Veterans Affairs Canada

Evaluation Framework for a Research Study on Continuing Care Services Provided by Veterans Affairs Canada: Final Report

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1. INTRODUCTION

1.1 Background

Veterans Affairs Canada (VAC) and the Government of Ontario have an interest in contributing to the broader policy debate regarding the provision of health services for the elderly in Canada. The current policy trend in Canada seems to focus on short term, acute care replacement home care, provided predominantly by professional care providers.[1] However, experience, and recent studies in Canada,[2] have demonstrated the importance of longer term supportive services as a means to delay institutionalization, and substitute for residential care services. Thus, recent research seems to indicate that longer term home care, including non-professional home support services, can be a means of increasing the efficiency and effectiveness of care services for the elderly and, as a consequence, the overall health care system.

There is also an emerging trend in the field of health services for persons with ongoing care needs, hereafter referred to as continuing care (home care and residential care),[3] to focus on supportive housing. It has long been recognized that some individuals may be admitted to residential services because they can no longer function on their own in their homes but could, in fact, function in a lower cost residential setting with appropriate, structured support services. Thus, given cost constraint, there has been a move across Canada to focus on supportive housing.

Veterans Affairs Canada, for some time, has had a well regarded and effective program of support services for aging veterans called the Veterans Independence Program (VIP) which has supported veterans in the community, and delayed institutionalization. However, not all categories of veterans are, or have been, eligible for the VIP. One case in point is the Overseas Veterans (OSVs) who until recently were only eligible for residential care services.

In the late 1990s VAC had growing waiting lists for residential beds for OSVs across Canada. To address this matter, the decision was made to conduct a pilot project in which VIP services would be made available to OSVs in three cities, Halifax, Ottawa, and Victoria, who were deemed to be at Level 2 in the federal residential care classification system.[4] An internal review of the pilot[5] found that it was well received by OSVs.

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[1] Kirby, M.J. (2002). *The Health of Canadians: The federal role. Volume Six: Recommendations for reform*. Ottawa, Ontario, Standing Senate Committee on Social Affairs, Science, and Technology; Romanow, R.J. (2002). *Building on values: The future of health care in Canada*. Ottawa, Ontario: Commission on the Future of Health Care in Canada; Health Canada (2003) Health Care Renewal Accord 2003. 2003 Firsts Ministers' Accord on Health Care Renewal. Online at http://www.hc-sc.gc.ca/english/hca2003/accord.html.

[2] Hollander, M.J. (2003). *Unfinished Business: The Case for Chronic Home Care Services, A Policy Paper.*Victoria: Hollander Analytical Services Ltd.; Hollander, M.J. and Chappell, N.L. (2002). *Synthesis Report: Final Report of the National Evaluation of the Cost-Effectiveness of Home Care*. Victoria: National Evaluation of the Cost-Effectiveness of Home Care.

[3] The term "continuing care" refers to a range of holistic medical and social services for individuals who do not have, or who have lost, some capacity to care for themselves, including elderly individuals, adults with physical disabilities, adults with mental health needs, and children with special needs. The continuing care services may be provided in the home, in supportive living environments, or in institutional settings.

[4] Level 2 clients are defined as: persons requiring the availability of personal care on a 24-hour basis under medical and nursing supervision for 1½ to 2½ hours of care or supervision per day.

[5] For an overview of the findings of this review see Pedlar, D. and Walker, J. (2004). (in press).

VAC is now interested in conducting a more rigorous study of the OSV VIP initiative both for internal planning and policy development, and as a means of obtaining information that can contribute to broader health policy discussions in Canada. The Government of Ontario (GO) also has an interest in learning about the potential benefits of long term home care and, furthermore, is interested to see if supportive housing could be a cost-effective alternative to residential care. Thus, VAC and the GO have decided to work together to conduct a detailed study of the relative costs and outcomes (i.e., cost-effectiveness) of long term home care (including home support), assisted living, and residential long term care services.

1.2 Purpose and Goals of the Project

The overall purpose of the proposed project is to develop new knowledge to contribute to future policy and planning initiatives. The specific goals of the project are:

- To obtain information which can be used to contribute to the broader policy debate in Canada about health services for the elderly;
- To obtain information on the relative success of the OSV VIP initiative;
- To obtain information about the contributions of long term home care and home support services in regard to the care of the elderly; and
- To obtain information on the relative costs and outcomes (i.e., cost-effectiveness) of long term home care (including home support), assisted living and residential care.

1.3 Development of the Project and the Approach to Research

Based on their mutual interest, VAC and the GO entered into discussions regarding the best way to meet the above goals. A number of different options were considered, from one large study to a multi-component program of research. After extensive review and consultation with external experts, field staff and senior executives a number of options were developed. These options were reviewed in regard to the following parameters:

- The desire to have a study of relevance to VAC;
- The desire to conduct a study which would contribute to the broader policy debate about continuing care and home support;
- The desire to incorporate an analysis of supportive housing into the study;
- The desire to have a credible and rigorous study, the results of which would be publishable in peer-reviewed scientific and/or professional journals; and
- The desire to have a study which could be conducted in a reasonable time period and at a reasonable cost.

Based on the above goals, it was decided to proceed with one project with two Substudies, or component parts: an evaluation of the OSV VIP initiative; and a more comprehensive evaluation of the costs and outcomes of home care, assisted living and residential care. This document constitutes the proposed Evaluation Framework for the overall project and its two Substudies.

2. AN OVERVIEW OF VAC HEALTH SERVICES FOR AGING VETERANS

2.1 Overview

VAC supports a wide range of health and supportive services for Veterans. It also provides funding to "top up" existing provincial services which may not be sufficient to meet the care needs of veterans, and provides funding for services which are not funded by Provincial Ministries of Health.

VAC has a complex structure of eligibility for services based on the type and location of military service which the veteran has had. VAC now also provides health and VIP services to some still-serving Canadian Forces members, members of the Royal Canadian Mounted Police (RCMP), and certain civilians, as well as to their dependents and survivors. Thus, there are numerous categories of veterans and other service recipients, and categories of benefits,[6] within two main programs: the Health Benefits Program (HBP) and the Veterans Independence Program (VIP). There is now also an interim program for Overseas Veterans who receive VIP benefits.

2.2 VAC Health Services

Veterans Affairs Canada offers health benefits including medical, surgical or dental examinations or treatment provided by health professionals; surgical or prosthetic devices or aids and their maintenance; home adaptations to accommodate the use of devices or aids; preventative health care; and prescribed drugs. In addition, clients may be eligible to receive supplementary benefits such as costs associated with travel to receive treatment, and travel costs for escorts, treatment allowances, and costs associated with medical examinations when requested by the DVA. A complete list of health benefits, and descriptions of the benefits, is provided as Table 1 in Appendix A.

There are two groups of clients who are eligible for Health Benefits through VAC. These are referred to as Group A clients and Group B clients. Clients receive a Health Identification Card which they can use to access health services for which they are eligible. Health benefits and services are offered through what is referred to as Programs of Choice (POC). The front of the health identification card identifies if the holder is an A or B client. The types of services (Program of Choice) which the cardholder is eligible to receive are noted on the back. Thus, the receipt of services is based on eligibility criteria and assessed need. There are also limits to the amount VAC will pay under the Health Benefits Program for particular services.

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[6] For an overview of what services are available to which individuals see: Veterans Affairs Canada (April, 2004) *A guide to access VAC health benefits and the Veterans Independence Program*, Charlotteown, PEI: Veterans Affairs Canada.

Group A clients only receive benefits that are related to the particular client's pensioned condition, for example, hearing aids or other benefits for people who have reduced, or lost, their hearing due to their service such as people involved in artillery. All payments for benefits for Group A clients require prior authorization from VAC before the service can be provided. All Group A clients are eligible for ambulance services, medical travel services, hospital services, medical services and prescription drugs, regardless of the pensioned condition, but the receipt of services must be clearly linked to a pensioned condition. Other services are approved on a case by case basis. Group A clients include:

- Veterans and civilians, including retired members of the Canadian Forces and the Royal Canadian Mounted Police as well as regular serving civilian members of the RCMP, who have been granted a disability pension by Veterans Affairs Canada.

Still-serving members of the Canadian Forces and regular serving members of the Royal Canadian Mounted Police who are VAC disability pensioners must continue to receive all medical treatment and health benefits exclusively from the Department through which they are employed until released. Once released from the Canadian Forces or RCMP, disability pensioners will commence receiving their health benefits directly through Veterans Affairs Canada.

