in community living are poorly understood. This project was developed to survey the current health care situation for this population living in Canada. Kelly et al. (1988), have concluded from their qualitative survey in Alberta that health care needs are not being adequately addressed; a lack of professional services was identified by both administrators of health care agencies and health care service providers.

Over the last two decades there has been an overall increase in the number of individuals in Canada with developmental handicaps who have maintained residency in community versus institutional environments (Kelly et al., 1988). Correspondingly, there has been an increase in the number and variety of health care services required to meet their individual needs. On the surface, this seems to be an optimal situation; however, the needs are poorly understood and the level of service and expertise required to meet them may be considerably lacking within existing health care systems (Kelly et al., 1988).

Researchers in Toronto (Wasylenki et al., 1985) have added a valuable dimension to previous studies by looking at estimated and met needs in five separate dimensions as well as outcomes. They examined perceived and met needs in the five dimensions of medical therapeutic, social recreational, vocational educational, housing, and financial needs. Only the medical therapeutic needs were fairly well met. The other needs were dealt with poorly, particularly the social recreational component. Similar concerns with regard to the "disabled" were raised in the comprehensive report of the Mental Health Planning Survey in British Columbia (1979).

Policy Implications

The Canadian health care delivery system differs from that of the United States in at least one fundamental respect: there is universal insurance coverage in Canada. The Canadian federal government pays one third and each province pays two thirds of the costs of health care in Canada. Health care is thus almost entirely funded publicly and is available to Canadians of any age (Kane & Kane, 1990). The health care delivery system in the United States is a direct-fee system, in which patients pay directly for services provided by physicians and hospitals.

It could be argued that universal access in Canada should result in the lesser importance of enabling factors such as family income, access to services, ratios of health personnel and facilities to the population, region of the country, etc. It is not known whether this is actually the case.

The proposed research project is not a cross-cultural comparison between the United States and Canada. It will, however, undoubtedly be of interest to U.S. policymakers who desire the best system possible for their population.

CHAPTER III

METHODOLOGY

Research Objective

The major, broad, long-term objective of this research is to examine the accessibility of, and the predictors of, use of health care and social services among noninstitutionalized developmentally disabled elderly adults in Canada. Data for older developmentally disabled adults in Canada was obtained from Statistics Canada's Health and Activity Limitation Survey (H.A.L.S.) for 1986 and 1987 (the latest available). The theoretical framework used for the research will be the health care services utilization framework developed by Ronald Andersen and his colleagues at the University of Chicago's Health Services Research Center (Andersen & Newman, 1973). The major dependent variables that will be analyzed using this model are the utilization of hospitals, physicians, and social services.

There are three major types of predictor variables in the health care utilization framework. First, the need variables include objective and subjective evaluations of health status. Second, the enabling variables include family level variables (income, public and private health insurance coverage, and access to transportation), and community level measures of availability of health care services, which are usually measured using proxy measures such as urban/rural residence and region of country of residence. Third are the predisposing variables, which include demographic characteristics, and health belief variables.

Description of the Data

The dataset to be used in this project is the Health and Activity Limitation Survey available from Statistics Canada, an agency of the government of the Dominion of Canada, with headquarters in Ottawa, Ontario. The Health and Activity Limitation Survey (H.A.L.S.) is a 1986-1987 post-censal survey of disabled persons residing in households and institutions.

The particular H.A.L.S. microfile data to be used contains 132,337 records of adults aged 15 and over residing in households. Tabulations are possible at the Canadian, provincial, and territorial levels, as well as eight Census Metropolitan Areas (C.M.A.'s): St. John's, Halifax, Montreal, Toronto, Winnipeg, Edmonton, Calgary, and Vancouver. If a record is not part of a C.M.A., the geographic designation is urban or rural. Full documentation is provided with each file. The documentation includes a record layout and a full description of the 553 variables. Standard statistical packages such as SPSS-X or SAS can be used to produce tabulations from the file. Figure 3 shows the operationalization of the variables and their factors.

Sample

The population targeted by the Health and Activity Limitation Survey (H.A.L.S.) was comprised of all persons with physical or psychological disabilities who were living in Canada during the 1986 Census. Persons living in the the Northwest Territories and the Yukon were included in this definition, as well as residents of reservations, most collective dwellings, and health-care institutions. Penal institutions and correctional facilities were not included (Statistics Canada, 1988).

Two surveys make up the H.A.L.S. dataset. One is the household survey, which was conducted soon after the 1986 Census of Population, and the other is the institutions survey, which was carried out in the spring of 1987 (Statistics Canada, 1988).

The Household Survey

There were two stages in the household survey. The first stage consisted of a question on the census questionnaire (shown in Figure 4) about activity limitations and disabilities, which was asked of 20% of all Canadian

Figure 3.

Summarized Adaptation of Andersen-Newman model.

- Utilization of Health Care Services
  - No. of doctor visits past 3 months
  - No. of hospital days past 12 months
  - No. of nurse visits in past 3 months
  - No. of physio/occupational/speech therapist visits
  - Aids for hearing impaired used
  - Aids for visually impaired used
  - Aids for mobility impaired used
  - No. of prescription drugs used daily
- Utilization of Social Services
  - How often use special bus/van
  - Receive outside help with daily activities
- Illness (Need) Variables
  - Trouble dressing or getting out of bed
  - Learning disability
  - Activities limited due to learning disability
  - Difficulty using public transportation
  - Condition caused difficulty riding in car
- Enabling Variables (Family Level)
  - Total income from pensions or welfare
  - Total income
  - Low-income status
- Enabling Variables (Community Level)
  - Rural/urban
  - Province of residence
- Predisposing Variables
  - Ethnic origin
  - Marital status
  - Sex
  - Age group
  - Educational level

Figure 4.

Question 20 of the 1986 Canadian Census.

20.(a) Are you limited in the kind or amount of activity that you can do because of a long-term physical condition, mental condition or health problem:
- At home?
  - No, I am not limited
  - Yes, I am limited
- At school or at work?
  - No, I am not limited
  - Yes, I am limited
  - Not applicable
- In other activities, e.g., transportation to or from work, leisure time activities?
  - No, I am not limited
  - Yes, I am limited

(b) Do you have any long-term disabilities or handicaps?
- No
- Yes (Statistics Canada, 1988:2)

households. The completion of the H.A.L.S. household questionnaire was the second stage (Statistics Canada, 1988).

This question identified a large portion of the disabled population of Canada. This was done prior to H.A.L.S. in order to focus the survey on the target group to the greatest extent (Statistics Canada, 1988).

Identifying eligible respondents for the household portion of H.A.L.S. was a very important part of the 1986 Census. A total of 23,530 census interviewers were asked to analyze the completed census questionnaires and to accumulate a list of persons of various ages who had responded "Yes" to the disability question during the census. The responses were divided into two categories: "Indian reservations and all other areas. All Indian reservations were included in the survey and a sample of the remaining areas was selected. A total of approximately 112,000 individuals in total were selected for the 'Yes' sample" (Statistics Canada, 1988:2).

Before the 1986 Census, a small field test was carried out in order to determine whether all disabled persons, according to the definition used in the C.H.D.S, would answer "Yes" to the 1986 Census disability question. This test indicated that many persons with milder disabilities, as well as some older persons, would not answer "Yes" to the census question. It was then decided to select a sample of persons who responded "No" to the disability question. (Statistics Canada, 1988)

On this basis, approximately 72,500 respondents were selected and interviews were conducted with them. When a positive response was given to any of the H.A.L.S. screening questions, the entire questionnaire was completed. "Of those individuals contacted, 5% converted from a 'No' to a 'Yes'; that is, 3,500 additional persons became part of the sample of disabled persons" (Statistics Canada, 1988:3).

For the current research certain characteristics have been selected for the purpose of analyzing the developmentally disabled elderly rather than the entire sample of disabled persons in Canadian households. This was accomplished through a series of "SELECT IF" statements in SPSS-X. These characteristics are shown in Figure 5.

Figure 5.

Characteristics of Respondents Analyzed.

Age 55 or older
Developmentally delayed
Mental retardation
Down's Syndrome or similar chromosomal anomaly
Cerebral palsy
Epilepsy
Other cerebral degenerations

Data Collection

According to Statistics Canada (1988:3), "Data collection for the household survey took place in the summer of 1986 immediately following the completion of the field work for the 1986 Census. Approximately 1,200 census representatives were retained to conduct the interviews and they received additional training on the survey content and procedures." In most cases the data were collected by personal interviews. For the "No" sample, however, telephone interviews were usually the means utilized.

For the most part, the interviews were done with the selected respondents. In some situations, however, the interviews were conducted with other members of the household. This was done when the respondents' physical or psychological states prevented them from participating in the survey. This was the case in approximately 12% of the interviews (Statistics Canada, 1988). Responses for the H.A.L.S. Household Survey are shown in Figure 6.

Figure 6.

Responses for the Health and Activity Limitation Survey
(Statistics Canada, 1988:3)

Category	Rate
Response	90%
Refused	3
No contact	6
Other	1
Total	100%

All H.A.L.S. database records were edited by complex computer techniques in which the validity of the responses was checked. Missing data were either identified as "unknown," or imputed using other information contained in the questionnaire (Statistics Canada, 1988).

In a sample survey such as H.A.L.S., each case in the sample represents a subset of individuals in the population being studied. Each data base record is, therefore, assigned a weight based on the number of persons represented. The weight is then further modified to offset non-responses and differences between the sample studied and the target population. The results are then multiplied by the derived weight in order to provide an estimate of the response in the entire population. H.A.L.S. records were weighted to represent the population of Canadian excluding individuals who were not eligible for the survey. Persons not eligible were those in correctional facilities and living on Native Canadian reservations not enumerated in the 1986 Census (Statistics Canada, 1988).

Data Limitations

Statistics Canada (1988:3) states: "Statistics from the H.A.L.S. data base are estimated based on a sample survey of a portion of the Canadian population (approximately 1 out of every 25 persons in the 'Yes' sample and 1 out of every 300 persons in the 'No' sample). As a result, the statistics are subject to two types of error: sampling and non-sampling."

Sampling error is the discrepancy between the estimate projected from a sample and the perameter that would be obtained from the population using the same data collection procedures. The H.A.L.S. dataset provides a warning for any estimate with a high degree of sampling error.

All other types of error (observation, response, processing, and non-response errors) are known as "non-sampling error." Identifying and evaluating the importance of many of these errors can be difficult (Statistics Canada, 1988).

Observation error arises when there is a substantial difference between the target population and the sample taken. This type of error has been reduced by integrating H.A.L.S. with the Census of Population. Observation error, therefore, should not have a significant impact on the H.A.L.S. data (Statistics Canada, 1988).

Statistical surveys are generally susceptible to a certain amount of non-response among the persons selected. A total non-response occurs when, for whatever reason, a selected respondent can not be interviewed. The non-response is said to be partial when only portion of the questionnaire is complete. The importance of non-response error to estimates depends primarily on the level of non-response. With respect to H.A.L.S., the response rate of 90% (see Figure 6 above) compares favorably with that usually observed for this type of survey (Statistics Canada, 1988).

Various techniques have been used to reduce bias caused by total non-responses. The most notable such technique is to adjust the sample data to reflect the distribution of certain demographic characteristics obtained by the population census. This technique will lessen the impact on the accuracy of the estimates (Statistics Canada, 1988).

The Questionnaires

Six questionnaires were used for H.A.L.S. The household survey used four and the institutional survey used two. The questionnaires were designed in consultation with both public officials who were involved in the delivery of programs for disabled persons. Also consulted were persons in the private sector who were involved in disabled persons advocacy associations (Statistics Canada, 1988). The various sections of the questionnaires and the rationale for the content of each section are discussed below.

Section A - Screening Questions

The purpose of the questions in this section was to determine whether respondents were limited in their day-to-day activities (often referred to as Activities of Daily Living) due to some condition or health problem which was expected to have a duration of six months or longer. The respondents were interrogated as to whether they have experienced problems in the performance of these activities even when utilizing special aids such as corrective lenses, hearing aids, braces, etc. Other questions were asked about respondents' limitations due to diagnosed learning disabilities as well as long-term emotional, psychological, nervous, or mental health problems (Statistics Canada, 1988).

Section B - Special Aids

Questions in this section were used to identify special aids utilized or needed by the respondent to help her or him move about and do things on her or his own. Inquiries were also made about the respondent's use of both prescription and non-prescription drugs (Statistics Canada, 1988).

Section C - Social Services

The purpose of the questions in this section was to gather information on how the respondent's condition affects her or his ability to carry on everyday activities such as preparing meals, shopping, performing housework and heavy household chores, handling personal finances, etc. This factor had an impact on the level of support needed by a disabled person to continue to live independently (Statistics Canada, 1988).

Section D - Employment

The questions in this section addressed the employment barriers faced by the disabled person. These barriers were relative to the respondent's status in the labor force. They had an influence on whether a disabled person was working, looking for work, or had stopped looking for work (Statistics Canada, 1988).

Section E - Education

The objective of this section was to question the impact that long-term physical and mental health problems had on a person's educational experience. It was measured in terms of last grade completed or number of years of formal schooling (Statistics Canada, 1988).

Section F - Transportation

The questions in this section were directed at the difficulties experienced by disabled persons while utilizing the local transportation system. It also asked about problems encountered while travelling on long trips by airplane, bus, train, or car (Statistics Canada, 1988).

Section G - Accommodation

The purpose of this section was to ask about special features the disabled person used or needed for entering, leaving, or moving about inside her or his place of residence. It was concerned primarily with architectural and permanent mechanical features (Statistics Canada, 1988).

Section H - Recreation and Lifestyles

This section of the questionnaire dealt with the respondent's participation in physical recreation and leisure activities. Also ascertained were her or his smoking, drinking, and eating habits. The questions in this section attempted to achieve a general idea of the range of the respondent's activities. Another aim was to identify some of the factors which were preventing or limiting her or his participation in these activities (Statistics Canada, 1988).

Section I - Economic Characteristics

The rationale for this section was to gather facts concerning any "out-of-pocket" expenses incurred by the respondent or her or his family. It also inquired about the total amount of disability income the respondent received (Statistics Canada, 1988).

Further Discussion of the Variables

Need Variables

Reported inability to carry out daily tasks necessary to live in the community indicates a need for health care or social services. Some deinstitutionalized persons, following a long-term hospitalization wherein their basic needs were met, find great difficulty in carrying out everyday routine affairs. Others, although hospitalized for short durations on a number of occasions in general hospital facilities, also lack such skills resulting from patterns learned during earlier socialization. Many are unable to cook for themselves, to budget their old-age or disability pensions, to use public transportation effectively, and to make everyday decisions (Smith & Herman, 1988).