Group B clients have access to services based on a clearly demonstrated health need, to the extent such services are not covered by a provincial health plan or a private plan. VAC is considered to be the payer of last resort and only covers payments for services which are over and above the services covered by provincial and/or private plans. Group B clients first bill their provincial and/or private insurer and submit claims for "top up" amounts (or for the full amount where the service is not covered by the provincial and/or private insurer) to VAC. Group B clients include:

- Income qualified Veterans and civilians, including civilian and War Veteran Allowance recipients;

- Veteran, civilian, and Special Duty Area pensioners who are receiving services under the Veterans Independence Program;

- Canada Service Veterans receiving services under the Veterans Independence Program; and

- Veteran pensioners or Overseas Service Veterans receiving care in a Departmental or contract care facility.

2.3 The Veterans Independence Program (VIP)

2.3.1 Overview of the VIP

The roots of the Veterans Independence Program at VAC can be traced to 1957 when Dr. E.B. Convery, Adviser in Geriatrics, penned a 'Charter for Aged Veterans'. Based on his concerns Convery called upon Veterans Affairs to launch a program for aging veterans. His vision included

day care in its hospitals, home delivered meals, supportive services in the home, social and health visiting, regular health examinations and rehabilitation services. He recommended close cooperation with the Royal Canadian Legion and other veterans and senior citizens organizations in order to develop recreational and educational programs for Canada's aging veterans. He foresaw teams of health workers working closely together to deliver these programs. Convery's vision foreshadowed many of the core ideas and initiatives which would ultimately inform the Aging Veterans Program, developed in the 1970s, launched in April 1981, and renamed the Veterans Independence Program in 1985.

A key policy driver and theme underlying the Veterans Independence Program has been what could be called "bed avoidance". That is to say, the development of home care initiatives at Veterans Affairs has generally been linked to pressure, sometimes urgent, arising from waiting lists for residential beds as well as the consequent pressure to greatly escalate the number of residential beds available.

In its current formulation, the VIP is a national home care program that assists clients to remain healthy and independent in their own homes or communities by offering a variety of services. VIP works in concert with other federal, provincial, or municipal programs. The services an eligible client may receive depend on their particular circumstances and health needs. VIP benefits include: grounds maintenance; housekeeping; personal care; home adaptations; nutrition services; health and support services provided by a health professional; ambulatory health care; access to community long term care beds (i.e., intermediate care beds when a client is no longer able to function at home); and social transportation (Table 2 in Appendix A provides a listing, and description, of VIP services). Home care services are provided using a comprehensive assessment and the development of a customized care plan.

The following persons are eligible for the VIP:

- Veterans whose income is insufficient to cover the costs of home care or long term care;
- Disability Pensioners who require home care or long term care due to limitations directly related to their pensioned condition;
- Veterans with exceptional health needs; and
- Seriously Disabled Veteran Pensioners meaning anyone in receipt of a combined total of 78% disability pension, or above (Regular Force Special Duty Area Pensioners and Military Service Pensioners are not included in the "Seriously Disabled Veteran" provision.)

VIP is not intended to duplicate or replace existing provincial or community services. When provincial or local services are not sufficient to meet a client's needs, VIP services may be approved to complement or "top up" the services provided by the province or a publicly funded local agency.

2.3.2 Overview of the OSV VIP

Veterans Affairs Canada has extended the OSV VIP At Home Pilot Project to constitute a new program within VAC. The policy which frames this new program is referred to as the "Provision of VIP Services at Home to Veteran Clients on a Waiting List for a Priority Access Bed (PAB)" This policy applies to OSVs, Veterans Pensioners and Dual Service Veterans who are on a waiting list for a PAB, and will be referred to in this text as the Overseas Service Veterans, Veterans Independence Program (i.e., OSV VIP). Thus, the OSV VIP is a program in which home care serves as a substitute for residential care services. To be eligible for the OSV VIP, the following conditions must apply:

- A VAC nursing assessment or an external agency assessment which may be used in place of the VAC form, must indicate that the Veteran client needs Federal Type II or Type III care, and has applied for an been placed on a wait list for a PAB;

- A PAB bed is not available to meet the Veteran client's need within the normal catchment area of Veteran client (i.e., the geographic are in which the veteran resides); and

- These services are not available to the Veteran client as an insured service under a provincial health care system.

Veteran clients who are in receipt of VIP services under the OSV VIP policy are eligible for treatment and supplementary benefits for any condition, unless such benefits are covered by a province. Thus, the eligible Veteran client must have been assessed in accordance with Departmental standards and a determination must have been made that the provision of the services outlined below would assist the Veteran client to remain at home while awaiting admittance to a PAB.

Veteran clients on the OSV VIP are entitled to receive the following:

- Health and support services by a registered health professional;

- Personal care services other than by a health professional;

- Housekeeping services;

- Grounds maintenance;

- Access to nutrition;

- Ambulatory health services; and/or

- Home adaptations.

Social transportation is not provided as this service is available to income-qualified veterans only. In addition, a Veteran pensioner receiving an attendance allowance is limited to fifty-nine (59)

days of personal care services annually. Finally, as the provision of services is intended to bridge a short term need pending the Veteran client's admission to a facility, home modifications are restricted to those essential for the safety of the Veteran (i.e., where failure to make the modifications would prevent the individual from living at the residence, and where there are no temporary solutions available).

OSV VIP services are terminated:

- The date following the Veteran client's admission to a long term care facility;
- The date of the Veteran client's refusal to accept placement in a suitable PAB results in the PAB being vacant;
- Once an official determination is made that care at home is no longer appropriate; or
- The date of the Veteran client's death.

Survivors of Veteran clients who died at home while awaiting a PAB may be eligible to a continuation of VIP housekeeping and/or grounds maintenance services, as appropriate.

2.4 Discussion

Combining the services provided through the Health Benefits Program and the Veterans Independence Program, VAC provides perhaps the widest range of services of any home care program in Canada. It is currently also the only truly national home care program in Canada. Thus, VAC provides a comprehensive program of care with a wide range of services, and has made a commitment to provide these services in depth, that is, to fully met the care needs of clients. In contrast to current policy directions, VAC has made a commitment to providing home support services on a long term basis to delay, and substitute for, institutional care. Clients are offered choices from a range of services to meet their needs and family caregivers are supported. Thus, VAC provides an alternative vision regarding home care and home support which, increasingly, is in contrast to current policy directions focusing on short term, professional home care. Given this alternative vision and its implications for future policy, it is now most timely to conduct a comprehensive evaluation of the VAC model of home care.

3. LITERATURE REVIEW

3.1 Introduction

There are a number of components to the proposed study. Given that the costs and benefits of home care, assisted living and residential care will be studied, this chapter will address the following issues:

- The extent to which home care and home support can delay admission to residential care and acute care;

- The extent to which home care and home support are a cost-effective alternative to residential care; and

- The extent to which supportive housing is, or is not, cost-effective, in the broader continuum of care.

While the following literature review includes acute care related findings, the topic of short term, acute care replacement, home care is not a primary objective of this study.

3.2 Preventive Home Care

3.2.1 Introduction

The existing literature evaluating the cost-effectiveness of the maintenance and preventive function of home care is relatively limited. While a comprehensive literature research was conducted, relatively few documents were found on this topic.

In reviewing the materials obtained, it was ascertained that there were very few Canadian studies on the maintenance and preventive function of home care. In addition, the typology of the three models or functions of home care (prevention/maintenance, long term care residential substitution, and acute care substitution), which is widely used in Canada, does not appear to be used in the international literature. Similarly, linkages between levels of care and preventive activities are generally not found in the international literature. The most relevant studies in the international literature typically focus on certain types of preventive programs, rather than on the broader preventive functions of home care *per se*. Thus, this section will have two primary parts, a sub-section on Canadian studies of the preventive aspects of home care and a sub-section on international studies of particular preventive programs.

There are generally considered to be the three levels of prevention. They are:

- **Primary Prevention** which focusses on general preventive activities for a population and includes programs such as lifestyle counselling and immunization. Specific activities would include the promotion of regular aerobic exercise, tobacco reduction and safe driving initiatives.

- **Secondary Prevention** which focusses on the identification of individuals at risk through preventive activities related to early detection of subclinical disease by screening or case finding to prevent disability. Examples of such activities include screening questionnaires for problem drinking, hearing impairment and diminished visual activity, and regular mammography and clinical examinations for breast cancer.

- **Tertiary Prevention** which focusses on minimizing disability and handicap from established diseases.

(Adapted from Patterson and Chambers, 1995)

The proposed project focusses primarily on tertiary prevention aimed at allowing people to function at their optimal capacity and reducing the rate of deterioration in health and functional status.

3.2.2 Canadian Studies on the Maintenance and Preventive Function of Home Care

3.2.2.1 Studies Indicating that Preventive Home Care is Not Cost-Effective

Patterson and Chambers (1995) note that while there is some evidence for the effectiveness of primary and secondary prevention, the evidence on tertiary prevention seems to indicate that it is not cost-effective in regard to improving the functional status of older people. They note that there is greater utilization of community services such as physiotherapy, domestic help, and chiropody, and that there are more referrals for specialist opinions (Patterson and Chambers, 1995, p. 1614).

There were a few Canadian studies which were specifically designed to evaluate whether or not preventive home care is cost-effective, Contandriopoulos, Tessier and Larouche (1986) in a study conducted in Lachute, Québec, looked at two different cohorts, one before a home care service was introduced and one after it was introduced. The hypotheses in the study were the following:

- Setting up home aid services will decrease the utilization of health care resources by those 65 and over (global impact); and

- The establishment of home aid services will decrease the utilization of the resources of the health care system by the program's clients (specific impact).

(Contandriopoulos, Tessier and Larouche , 1986, p. 733)

The authors used multiple regression to study the impacts of socio-demographic, economic and health status variables, and the presence or absence of home care, as independent variables. The utilization of hospital inpatient services, emergency and outpatient hospital services, physician services, and home care services, were used as dependent variables. While the authors only present findings for the use of hospital services they note that the results were similar for all of the services. In both the global and specific impacts analyses the presence of home aid services was not found to be a significant variable in regard to the use of hospitals or other services. The two variables which were significant were age and the number of tests or examinations the client had received.

Another Canadian study was conducted in Saskatchewan (HSURC, 2000) and was a retrospective, observational cohort study which used administrative data. Some 26,490 seniors from across Saskatchewan were in the sample of whom 36 percent (9,524) received preventive home care (defined as being at level 1 or 2 of a four level classification system) and nine percent (2,484) were in seniors housing. This cohort of seniors was studied for eight years. The major findings of the study were that 50 percent of those receiving preventive home care were more likely to lose their independence or die than those not receiving this service. In addition, costs for clients on preventive home care were three times as high as for clients not receiving this service.

There are a number of issues that could have affected the results of this study. The first issue is the extent to which the researchers were able to have true comparability between clients on home care and those not on home care. The authors note that they had a limited number of variables with which they could adjust the non-home care subjects in the study. This could be a serious limitation as the people who are accepted into a home care program must have care needs sufficient to make them eligible for services. In addition, the fact that home care services are available is widely known, or easily discovered, by prospective clients or family members making a few phone calls to the health region office or to their physician. Thus, there is good reason to believe that individuals on home care have higher care needs, and greater functional deficits, than those who are not on home care because if the non-home care individuals had the same needs, many of them would have applied for, or been "self-selected" into, home care services.

A major shortcoming of the study was that the research team did not have data on the functional status of clients not in home care. As classification systems in Canada for the elderly and people with disabilities rely heavily on functional status (the ability to perform activities of daily living such as bathing and eating) and, in some jurisdictions, the ability to perform instrumental activities of daily living such as shopping, it would be difficult to make statistical adjustments to truly match clients on home care, and not on home care, without information on the functional status of the people in the study. Thus, there is some question about the comparability of the home care and non-home care people in the Saskatchewan study. In addition, the study did not have information on the availability of informal supports, another important factor that can have an impact on service utilization and health outcomes.

In order to address the above issues of selection bias, several sets of statistical adjustments were made. Even though there is no reason to believe that the adjustments were inappropriate, one has to question the extent to which a series of different types of adjustments, based on a limited administrative data set that lacks information about functional status, can reflect the complex and real world dynamics of the home care system and the characteristics of home care clients. The researchers themselves recognized most of the above noted shortcoming in their study (HSURC, 2000).

3.2.2.2 Studies Indicating that Preventive Home Care is Cost-Effective

In contrast to the above findings, other recent Canadian studies on the cost-effectiveness of preventive home care indicate that it is cost-effective. Hollander (2001a) conducted a study of a natural experiment which occurred in British Columbia in the 1994 to 1995 period in which some health regions cut people from care who were at the lowest level of care need and were only receiving housecleaning services (one component of home support services), and some regions did not make such cuts. He studied the overall costs to the health care system of people who were cut from service in two health regions compared to people who were not cut from service in two similar regions where there were no, or limited, cuts. In the year before the cuts the average annual cost per client for those who were cut from service was $5,052 and the cost per client for the comparison group was $4,535. In the third year after the cuts were made the comparative costs were $11,903 and $7,808, respectively, for a net difference of some $3,500. Thus, on average, the people who were cut from care cost the health care system some $3,500 more in the third year after the cuts than people

who were not cut. Total costs over the three year period after the cuts were $28,240 and $20,543, respectively, for those who were cut from care compared to those who were not cut.

In examining the data, it was found that most of the differences in costs were accounted for by increased costs for acute care and long term residential care. Over the three years, there was a net difference in hospital costs of some $2,300 (i.e., an average additional costs of $2,300 for people who were cut from care compared to those who were not cut) and residential long term care service costs of some $3,200. Thus, the findings of the study seem to indicate that even basic home support services can have a significant impact on the cost-effectiveness of our health care system. While the reasons for increased costs could not be directly ascertained in the study, there was some anecdotal evidence to indicate that the findings are consistent with the following scenario. The people who were receiving cleaning services had been assessed by a health professional as needing government-funded services to enable them to remain independent. The assessment would have indicated that the clients needed cleaning to maintain a normal, sanitary home environment due to frailty or some other limiting condition. Thus, one can hypothesize that if these people were not able to pay for cleaning, or did not have family members who could assist, or in some cases even if they did, they may have attempted to clean and vacuum by themselves. This may have led to an accident requiring hospitalization, or a more rapid deterioration in function which may have led to institutionalization.

With regard to Canadian studies on specific program interventions, Darby (1992) found that a Quick Response Team in the Greater Niagara Hospital in Ontario was able to prevent 206 admissions from the Emergency Department to the hospital of frail, elderly adults, out of 237 referrals over a 12 month period. While Darby does not provide a cost comparison, he does indicate that by being able to send people home, with enhanced services, the Quick Response Team was able to free up the equivalent of 8 to 10 beds for a one year period.

Larson, Odegard and Brown (1992) conducted a comparative cost analysis of a Respiratory Home Care Program in Alberta for patients on ventilators who were cared for in the hospital (in a long stay unit) and at home. While the sample size was fairly modest, they found that by treating patients at home through the Respiratory Home Care Program, they were able to save some $2.7 million per year as a result of the cost differential of treating 27 patients at home compared to the hospital. In a study conducted in Prince Edward Island, Robertson and Kayhko (2001), found that an intensive home care follow-up program for first time post-myocardial infarction patients provided a cost-effective alternative to traditional cardiac rehabilitation programs.

Finally, Detsky, McLaughlin, Abrams, Whittaker, Whitwell, L'Abbé and Jeejeebhoy (1986) conducted an economic evaluation of a home parenteral nutritional (HPN) program in Toronto. They found that, over a 12 year time period from 1970 to 1982, HPN resulted in a net savings of $19,232 per patient, over the 12 year period, compared to Total Parenteral Nutrition provided in the hospital.

3.2.3 International Studies on Preventive Home Care

3.2.3.1 Introduction

The findings from the international literature tend to fall into four categories: long term substitution of home care for services provided in hospital; case management and hospital related

approaches to prevent re-admissions to hospital; community based programs to reduce admissions or readmissions to hospitals and care facilities; and other special topics. While results were somewhat mixed, the preponderance of studies seemed to indicate positive and/or cost-effective outcomes for preventive home care initiatives.

3.2.3.2 Long Term Hospital Substitution

In an Israeli pre-post study, Guber, Morris, Chen and Israeli (2002) compared the costs of people receiving a home care management system for respiratory patients to the costs of providing respiratory care to the same people in hospital before their transfer to home care. The average length of stay in hospital of the people on the home care program was 181 days per patient and the average time on home care itself was 404 days. The comparative average monthly cost for home care patients was one third of the costs they had incurred in the hospital, that is $3,547 and $11,000 respectively.

In an American study, Harjai, Mehra, Ventura, Lapayre, Murgo, Stapleton and Smart (1997) conducted an analysis of the costs and outcomes of home IV inotropic therapy for patients with with advanced heart failure. Based on a retrospective analysis of 24 patients treated at home and in hospital, they concluded that home IV inotropic therapy "reduces hospital admissions, length of stay, and cost of care and improves functional class in patients with advanced (NYHA class IV) heart failure."