Predisposing Variables

At what age a developmentally disabled person is considered elderly has not been as explicitly defined. Some authors suggest that social expectations of aging among the developmentally disabled begin at about age 35 (Dickerson, Hamilton, Huber, & Segal, 1980). Most researchers have chosen age 55 based on actual observations of change in age-related activities (Janicki et al., 1985). In cases of Down's Syndrome, aging-related changes can often be identified in the thirties and forties (Lott & Lai, 1982). Many researchers choose the traditional retirement age of 65 in order to make comparisons of the developmentally disabled with other elderly categories. The consensus seems to be in favor of calling those from age 55 to age 64 "the aging developmentally disabled," and those who are age 65 and over "the elderly developmentally disabled" (Rose & Ansello, 1987:35). Smith and Herman (1988) collected data from persons 55 years and older for their study of chronic mentally ill elderly in Canada. This is the age range to be used in the current research.

Some older developmentally disabled persons desire to enhance their self-esteem by working in some type of nonsheltered employment, but are unable to secure such jobs. Factors such as age, lack of skills, loss of skills, and the stigma of their illness history impede or preclude employment. "'Sheltered workshops' for the mentally handicapped could well be the only source for work; however, many times tasks are considered menial and sometimes degrading or for low wages...the pay is only miniscule, and the jobs reinforce negative self-conceptions and identities" (Smith & Herman, 1988:118).

Enabling Variables

Poverty is a common misfortune. Over 95% of all noninstitutionalized developmentally disabled in Canada face poverty as a condition of daily life (Smith & Herman, 1988). Most of them exist on some form of disability pension that is quickly gone to pay rent or its equivalent. For those who depend on restaurants, money for eating runs short. In response to their lack of money, some attempt to sell their medications on the streets. Failing to take their medicine can result in a cycle of risks that are probably greatest among the most isolated and retreated of the population.

Disability

"In the context of health experience, a disability is any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being" (World Health Organization, 1980:143). With the development of the International Classification of Impairments, Disabilities, and Handicaps, the World Health Organization has developed a framework within which one can measure the consequence of disease. The "disability" concept was operationalized through a series of questions that has come to be known as "Activities of Daily Living".

For the purpose of the national database on disability, the functional limitation approach has been utilized for the adult population (age 15 and older) through the use of a modified version of the "Activities of Daily Living" questions. Individuals are not considered disabled if they use a technical aid and that aid completely eliminates the limitation; e.g., an individual who uses a hearing aid and states that he has no limitation when using the aid would not be included in the data base. The concept of time has also been added as an additional parameter--the limitation has to be of a minimum six months duration, i.e., has lasted or is expected to last six months or more.

Data Analysis

The data analysis was done using SPSS-X (Norusis, 1985). Descriptive statistics, including mean, median, mode, standard deviation, and measures of skewness and kurtosis, were used to describe the data in the H.A.L.S. dataset. Step-wise multiple regression analysis using unstandardized regression coefficients was used to compare the strength of the predictors of use of specific health care and social services.

Although multivariate approaches may not be the most appropriate analysis in all cases, their ability to allow for the simultaneous consideration of a broad range of variables makes them useful approaches in those instances where there is a need to control for interactive and spurious relationships. As a result, multivariate analysis can minimize the possibility of data misinterpretation (Starrett et al., 1988).

Two of the greatest methodological problems in doing secondary analysis of preexisting datasets are (a) not all variables may have been measured that the researcher would have preferred, and (b) not all variables may have been measured in the way that the researcher may have desired. The operational measures for these variables in the Health and Activity Limitation Survey are presented in Table 1.

Inspection of Table 1 reveals that there are measures of the major dependent variables (use of physicians, hospitals, and social services) as well as of the major categories of predictor variables including health status, income, and age. Measures of use of hospital services in the past year include a measure of the number of times the respondent was hospitalized in the past year. In addition, questions were included that measured whether or not the respondent had seen a health professional in the past three months, with separate measures for physician, chiropractor, nurse, and physio/occupational/speech therapist. Also included are questions concerning use of prescription drugs, hearing aids, artificial limbs, etc.

Measures of use of social services include questions about assistance received in everyday living, such as preparation of meals, household chores, help with personal finances, transportation, schooling of all kinds, and special equipment (such as elevators and ramps). Included as well are social services needed but not being utilized, whether because of lack of availability or lack of access.

Data are available for measures of need. These include numerous questions concerning limitations of the person's activities, as well as difficulty remembering and/or learning.

Enabling variables at the family level include measures of annual household income, measures of pension income and other benefits, and work activity. At the community level, H.A.L.S. provides information on province and rural or urban residence.

Finally, among the measures of predisposing variables, measures of age, sex, and education are available. Additionally, there are measures of occupation, marital status, ethnic origin, and language spoken.

A word needs to be said about the level of measurement of the variables and the use of analysis of variance and regression analysis. Most of the variables in the dataset are measured either as dichotomous nominal variables or as ordinal variables. Dichotomous nominal variables can be used as interval variables by creating dummy variables. The means of dummy variables with codes of 0 and 1 are meaningful (the mean equals the proportion of the respondents coded 1) and can be analyzed provided that the variables are not too skewed (i.e., fewer than 10 percent of cases in smallest category.) Use of analysis of variance and regression models is preferable to nonparametric models because more predictor variables can be included. Comparisons of the linear models with more cumbersome nonparametric alternatives reveals that the results obtained are comparable and the regression analysis is more interpretable.

Multiple Regression

One of the more popular statistical techniques is multiple linear regression, which is made up of two parts. The first is the deterministic portion. In a bivariate model, the deterministic component is a straight line, implying that the pattern for the X and Y variables is linear (Norusis, 1988):

$$Y = B_0 + B_1X$$

In this equation, B_1 is the slope of the line; that is, the change in the dependent variable (Y) for each change in the independent variable (X). B_0, sometimes referred to as "alpha," is the intercept, or the theoretical estimate of Y if the value of X were zero.

In reality, however, all the sample data will seldom, if ever, lie exactly on a straight line (Norusis, 1988). The resulting error is the random portion of the regression equation. The simple linear regression equation, when modified to account for the error, is:

$$Y = B_0 + B_1X + e$$

The multiple linear regression model, since it uses more than one predictor variable, is multi-dimensional, not just a straight line, and is difficult to represent graphically. The equation for this model is:

$$Y = B_0 + B_1X_1 + B_2X_2 + \ldots + B_kX_k + e$$

with X_1, X_2, ..., X_k representing k independent (predictor) variables, and the error term is e. In multiple regression it is assumed that there is a normal distribution of the dependent variable for every combination of the values of the independent variables in the model (Norusis, 1988). All the distributions will have the same variance even though their means may be different.

The equations above are for populations, whereas the purpose of a sample such as the Health and Activity Limitation Survey is to estimate or predict the reality of the population, which must necessarily remain unknown. This is facilitated by the least squares estimate of the B's that makes the sum of squares of the errors as small as possible:

$$SSE = SUM(Y - \hat{Y})^2$$

Y is the actual value of the dependent variable in the sample, and $\hat{Y}$ is the predicted (estimated or expected) value. This results in the prediction equation:

$$\hat{Y} = b_0 + b_1X_2 + b_2X_2 + \ldots + b_kX_k$$

where the b's represent the estimated regression coefficients. This helps prevent the problem of positive errors canceling out negative ones. These coefficients will be calculated by SPSS-X.

Assumptions

The assumptions of multiple regression analysis are:

1. that the errors are normally distributed,
2. they have a mean of zero,
3. that the dependent scores have equal variance for each value of the independent variables (homoscedasticity),
4. the variables are interval in measurement (see discussion of dummy variables above) and are measured without error,
5. there is no autocorrelation--the errors are independent of each other,
6. each independent variable is uncorrelated with the error term,
7. there is no perfect collinearity--no independent variable is perfectly linearly related to one or more of the other independent variables in the model,
8. the relationship between the dependent variable and each independent variable is linear, and
9. the effects of the independent variables are additive (Berry & Feldman, 1985:10-11).

The first two assumptions, normality and homoscedasticity, can be relaxed with little risk when the sample size is reasonably large (Blalock, 1979). The stepwise procedure in SPSS-X eliminates most problems of collinearity and multicollinearity. The listwise procedure provides warnings for extremely low levels of tolerance.

The Hypotheses to Be Tested by the Project

The first step in the analysis of multiple regression is to test the following hypotheses:

H_0 (Null Hypothesis): $B_1 = B_2 = \ldots = B_k = 0$ (all B's = 0)

H_a (Alternative Hypothesis): at least one $B \neq 0$

If the Null Hypothesis is rejected, it can be concluded that the model is satisfactory because at least one of the independent variables contributes significantly to the prediction of the dependent variable (Kvanli, Guynes, & Pavur, 1986: p. 506). Failure to reject H_0 indicates the inability to demonstrate that any of the independent variables (or combination of them) helps explain the behavior of the dependent variable, Y.

In order to determine whether to reject or fail to reject H_0, an F-test will be conducted. F is the mean square for regression divided by the mean square for error (Kvanli et al, 1986). It appears in the Analysis of Variance table in the output of the SPSS-X procedure for multiple regression. Consulting a standard table of percentage points of the F-distribution based on the degrees of freedom of the numerator and denominator of the F-statistic will reveal whether the F produced by the regression analysis is greater than the F score in the table at any particular level of significance. If it is greater, the Null Hypothesis can be rejected. If it is smaller than the F in the table, H_0 should not be rejected, because there is not significant probability that any of the independent variables contributes to the prediction of the dependent variable. In other words, there is an unacceptably large probability of commiting a Type I error (rejecting H_0 when it is true).

If the Null Hypothesis should be rejected and the Alternative Hypothesis appears to be true, the next step in the analysis is to attempt to determine which of the independent variables contribute to the variation in the dependent variable. This problem is stated in hypothesis form as (Kvanli et al., 1986):

$$H_0 \text{ (Null Hypothesis): } B_i = 0$$

$$H_a \text{ (Alternative Hypothesis): } B_i \neq 0$$

where B_i is the slope of an individual independent variable. Rejection or failure to reject this Null Hypothesis can be determined by either a two-tailed t-test for each independent variable in the equation or by a partial F-test. SPSS-X provides both.

Using the health care services utilization framework to predict utilization of physicians, hospitals, and social services among noninstitutionalized older developmentally disabled persons in Canada, it is hypothesized that the illness (need) variables will be the most predictive correlate of the utilization of health care and social services. The enabling variables will have secondary explanatory power, with the predisposing variables accounting for the least amount of variance.

In order to analyze the data in the above manner, it will be necessary to assign relative importance to each independent variable. There are two important questions that must be considered (Norusis, 1988:38):

1. How important are the independent variables when each one is used alone to predict the dependent variable?
2. How important are the independent variables when they are used to predict the dependent variable along with other independent variables in the regression equation?

The first question is answered by looking at the (unstandardized) zero-order correlation coefficients (r^2) between the dependent variable and the independent variables. The larger the absolute value of r^2, the stronger the association (Norusis, 1988: p. 38).

The answer to the second question is not so easily determined, particularly when the independent variables are somewhat correlated among themselves, as is usually the case. It is common to use the Beta (standardized) correlation coefficients for this purpose. Norusis

(1988:39), however, warns against this practice because the Beta coefficients "...are contingent on the other independent variables in the equation. They are also affected by the correlations of the independent variables and do not in any absolute sense reflect the importance of the various independent variables." She recommends, instead, analyzing the partial corrrelation coefficient, which is the correlation between a given independent variable and the dependent variable when the linear effects of the other independent variables have been removed from both X_i and Y.

The goodness of fit of the model to the sample is measured by the coefficient of determination, R^2. This statistic tells what percentage of the variation in the dependent variable is explained by the predictor (independent) variables in the regression equation. One way to find the best-fitting set of predictor variables is to use step-wise regression analysis in SPSS-X (King & Julstrom, 1982). This procedure, used in this research, constructs a sequence of regression equations, adding or deleting independent variables at each step.

It is furthermore asserted that the predisposing variables will be somewhat predictive of both the need and enabling factors. Multiple regression analysis will be used to examine the underlying relationships among the independent variables.

TABLE 1

FREQUENCIES, MEANS, STANDARD DEVIATIONS, AND MEASURES OF SKEWNESS AND KURTOSIS FOR VARIABLES IN THE CANADIAN HEALTH AND ACTIVITY LIMITATION SURVEY, 1986-1987

VARIABLES	(N=640)	CATEGORIES
DEPENDENT VARIABLES		
<u>Use of Health Care Services</u>		
Saw physician in past three months		
	31.0%	0=No
	69.0%	1=Yes
M=	.690	
SD=	.463	
SK=	-.824	
K=	-1.325	
(MD)=	(14)	
Hospitalized in past year		
	66.7%	0=No
	33.3%	1=Yes
M=	.333	
SD=	.472	
SK=	.709	
K=	-1.502	
(MD)=	(13)	
Number of hospital stays past year		
	66.7%	0=None
	19.5%	1=One
	6.7%	2=Two
	2.2%	3=Three
	2.1%	4=Four
	2.9%	5=Five or more
M=	.622	
SD=	1.152	
SK=	2.320	
K=	5.187	
(MD)=	(13)	

VARIABLES	(N=640)	CATEGORIES
Number of physician visits past three months		
	31.0%	0=None
	26.8%	1=One
	11.7%	2=Two
	15.5%	3=Three
	3.7%	4=Four
	1.8%	5=Five
	9.6%	6=Six or more
M=	.575	
SD=	2.179	
SK=	-.585	
K=		
(MD)=	(14)	
Saw chiropractor in past three months		
	97.0%	0=No
	3.0%	1=Yes
M=	.030	
SD=	.171	
SK=	5.514	
K=	28.501	
(MD)=	(42)	
Saw nurse in past three months		
	85.9%	0=No
	14.1%	1=Yes
M=	.141	
SD=	.348	
SK=	2.068	
K=	2.283	
(MD)=	(16)	
Saw a physio/occupational/speech therapist in past three months		
	98.2%	0=No
	1.8%	1=Yes
M=	.018	
SD=	.134	
SK=	7.243	
K=	50.626	
(MD)=	(33)	