3.2.3.3 Case Management and Hospital Related Approaches

Mixed results were found by Stuck, Aronow, Steiner, Alessi, Büla, Gold, Yuhas, Nisenbaum, Rubenstein and Beck (1995) in California with regard to a trial of in-home comprehensive geriatric assessment for elderly people living in the community. This was a three-year, randomized, controlled trial of in-home comprehensive geriatric assessment and follow-up for people 75 years of age or older living in the community. There were 215 people in the intervention group and 199 people in the control group. The latter received regular medical care. Nine people in the intervention group compared to 20 in the control group were permanently admitted to nursing homes and, after three years, 12 percent of surviving participants in the intervention group, compared to 22 percent of people in the control group required assistance in performing the basic activities of daily living. That is, a higher proportion of clients had deteriorated in regard to their functional status over time in the control group. However, the proportion of people needing assistance with the instrumental activities of daily living did not differ significantly between the two groups. Similarly, the number of admissions to acute care hospital, and short term nursing home stays, did not differ significantly between the two groups. In the second and third year of the study the intervention group members had significantly higher numbers of visits to physicians than the control group members.

Rich, Beckham, Wittenberg, Leven, Freeland and Carney (1995) conducted a study in St. Louis on the effects of a nurse-oriented, post-discharge multidisciplinary intervention to prevent the readmission to hospital of elderly patients with congestive heart failure, compared to conventional care. In this prospective, randomized trial, it was found that the treatment group had 56.2% fewer readmissions for heart failure and 28.5% fewer admissions for other causes within 90 days of hospital discharge compared to people receiving conventional care. For the treatment group, the overall costs of care was also $460 less per patient than for the control group.

In an Australian study, Lim, Lambert and Gray (2003) found that patients receiving post-acute care coordination used fewer hospital days in the six months post discharge than patients receiving usual care and that this resulted in an average net savings of $1,545 per person for the treatment group. There were also two Australian studies on home care services for people with congestive heart failure (Stewart, Marley and Horowitz, 1999; Stewart and Horowitz, 2003). Stewart Marley and Horowitz (1999) in a randomized study found that a multi-disciplinary home-based intervention, consisting of a home visit by a cardiac nurse resulted in fewer unplanned readmissions and associated days in hospital compared to usual care. There were 100 patients in both the treatment group and the control group. The overall hospital costs for the treatment group, in Australian dollars, was $490,300 compared to $922,600 for the control group. In a more recent study, Stewart and Horowitz (2003) found in their own work, and in a broad literature review, that home based care for chronic heart failure patients is some 30 to 50 percent less than usual care.

3.2.3.4 Community Based Programs

With regard to the impact of home care services on preventing re-admissions to hospital. Melin and Bygren (1993) in a Swedish study evaluated the impacts of a primary home care intervention program for people discharged from a short stay hospital. Some 249 clients were randomly assigned to the intervention group (150) and to the control group (99). The intervention group received services from a physician-led primary home care and home assistance team providing 24-hour services. The control group received standard care. The clients in this study were frail elderly individuals with higher level care needs. At 6-month follow-up, the intervention group members showed significant improvements in the instrumental activities of daily living ($p<.04$) and outdoor walking ($p<.03$). They also used less long term hospital services ($p<.001$) than controls. Unfortunately, the authors do not provide a comparative cost analysis for the two groups.

In a randomized controlled British study, Townsend, Piper, Frank, Dyer, North and Meade (1988) analyzed the impact of a community support program using care attendants, for a two week period, compared to standard care. After 18 months, they found that hospital readmission rates were significantly higher for the control group resulting in 30.6 hospital days for the control group compared to 17.1 days for the treatment group. The authors indicate that if the results are extrapolated to all patients 75 years of age who live alone, an average sized health district could save some 23 hospital beds using this approach, at a net annual savings of 220,000 British pounds.

In an American study of a senior's health promotion program, Nuñez, Arbruster, Phillips and Gale (2003) found that in a community based, nurse-managed health promotion and chronic disease management program for community-residing older adults, such adults had better health and social functioning, and fewer doctor visits and hospital days per year, than a national comparison group.

There were two Italian studies on the impact of an integrated home care program (including social and health services) on hospital use (Landi, Gambassi, Pola, Tabaccanti, Cavinato, Carbonin and Bernabei, 1999; Landi, Onder, Russo, Tabaccanti, Rollo, Federici, Tua, Cesari and Bernabei, 2001). These studies indicate a significant reduction in hospitalizations, hospital days and costs, when one compares data for the same patients before and after the implementation of the integrated home care program.

3.2.3.5 Special Topics

In a study of comprehensive rehabilitation services for elderly homebound patients with arthritis and orthopedic disability, it was found that there were no overall significant differences in functional scores, institutionalization or contentment between clients receiving a goal oriented outreach rehabilitation program and those receiving usual care (Liang, Partridge, Larson, Gall, Taylor, Berkman, Master, Feltin and Taylor, 1984).

An important preventive and supportive program is that of preventing falls among the elderly. Rizzo, Baker, McAvay and Tinetti (1996) conducted a cost-effectiveness study of a multifactorial, targetted prevention program for falls among community living elderly persons. Their study consisted of 301 participants aged 70 years of age or older who possessed at least one targetted risk factor for falling. Some 153 participants were randomly assigned to the treatment group and received a combination of medication adjustment, behavioural recommendations, and exercises, determined by their baseline assessment. The remaining 148 participants were randomized to the control group and received a series of home visits by a social work student. The findings of the study were that, overall, the mean health care cost was $2,000 (US) less for the treatment group than the control group. This reduction in cost was due to lower overall health care costs and fewer falls. Subgroup analysis indicated that within the treatment group, the strongest effects were for individuals at high risk of falling, defined as having at least four of the eight targetted risk factors.

Mann, Ottenbacher, Fraas, Tomita and Granger (1999) conducted a study of the effectiveness of assistive technology and environmental interventions in maintaining independence and reducing home care costs for the frail elderly. This was a randomized controlled trial of 104 home based frail elderly persons living in western New York state. All 104 participants received a comprehensive functional assessment. The 52 people in the treatment group received assistive devices and environmental interventions depending on their needs. The 52 clients in the control group received usual care services. After an 18 month intervention it was found that scores for the Functional Independence Measure (FIM) were reduced for both groups but that there was a significantly greater decline for the control group. While the costs of assistive devices and environmental interventions were higher for the treatment group ($2,620) than the control group ($443), the control group had significantly greater expenditures for institutional care ($21,846 versus $5,630) and for nurse and case manager visits ($1,035 versus $536). The authors note that there was no statistically significant difference for overall costs, even though the average cost per person was $14,173 for the treatment group and $31,610 for the control group.

3.3 Home Care as a Substitute for Residential Care

3.3.1 Findings that Home Care is Not Cost-Effective[7]

A considerable amount of research has been conducted on studies of home care as a substitute for residential services in the United States. Much of the literature is based on two series of federally funded studies: 14 community care demonstration projects which were funded in the late 1970s and the early 1980s, and an additional 10 projects which were funded between 1982 and 1985.

Given the nature of the American continuing care system in the 1980s, it was considered that the appropriate way to study whether or not home care was a cost-effective alternative to residential care was to introduce case management (often with an enhanced home care program) into a community and then randomly assign eligible clients to existing community services or to enhanced services. Researchers then determined whether or not the enhanced services led to greater quality of life and client satisfaction, decreased morbidity and mortality, increased functional status, and reduced admissions to long term care facilities and hospitals.

Generally, researchers found that the experimental group had greater satisfaction and quality of life and somewhat reduced costs relative to the control group (Mathematica Policy Research Inc., 1986, April). However, when the costs of the enhanced home care program were added into the equation, the overall costs were generally greater for the experimental group than for the control group (Berkeley Planning Associates, May 1985; Mathematica Policy Research Inc., 1986, May).

A study which illustrates the general approach used in the United States to analyze the cost-effectiveness of home and community based services is that of Skellie, Favor, Tudor and Strauss (1984) who analyzed the Georgia Alternative Health Services Project. Enrollees in this study were required to be Medicaid-eligible, at least 50 years of age, and certified as eligible for residential care. The experimental group was comprised of 444 individuals who received a comprehensive range of community based services including alternative living services, adult day rehabilitation and home delivered services. They also received screening and case management services. The control group of 135 individuals was eligible to receive existing community services. Clients were randomly assigned to the two groups.