VARIABLES	(N=640)	CATEGORIES
Aids for hearing impaired used		
	73.0%	0=Not used
	27.0%	1=Used
M=	.270	
SD=	.444	
SK=	1.037	
K=	-.927	
(MD)=	(11)	
Aids for visually impaired used		
	89.1%	0=Not used
	10.9%	1=Used
M=	.109	
SD=	.311	
SK=	2.522	
K=	4.372	
(MD)=	(14)	
Aids for mobility impaired used		
	83.0%	0=Not used
	17.0%	1=Used
M=	.170	
SD=	.376	
SK=	1.763	
K=	1.112	
(MD)=	(4)	
Use any prescription or nonprescription drugs		
	27.7%	0=Not used
	72.3%	1=Used
M=	.723	
SD=	.448	
SK=	-1.001	
K=	-1.000	
(MD)=	(0)	

VARIABLES	(N=640)	CATEGORIES
Number of prescription drugs used daily		
	3.3%	00=None
	25.6%	01=One
	25.6%	02=Two
	16.7%	03=Three
	11.3%	04=Four
	6.7%	05=Five
	7.2%	06=6-7 drugs taken daily
	3.0%	07=8-10 drugs taken daily
	0.7%	08=11 or more taken daily
M=	2.751	
SD=	1.787	
SK=	.804	
K=	-.113	
(MD)=	(179)	
Number of non-prescription drugs used each week		
	75.2%	00=None
	15.9%	01=One
	4.6%	02=Two
	1.5%	03=Three
	2.2%	04=4-7 per week
	0.7%	05=8 or more per week
M=	.416	
SD=	.905	
SK=	2.786	
K=	8.291	
(MD)=	(181)	
Aids for hearing impaired needed but do not have		
	92.3%	0=No
	7.7%	1=Yes
M=	.077	
SD=	.267	
SK=	3.173	
K=	8.096	
(MD)=	(6)	

VARIABLES	(N=640)	CATEGORIES
Aids for visually impaired needed but do not have		
	66.8%	0=No
	33.2%	1=Yes
M=	.332	
SD=	.471	
SK=	.714	
K=	-1.495	
(MD)=	(14)	
Aids to move arms and legs needed but do not have		
	97.8%	0=No
	2.2%	1=Yes
M=	.022	
SD=	.146	
SK=	6.553	
K=	41.066	
(MD)=	(0)	
Use of Social Services		
Signing or lip-reading skills needed but do not have		
	98.0%	0=No
	2.0%	1=Yes
M=	.020	
SD=	.139	
SK=	6.959	
K=	46.575	
(MD)=	(26)	
Help for preparing meals needed but do not have		
	73.2%	0=No
	26.8%	1=Yes
M=	.268	
SD=	.443	
SK=	1.050	
K=	-.901	
(MD)=	(32)	

VARIABLES	(N=640)	CATEGORIES
Help with grocery shopping needed but do not have		
	69.4%	0=No
	30.6%	1=Yes
M=	.306	
SD=	.461	
SK=	.846	
K=	-1.288	
(MD)=	(28)	
Help or additional help with housework needed but do not have		
	69.1%	0=No
	30.9%	1=Yes
M=	.309	
SD=	.463	
SK=	.827	
K=	-1.320	
(MD)=	(29)	
Help or additional help w/heavy chores needed but do not have		
	62.1%	0=No
	37.9%	1=Yes
M=	.379	
SD=	.485	
SK=	.502	
K=	-1.754	
(MD)=	(35)	
Help with personal finances needed but do not have		
	72.0%	0=No
	28.0%	1=Yes
M=	.280	
SD=	.449	
SK=	.983	
K=	-1.037	
(MD)=	(29)	

VARIABLES	(N=640)	CATEGORIES
Help or additional help with personal care needed but do not have		
	66.9%	0=No
	33.1%	1=Yes
M=	.331	
SD=	.471	
SK=	.722	
K=	-1.484	
(MD)=	(11)	
Help or additional help moving within residence needed but do not have		
	92.6%	0=No
	7.4%	1=Yes
M=	.074	
SD=	.261	
SK=	3.276	
K=	8.761	
(MD)=	(28)	
Need attendant/companion for short trips but do not have		
	65.6%	0=No
	34.4%	1=Yes
M=	.344	
SD=	.475	
SK=	.657	
K=	-1.573	
(MD)=	(27)	
Need attendant/companion for long trips but do not have		
	63.1%	0=No
	36.9%	1=Yes
M=	.369	
SD=	.483	
SK=	.546	
K=	-1.707	
(MD)=	(24)	

VARIABLES	(N=640)	CATEGORIES
Receive help from non-family, non-neighbor		
	57.5%	0=No
	42.5%	1=Yes
M=	.425	
SD=	.495	
SK=	.302	
K=	-1.915	
(MD)=	(43)	
How often use special bus/van		
	95.8%	0=Seldom/never
	1.8%	1=Occasionally
	2.4%	2=Frequently
M=	.066	
SD=	.333	
SK=	5.173	
K=	26.078	
(MD)=	(23)	
Need special transportation but do not have		
	87.7%	0=No
	12.3%	1=Yes
M=	.123	
SD=	.328	
SK=	2.308	
K=	3.339	
(MD)=	(36)	
Need special features to enter/leave residence but do not have		
	95.9%	0=No
	4.1%	1=Yes
M=	.041	
SD=	.197	
SK=	4.673	
K=	19.893	
(MD)=	(23)	

VARIABLES	(N=640)	CATEGORIES
Need special features to move inside residence but do not have		
	90.0%	0=No
	10.0%	1=Yes
M=	.100	
SD=	.301	
SK=	2.664	
K=	5.114	
(MD)=	(23)	
NEED VARIABLES		
Difficulty hearing conversation		
	73.1%	0=No
	26.9%	1=Yes
M=	.269	
SD=	.444	
SK=	1.043	
K=	-.914	
(MD)=	(1)	
Trouble with eyesight		
	67.8%	0=No
	32.2%	1=Yes
M=	.322	
SD=	.468	
SK=	.762	
K=	-1.424	
(MD)=	(1)	
Difficulty speaking and being understood		
	66.0%	0=No
	34.0%	1=Yes
M=	.340	
SD=	.474	
SK=	.679	
K=	-1.544	
(MD)=	(1)	

VARIABLES	(N=640)	CATEGORIES
Difficulty walking		
	47.4%	0=No
	52.6%	1=Yes
M=	.526	
SD=	.500	
SK=	-.104	
K=	-1.996	
(MD)=	(1)	
Difficulty carrying, moving, or standing		
	46.6%	0=No
	53.4%	1=Yes
M=	.534	
SD=	.499	
SK=	-.139	
K=	-1.987	
(MD)=	(2)	
Difficulty bending and picking up object		
	63.4%	0=No
	36.6%	1=Yes
M=	.366	
SD=	.482	
SK=	.557	
K=	-1.695	
(MD)=	(1)	
Difficulty dressing/undressing difficulty getting in/out of bed		
	71.5%	0=No
	28.5%	1=Yes
M=	.285	
SD=	.452	
SK=	.953	
K=	-1.095	
(MD)=	(2)	
Difficulty using fingers or hands		
	48.4%	0=No
	51.6%	1=Yes
M=	.516	
SD=	.500	
SK=	-.063	
K=	-2.002	
(MD)=	(2)	

VARIABLES	(N=640)	CATEGORIES
Difficulty reaching		
	66.0%	0=No
	34.0%	1=Yes
M=	.340	
SD=	.474	
SK=	.677	
K=	-1.547	
(MD)=	(2)	
Activities limited		
	20.2%	0=No
	79.8%	1=Yes
M=	.798	
SD=	.401	
SK=	-1.491	
K=	.225	
(MD)=	(0)	
Diagnosed with learning disability		
	45.9%	0=No
	54.1%	1=Yes
M=	.541	
SD=	.499	
SK=	-.165	
K=	-1.979	
(MD)=	(6)	
Ongoing problem remembering/learning		
	27.7%	0=No
	72.3%	1=Yes
M=	.723	
SD=	.448	
SK=	-.999	
K=	-1.005	
(MD)=	(1)	
Activities limited due to learning disability		
	30.3%	0=No
	69.7%	1=Yes
M=	.697	
SD=	.460	
SK=	-.859	
K=	-1.267	
(MD)=	(0)	

VARIABLES	(N=640)	CATEGORIES
Trouble using public transportation		
	88.1%	0=No
	11.9%	1=Yes
M=	.119	
SD=	.324	
SK=	2.355	
K=	3.558	
(MD)=	(28)	
Condition prevents taking long trips		
	65.1%	0=No
	34.9%	1=Yes
M=	.349	
SD=	.477	
SK=	.635	
K=	-1.602	
(MD)=	(1)	
Condition completely prevents working		
	66.1%	0=No
	33.9%	1=Yes
M=	.339	
SD=	.474	
SK=	.680	
K=	-1.542	
(MD)=	(27)	
Condition causes trouble driving		
	51.4%	0=No
	48.6%	1=Yes
M=	.486	
SD=	.500	
SK=	.057	
K=	-2.005	
(MD)=	(144)	
Condition causes trouble as passenger in private vehicle		
	93.3%	0=No
	6.7%	1=Yes
M=	.067	
SD=	.250	
SK=	3.479	
K=	10.138	
(MD)=	(11)	

VARIABLES	(N=640)	CATEGORIES
Trouble using train, plane, or bus on long trips		
	84.9%	0=No
	15.1%	1=Yes
M=	.151	
SD=	.358	
SK=	1.954	
K=	1.825	
(MD)=	(64)	
ENABLING VARIABLES		
Family Level		
Total income from pensions/welfare		
	71.9%	0=None
	4.4%	1=$1-499
	1.9%	2=500-999
	1.1%	3=1,000-1,999
	9.2%	4=2,000-4,999
	9.2%	5=5,000-9,999
	2.3%	6=$10,000 or more
M=	.798	
SD=	1.514	
SK=	1.534	
K=	.675	
(MD)=	(20)	
Census family total income		
	0.3%	0=Less than zero
	3.6%	1=Zero
	13.3%	2=$1-4,999
	38.4%	3=5,000-9,999
	16.6%	4=10,000-14,999
	12.7%	5=15,000-19,999
	3.4%	6=20,000-24,999
	3.9%	7=25,000-29,999
	2.2%	8=30,000-34,999
	1.4%	9=35,000-39,999
	2.0%	10=40,000-49,999
	2.2%	11=$50,000 or more
M=	3.975	
SD=	2.101	
SK=	1.540	
K=	2.415	
(MD)=	(0)	

VARIABLES	(N=640)	CATEGORIES
Total income		
	0.2%	0=Less than zero
	7.0%	1=Zero
	4.8%	2=$1-999
	5.0%	3=1,000-2,999
	11.7%	4=3,000-4,999
	14.8%	5=5,000-6,999
	36.9%	6=7,000-9,999
	10.2%	7=10,000-14,999
	3.7%	8=15,000-19,999
	1.4%	9=20,000-24,999
	1.2%	10=25,000-29,999
	1.6%	11=30,000-34,999
	1.4%	12=$35,000 or more
M=	5.344	
SD=	2.170	
SK=	.142	
K=	1.043	
(MD)=	(0)	
Low-income status		
	36.6%	0=Below line
	63.4%	1=Above line
M=	.634	
SD=	.482	
SK=	-.559	
K=	-1.694	
(MD)=	(96)	
Community Level		
Province: Newfoundland		
	96.7%	0=Other
	3.3%	1=Yes
M=	.033	
SD=	.178	
SK=	5.257	
K=	25.720	
(MD)=	(0)	

VARIABLES	(N=640)	CATEGORIES
Province: Prince Edward Island		
	99.5%	0=Other
	0.5%	1=Yes
M=	.005	
SD=	.068	
SK=	14.537	
K=	209.984	
(MD)=	(0)	
Province: Nova Scotia		
	95.3%	0=Other
	4.7%	1=Yes
M=	.047	
SD=	.212	
SK=	4.298	
K=	16.521	
(MD)=	(0)	
Province: New Brunswick		
	93.1%	0=Other
	6.9%	1=Yes
M=	.069	
SD=	.253	
SK=	3.417	
K=	9.704	
(MD)=	(0)	
Province: Quebec		
	72.0%	0=Other
	28.0%	1=Yes
M=	.280	
SD=	.449	
SK=	.984	
K=	-1.035	
(MD)=	(0)	
Province: Ontario		
	80.2%	0=Other
	19.8%	1=Yes
M=	.198	
SD=	.399	
SK=	1.516	
K=	.299	
(MD)=	(0)	

VARIABLES	(N=640)	CATEGORIES
Province: Manitoba		
	93.1%	0=Other
	6.9%	1=Yes
M=	.069	
SD=	.253	
SK=	3.417	
K=	9.704	
(MD)=	(0)	
Province: Saskatchewan		
	88.0%	0=Other
	12.0%	1=Yes
M=	.120	
SD=	.326	
SK=	2.340	
K=	3.485	
(MD)=	(0)	
Province: Alberta		
	93.9%	0=Other
	6.1%	1=Yes
M=	.061	
SD=	.239	
SK=	3.679	
K=	11.575	
(MD)=	(0)	
Province: British Columbia		
	88.3%	0=Other
	11.7%	1=Yes
M=	.117	
SD=	.322	
SK=	2.386	
K=	3.704	
(MD)=	(0)	
Province: Yukon		
	100.0%	0=Other
	0.0%	1=Yes
M=	.000	
SD=	.000	
SK=	none	
K=	flat	
(MD)=	(0)	

VARIABLES	(N=640)	CATEGORIES
Province: Northwest Territories		
	99.8%	0=Other
	0.2%	1=Yes
M=	.002	
SD=	.040	
SK=	25.298	
K=	640.000	
(MD)=	(0)	
Urban residence		
	35.6%	0=Other
	64.4%	1=Yes
M=	.644	
SD=	.479	
SK=	-.602	
K=	-1.643	
(MD)=	(0)	
Rural residence		
	64.4%	0=Other
	35.6%	1=Yes
M=	.356	
SD=	.479	
SK=	.602	
K=	-1.643	
(MD)=	(0)	
PREDISPOSING VARIABLES		
Demographic Variables		
Sex		
	50.2%	0=Female
	49.8%	1=Male
M=	.498	
SD=	.500	
SK=	.006	
K=	-2.006	
(MD)=	(0)	

VARIABLES	(N=640)	CATEGORIES
Age group		
	24.2%	0=55 to 59
	23.3%	1=60 to 64
	18.3%	2=65 to 69
	13.7%	3=70 to 74
	10.9%	4=75 to 79
	6.6%	5=80 to 84
	3.0%	6=85 and over
M=	1.955	
SD=	1.687	
SK=	.607	
K=	-.590	
(MD)=	(0)	
Social Structure Variables		
Census family status: Adult child		
	96.9%	0=No
	3.1%	1=Yes
M=	.031	
SD=	.174	
SK=	5.401	
K=	27.254	
(MD)=	(0)	
Census family status: Husband		
	78.9%	0=No
	21.1%	1=Yes
M=	.211	
SD=	.408	
SK=	1.420	
K=	.018	
(MD)=	(0)	
Census family status: Wife		
	85.8%	0=No
	14.2%	1=Yes
M=	.142	
SD=	.350	
SK=	2.054	
K=	2.225	
(MD)=	(0)	