After the first two years of enrolment, 22% of the control group (that is, individuals receiving standard community services) and 21% of the experimental group (that is, individuals receiving enhanced community services) were admitted to a long term care facility. Thus, there was no difference between the groups. It was found that the costs of the experimental group were considerably higher than that of the control group and, as such, constituted "add-on" costs to Medicaid-reimbursed services. The authors noted that the cost per quarter for the experimental group was, however, considerably lower than the cost for residential care and suggested that savings should be possible where home care could be substituted for residential care. The authors also noted that it

[7] There is a growing literature on the techniques of economic analysis in health care. Drummond, O'Brien, Stoddart, and Torrance (1997) note that economic analysis focuses on two aspects: the costs and consequences of activities; and choices between alternatives. There are four methods of economic evaluation, namely, cost-minimization, cost-effectiveness, cost-utility, and cost-benefit analysis. For ease of reporting, the term *cost-effectiveness* will be used here as a generic term to refer to all four methods.

was difficult, under a voluntary screening system, to select individuals for whom community based services could be cost-effective. In addition, given the low demand for project services, the low volume of clients screened resulted in higher administrative and direct service costs.

In a related study, Vertrees, Manton and Adler (1989) examined the Georgia and California Medicaid waiver programs. These programs were enhancements of earlier programs and placed a greater emphasis on screening to ensure that those receiving community based services would be likely candidates for admission to a long term care facility. The authors found that, for California, the monthly cost of community care was $350 while monthly long term care facility costs were $1,144 for a savings of $794. However, not all individuals admitted to the community program were eligible for residential care and for those who were eligible, community services did not prevent admissions. This also occurred in Georgia. The rate of admission to a long term care facility was similar for controls (that is, individuals receiving standard community services) and for those in the enhanced community program.

Hedrick and Inui (1986) analyzed 12 studies on the cost-effectiveness of home care that used experimental or quasi-experimental research designs and were deemed to be methodologically sound by the authors. These studies involved chronically ill individuals. Hedrick and Inui found that home care services appeared to have no impact on mortality, patient functioning or long term care facility placements. They also found that home care had either no effect on hospitalization or tended to increase the number of hospital days. In addition, they found that either the cost of home care was not affected or was increased by up to 15 percent.

Weissert (1985) argued that it is difficult to make home and community based services cost-effective because: community care is an add-on to other services and is not a substitute for residential care; community care does not reduce institutionalization rates; only short long term care facility stays can be avoided by community based care; screening and assessment costs are high; overhead costs can be relatively high particularly when community services are small; and improvements in health status are limited.

Weissert et al., (1988) expanded on this analysis in a study that looked at over 700 citations published since 1960 with regard to the relative costs of community and home based services versus residential long term care services. Of the 700 documents, 150 were selected for review and the 27 most rigorous and generalizable studies were chosen for detailed analysis. Weissert et al. concluded that their analysis indicated that home and community based long term care services usually raised overall health care service use and costs. They also noted that small savings for institutional care were often offset by the costs of the new home and community service.

There is also some evidence that home care is not a cost-effective alternative to residential care from countries other than the United States. Two studies from Taiwan (Chiu, L., Shyu, W-C., and Liu, Y-H, 2001; Chiu, L and Shyu, W-C, 2001) indicate that residential services are considerably more cost-effective than home care. However, a significant portion of the cost is attributed to the labour provided by informal caregivers, at replacement wages. If one eliminates the informal labour costs, then home care (including out-of-pocket expenses of informal caregivers and clients) is less costly than residential care.

Given the findings of studies such as those reviewed above, American, and other researchers concluded that home care was not a cost-effective alternative to residential care because it did not decrease the rate of admission to long term care facilities and, therefore, that home care constitutes an add-on cost.

3.3.2 Findings that Home Care is Cost-Effective

3.3.2.1 International Studies

The research reviewed above suggests that home care is not cost-effective compared to residential care. However, the research generally does not compare the costs of community and home based services versus the costs of long term residential care directly. Rather, the studies tend to compare costs associated with the introduction of a new home care service to existing community services. Several recent studies have shown that when the costs of community based services are compared directly with the costs of long term care services, home care has the potential to be a cost-effective substitute for facility care.

Weissert, Lesnick, Musliner and Foley (1997), in an American study, showed that home care can be cost-effective when home and community based services are designed to be a substitute for facility care. In a study examining the Arizona Long Term Care System, which was the first capitated, long term care Medicaid program in the United States, Weissert and his colleagues noted that the cost of home and community based services was substantially less than the cost of facility care. The investigators suggested that savings probably came from several sources, including the use of a payment methodology that encouraged program contractors to place clients in home and community based services rather than risk losing money by using more facility days than their monthly capitated rate allowed.

There are also other international studies which demonstrate the cost-effectiveness of home care. A Belgian study of people with dementia (Scurvee-Moreau, J., Kurz, X., Dresse, A and the NADES Group; 2002) found that the average monthly costs in Belgian francs was 445.50 francs for dementia patients treated at home and 2,301.70 francs for dementia patients in institutions. The comparable costs for persons with severe dementia were 556.88 francs and 2,465.28 francs, respectively. Stuart and Weinrich (2001) conducted a broad systems level analysis of the costs of continuing care services in Denmark by comparing the cost trends in Denmark and the United States. Denmark has for many years had an integrated system of care delivery for the elderly and persons with disabilities which puts a priority on home care, and includes a home support component. The authors found that, over the twelve year period after this integrated system was put into place, Danish long term care expenditures leveled off, while expenditures in the United States continued to increase over the same time period. More specifically, they found that for the period 1985 to 1997 per capita expenditures on continuing care services per persons 65 years of age or older increased by eight percent in Denmark and 67 percent in the United States. For persons 80 years of age or older costs actually decreased by 12 percent in Denmark while they increased 68 percent in the United States. It appears that the savings in Denmark were the result of reducing nursing home beds by 30 percent. In the United States, over the same period of time (1985 to 1997) there was a 12 percent increase in nursing home beds. Thus, an increasing proportion of people were cared for at home without decreases in client satisfaction or health status.

3.3.2.2 Canadian Studies

With regard to findings from Canada, Hollander (2001b) in a study of the cost-effectiveness of long term home care found that over time, and for all levels of care needs, home care, on average, was significantly less costly than care in a long term care facility. For example, average annual costs to government for people with moderate care needs (Intermediate care 1 or IC1) in the mid-to-late 1990s, in British Columbia, was $9,624 for persons on home care and $25,742 for people in institutions. For people at the highest, or chronic, level of care (Extended Care) the corresponding costs were $34,859 and $44,233. In a related study, Hollander, Chappell, Havens, McWilliam and Miller (2002) note that similar cost differences are seen if one adopts a broader societal perspective which incorporates out-of-pocket expenses and the care time of informal caregivers into the analysis.

It should be noted that the savings from substituting home care services for residential services are not only theoretical. Actual savings were achieved in British Columbia by holding down future construction of long term care facilities and making investments in home care. (Hollander 2001b). Utilization of home and community care services in fiscal 1984/85 was 92 person years per 1,000 population 65 years of age and older and was 71.7 person years, or beds, for residential care for a total of 163.7. The overall utilization rate was also 163.7 for the 1994/95 fiscal year, but the utilization rate for residential services (long term care and chronic, or extended care, services) was reduced to 50.7 and the utilization rate of home care increased to 113. Thus, over a 10 year period, due to a pro-active policy of substituting home care services for residential services, the utilization of some 21 person years per 1000 population 65 years or older was shifted from residential care to home care for persons with ongoing care needs.

What role has home support played in regard to the cost-effectiveness of long term, or chronic, home care? It turns out that home support is central to this form of home care and the cost-effective substitutions it can engender. Hollander (2001b) provides evidence on the relative costs of home support and professional home care (e.g., nurses, physiotherapists) in long term home care. He found that approximately 90% of the expenditure for long term home care, for people with higher level care needs, were for home support services while 10% were for professional services. Thus, the cost-effectiveness of home care compared to residential care is, in large part, due to home support services.

Some Canadian studies have focused on the cost-effectiveness of home care for individuals with cognitive impairments. Using data from the Canadian Study of Health and Aging (CSHA),[8] Østbye and Crosse (1994) calculated the net economic costs of dementia, that is, costs that were incurred because of the dementia, using both direct costs (such as home support, physiotherapy, respite care, day centre care) and indirect costs (such as time spent by informal caregivers in assisting clients with activities of daily living). Østbye and Crosse estimated that the annual direct

[8] The Canadian Study of Health and Aging Working Group (1994) estimated that approximately 8% of the population 65 years of age and older are affected by some form of dementia, and that the prevalence of dementia increases with age, affecting about 35% of those 85 years of age and older. Approximately 50% of those with dementia live in the community. A recent study estimated that 60,150 new cases of dementia are identified each year in Canada (Canadian Study of Health and Aging Working Group, 2000). Alzheimer's disease is the most common form of dementia, accounting for 64% of the individuals with dementia (Canadian Study of Health and Aging Working Group, 1994).

costs of caring for someone without dementia in the community was $1,790. In contrast, the annual direct costs of caring for someone with dementia in the community was estimated to be $4,506 for those with mild dementia and $8,109 for those with severe dementia. For individuals with dementia, it was estimated that the annual net cost of providing care for those in the community was $10,100 ($4,970 for direct costs and $5,130 for indirect costs). In contrast, it was estimated that the annual net cost of providing care to individuals with dementia in a facility was $19,100.

Hux, O'Brien, Iskedjian, Goeree, Gagnon and Gauthier (1998), also using data from the CSHA, examined the costs of caring for individuals with Alzheimer's disease. The authors found that costs increased significantly in relation to the severity of the disease. The annual societal cost, per person, was estimated to be $9,451 for those with mild Alzheimer's disease and $36,794 for those with severe Alzheimer's disease. This study provided detailed cost estimates for both formal and informal care services. While the authors did not do a direct comparison of all costs for community and residential services, they did provide comparative costs for component parts of their analysis. A comparison of the community and facility costs for those with severe Alzheimer's disease indicated that the cost of residential care was significantly higher than the cost of care in the community.

3.4 Assisted Living

3.4.1 The Emergence of a New Sector

3.4.1.1 Definitions of Assisted Living

Assisted living is a new and emerging component of the care continuum for seniors. While new, it has many antecedents, which have, in fact, been in place in various forms over time. What is new is a shift by policy makers to provide more of a focus on this sector and begin to promote and develop assisted living arrangements more formally into the care continuum. There is no current, agreed upon, definition of assisted living. *Assisted Living* is, in fact, an umbrella term which, at least currently, seems to incorporate a number of new, and previously existing, housing arrangements such as group homes, congregate living, room and board (to the extent some additional supportive services were included), group living situations, and supportive housing.

Nyman (1994) states that assisted living can be defined in relation to two dimensions: the nature of the commodity and types of services provided; and the care needs of the person receiving the services. He cites Kane and Wilsons' definition of assisted living as being:

> Any group residential program other than a licenced nursing home that provides personal care for persons with impairments in performance of activities of daily living . . . and has the capacity to meet unscheduled needs for assistance.

This definition would leave out nursing homes and most room and board and congregate housing alternatives. A less restrictive example also cited by Nyman (1994) is that of the Assisted Living Facilities Association of America. They define assisted living as:

> A special combination of housing and personalized health care designed to respond to the

individual needs of those who need help with activities of daily living. Care is provided in a professionally managed group living environment, in a way that promotes maximum independence and dignity for each resident and involves the resident's family, neighbors, and friends.

Murer (1998) also provides definitions for assisted living for the US Health Care Financing Administration and the American Health Association. These definitions, respectively, state that:

> "Assisted living may be defined as services such as homemaker, chore, attendant care, companion services, medication oversight (to the extent permitted under state law), and therapeutic, social and recreational programming, provided in a licensed community care facility, in conjunction with those individuals residing in the facility. This includes 24-hour on-site response staff to meet scheduled or unpredictable needs and to provide supervision of safety and security. Other individuals or agencies may also furnish care directly, or under arrangement with the community nursing facility, but the care provided by these other entities supplements the community care facility and does not supplant it. Care is furnished to individuals who reside in their own living units (which may include dually occupied units when both occupants consent to the arrangement), which may or may not include kitchenette and/or living rooms, as well as bedrooms.
>
> An assisted living setting is: 1) a residential setting that provides or coordinates personal care services, 24-hour supervision and assistance (scheduled and unscheduled), activities, and health-related services; 2) designed to minimize the need to move; 3) designed to accommodate the customer's changing needs; and 4) designed to encourage family and community involvement."

3.4.1.2 The Emergence of Assisted Living

A number of factors have been noted in regard to the emergence of Assisted Living. In a comprehensive review of the expanding concept of home care, Rosalie Kane (1995) discusses the move of home care from being "care in the home" to care for people living in the community, including assisted living arrangements. Some of the rationales which have been put forward for assisted living are:

- The ability to focus on individualized care, compared to nursing homes (i.e., residential long term care);
- Greater freedom around schedules, lifestyles, the choice of food and other "independence" factors, compared to nursing homes;
- The belief that assisted living can provide a cost-effective alternative to nursing homes;
- Positive examples of home care organizations with a short stay residential component such as the On Lok program in San Francisco's Chinatown and a number

of related programs referred to as Programs for All-Inclusive Care for the Elderly (PACE);

- The trend to delegation of professional nursing functions to home support staff or care aids, facilitating supportive care in a congregate environment.

- Advocates who have claimed that hospitals and nursing homes discriminate on the basis of health and disability through diagnosis and treatment, and case mix funding (e.g., more funding for higher care needs clients). Thus residential settings make distinctions based on disability while housing arrangements do not.

Kane (1995) also points out potential negative factors related to assisted living. The first is the interface between assisted living and licensed care facilities, and that at some point people may be forced to move out of assisted living arrangements into care facilities, by policy or legislation, against their will. Issues of legal liability are also a concern related to transfer of function arrangements in which professional functions are transferred to non-professionals. There are also potential liability issues related to health and safety considerations, particularly if a significant portion of the residents have aged in place and require significantly more care services than they did when they first came into the assisted living setting. Policy makers are also concerned that while advocates promote independence, they still wish to hold the state liable for accidents or other mishaps.

Similar issues to those noted above, and cost estimates, are made by other authors (Becker, Stiles and Schonfeld, 2002; Bicknell and Pike, 1993; Bowe, 1993; Fahrenfort, 1995; Hatton, Emerson, Robertson, Henderson, and Cooper, 1995; Moore, 1991; Moore, 1995; Moore, 1996; Ruchlin and Morris, 1987; Sohng, 1996; Valins, 1995).

3.4.2 The Cost-Effectiveness of Assisted Living

There is now an emerging body of evidence on the cost-effectiveness of assisted living. Most of these studies compare the costs, or costs and outcomes, of assisted living with residential long term care. This literature is coming out of a number of countries.

In a Swedish study, Wimo, Mattson, Krakau, Eriksson, Welvig, and Karlsson (1995) conducted a cost utility analysis of a group living situation for dementia patients. The authors compared 46 patients in group living with 39 patients receiving home care and 23 institutionalized patients. Their overall finding was that the cost per gained quality-adjusted life year was most favourable for the group living alternative. This was quite a sophisticated study that looked at static and dynamic (change over time) models. The authors used Markovian analysis and had sound, validated scales of well being (the outcome measures). In the static model, home care was the most favourable outcome. However, in the dynamic model, which looked at changes over time, group living was the most favourable outcome for people with intermediate to high level dementia. The difference in outcomes between the static and dynamic models is, at least in part, attributable to the fact that patients in group living deteriorated at a slower rate than those receiving home care.

In a British study of different types of assisted living, Emerson, Robertson, Gregory, Hatton, Kessissoglou, Hallam, Järbrink, Knapp, Netten and Walsh (2001) analyzed the comparative quality and costs of supported living residences and group homes in the United Kingdom. This study essentially compared different types of "assisted living" arrangements. The authors found that, once adjustments were made for client characteristics, there were no statistically significant differences in service costs. The sample consisted of 63 people in supported living residences, 55 in group homes of 1 to 3 people (small group homes) and 152 people in large group homes (4 to 6 co-residents). There were also relatively few differences in outcomes across the three groups.

There were three American studies on the cost-effectiveness of assisted living. Nyman (1994) conducted a review of studies of the costs of assisted living arrangements and concluded that, overall, the unit costs of assisted living are lower than the unit costs of residential long term care facilities.

Schinka, Francis, Hughes, LaLone and Flynn (1998) compared the costs and outcomes of inpatient care and supportive housing for substance-dependent veterans. Patients in both settings went through a three week substance abuse treatment program in a large, metropolitan Veterans Affairs medical centre. The clients in the residential program resided in the hospital while the other clients lived in assisted living apartments and walked four blocks to the hospital each day. The clients in both groups were similar at baseline. The treatment outcomes were also similar. However, the cost for the inpatient group was $9,524, compared to $4,291 for the supportive housing group. Most of the differential in costs between the two groups was related to the cost of housing (i.e., hospital versus assisted living residence).

Leon and Moyer (1999) conducted an analysis of the comparative costs of assisted living versus nursing homes for patients with Alzheimer's disease. Costs of care were moderately lower in assisted living arrangements compared to nursing homes. Combining all levels of severity, the authors found that the annual costs of assisted living were 13.9% lower than the costs for nursing homes.

3.5 Discussion

As noted above, it is clear that while there is some emerging evidence of the cost-effectiveness of home care and assisted living, the evidence is still limited and somewhat mixed. In addition, there is a paucity of research on the impacts of home support services on the cost-effectiveness of home care, and on the ability of home care to delay admissions into long term care facilities and hospitals. While there is now some evidence that home support is a critical component in making home care cost-effective, more work needs to be done. This is particularly the case now as policy makers seem to be shifting the focus of home care to short term home care. Thus, while current findings are encouraging, more focused research is required on the cost-effectiveness of home care in order to determine if it is truly cost-effective.