VARIABLES	(N=640)	CATEGORIES
Census family status: Female single parent		
	97.5%	0=No
	2.5%	1=Yes
M=	.025	
SD=	.156	
SK=	6.099	
K=	35.310	
(MD)=	(0)	
Census family status: Male single parent		
	98.9%	0=No
	1.1%	1=Yes
M=	.011	
SD=	.104	
SK=	9.426	
K=	87.128	
(MD)=	(0)	
Census family status: Not a census family member		
	42.0%	0=No
	58.0%	1=Yes
M=	.580	
SD=	.494	
SK=	-.324	
K=	-1.901	
(MD)=	(0)	
Highest level of schooling attained		
	19.5%	0=Kdgn or below
	21.2%	1=Grades 1-4
	32.2%	2=Grades 5-8
	8.0%	3=Grades 9-10
	7.7%	4=Grades 11-13
	9.5%	5=Trade school
	1.2%	6=Bachelor degree
	0.5%	7=Masters degree
	0.2%	8=Earned doctorate
M=	1.998	
SD=	1.617	
SK=	.767	
K=	.022	
(MD)=	(0)	

VARIABLES	(N=640)	CATEGORIES
Marital status: Married		
	63.4%	0=No
	36.6%	1=Yes
M=	.366	
SD=	.482	
SK=	.559	
K=	-1.692	
(MD)=	(0)	
Marital status: Not married (Divorced, widowed, or single)		
	36.6%	0=No
	63.4%	1=Yes
M=	.634	
SD=	.482	
SK=	-.559	
K=	-1.692	
(MD)=	(0)	
Ethnic origin: British		
	56.4%	0=No
	43.6%	1=Yes
M=	.436	
SD=	.496	
SK=	.259	
K=	-1.939	
(MD)=	(0)	
Ethnic origin: French		
	69.7%	0=No
	30.3%	1=Yes
M=	.303	
SD=	.460	
SK=	.859	
K=	-1.267	
(MD)=	(0)	

VARIABLES	(N=640)	CATEGORIES
Ethnic origin: Neither British nor French		
	73.9%	0=No
	26.1%	1=Yes
M=	.261	
SD=	.439	
SK=	1.091	
K=	-.821	
(MD)=	(0)	
Official language: English		
	34.4%	0=No
	65.6%	1=Yes
M=	.656	
SD=	.475	
SK=	-.659	
K=	-1.570	
(MD)=	(0)	
Official language: French		
	78.3%	0=No
	21.7%	1=Yes
M=	.217	
SD=	.413	
SK=	1.375	
K=	-.110	
(MD)=	(0)	
Official language: Both English and French		
	89.8%	0=No
	10.2%	1=Yes
M=	.102	
SD=	.302	
SK=	2.644	
K=	5.008	
(MD)=	(0)	

VARIABLES	(N=640)	CATEGORIES
Official language: Neither English nor French		
	97.5%	0=No
	2.5%	1=Yes
M=	.025	
SD=	.156	
SK=	6.099	
K=	35.310	
(MD)=	(0)	

CHAPTER IV

FINDINGS

Descriptives

After selecting respondents according to the characteristics in Chart 3, a total of 640 developmentally disabled over age 55 remain as valid cases for the current research. Of the 640 in the sample, nearly half (47.5%) are ages 55 to 64, one third (32%) are ages 65 to 74, less than one fifth (17.5%) are ages 75 to 84, and only 3% are aged 85 or over. The median age is 62.

In terms of disabling conditions, over a third (35.1%) have been diagnosed as being developmentally delayed. Nearly equal in number to each other are those who are either mentally retarded (21.2%) or suffer from cerebral palsy or similar cerebral degeneration (21.4%). Epilepsy accounts for 15%, Down's Syndrome 1%, and other related conditions 6.3% of the cases.

The sample is divided almost evenly on the category of sex. One half (50.2%) are female and one half (49.8%) of the 640 respondents are male.

Over half the respondents are either married (36.6%) or widowed (15.8%). Less than one tenth are either divorced (3.1%) or separated (4.1%). A large percentage (40.5%) have remained single throughout their lifetimes, and 58% are currently living completely apart from any family members. Interestingly, 2.5% are female single parents and 1.1% are male single parents. Only 3.1% are adult children living with their parents.

About one quarter (27%) have attained more than eight years of formal education. One fifth (19.5%) have no formal education or kindergarten only. Very few (1.9%) are college graduates. One respondent has an earned doctorate.

About two-thirds (65.6%) speak English as their first language. Only a fifth (21.2%) speak French as their first language, although nearly a third (30.3%) claim French ethnicity, and a tenth (10.2%) are bilingual. A small number (2.5%) are proficient in neither English nor French.

Fully 64.4% of the respondents live in urban areas. About half reside in the provinces of Quebec (28%) and Ontario (19.8%). The next most prevalent home provinces of respondents are Saskatchewan (12%) and British Columbia (11.7%).

The median total annual income for all respondents is $8,499. Over one-third (36.6%) fall below the poverty line. Three-quarters of the respondents receive less than $500 per year in pensions and welfare payments.

In terms of having been hospitalized in the past year, one of the dependent variables in the Andersen-Newman schema, exactly one-third (33.3%) responded affirmatively. More than two-thirds (69%) report having seen a physician in the past three months. One-seventh (14.1%) of the respondents have seen a nurse in the same period, while only 3% have visited a chiropractor. Fewer still are the cases of respondents who have seen a physical, occupational, or speech therapist (1.8%).

Over a quarter (27%) of the cases indicate the utilization of aids for the hearing impaired, but 7.7% indicate an unfulfilled need for such aids. Aids for the visually impaired are used by one-tenth (10.9%) of the respondents, while 33.2% need visual aids but are not utilizing them. Fully 17% make use of aids for the mobility impaired, with only 2.2% indicating that they have such a need but do not have the aids.

Nearly three-fourths (72.3%) of the Canadian developmentally disabled elderly in the H.A.L.S. survey report the use of prescription or nonprescription drugs. Of these, 45.6% take three or more different prescription drugs daily and 4.4% take three or more different nonprescription drugs weekly.

With regard to social services utilization, a minority of the sample (42.5%) report receiving outside help with the activities of daily living. By "outside help" is meant a non-child, non-parent, non-spouse, non-relative, or non-neighbor. In other words, the helper is either hired or has volunteered to perform social service work. The services provided include meal preparation, shopping for groceries, housework, heavy household chores, looking after personal finances, personal care, and help moving around within the residence.

Almost three-quarters (72.3%) of the respondents report an ongoing problem with remembering or learning. Fully 69.7% relate that their activities are limited due to a learning disability.

At least one-third of respondents must utilize an attendant or companion when travelling on long trips (36.9%) or even short trips (34.4%). Only a few (4.2%) utilize a special bus or van provided for the transportation of the disabled. For a number of the respondents, their conditions are blamed for causing difficulty as passengers in automobiles (6.7%) or trouble using public transportation (11.9%).

Slightly more than half (53.4%) of the cases in the survey experience difficulty carrying objects, moving around, or standing over twenty minutes. Over one-fourth (28.5%) have trouble getting out of bed or dressing and getting undressed. Half the respondents (51.6%) find it difficult to use their hands or fingers to grasp or handle objects, and a third (34%) cannot readily reach in any direction; for instance, many (22.4%) find it hard to cut their own food.

Correlates of Utilization of Health Care Services

Physician Use

Significant correlates for utilization of health care services are shown in Table 2. The F-test for having seen a physician in the past three months (Table 2.A.) reveals that the first H_0 can be rejected. Not all the B's = zero. This means that at least one independent variable contributes significantly to the prediction of the dependent variable.

A two-tailed t-test was conducted to test each independent variable for the second null hypothesis that its slope = zero. Table 2 includes only those variables for which this H_0 can be rejected. The table provides the t-score and its level of significance for each independent variable. Those developmentally disabled elderly who tend to utilize physician services are characterized as having non-French ethnic origin, above average schooling (average for this sample is about the fifth grade level), as being female, married, as having income below the poverty line, and as having urban residence.

The unstandardized correlation coefficient shows the strength of the association between the dependent variable and each independent variable when considered apart from the other independent variables. This analysis shows ethnic origin as having the strongest association. In descending order of correlation with physician use, the other variables are: education, sex, rural residence, low income status, and marital status.

When the partial correlation coefficients are considered, the explanatory power of the enabling variables is somewhat diminished and more weight is given to the predisposing variables. None of the significant correlates is in the need category. Four are in the predisposing category and two are enabling variables. The R^2 statistic for this model of six variables shows that it explains 14% of the variance in the utilization of physician services by the respondents in the past three months. The model does not support, at least for this variable, the stated hypothesis that the need variables will be the most predictive, followed by the enabling and predisposing categories, respectively.

The importance of enabling factors suggests the impact of lifestyle and culture on the utilization of physician services. Use of these services can be viewed as a form of self-care because the individual often initiates the visit and in order to keep the appointment must actually leave her or his residence, arrange for transportation, etc. (Chappell & Blandford, 1987). Due to proximity, physicians are more accessible for urban residents.

Less obvious is why French ethnic orientation is negatively correlated with physician utilization. One explanation is that since being a French Canadian is significantly correlated with functional disability (see Table 4.A.), fewer French are able to visit physicians' offices. French Canadians also tend to have more trouble using public transportation (see Table 4.C.), possibly due to language factors.

Hospital Use

Utilization of hospital services involves at least one overnight stay in a hospital during the past year. Use of out-patient services and stays of less than twenty-four hours duration are not included. Significant correlates for hospital use are shown in Table 2.B. The F-test for having stayed in a hospital in the past twelve months reveals that the first H_0 can be rejected. Not all the B's = zero. This means that at least one independent variable contributes significantly to the prediction of the dependent variable.

Analysis of the t-score and its level of significance for each independent variable shows that those respondents having been admitted to a hospital are less likely to be functionally able (as measured by trouble dressing and getting out of bed). They are more likely to have their activities limited due to a learning disability, to have more years of education, to be male, and to be more advanced in age.

Analysis of the unstandardized correlation coefficients reveals functional disability as having the strongest association. In descending order of correlation with hospital stays the other variables are: age, activities limited due to learning disability, years of education, and sex.

Consideration of the partial correlation coefficients seems to somewhat diminish the explanatory power of all the independent variables. Two of the significant correlates are in the need category. Three of them are in the predisposing category and none is an enabling variable. The R^2 statistic for this model of five variables shows that it explains 15% of the variance in hospital stays by the respondents in the past year. This model supports the portion of the stated hypothesis that the need variables will be the most predictive, but does not show the precedence of the enabling category over the predisposing factors.

Nurse Utilization

Significant correlates for having seen a nurse in the past three months are shown in Table 2.C. The F-test for having seen a nurse reveals that the first H_0 can be rejected. Not all the B's = zero. This means that at least one independent variable contributes significantly to the prediction of the dependent variable.

Analysis of the t-score and its level of significance for each independent variable shows that those respondents having seen a nurse are more likely to have been diagnosed as having a learning disability but are less likely to have their activities limited due to the learning disability. They have less trouble using public transportation, have non-French ethnic origin, are female, tend to be older, have income below the poverty line, and have urban residence.

Analysis of the unstandardized correlation coefficients reveals non-French ethnicity as having the strongest association. In descending order of correlation with nurse visits the other variables are: sex, low income status, activities limited due to learning disability, learning disability diagnosis, type of residence, and difficulty using public transportation.

Consideration of the partial correlation coefficients seems to somewhat diminish the explanatory power of all the independent variables, with one notable exception: age emerges as a significant correlate. The R^2 statistic for this model of eight varibles indicates that it explains 31% of the variance in nurse visits for the respondents during the past three months. The three need variables are strong, but are overshadowed by the three significant predisposing variables, especially when the partial correlation coefficients are considered. The significant enabling variables are also strong, adding to the relatively high total R^2 goodness-of-fit measure.

Utilization of Physio/Occupational/Speech Therapist

Significant correlates for having seen a physiotherapist, occupational therapist, or speech therapist in the past three months are shown in Table 2.D. The F-test for having seen a therapist reveals that the first H_0 can be rejected. Not all the B's = zero. This means that at least one independent variable contributes significantly to the prediction of the dependent variable.

Analysis of the t-score and its level of significance for each independent variable shows that those respondents having seen a physio/occupational/speech therapist are likely to be functionally disabled, diagnosed as having a learning disability, and are likely to have their activities limited due to the learning disability. They have more years of education and tend to be married.

Analysis of the unstandardized correlation coefficients reveals functional disability as having the strongest association. In descending order of correlation with having seen a physio/occupational/speech therapist the other variables are: education, marital status, and activities limited due to learning disability.

Consideration of the partial correlation coefficients diminishes the explanatory power of all the independent variables, with one notable exception: diagnosis of learning disability emerges as a significant correlate. The R^2 statistic for this model of five variables indicates that it explains 7% of the variance in the utilization of physical therapists, occupational therapists, or speech therapists during the past three months. Three of the significant correlates are in the need category. Two are in the predisposing category and none is an enabling variable. As with hospital utilization, the model supports the stated hypothesis to the extent that the need variables are the most predictive, but does not show the superiority of the enabling category over the enabling factors.

Utilization of Aids for the Hearing Impaired

The significant correlates for the utilization of aids for the hearing impaired appear in Table 2.E. The F-test for using aids for the hearing impaired reveals that the first H_0 can be rejected. At least one independent variable contributes significantly to the prediction of the dependent variable.

Analysis of the t-score and its level of significance for each independent variable shows that those respondents utilizing aids for the hearing impaired are likely to be functionally impaired (as measured by trouble dressing and getting out of bed). They are more likely to have French ethnic origin, to be male, and to be more advanced in age.

Analysis of the unstandardized correlation coefficients reveals functional disability as having the strongest association. In descending order of correlation with utilization of aids for the hearing impaired the other variables are: age, French ethnicity, and sex.