The evidence on the cost-effectiveness of assisted living is only beginning to emerge. Nevertheless, there is currently considerable interest by policy makers in developing assisted living options. Thus, further research is also required in this area.

Thus, while there are encouraging results, as noted above, the results are still mixed. Given the alternative visions of home care that have now emerged across Canada, and the ongoing debate about the cost-effectiveness of home care, this proposed project should go a long way to building Canadian evidence for, or against, the cost-effectiveness of long term home care (including home support), and assisted living.

4. RESEARCH DESIGN AND METHODS

4.1 An Overview of the Two Substudies

4.1.1 Introduction

As noted above, it is proposed that two inter-related Substudies be conducted for this project. The same core set of instruments and procedures will be used in both studies in regard to obtaining cost and outcome data for individual clients. Thus, having two studies will also constitute a form of replication of the basic research approach as the same design, methods and instruments will be used to address the same set of core research questions. Each study will also have some unique research questions.

4.1.2 Substudy 1: A Case Study of the OSV VIP Experience

In 1999 Veterans Affairs Canada (VAC) implemented the Overseas Service Veterans At Home Pilot Project in response to a growing number of clients on waiting lists for beds in long term care facilities. The "At Home" pilot offered certain clients, on waiting lists, who met nursing level care and military service requirements, access to the Veterans Independence Program (VIP) home care and treatment services for which they had previously been ineligible. An internal review of the pilot showed that a large majority of clients preferred to remain at home, with support, rather than accept a long term care placement even when a bed became available. The pilot has helped reduce waiting times for nursing home beds and may have important implications for reducing costs and the demand for long term care beds. VAC implemented this program nationally in 2002.

VAC has yet to conduct a thorough study to determine the impacts of the OSV VIP initiative. Thus, it is proposed that a more detailed case study of this initiative be conducted. This would allow for a rigorous and independent evaluation of the outcomes of the OSV VIP initiative. The study would be conducted in the same three sites used for the original pilot: Halifax, Ottawa, and Victoria. It would include, to the extent the analysis of VAC data permits, a trend analysis of the uptake of VIP, and the comparative service utilization of VIP and residential care before and after the introduction of the VIP initiative. In addition to the historical analysis, a study of current OSV clients in VIP and residential services would be conducted to compare and contrast costs and outcomes between home care and residential care, by level of care.

This case study approach would allow VAC to tell its story of the OSV VIP initiative and would provide information on the comparative costs of home care and residential care, and the important role played by home support. However, there are a relatively limited number of people on OSV and, thus, the sample size across the three locations would be somewhat modest. This could

limit the rigour and generalizability of the findings. Thus, a broader companion study is also proposed.

4.1.3 Substudy 2: The Comparative Cost-Effectiveness of Home Care, Assisted Living and Residential Care

In this study, three groups of veterans would be compared: (1) VIP clients living at home; (2) VIP clients in assisted living settings; and (3) clients in residential long term care. These groups would be randomly sampled from Veterans receiving home care, assisted living and residential services who live in the greater Toronto region. If the sample size for Veterans in assisted living proves to be insufficient, this component of the study would be supplemented with non-veterans. A number of instruments and procedures to group clients into comparable levels of care needs would be used in order to conduct "apples to apples" comparisons across the three sites and to estimate the costs and outcomes of care, within levels of care, that is, for clients with comparable care needs. Comparative costs, satisfaction with care, and quality of life, would be analyzed for similar people across the three settings. The contribution that home support services play in keeping people in the community (home or assisted living), and the factors which lead to eventual institutionalization, would also be studied. This study would be more rigorous as it would have a larger sample size than the OSV VIP Study and would include an assisted living component.

4.2 Project Governance

As noted above, this project will be a collaboration between VAC and the GO. VAC will provide the primary funding for this project and VAC and the GO will also provide additional in-kind support. Given the current policy reviews and discussions, in both organizations, about home care and assisted living this project should provide needed new knowledge to inform decision making and contribute to broader, national policy discussions. While the primary interest in regard to assisted living comes from the GO, VAC has also, through the Legion, been involved in assisted living. However, VAC is not currently intending to develop new assisted living services as part of this project. The VAC Research Directorate will, at the start of this project, propose a strategic work plan for implementing the project which will include a model for the governance of this project.

4.3 Key Research Questions

Table 1 provides an overview of the key research questions for this project and how they relate to project goals. It also indicates which questions are of primary relevance to VAC and/or the GO.

Table 1: Project Goals and Key Research Questions

Key Research Questions	Project Goals			
	1. To obtain information which can be used to contribute to the broader policy debate in Canada about health services for the elderly.	2. To obtain information on the relative success of the OSV VIP initiative.	3. To obtain information about the contributions of long term home care and home support services in regard to the care of the elderly.	4. To obtain information on the relative costs and outcomes (i.e., cost-effectiveness) of long term home care (including home support), assisted living and residential care.
1. To what extent have people, who originally would have only received facility care, embraced the VIP home option?[1]		X	X	
2. What are the comparative systems costs i.e., overall costs, for OSV clients before and after introducing the VIP home option, on a cost standardized basis? [1]		X	X	X
3. How satisfied are VAC staff and managers with the new approach, what do they see as its strengths and weaknesses, and how would they rate the success of the program? [1]		X	X	
4. How satisfied are comparable clients in VIP, assisted living, and residential care and how do they rate their quality of life? [2]	X	X	X	X
5. What proportion of home care services (VIP and health services) are provided by home support services? [2]	X			X
6. Which home care and home support services are the most instrumental in keeping people out of facility care? [2]	X	X	X	
7. What factors contributed to community and assisted living clients entering residential care? [2]		X	X	X

Key Research Questions	Project Goals			
	1. To obtain information which can be used to contribute to the broader policy debate in Canada about health services for the elderly.	2. To obtain information on the relative success of the OSV VIP initiative.	3. To obtain information about the contributions of long term home care and home support services in regard to the care of the elderly.	4. To obtain information on the relative costs and outcomes (i.e., cost-effectiveness) of long term home care (including home support), assisted living and residential care.
8. What have been the positive and negative impacts on family caregivers? [2]	X		X	X
9. What is the cost effectiveness of home care compared to residential care? [2]	X	X	X	X
10. To what extent is "Assisted Living" an appropriate alternative to home care and residential care? [3]	X			X
11. To what extent would adding "Assisted Living" contribute to an enhanced, and cost-effective, continuum of care for VAC clients? [3]	X			X

Notes:
[1] Questions primarily of interest to VAC
[2] Questions primarily of interest to VAC *and* the GO
[3] Questions primarily of interest to the GO
Substudy 1 incorporates questions 1-9
Substudy 2 incorporates questions 4-11

4.4 Design and Methods

4.4.1 Introduction

The proposed Substudies for this project will build on previous work, particularly the work conducted for the National Evaluation of the Cost-Effectiveness of Home Care. Substudy 5 of the National Evaluation (Hollander et al., 2002) used a comprehensive set of measurement instruments to study the costs and outcomes of care from a broader societal perspective. A number of key scales and measurement instruments were validated as part of this study. Thus, the base for the selection of instruments to be used will be a set of instruments whose validity has already been tested, and proven, in a real world context. Other new, emerging and validated instruments will also be considered. In cases where no validated instruments exist, the research team will develop new instruments, customized to meet the needs of this project.

It will also be important to identify which model of assisted living will be used for this study. This will take some initial development work.

As noted previously, it is intended that, to the extent possible the same, or very similar, measurement instruments and protocols will be used for both Substudies. By doing so, one is actually conducting both a study, and a type of replication of the study. If the results are consistent across both Substudies (for the components of these Substudies which are similar), this will further enhance the validity of the findings.

4.4.2 Sample Selection

In terms of sample selection, the VAC assessment form contains a number of ADL and IADL questions. These questions will be used as a preliminary screen (using the total score of ADL questions) to define a sampling universe composed of people with similar scores for each of the study groups (VIP and residential care for the Case Study and VIP, assisted living and residential care for the Cost-Effectiveness Study). The samples for the respective populations will be selected from this universe. Contact will be made by VAC with the people selected to determine if they are willing to participate in the study. An assessment of the people who have agreed to participate in the study will be conducted using the SMAF, an assessment tool used in the province of Québec which has been tested for validity and reliability and which has, imbedded in the tool, a validated client classification system. Clients with similar ranges of scores on the SMAF will be clustered into levels of care. It is expected that most clients will fall into one of four care levels. This should ensure that clients, within each level of care, have similar care needs and can thus be compared across service settings on cost and outcome measures.