Consideration of the partial correlation coefficients seems to somewhat diminish the explanatory power of all the independent variables, with one exception. Sex shows a stonger correlation when the other independent variables are included in the regression equation. The R^2 statistic for this model of four variables shows that it explains 13% of the variance in hospital stays by the respondents in the past year. The strongest of the significant correlates is in the need category. The other three are in the predisposing category and none is an enabling variable. This model supports the portion of the stated hypothesis that the need variables will be the most predictive, but does not show the precedence of the enabling category over the enabling factors. Age is important since some decline in sensory ability is normal in the later stages of the aging process (United States National Center for Health Statistics, 1989).

Utilization of Aids for the Mobility Impaired

The significant correlates for the utilization of aids for the mobility impaired appear in Table 2.F. The F-test for using aids for the mobility impaired reveals that the first H_0 can be rejected. At least one independent variable contributes significantly to the prediction of the dependent variable.

Analysis of the t-score and its level of significance for each independent variable shows that those respondents utilizing aids for the mobility impaired are likely to be functionally impaired (as measured by trouble dressing and getting out of bed). They are less likely to have their activities limited due to a learning disability, are likely to have non-French ethnic origin, to be female, less likely to be married, and are characterized as having urban residence.

Analysis of the unstandardized correlation coefficients reveals lack of activity limitation due to a learning disability as having the strongest association. In descending order of correlation with utilization of aids for the mobility impaired the other variables are: urban residence, sex, functional disability, marital status, and non-French ethnicity.

Consideration of the partial correlation coefficients seems to somewhat diminish the explanatory power of all the independent variables except functional disability and ethnicity. The R^2 statistic for this model of six variables shows that it explains 22% of the variance in utilization by the respondents of aids for the mobility impaired. The strongest of the significant correlates, based on consideration of the partial correlation coefficients, are both in the need category. The second strongest factor is in the enabling category and the three weakest correlates are predisposing variables. This model supports the stated hypothesis that the need variables will be the most predictive of the utilization of health care services, with the enabling variables having secondary explanatory power, and the predisposing variables accounting for the least amount of variance.

Utilization of Aids for the Visually Impaired

The significant correlates for the utilization of aids for the visually impaired appear in Table 2.G. The F-test for using aids for the visually impaired reveals that the first H_0 can be rejected. At least one independent variable contributes significantly to the prediction of the dependent variable.

Analysis of the t-score and its level of significance for each independent variable shows that those respondents utilizing aids for the visually impaired are likely to be functionally impaired (as measured by trouble dressing and getting out of bed). They are likely to have their activities limited due to a learning disability, are likely to have fewer years of schooling, and are characterized as having urban residence.

Analysis of the unstandardized correlation coefficients reveals activity limitation due to a learning disability as having the strongest association. In descending order of correlation with utilization of aids for the visually impaired the other variables are: urban residence, functional disability, and education level.

Consideration of the partial correlation coefficients seems to somewhat diminish the explanatory power of two of the variables: activity limitation due to a learning disability and urban residence. Functional disability emerges as having the strongest association. When the utilization of aids for the visually impaired serves as the dependent variable, the four independent variables in the model combine to explain 8% of the variance. The strongest of the significant correlates, based on consideration of the partial correlation coefficients, are both in the need category. As is the case for the use of aids for the mobility impaired, this model supports the stated hypothesis that the need variables will be the most predictive ofthe utilization of health care services, with the enabling variables having secondary explanatory power, and the predisposing variables accounting for the least amount of variance.

Utilization of Prescription Drugs

Significant correlates for the number of prescription drugs used daily are shown in Table 2.H. The F-test for the utilization of prescription drugs reveals that the first H_0 can be rejected. At least one independent variable contributes significantly to the prediction of the dependent variable.

Analysis of the t-score and its level of significance for each independent variable shows that those respondents using several prescription drugs daily (mean number of drugs taken is about three) are not likely to have been diagnosed as having a learning disability, are likely to have French ethnic origin, and are characterized as being male.

Analysis of the unstandardized correlation coefficients reveals ethnic origin as having the strongest association. In descending order of correlation with the number of prescription drugs taken daily the other variables are: sex and activity limitation due to learning disability.

Consideration of the partial correlation coefficients somewhat diminishes the explanatory power of all the independent variables. The R^2 statistic for this model of three variables indicates that it explains 21% of the variance in the utilization of prescription drugs among the noninstitutionalized developmentally disabled elderly in Canada. The two variables with the highest correlation coefficients are in the predisposing category. The other significant correlate is in the need category and no variables are in the enabling category. The model for this dependent variable does not support the stated hypothesis that the need variables will be the most predicitve, followed by the enabling and predisposing categories, respectively.

Correlates of Utilization of Social Services

Utilization of Helping Services

Significant correlates for the utilization of social services are shown in Table 3. The first dependent variable is a measure of having received help from a non-family member, either a volunteer or a paid worker. The help takes the form of one or more of the following: preparing meals, shopping for groceries, housework, heavy household chores, looking after personal finances, personal care, and moving within one's own residence. The F-test for having received help (Table 3.A.) reveals that the first H_0 can be rejected. Not all the B's = zero. This means that at least one independent variable contributes significantly to the prediction of the dependent variable.

A two-tailed t-test was conducted to test each independent variable for the second null hypothesis that its slope = zero. Table 3 includes only those variables for which this H_0 can be rejected. The table provides the t-score and its level of significance for each independent variable. Those developmentally disabled elderly who tend to receive helping services are characterized as having functional limitation (as measured by difficulty dressing and getting out of bed), as having their activities limited due to a learning disability, and as being advanced in age.

The unstandardized correlation coefficient shows the strength of the association between the dependent variable and each independent variable when considered apart from the other independent variables. This analysis shows functional disability as having the strongest association. In descending order of correlation with receiving help, the other variables are: education, sex, rural residence, low income status, and marital status. When the partial correlation coefficients are considered, the explanatory power of the enabling variables is somewhat diminished. The R^2 statistic for this model of three variables shows that it explains 13% of the variance in the utilization of helping services by the respondents. Two of the three significant correlates are in the need category. The other is in the predisposing category and the model includes no enabling variables. The model supports the stated hypothesis to the extent that the need variables are the most predictive, but does not show the superiority of the enabling category over the enabling factors.

Utilization of a Special Bus or Van

Significant correlates for using a special bus or van are shown in Table 3.C. The F-test for having an attendant reveals that the first H_0 can be rejected. At least one independent variable contributes significantly to the prediction of the dependent variable.

Analysis of the t-score and its level of significance for each independent variable shows that those respondents frequently using a special bus or van are likely to be functionally disabled. They are less likely to have their activities limited due to a learning disability, and are likely to be unmarried.

Analysis of the unstandardized correlation coefficients reveals functional disability as having the strongest association. In descending order of correlation with frequency of using a special bus or van the other variables are: activities limited due to learning disability, and marital status.

Consideration of the partial correlation coefficients increases the explanatory power of all the independent variables. The R^2 statistic for this model of three variables indicates that it explains 3% of the variance in the frequency of utilization of a special bus or van. Two of the significant correlates are in the need category. The other one is in the predisposing category and none is an enabling variable. As with receiving help, the model supports the stated hypothesis to the extent that the need variables are the most predictive, but does not show the superiority of the enabling category over the enabling factors.

Relationships among the Need, Predisposing, and Enabling Variables

Correlates of Need Variables

Regression analysis shows the predisposing variables to be predictive, to varying extents, of the need and enabling variables. Table 4 shows the correlates of the need variables when regressed on the predisposing factors. Table 4.A. shows that 19% of the variance in functional disability is explained by four significant predisposing correlates: age, marital status, French ethnicity, and educational level.

Diagnosis with a learning disability has three significant correlates (see Table 4.B.). These predisposing variables together produce an R^2 statistic of .13. Developmentally disabled elderly in Canada who have been diagnosed with learning disabilities tend to be unmarried, have fewer years of schooling, and are in the younger age group in the sample (the sample includes only ages 55 and older). The predisposing variables most predictive of the need variable measured by having trouble using public transportation only explain 2% of the variance (see Table 4.C.). These two significant correlates are French ethnic origin and level of education. Lower levels of education are characteristic of the respondents reporting that they have this difficulty. A somewhat similar need variable, having difficulty riding as a passenger in a private car, also has two predisposing correlates (Table 4.D.). These two variables produce an R^2 statistic of only .03, and characterize the respondents having this difficulty as both married and advanced in age.

Table 4.E. shows that having one's activities limited due to a learning disability has four significant correlates: being male, being advanced in age, being married, and having French ethnic origin. These variables together explain 7% of the variance in having one's activities limited due to a learning disability.

Correlates of Enabling (Family Level) Variables

Significant correlates of total personal income for the respondents include four predisposing variables which explain 23% of the variance (see Table 5.A.). These predisposing factors characterize the nonistitutionalized developmentally disabled elderly in Canada with higher personal incomes as being older, male, having higher educational level, and as being unmarried.

Table 5.A. shows the multiple regression outcomes for the need variable, low income status. Two significant correlates emerge, producing an R^2 statistic of .03. These variables characterize those respondents whose incomes place them above the Canadian poverty line as being advanced in age and as being male.

Correlates of Enabling (Community Level) Variables

Analysis of the significant correlates for urban/rural residence shows three such variables (see Table 6). These predisposing factors combine to explain 7% of the variance in urban/rural residence: sex, level of education, and age. Those who have rural residence are likely to be male, have lower levels of education, and are likely to be advanced in age. Hospitalization is a substantially different experience from a physician visit in that the individual does not usually make all the arrangements, including transportation to the hospital. Since hospitalization is not self-care, the predisposing factors take on secondary importance, with the need determininants emerging as predominant.

TABLE 2

CORRELATES OF HEALTH CARE USE

A. Seen Physician in Past 3 Months

NEED	t-Score	Sig t	Corr*	Partial**

(No significant correlates)

PREDISPOSING	t-Score	Sig t	Corr*	Partial**
Ethnic origin French	-4.616	>.0001	-.1981	-.1993
Highest level of schooling attained	3.047	>.0001	.1671	.1331
Sex	-2.688	>.01	-.1641	-.1177
Marital status	2.400	>.05	.0626	.1052

ENABLING (FAMILY LEVEL)	t-Score	Sig t	Corr*	Partial**
Low income status below line/above line	-2.979	>.005	-.1455	-.1301

ENABLING (COMMUNITY LEVEL)	t-Score	Sig t	Corr*	Partial**
Rural residence	-4.120	>.0001	-.1504	-.1053

R^2 = .14 Adjusted R^2 = .13

F = 14.47719 Sig F = >.0001

*Simple correlation coefficient
**Partial correlation coefficient

B. Hospitalized in Past Year

NEED	t-Score	Sig t	Corr*	Partial**
Trouble dressing/ getting out of bed	4.002	>.0001	.2805	.1758
Activities limited due to learning disability	2.401	>.05	.1788	.1066

PREDISPOSING	t-Score	Sig t	Corr*	Partial**
Highest level of schooling attained	2.821	>.005	.1559	.1249
Sex	3.047	>.005	.1373	.1348
Age	3.934	>.0001	.2356	.1729

ENABLING (FAMILY LEVEL)	t-Score	Sig t	Corr*	Partial**

(No significant correlates)

ENABLING (COMMUNITY LEVEL)	t-Score	Sig t	Corr*	Partial**

(No significant correlates)

$R^2 = .15$ Adjusted $R^2 = .14$

F = 17.09341 Sig F = >.0001

*Simple correlation coefficient
**Partial correlation coefficient

C. Seen A Nurse Past 3 Months

NEED	t-Score	Sig t	Corr*	Partial**
Diagnosed with learning disability	3.909	>.0001	.2507	.1729
Activities limited due to learning disability	-2.715	>.01	-.2990	-.1210
Trouble using public transportation	-2.333	>.05	-.1529	-.1042

PREDISPOSING	t-Score	Sig t	Corr*	Partial**
Ethnic origin French	-6.908	>.0001	-.3108	-.2963
Sex	-5.101	>.0001	-.3104	-.2233
Age	2.392	>.05	-.0036	.1068

ENABLING (FAMILY LEVEL)	t-Score	Sig t	Corr*	Partial**
Low income status above poverty line	-3.187	>.005	-.2995	-.1417

ENABLING (COMMUNITY LEVEL)	t-Score	Sig t	Corr*	Partial**
Rural residence	-4.424	>.0001	-.2406	-.1948

R^2 = .31 Adjusted R^2 = .30

F = 28.33097 Sig F = >.0001

*Simple correlation coefficient
**Partial correlation coefficient

D. Seen Physio/Occupational/Speech Therapist in Past 3 Months

NEED	t-Score	Sig t	Corr*	Partial**
Trouble dressing/ getting out of bed	3.330	>.001	.1874	.1363
Diagnosed with learning disability	3.082	>.005	.0116	.1263
Activities limited due to learning disability	2.310	>.05	.1000	.0893

PREDISPOSING	t-Score	Sig t	Corr*	Partial**
Highest level of schooling attained	3.036	>.005	.1517	.1244
Marital status	2.171	>.05	.1462	.0893

ENABLING (FAMILY LEVEL)	t-Score	Sig t	Corr*	Partial**

(No significant correlates)

ENABLING (COMMUNITY LEVEL)	t-Score	Sig t	Corr*	Partial**

(No significant correlates)

R^2 = .07 Adjusted R^2 = .06

F = 9.07187 Sig F = >.0001

*Simple correlation coefficient
**Partial correlation coefficient

E. Aids for Hearing Impaired Used

NEED	t-Score	Sig t	Corr*	Partial**
Trouble dressing/ getting out of bed	4.501	>.0001	.2594	.1791

PREDISPOSING	t-Score	Sig t	Corr*	Partial**
Ethnic origin				
French	3.703	>.0005	.2123	.1482
Sex	3.192	>.005	.1250	.1636
Age	4.099	>.0001	.2214	.1281

ENABLING (FAMILY LEVEL)	t-Score	Sig t	Corr*	Partial**

(No significant correlates)

ENABLING (COMMUNITY LEVEL)	t-Score	Sig t	Corr*	Partial**

(No significant correlates)

R^2 = .13 Adjusted R^2 = .12

F = 22.49721 Sig F = >.0001

*Simple correlation coefficient
**Partial correlation coefficient

F. Aids for Mobility Impaired Used

NEED	t-Score	Sig t	Corr*	Partial**
Trouble dressing/ getting out of bed	5.889	>.0001	.1206	.2309
Activity limited due to learning disability	-7.885	>.0001	-.3222	-.3028

PREDISPOSING	t-Score	Sig t	Corr*	Partial**
Ethnic origin French	-3.002	>.005	-.1040	-.1201
Sex	-3.828	>.0001	-.2446	-.1524
Marital status	-2.374	>.05	-.1159	-.0952

ENABLING (FAMILY LEVEL)	t-Score	Sig t	Corr*	Partial**

(No significant correlates)

ENABLING (COMMUNITY LEVEL)	t-Score	Sig t	Corr*	Partial**
Rural residence	-4.569	>.0001	-.2502	-.1811

R^2 = .22 Adjusted R^2 = .21

F = 29.02828 Sig F = >.0001

*Simple correlation coefficient
**Partial correlation coefficient

G. Aids for Visually Impaired Used

NEED	t-Score	Sig t	Corr*	Partial**
Trouble dressing/ getting out of bed	3.809	>.0005	.1444	.1526
Activities limited due to learning disability	2.862	>.005	.1660	.1152

PREDISPOSING	t-Score	Sig t	Corr*	Partial**
Highest level of schooling attained	-3.438	>.001	-.1189	-.1380

ENABLING (FAMILY LEVEL)	t-Score	Sig t	Corr*	Partial**

(No significant correlates)

ENABLING (COMMUNITY LEVEL)	t-Score	Sig t	Corr*	Partial**
Rural residence	-3.480	>.0005	-.1567	-.1396

R^2 = .08 Adjusted R^2 = .07

F = 13.09850 Sig F = >.0001

*Simple correlation coefficient
**Partial correlation coefficient

H. Number of Prescription Drugs Used Daily

NEED	t-Score	Sig t	Corr*	Partial**
Diagnosed with learning disability	-2.511	>.05	-.1467	-.1178

PREDISPOSING	t-Score	Sig t	Corr*	Partial**
Ethnic origin				
French	9.097	>.0001	.4053	.3949
Sex	3.992	>.0001	.2015	.1853

ENABLING (FAMILY LEVEL)	t-Score	Sig t	Corr*	Partial**

(No significant correlates)

ENABLING (COMMUNITY LEVEL)	t-Score	Sig t	Corr*	Partial**

(No significant correlates)

$R^2 = .21$ Adjusted $R^2 = .20$

$F = 38.66336$ Sig $F = >.0001$

*Simple correlation coefficient
**Partial correlation coefficient

TABLE 3

CORRELATES OF SOCIAL SERVICES USE

A. Receive Help

NEED	t-Score	Sig t	Corr*	Partial**
Trouble dressing/ getting out of bed	4.312	>.0001	.2581	.1761
Activities limited due to learning disability	4.761	>.0001	.2420	.1938

PREDISPOSING	t-Score	Sig t	Corr*	Partial**
Age	4.339	>.0001	.2441	.1772

ENABLING (FAMILY LEVEL)	t-Score	Sig t	Corr*	Partial**

(No significant correlates)

ENABLING (COMMUNITY LEVEL)	t-Score	Sig t	Corr*	Partial**

(No significant correlates)

R^2 = .13 Adjusted R^2 = .13

F = 29.78807 Sig F = >.0001

*Simple correlation coefficient
**Partial correlation coefficient

B. How Often Use Special Bus or Van

NEED	t-Score	Sig t	Corr*	Partial**
Trouble dressing/ getting out of bed	3.150	>.005	.0877	.1275
Activities limited due to learning disability	-2.284	>.05	-.0812	-.0928

PREDISPOSING	t-Score	Sig t	Corr*	Partial**
Marital Status	-2.347	>.05	-.0741	-.0953

ENABLING (FAMILY LEVEL)	t-Score	Sig t	Corr*	Partial**

(No significant correlates)

ENABLING (COMMUNITY LEVEL)	t-Score	Sig t	Corr*	Partial**

(No significant correlates)

$R^2 = .03$ Adjusted $R^2 = .02$

F = 5.496827 Sig F = >.001

*Simple correlation coefficient
**Partial correlation coefficient

TABLE 4

CORRELATES OF NEED (ILLNESS) VARIABLES

A. Trouble Dressing/Getting Out of Bed

PREDISPOSING	t-Score	Sig t	Corr*	Partial**
Ethnic origin French	4.133	>.0001	.2097	.1676
Age	6.777	>.0001	.2950	.2685
Highest level of schooling attained	3.076	>.005	.1990	.1256
Marital Status	5.856	>.0001	.2790	.2342

R^2 = .19 Adjusted R^2 = .19

F = 35.38660 Sig F = >.0001

*Simple correlation coefficient
**Partial correlation coefficient

B. Diagnosed with Learning Disability

PREDISPOSING	t-Score	Sig t	Corr*	Partial**
Age	-2.635	>.01	-.1260	-.1077
Highest level of schooling attained	-4.198	>.0001	-.2387	-.1700
Marital Status	-6.372	>.0001	-.3021	-.2534

R^2 = .13 Adjusted R^2 = .12

F = 28.25282 Sig F = >.0001

*Simple correlation coefficient
**Partial correlation coefficient

C. Trouble Using Public Transportation

PREDISPOSING	t-Score	Sig t	Corr*	Partial**
Ethnic origin French	2.507	>.05	.0973	.1024
Highest level of schooling attained	-2.454	>.05	-.0950	-.1003

R^2 = .02 Adjusted R^2 = .02

F = 5.87261 Sig F = >.005

*Simple correlation coefficient
**Partial correlation coefficient

D. Difficulty Riding in Private Car

PREDISPOSING	t-Score	Sig t	Corr*	Partial**
Marital Status	4.243	>.0001	.1758	.1717
Age	1.982	>.05	.0897	.0811

R^2 = .04 Adjusted R^2 = .03

F = 11.47607 Sig F = >.0001

*Simple correlation coefficient
**Partial correlation coefficient

E. Activities Limited Due to Learning Disability

PREDISPOSING	t-Score	Sig t	Corr*	Partial**
Ethnic origin				
French	1.980	>.05	.1167	.0812
Age	3.566	>.0005	.1488	.1451
Sex	3.810	>.0005	.1693	.1549
Marital Status	2.230	>.05	.1355	.0913

R^2 = .07 Adjusted R^2 = .06

F = 10.99914 Sig F = >.0001

*Simple correlation coefficient
**Partial correlation coefficient

TABLE 5

CORRELATES OF ENABLING (FAMILY LEVEL) VARIABLES

A. Total Personal Income

PREDISPOSING	t-Score	Sig t	Corr*	Partial**
Sex	7.460	>.0001	.2043	.2839
Age	10.137	>.0001	.3530	.3732
Highest level of schooling attained	7.102	>.005	.2300	.2713
Marital Status	-2.527	>.05	.0389	-.0998

R^2 = .23 Adjusted R^2 = .23

F = 47.39427 Sig F = >.0001

*Simple correlation coefficient
**Partial correlation coefficient

B. Low Income Status Below Line/Above Line

PREDISPOSING	t-Score	Sig t	Corr*	Partial**
Sex	2.253	>.05	.1194	.0980
Age	3.998	>.0001	.1665	.1722

R^2 = .03 Adjusted R^2 = .03

F = 5.10667 Sig F = >.0001

*Simple correlation coefficient
**Partial correlation coefficient

TABLE 6

CORRELATES OF ENABLING (COMMUNITY LEVEL) VARIABLES

Rural Residence

PREDISPOSING	t-Score	Sig t	Corr*	Partial**
Sex	6.146	>.0001	.2315	.2368
Age	2.533	>.05	.0724	.0999
Highest level of schooling attained	-2.629	>.01	-.1086	-.1037

$R^2 = .07$ Adjusted $R^2 = .07$

F = 16.58932 Sig F = >.0001

*Simple correlation coefficient
**Partial correlation coefficient

CHAPTER V

SUMMARY AND CONCLUSIONS

Purpose and Model of Research

This research sought to identify the determinants of the utilization of health care services and social services. The population of interest was the noninstitutionalized developmentally disabled elderly in Canada who participated in the Health and Activity Limitation Survey in 1986 and 1987. Andersen and Newman's (1973) health care services utilization model served as the conceptual framework for this research. Andersen and Newman postulated that utilization behavior was a complex phenomenon that was influenced by three individual determinants: need, enabling, and predisposing.

The predisposing variables are those that provide an indication of the lifestyle of the individual, in terms of both the physical and social environment, and the individual's position within the social system. Andersen and Newman (1973) postulated that these factors are likely to influence use of health care services, but are not directly responsible for the use of services.

Those conditions that permit an individual to satisfy a health care need or desire were referred to as enabling variables. These include the availability of health care resources, as well as individual enabling variables, such as financial resources and whether one's residence is in a rural or an urban area.

Given the presence of the predisposing and enabling variables, the individual must still identify a condition as an illness before utilization will take place. Identification of a physical condition as a potential illness is the characteristic most directly responsible for health care utilization behavior. Andersen and Newman (1973) termed this process the "need/illness determinant."

There is some precedent in the research literature for applying the Andersen-Newman model to the utilization of social services. Most of the findings concerning hospital and physician utilization also hold true for the utilization of social services among the elderly who are not necessarily developmentally disabled (Coulton & Frost, 1982; Evashwick et al.; Rowe, Diehr, & Branch, 1984). George (1981) found enabling and predisposing variables more predictive of the use of social services than the need variables. Krout (1983) found awareness of the availability of social services to be the strongest predictor. Starrett et al. (1989), made use of the Andersen-Newman theoretical framework in a study of the utilization of social services by Cuban, Puerto Rican, and Mexican American elderly persons.

This model was used with multiple regression analysis to examine the accessibility of, and predictors of, use of health care and social services among developmentally disabled elderly adults in Canada using a nationally representative social survey. The first null hypothesis for each dependent variable was that none of the independent variables contributes significantly to the prediction of the dependent variable. For each dependent variable for which the first null hypothesis was rejected, the second null hypothesis was proposed for each independent variable to determine which of the independent variables contribute to the variation in the dependent variable. This hypothesis was:

$$H_0 \text{ (Null Hypothesis): } B_i = 0$$

For the instances in which both these null hypotheses were rejected, it was further hypothesized that the need variables would be the most predictive correlates of the utilization of health care and social services. It was furthermore hypothesized that the enabling variables would have secondary explanatory power, with the predisposing variables accounting for the least amount of variance.

Two questions guided the interpretation of the multiple regression analysis. The first question was concerned with the importance of the independent variables when used alone to predict the dependent variable. The second question dealt with the importance of the independent variables when they are used to predict the dependent variable along with other independent variables in the regression equation.

This research further attempted to measure the goodness of fit of the model to the sample. This was done by analyzing the percentage of the variation in the dependent variable that was explained by the independent variables in the equation.

The underlying relationships among the predictor variables were examined. This was done by analyzing the regression of the need and enabling variables on the predisposing category.

Summary and Results

The data reported here add support to the importance of the need concept in predicting utilization of health care and social services. Variables within this category emerged as significant predictors for 62.5% of the health care variables and 100% of the social services variables for which significant correlates were found. These variables were hospital utilization, having seen a physio/occupational/speech therapist, utilization of aids for the hearing, mobility, and visually impaired, utilization of volunteer or hired help, and utilization of a special bus or van.

Only 25% of the regression equations for the health care services dependent variables supported the Andersen-Newman schema of the preeminence of need, followed by enabling and predisposing factors, in that order. In fact, fully 37.5% percent of the health care variables showed the predisposing correlates as explaining the largest proportion of the variance.

Measures of functioning provide a social definition of health and illness in lieu of using narrow medical or biological criteria. Chappell and Blandford (1987) draw attention to McKinlay's (1980) assertion that symptoms which interfere with everyday activities and are socially disruptive are more likely to be defined as worthy of health care utilization. In all instances in which need emerged as the most significant predictor of health care use, the functioning component of that category was a significant correlate. This also holds true for social service use.

Health Care Services Utilization

For physician utilization, no need factors emerged as significant. This is consistent with the findings of Chappell and Blandford (1987), who also used Canadian data, although their respondents were not developmentally disabled. The reason for this may be that physician utilization is based on pathological medical problems and other services are used on the basis of functional limitation. The factors that did emerge from the predisposing and enabling categories, however, indicate that physician use may be strongly linked to lifestyle and culture. The total variance explained by the significant independent variables was 14%.

Those developmentally disabled elderly who tend to utilize physician services were characterized in this research as having non-French ethnic origin, a higher level of schooling, as being female, married, as having income below the poverty level, and as having urban residence. The low income status of these respondents suggests that low income is not a barrier to physician utilization within the Canadian health care system. The physician population tends to be concentrated in urban areas; therefore, they are undoubtedly more accessible for urban residents.

Those respondents having been admitted to a hospital were found to be less likely to experience functional disability (as measured by trouble dressing and getting out of bed). They were also found to be more likely to have their activities limited due to a learning disability, to have more years of education, to be male, and to be more advanced in age. The total variance explained by the significant independent variables was 15%.

The Canadian developmentally disabled aged 55 and older having seen a nurse were found to be likely to have been diagnosed as having a learning disability but not likely to have their activities limited due to the learning disability. They were found to have less trouble using public transportation, have non-French ethnic origin, are female, tend to be older, have income below the poverty line, and have urban residence. The total variance explained by the significant independent variables was 31%.

Why persons with less disability tend to have seen a nurse is not known. Perhaps persons with greater functional limitation are seen as requiring physician or hospital services, whereas the technical skills of nurses are sufficient for other persons. Those who use physician services, furthermore, were found to be likely to be married. Marital status was not found to be a significant correlate of having seen a nurse in the past three months. An explanation might be that the visiting nurse performs functions that may be performed by a spouse for married persons.

As was the case with physician utilization, it was found in this study that non-French ethnic origin is correlated with having seen a nurse. The reason for this is not clear. There may be a cultural factor such as a hesitancy by persons of French ethnicity to utilize health services. There was no allusion to such a phenomenon in the literature reviewed. It may be that there is somewhat more social cohesion among residents of French communities and they therefore fulfill more caretaking roles for one another.

Those respondents having seen a physiotherapist, occupational therapist, or speech therapist were found to be likely to be functionally disabled, diagnosed as having a learning disability, and to have their activities limited due to the learning disability. They were found to have more years of education and likely to be married. The total variance explained by the significant independent variables was 7%.

Multiple regression analysis revealed that those respondents utilizing aids for the hearing impaired were likely to be functionally impaired (as measured by trouble dressing and getting out of bed). They were also found to be more likely to have French ethnic origin, to be male, and to be more advanced in age. The total variance explained by the significant independent variables was 13%.

Analysis of each independent variable for the utilization of aids for the mobility impaired shows that those respondents using such aids were likely to be functionally impaired (as measured by trouble dressing and getting out of bed). They were characterized as less likely to have their activities limited due to a learning disability, as likely to have non-French ethnic origin, to be female, less likely to be married, and as having urban residence. The total variance explained by the significant independent variables was 22%.

The Canadian developmentally disabled elderly who utilize aids for the visually impaired were found to be likely to be functionally impaired (as measured by trouble dressing and getting out of bed). They were discovered to be likely to have their activities limited due to learning disabilities, to have fewer years of schooling, and were characterized as having urban residence. The total variance explained by the significant independent variables was 8%.

It was found in this study that those respondents using several prescription drugs daily (mean number of drugs taken was about three) were not likely to have been diagnosed as having a learning disability. They were also found to be likely to have French ethnic origin, and were characterized as being male. The total variance explained by the significant independent variables was 21%.

Social Services Utilization

For social services utilization, need factors emerged as the most significant category of independent variables. This is consistent with the findings of Chappell and Blandford (1987) and Starrett et al. (1989). Both of these studies involved measures of the utilization of social services, but neither studied the developmentally disabled.

Both of the dependent variables used to measure use of social services included functional limitation as a significant correlate. The factors that emerged from the predisposing category indicated that social services use may be linked somewhat to lifestyle and culture.

Those developmentally disabled elderly who tend to receive helping services were by this study characterized as having functional limitation (as measured by difficulty dressing and getting out of bed), as having their activities limited due to a learning disability. They were further characterized as being advanced in age. The total variance explained by the significant independent variables was 13%.

Multiple regression analysis revealed that respondents who frequently use a special bus or van were likely to be functionally disabled. They were less likely to have their activities limited due to a learning disability, and unlikely to be married. The total variance explained by the significant independent variables was 3%.

Conclusions and Implications

This study employed the Andersen-Newman (1973) health care services utilization model to study access to and utilization of health care and social services among noninstitutionalized aging developmentally disabled persons in Canada. Of particular interest were the relationships among services utilization and particular need, enabling, and predisposing variables.

Analysis of multiple regression statistics indicated that, as the theoretical framework suggested, the need category of independent variables emerged as most predictive of the use of both health care and social services. Contrary to Andersen's model, however, this study found the predisposing factors to have somewhat greater explanatory power than the enabling variables. In only two instances, utilization of physician services and having seen a nurse, did the enabling category include any measure of income as being significantly correlated. In both instances, persons with incomes below the poverty line accessed the services. This undoubtedly reflects Canada's health care delivery system, which is a mixture of private enterprise and socialized medicine.

This research has important policy implications that should be informative for policymakers in both the United States and Canada. The implications will be particularly relevant to those persons in both the private and public sectors who are in positions from which to influence policies concerning the developmentally disabled elderly. The Andersen-Newman theoretical framework was conceived and has been replicated in the United States. The findings of this research indicate that enabling factors such as income, which are so important to health care and social services access in the United States, are not as significant in Canada. The fact that need emerges as correlated with the use of services and income does not suggests that health care and social services are provided equitably for Canadian developmentally disabled elderly. This is not to say that the services offered in Canada are necessarily superior or particularly appropriate, but only that they are accessible primarily on the basis of need.

The findings of this study, when combined with other facts about the Canadian and United States health care delivery systems, suggest that the United States would do well to emulate at least some aspects of the Canadian system. Free access to physicians' offices, hospitals, nurses, and other health care practitioners and services tends to provide more care for those who need it most. Following the introduction of cost-free medical care in Canada (Hatcher et al., 1984), physicians reported seeing fewer patients for frivolous reasons and more persons with serious complaints. Canada provides equal service for rich and poor alike. It is not a two-class health care system.

The quality of health care in Canada is similar to that of the United States. The major emphasis is upon general practitioners rather than specialists, and there are twice as many general practitioners per capita in Canada than in the United States (Hatcher et al., 1984). Cockerham (1989:295) states, "The health profile of Canadians with respect to infant mortality and life expectancy is somewhat better than for Americans." The infant mortality rate (per 1,000 live births) in Canada is the third lowest in the world at 7.2 (Hatcher et al., 1984). This is substantially lower than that of the United States, at 10.5 (Schaefer, 1989).

The outcome of deinstitutionalization has been less unfavorable in Canada than in the United States. The mental health services in Canada have been evaluated as superior to those throughout most of the United States (Smith & Herman, 1988).

Despite the equality and generosity of its health care program, Canada is one of the few countries that has held the cost of all health care to a constant proportion of the Gross National Product (Hatcher et al., 1984). Per capita health care costs in Canada are only half those in the United States, even though most hospitals are privately owned and most physicians are in independent private practice. Only 1.5% is spent on administrative costs, making the Canadian system possibly the most efficient in the world (Hatcher et al., 1984). In Canada, malpractice insurance is not a factor in medical costs. In addition, there is not a large insurance industry to contribute to spiraling health care costs, as in the U.S. (Kane & Kane, 1990).

For Canadian policymakers there is much to gain from a study of the Canadian health care delivery system as it applies to the developmentally disabled elderly. Having empirical information on variables that differentiate and characterize (and are potentially modifiable via social policy) those elderly respondents prone to use services will enable policymakers and program developers to structure or restructure the service delivery system in ways that will effectively meet the needs of the developmentally disabled.

As with health care utilization, need factors emerged in this research as the most significant determinants of social services utilization. For both the United States and Canada, it will be beneficial for policymakers and social services practioners who work with elderly developmentally disabled persons to have an understanding of the different variables that predict the utilization of services. This kind of information is mandatory for effective service programs to be developed and implemented, particularly in an environment in which resources are limited.

An important concept concerning social services is that they have historically been equated with welfare, usually in a negative sense, and recipients have been stigmatized (Tenhoor, 1982). In times of financial exigency, they are often targeted for elimination. In actuality, however, social services such as the ones investigated in this research (receiving help with the activities of daily living and the use of a bus or van) "...are frequently preventive in nature, and...prevention is generally accepted as less costly than diagnosis and treatment" (Chappell, 1988:83).

A few final comments about the limitations of this research are in order. A relatively small portion of the variance was explained for some of the dependent variables by the application of multivariate analysis. Similar results have been obtained in other studies (Eve et al., 1980; Wolinsky & Coe, 1984) dealing with different categories of respondents. In particular, the enabling variables account for a disappointlingly small proportion of the variance in the model. The variables in this study, though taken from a scientifically designed questionnaire, did not provide as much insight as might have been desirable. For example, the study would have been enhanced had it been possible to distinguish among physician visits which were initiated by the patient, visits initiated at the physician's request, and by some third party, such as a social service worker or a relative. Future research should attempt to obtain information which can be more conducive to such considerations.

Future studies should also attempt to incorporate variables, unavailable in this research, that indicate the respondents' knowledge of health care and social services and how and when to use them. Such knowledge could be operationalized as an enabling variable and would logically have some predictive power in the utilization model.

BIBLIOGRAPHY

Aday, L., & Andersen, R. (1981). Equity of access to medical care: A conceptual and empirical overview. Medical Care, 19(December Supplement), 4-27.

Aday, L., Andersen, R., & Fleming, G. (1980). Health care in the U.S.: Equitable for whom? Beverly Hills, CA: Sage Publications.

Aday, L., Fleming, G., & Andersen, R. (1984). Access to medical care in the U.S.: Who has it, who doesn't. Chicago, IL: Pluribus Press.

Andersen, R. (1968). A behavioral model of families' use of health services. Chicago, IL: Center for Health Administration Studies.

Andersen, R., & Newman, J. (1973). Societal and individual determinants of medical care utilization in the United States. Milbank Memorial fund Quarterly, 51, 95-124.

Andersen, R., & Anderson, O. (1979). Trends in the use of health services. In H. Freeman, S. Levine, & L. Reeder (Eds.), Handbook of medical sociology (pp. 371-391). Englewood Cliffs, NJ: Prentice-Hall.

Andersen, R., Kravits, J., & Anderson, O. (1975). Equity in health services. Cambridge, MA: Ballinger.

Andersen, R., Kravits, J., & Anderson, O. (1976). Two decades of health services. Cambridge, MA: Ballinger.

Anglin, B. (1981). They never asked for help: A study on the needs of the elderly retarded people in metro Toronto. Maple, Ontario: Belsten.

Badry, D., Vrbancic, M., Groeneweg, G., McDonald, L., & Hornick, J. (1986). An examination of the service needs of older developmentally disabled persons in the province of Alberta, Canada. Calgary, Alberta: The Vocational and Rehabilitation Research Institute.

Becker, M., & Maiman, L. (1983). Models of health-related behavior. In Mechanic, D. (Ed.), Handbook of health, health care, and the health professions (pp. 539-568). New York, NY: Free Press.

Bell, A., & Zubeck, J. (1960). The effect of age in the intellectual performance of mental defectives. Journal of Gerontology, 15, 285-295.

Belsley, D., Kuh, E., & Welsch, R. E. (1980). Regression diagnostics: Identifying influential data and sources of collinearity. New York, NY: John Wiley and Sons.

Berg, J., & Dalton, A. (1980). The mentally retarded in middle age. Toronto, Ontario: Ontario Ministry of Community and Social Services.

Berkanovic, E., & Telesky, C. (1982). Social networks, beliefs, and the decision to seek medical care: An analysis of congruent and incongruent patterns. Medical Care, 20, 1018-1026.

Berki, S., & Kobashigawa, B. (1976). Socioeconomic and need determinants of ambulatory care use: Path analysis of the 1970 health interview survey. Medical Care, 14, 405-417.

Berki, S., Wyszewianski, L., Lichtenstein, R., Gimotty, P., Bowlyow, J., Papke, E., Smith, T., Crane, S., & Bromberg, J. (1985). Health insurance coverage of the unemployed. Medical Care, 23, 847-854.

Berry, W. D., & Feldman, S. (1985). Multiple regression in practice. Sage university paper series on quantitative applications in the social sciences, 07-050. Beverly Hills, CA: Sage Publications.

Blalock, H. M. (1979). Social statistics. New York, NY: McGraw-Hill.

Borzecki, M., & Wormith, J. S. (1985). The criminization of psychiatrically ill people: A review with a Canadian perspective. Psychiatric Journal of the University of Ottawa, 10, 242-247.

Buehler, B., Smith, B., & Fifield, M. (1985). Medical issues in serving adults with developmental disabilities. Technical Report #4. Logan, Utah: Utah State University Developmental Center for Handicapped Persons.

Butler, P. A. (1988). Too poor to be sick: Access to medical care for the uninsured. Washington, DC: American Public Health Association.

Cantor, M., & Mayer, M. (1975). Factors in differential utilization of services by urban elderly. The Gerontologist, 15, 19-98.

Carter, G., & Jancar, J. (1983). Mortality in the mentally handicapped: A 50 year survey at the stoke park group of hospitals. American Journal of Mental Deficiency Research. 27, 143-156.

Catapano, P., Levy, J., & Levy, P. (1985). Day activity and vocational program services. In M. Janicki & H. Wisniewski (Eds.), Aging and developmental disabilities: Issues and approaches (pp. 305-323). Baltimore, MD: Paul H. Brookes.

Chappell, N. (1988). Long term care in Canada. In E. Rathbone-McGuan & B. Havens (Eds.), North American elders: United States and Canadian perspectives (pp. 73-88). New York, NY: Greenwood Press.

Chappell, N., & Blandford, A. (1987). Health service utilization by elderly persons. Canadian Journal of Sociology, 12, 195-214.

Cockerham, W. (1989). Medical sociology. Englewood Cliffs, NJ: Prentice Hall.

Committee of Enquiry. (1984). The legislation of concern. Regina, Saskatchewan: Mental Health Association.

Cotton, P., Sison, G., & Starr, S. (1981). Comparing elderly mentally retarded and non-mentally retarded individuals: Who are they? What are their needs? The Gerontologist, 21, 359-360.

Coulton, C., & Frost, A. (1982). Use of social services by the elderly. Journal of Health and Social Behavior, 23, 330-339.

Cuellar, J. B., & Weeks, J. (1980). Minority elderly Americans: A prototype for area agencies on aging. San Diego, CA: Allied Home Health Association.

Delaney, S. (1984). Survey of persons with mental retardation over age 50. Toronto, Ontario: Ontario Association for the Mentally Retarded.

Department of Health and Human Services. (1985). Health, United States, 1984. DHHS Publication No. 85-1232. Washington, DC: U.S. Government Printing Office.

Dickerson, M., Hamilton, J., Huber, R., & Segal, R. (1980). The aged mentally retarded: The invisible client, a challenge to the community. In D. Sweeney & T. Wilson (Eds.). Double jeopardy: The plight of aging and aged developmentally disabled persons in mid-America (pp. 45-61). Ann Arbor, MI: University of Michigan Institute for the Study of Mental Retardation and Related Disabilities.

Dobrof, R. (1985). Some observations from the field of aging. In M. Janicki & H. Wisniewski (Eds.). Aging and developmental disabilities: Issues and approaches (pp. 403-415). Baltimore, MD: Paul H. Brookes.

Downing, R. (1977). The older person in crisis: An exploratory study of 250 older persons. The Gerontologist, 17, 28-29.

Evashwick, C., Rowe, G., Diehr, P., & Branch, L. (1984). Factors explaining the use of health care services by the elderly. Health Services Research, 19, 357-382.

Eve, S. (1982). Use of health maintenance organizations by older adults. Research on Aging, 4, 179-203.

Eve, S. (1984). Age strata differences in health care services utilization among adults in the United States. Sociological Focus, 17, 105-120.

Eve, S. (1988). A longitudinal study of use of health care services among older women. Journal of Gerontology, 43.

Eve, S., & Friedsam, H. (1980). Multivariate analysis of health care services utilization among older Texans. Journal of Health and Human Resources Administration, 3, 169-191.

Eve, S., Watson, J., & Reiss, E. (1980). Use of health care services among older adults. Paper presented at the annual meeting of the Gerontological Society of America, San Diego, CA.

Eyman, R., Chaney, R., Givens, C., Lopez, E., & Lee, C. (1986). Medical conditions underlying increasing mortality of institutionalized persons with mental retardation. Mental Retardation, 24, 306-310.

Famighetti, R. (1985). Meeting an emergent need in curriculum development: Aging and developmental disabilities. Gerontology and Geriatrics Education, 6(1), 25-36.

Freidson, E. (1970). *Profession of medicine: A study in the sociology of applied knowledge*. New York, NY: Harper and Row.

Geersten, R., Klauber, M., Rindflesh, M., Kane, R., & Gray, R. (1975). A re-examination of Suchman's views on social factors in health care utilization. *Journal of Health and Social Behavior*, *16*, 226-237.

George, L. (1981). Predicting health service utilization. Paper presented at the annual meeting of the Gerontological Society of America, Toronto, Ontario.

Goldberger, A. S. (1968). *Topics in regression analysis*. New York, NY: MacMillan.

Guilford, J. P., & Fruchter, B. (1973). *Fundamental statistics in psychology and education*. New York, NY: McGraw-Hill.

Harris, D. (1975a). An elaboration of the relationship between general hospital bed supply and general hospital bed utilization. *Journal of Health and Social Behavior*, *16*, 163-172.

Harris, L. (1975b). *The myth and reality of aging in America*. Washington, DC: National Council on Aging.

Hatcher, G. H., Hatcher, P. R., & Hatcher, E. C. (1984). Health services in Canada. In M. W. Raffel (Ed.), *Comparative health systems: Descriptive analyses of fourteen national health systems* (pp. 86-132). University Park, PA: The Pennsylvania State University Press.

Haub, C, & Kent, M. (1987). *World population data sheet*. Washington, DC: Population Reference Bureau.

Hauber, F., Rotegard, L., & Bruininks, R. (1985). Characteristics of residential services for older/elderly p454Xmentally retarded persons. In Janicki, M., & Wisniewski (Eds.) H. *Aging and developmental disabilities: Issues and approaches* (pp. 327-350). Baltimore, MD: Paul H. Brookes.

Havighurst, C. C. (1982). *Deregulating the health care industry: Planning for competition*. New York, NY: Harper and Row.

Herr, S. (1985). Legal processes and the least restrictive alternative. In M. Janicki & H. Wisniewski (Eds.). *Aging and developmental disabilities: Issues and approaches* (pp. 77-92). Baltimore, MD: Paul H. Brookes.

Hollingsworth, J. R. (1986). A political economy of medicine: Great Britain and the United States. Baltimore, MD: Johns Hopkins University Press.

Jacobson, J., Sutton, M., & Janicki, M. (1985). Demography and characteristics of aging and aged mentally retarded persons. In M. Janicki & H. Wisniewski (Eds.). Aging and developmental disabilities: Issues and approaches (pp. 115-141). Baltimore, MD: Paul H. Brookes.

Janicki, M., Otis, J., Puccio, P., Rettig, J., & Jacobson, J. (1985). Service needs among older developmentally disabled persons. In M. Janicki & H. Wisniewski (Eds.). Aging and developmental disabilities: Issues and approaches (pp. 289-304). Baltimore, MD: Paul H. Brookes.

Kadushin, C. (1958). Individual decisions to undertake psychotherapy. Administrative Science Quarterly, 3, 379-411.

Kane, R., & Kane, R. (1990). Health care for older people: organizational and policy issues. In R. Binstock & L. George (Eds.), Handbook of aging and the social sciences (pp. 415-437). San Diego, CA: Academic Press.

Kaplan, E. (1985). The usefulness of preoperative laboratory screening. Journal of the American Medical Association, 253(24), 3576-3581.

Kastenbaum, R. (1964). The reluctant therapist. In R. Kastenbaum (Ed.). New thoughts on old age (pp. 139-145). New York, NY: Springer Publishing.

Kelly, S., Larsen, P., & Groeneweg, G. (1988). A survey of the health care needs and the accessibility of the appropriate generic health services for adults with developmental disabilities. Calgary, Alberta: The Vocational and Rehabilitation Research Institute.

King, R. S., & Julstrom, B. (1982). Applied statistics: Using the computer. Sherman Oaks, CA: Alfred Publishing.

Krout, J. (1983). Utilization of services by the elderly. Paper presented at the annual meeting of the Gerontological Society of America, San Francisco, CA.

Kvanli, A. H., Guynes, C. S., & Pavur, R. J. (1986). Introduction to business statistics: A computer integrated approach. St. Paul, MN: West Publishing.

Lacayo, C. G. (1980). A national study to assess the service needs of the Hispanic elderly. Washington, DC: Library of Congress.

Lehman, A., Ward, N., & Linn, L. (1982). Chronic mental patients: The quality of life issue. American Journal of Psychiatry, 139, 1271-1276.

Lewin, K. (1951). Field theory in social science. New York, NY: Free Press.

Light, D. (1986). Comparing health care systems: Lessons from East and West Germany. In P. Conrad & R. Kern (Eds.), The sociology of health and illness (pp. 429-443). New York, NY: St. Martin's Press.

Light, D., Keller, S., & Calhoun, C. (1989). Sociology. New York, NY: McGraw-Hill.

Lippman, L., & Loberg, D. (1985). An overview of developmental disabilities. In M. Janicki & H. Wisniewski (Eds.). Aging and developmental disabilities: Issues and approaches (pp. 41-58). Baltimore, MD: Paul H. Brookes.

Long, J. (1983). Covariance structure models. Beverly Hills, CA: Sage Publications.

Lott, I., & Lai, F. (1982). Dementia in Down's syndrome: Observations from a neurology clinic. Applied Research in Mental Retardation, 3, 233-239.

Lowry, L. (1979). Social work with the aging. New York, NY: Harper & Row.

Macionis, J. (1989). Sociology. Englewood Cliffs, NJ: Prentice Hall.

Maldonado, D. (1985). The Hispanic elderly: A sociohistorical framework for public policy. Journal of Applied Gerontology, 4, 18-27.

Marcus, A., & Seeman, T. (1981a). Sex differences in health status: A re-examination of the nurturant role hypothesis. American Sociological Review, 46, 119-123.

Marcus, A., & Seeman, T. (1981b). Sex differences in reports of illness and disability: A preliminary test of the 'fixed-role obligations' hypothesis. Journal of Health and Social Behavior, 22, 174-182.

Marcus, A., & Seigel, J. (1982). Sex differences in the uses of physician services: A preliminary test of the fixed role hypothesis. Journal of Health and Social Behavior, 23, 186-197.

Marshall, J., Gregario, D., & Walsh, D. (1982). Sex differences in illness behavior: Care seeking among cancer patients. Journal of Health and Social Behavior, 23, 197-204.

Marx, K., & Engels, F. (1963 [1847]). Manifesto of the communist party. New York, NY: Russell and Russell.

McCaslin, R., & Calverts, W. R. (1975). Social indicators in black and white: Some ethnic considerations in delivery of service to the elderly. Journal of Gerontology, 30, 60-66.

McKinlay, J. B. (1980). Social network influences on morbid episodes and the career of help seeking. In L. Eisenberg & A. Kleinman (Eds.), The relevance of social science for medicine (pp. 77-107). Dordrecht, Netherlands: D. Reidel.

Mechanic, D. (1968). Medical sociology: A selective view. New York, NY: Free Press.

Mechanic, D. (1972). Social psychological factors affecting the presentation of bodily complaints. New England Journal of Medicine, 286, 1132-1139.

Mechanic, D. (1978). Medical sociology. New York, NY: Free Press.

Mechanic, D. (1985). Cost containment and the quality of medical care: Rationing services in an era of constrained resources. Milbank Memorial Fund Quarterly, 63, 453-475.

Mechanic, D. (1986). From advocacy to allocation: The evolving american health care system. New York, NY: Free Press.

Mechanic, D., & Volckert, E. (1961). Stress, illness behavior, and the sick role. American Sociological Review, 25, 51-58.

Mental health planning survey. (1979). Report of the Mental Health Planning Survey of British Columbia. British Columbia.

Mindel, C. H., & Wright, R., Jr. (1982). The use of social services by black and white elderly: The role of social support systems. Journal of Gerontological Social Work, 4, 107-120.

Miniszek, N. (1983). Development of Alzheimer's disease in Down's syndrome individuals. American Journal of Mental Deficiency Research, 87, 377-385.

Nelson, R., & Crocker, A. (1979). The medical care of mentally retarded persons in public residential facilities. New England Journal of Medicine, 299, 1039-1044.

Neugarten, B. (1974). Age groups in American society and the use of the young-old. Annals of the American Academy of Political and Social Science, 415, 187-198.

Norusis, M. (1988). SPSS-X advanced statistics guide. New York, NY: McGraw-Hill.

Nusberg, C. (1984). Innovative aging programs abroad: Implications for the United States. Westport, CT: Greenwood Press.

Parsons, T. (1951). The social system. New York, NY: Free Press.

Pedhauzer, E. J. (1982). Multiple regression in behavioral research. New York, NY: Holt, Rinehart, & Winston.

Queralt, M. (1983). The elderly of Cuban origin. In R. McNeely & J. Colen (Eds.). Aging in minority groups (pp. 50-65). Beverly Hills, CA: Sage Publications.

Richards, B., & Siddigui, A. (1980). Age and mortality trends in residents of an institution for the mentally handicapped. Journal of Mental Deficiency Research, 24, 99-105.

Robinson, D. (1987). The mentally retarded elderly: Their problems, options, and the future. Unpublished manuscript, University of North Texas.

Roemer, M. (1961). Bed supply and hospital utilization. Hospitals, 48, 51-56.

Rose, T., & Ansello, E. (1987). Aging and developmental disabilities: Research and planning. College Park, MD: Center on Aging, University of Maryland.

Rose, T., & Janicki, M. (1986). Older developmentally disabled adults: A forgotten population. Aging Network News, III(5), 1.

Ruiz, R. A., & Miranda, M. (1981). Chicano aging and mental health. Rockville, MD: National Institute of Mental Health.

Rushing, W. (1975). Community, physicians, and inequality. Lexington, MA: D. C. Heath Publishing.

Schaefer, R. T. (1989). Sociology. New York, NY: McGraw-Hill.

Seltzer, M., & Seltzer, G. (1985). The elderly mentally retarded: A group in need of service. Journal of Gerontological Social Work, 8, 99-119.

Sidel, V. W., & Sidel, R. (1982). A healthy state: An international perspective on the crisis in United States medical care. New York, NY: Pantheon.

Smith, C., & Herman, N. (1988). The chronic mentally ill in Canada. In E. Rathbone-McGuan & B. Havens (Eds.), North American Elders: United States and Canadian Perspectives (pp. 111-121). New York, NY: Greenwood Press.

Snider, E. (1980). Factors influencing health service knowledge among the elderly. Journal of Health and Social Behavior, 21, 371-377.

Starr, Paul. (1982). The social transformation of American medicine: The rise of a sovereign profession and the making of a vast industry. New York, NY: Basic Books.

Starrett, R. A., Mindel, C. M., & Wright, R., Jr. (1983). Influence of support systems on the use of social services by the Hispanic elderly. Social Work Research and Abstracts, 19, 35-40.

Starrett, R. A., Wright, R., Mindel, C. H., & Tran, T. V. (1989). The use of social services by Hispanic elderly: A comparison of Mexican American, Puerto Rican, and Cuban elderly. Journal of Social Service Research, 13(1), 1-25.

Statistics Canada. (1989). Disabled persons have higher institutionalization rate: Focus on seniors. Ottawa, Ontario: Statistics Canada.

Statistics Canada. (1988). Health and activity limitation survey: User's guide. Ottawa, Ontario: Statistics Canada.

Suchman, E. (1965a). Social patterns of illness and medical care. Journal of Health and Human Behavior, 6, 2-16.

Suchman, E. (1965b). Stages of illness and medical care. Journal of Health and Human Behavior, 6, 114-128.

Sweeney, D. (1980). Denied, ignored, or forgotten? An assessment of community services for older developmentally disabled persons. In D. Sweeney & T. Wilson (Eds.), Double jeopardy: The plight of aging and aged developmentally disabled Americans. Ann Arbor, MI: University of Michigan Institute for the Study of Mental Retardation and Related Disabilities.

Tenhoor, W. (1982). United States: Health and personal social services. In M. Hokenstad & R. Ritvo (Eds.), Linking health care and social services (pp. 25-59). Beverly Hills, CA: Sage Publications.

United Nations. (1983). Demographic yearbook 1983. New York, NY: United Nations.

United States National Center for Health Statistics. (1989). Current estimates from the national health survey, 1988. Washington, DC: United States Government Printing Office.

Valle, R., & Mendoza, L. (1978). The elderly latino. San Diego: The Campanile Press.

Wallace, S. P., & Estes, C. L. (1989). Health policy for the elderly. Society, September/October, 66-75.

Walz, T., Harper, D., & Wilson, J. (1986). The aging developmentally disabled person. The Gerontologist, 26(6), 622- 629.

Wan, T., & Soifer, S. (1974). Determinants of physician utilization: A causal analysis. Journal of Health and Social Behavior, 15, 100-108.

Ward, R. A. (1977). Services for older people: An integrated framework for research. Journal of Health and Social Behavior, 18, 61-70.

Wasylenki, D. (1982). The psychogeriatric problem. Canada's Mental Health, 30(3), 16-19.

Wasylenki, D., Doering, P., Lancee, W., & Freedman, S. (1985). Psychiatric aftercare in a metropolitan setting. Canadian Journal of Psychiatry, 30, 329-336.

Weinberg, M. (1977). Penwern Hall: Lifetime care for the mentally handicapped. Social Work Today, 8(44), 7-9.

Wesolowsky, G. O. (1976). Multiple regression and analysis of variance. New York NY: John Wiley and Sons.

Wolinski, F. (1976). Health service utilization and attitudes toward health maintenance organizations: A theoretical and methodological discussion. Journal of Health and Social Behavior, 17, 221-236.

Wolinski, F. (1978). Assessing the effects of predisposing, enabling, and illness-morbidity characteristics on health service utilization. Journal of Health and Social Behavior, 19, 384-396.

Wolinski, F., (1988). The sociology of health: principles, practitioners, and issues. Belmont, CA: Wadsworth.

Wolinsky, F., Coe, R., Miller, D., Prendergrast, J., Creel, M., & Chavez, M. (1983). Health services utilization among the noninstitutionalized elderly. Journal of Health and Social Behavior, 24, 325-336.

Wolinsky, F. & Coe, R. (1984). Physician and hospital utilization among elderly adults: An analysis of the health interview survey. Journal of Gerontology, 39, 334-341.

Wolinsky, F., Moseley, R., and Coe, R. (1986). A cohort analysis of the use of health services by elderly Americans. Journal of Health and Social Behavior, 27, 209-219.

World Health Organization. (1946). Constitution of the world health organization. New York, NY: World Health Organization Interim Commission.

World Health Organization. (1980). International classification of impairments, disabilities, and handicaps. New York NY: World Health Organization.

Wright, R., Creecy, R.F., & Berg, W.E. (1979). The black elderly and their use of health care services: A causal analysis. Journal of Gerontological Social Work, 2, 11-28.

Young, J. (1981). Medical choice in a Mexican village. New Brunswick, NJ: Rutgers University Press.