In terms of sample size, it is anticipated that there will be up to 60 community and 60 residential clients in each location for the OSV VIP Case Study (i.e., Substudy 1). It is anticipated that there will be up to 320 VIP, 320 assisted living and 320 residential clients in the more comprehensive Cost-Effectiveness Study (i.e., Substudy 2). The actual number of clients in the two Substudies will depend on whether or not there are sufficient clients to fill each type and level of care cell.

Thus, for Substudy 1 on the OSV VIP initiative, it is anticipated that there will be 15 clients in each type of service (home care or residential) for each level of care (we anticipate having four levels of care). Across the three communities (Victoria, Ottawa and Halifax), there will thus be a maximum of 180 community clients and 180 residential clients, for a total of 360 clients. If one combines the three sites, there will be a maximum of 45 people in each type of service and level of care cell in Substudy 1 (see Table 2).

For Substudy 2, the Cost-Effectiveness study, there will be a maximum of 80 people in each type of service and level of care cell, or 320 people for each of the three types of services, i.e., home care assisted living and residential care, for an overall total of 960 clients in the study (see Table 3). The sample size for this study, for each type of service, is consistent with the sample size used in Substudy 5 of the National Evaluation of the Cost-Effectiveness of Home Care. Substudy 5 had a combined sample of 588 clients for home care and residential care (222 home care clients and 358 residential clients) while this study will have 320 clients for each type of care (i.e., home care, residential care and assisted living).

Table 2: Overview of Sampling Design: Substudy 1 on OSV VIP Clients*

Type of Service	Jurisdiction							
	Victoria		Ottawa		Halifax		Total	
	Clients	Informal Caregivers	Clients	Informal Caregivers	Clients	Informal Caregivers	Clients	Informal Caregivers
Home Care								
Level 1	15	12	15	12	15	12	45	36
Level 2	15	12	15	12	15	12	45	36
Level 3	15	12	15	12	15	12	45	36
Level 4	15	12	15	12	15	12	45	36
Total	60	48	60	48	60	48	180	144
Residential Care								
Level 1	15	12	15	12	15	12	45	36
Level 2	15	12	15	12	15	12	45	36
Level 3	15	12	15	12	15	12	45	36
Level 4	15	12	15	12	15	12	45	36
Total	60	48	60	48	60	48	180	144
Total								
Level 1	30	24	30	24	30	24	90	72
Level 2	30	24	30	24	30	24	90	72
Level 3	30	24	30	24	30	24	90	72
Level 4	30	24	30	24	30	24	90	72
Total	120	96	120	96	120	96	360	288

* It may be that it will not be possible to obtain the full allocation of clients and informal caregivers for each cell in this table. For example, there may be relatively few level 4 clients in home care and relatively few Level 1 clients in residential care. Thus, this table represents the maximum sample which would be collected.

For both Substudies, interviews will be conducted to obtain other data from the primary family, or informal, caregiver for the client. It is estimated (based on previous work) that some 80% of clients will have an informal caregiver. Furthermore, it is also recognized, from previous work, that informal caregivers maintain contact with the client even after they are admitted to facility care. Thus, using this 80% ratio, it is estimated that a maximum of 288 informal caregivers would be included in Substudy 1 and a maximum of 768 informal caregivers would be included in Substudy 2.

While the above provides an initial estimate of the sample for the proposed study, the determination of the final sample and cell sizes will be determined in consultation with a qualified statistician, taking into consideration issues of statistical power and related questions.

4.4.3 Measurement Instruments and Procedures

4.4.3.1 Introduction

As noted above, the instruments used in Substudy 5 of the National Evaluation of the Cost-Effectiveness of Home Care will serve as the initial basis for instrument selection and development for this study. While some custom instruments will need to be designed for the two Substudies, the types of instruments and procedures noted below will be used in the two proposed Substudies for

this project. A review of the literature and interviews with recognized experts will also be conducted, in order to take advantage of any advances in measurement which may have occurred since the conduct of Substudy 5.

Table 3: Overview of Sampling Design: Substudy 2 on the In-Depth Cost-Effectiveness Analysis*

Type of Service	Type of Respondent		
	Client	Informal Caregivers	Total
Home Care			
Level 1	80	64	144
Level 2	80	64	144
Level 3	80	64	144
Level 4	80	64	144
Total	320	256	576
Residential Care			
Level 1	80	64	144
Level 2	80	64	144
Level 3	80	64	144
Level 4	80	64	144
Total	320	256	576
Assisted Living			
Level 1	80	64	144
Level 2	80	64	144
Level 3	80	64	144
Level 4	80	64	144
Total	320	256	576
Total			
Level 1	240	192	432
Level 2	240	192	432
Level 3	240	192	432
Level 4	240	192	432
Total	960	768	1,728

* It may be that it will not be possible to obtain the full allocation of clients and informal caregivers for each cell in this table. For example, there may be relatively few level 4 clients in home care and relatively few Level 1 clients in residential care. Thus, this table represents the maximum sample which would be collected.

4.4.3.2 Client Assessment

The following types of instruments and/or questions would be used to obtain information about the client and his or her care needs:

- Demographic information for clients;
- Functional assessment and determination of the care levels for clients (e.g., the Systeme de measure de l'autonomie functionele or SMAF, the primary continuing care assessment tool used in the province of Québec);

- Questions on health status;
- Questions on cognition (e.g., the the Modified Mini-Mental Satus Examination); and
- Questions related to social support.

4.4.3.3 Outcome Measures

The following types of instruments and/or questions could be used:

- A quality of life scale;
- Satisfaction with life questions;
- Questions on satisfaction with care related services;
- Questions on the conditions under which clients may seek, or have been admitted to, institutional care; and
- Questions on satisfaction with the OSV VIP for clients, informal caregivers, and VAC staff and management.

4.4.3.4 Informal Caregivers

The following types of instruments and/or questions could be used to obtain information about informal caregivers, their caring experience and their satisfaction with the professional care services provided for the client:

- Demographic information;
- Questions related to issues regarding the perceptions of, and process of, providing informal care;
- A caregiver burden scale; and
- A caregiver satisfaction scale in regard to care provided to the client.

4.4.3.5 Diaries and Service Utilization Measures

The following instruments could be used to obtain data on service utilization and costs:

- A set of questions on service utilization;
- A diary on time and assistance provided by paid care providers;
- A diary on time and assistance provided by informal caregivers;

- A diary on client out-of-pocket expenses; and
- A diary on out-of-pocket expenditures by informal caregivers.

4.4.3.6 Costing and Other Procedures

Developing cost estimates is a complex task. It is unlikely that it will be possible to obtain standardized costs by level of care for home care and residential care clients from administrative data sets. Many jurisdictions do not use case mix funding. Thus, it will be necessary to develop one single care level classification system which can be used across all sites, specific client level data will need to be collected. Thus, data may need to be collected directly from participating service provider agencies. This will require obtaining the cooperation of such agencies in regard to access to at least some of their financial data, and access to the clients they serve.

Standard costs (costs to VAC and the provinces) will be estimated for each level of care for residential care services, assisted living, and home care services, from expenditure and budget data from the participating agencies. This information will be supplemented with data obtained from a set of logs about: actual client contact time with professional care providers in facilities (to refine the costs by care level estimates) and in the home and community; information about care related out-of-pocket expenses for clients and family members; and information about care related time for informal caregivers to estimate the informal costs of care. These latter two items will allow for the development of client and caregiver specific costing for the informal costs of care.

The Substudies will use standard unit costs for each type of service, for example nursing visits, home support hours, adult day care days and facility care (a standard per diem cost for each level of care). Standard costs will also be developed for costs related to other parts of the health care system such as hospital services, physician services, drugs, visits to the emergency, use of an ambulance, and other such services. Standard costs are used to standardize costs across service providers, thus providing an average cost for a given set of service providers in order to control for differences in unit costs across providers. This is important because, for example, one could have an artificially inflated cost for home care services if 70% of the services in the study are provided by an agency charging $25.00 per visit and 30% of the services are provided by an agency charging $15.00 per visit. The results would be quite different if the lower cost agency had 70% of the cases and the more costly agency had 30% of the cases. Thus, without using standard costs, study result could be an artifact of having a higher proportion of cases looked after by a more expensive, or less expensive, agency. In developing the client specific estimated cost per day, month and/or year, one multiplies the amount of service provided (e.g., 5 home nursing visits) per month by the unit cost (e.g., $40.00 per visit) to obtain the estimated aggregate cost per client per month.

With regard to the cost analysis for facility care, the basic analysis will consist of pro-rating all non care related costs (i.e., treating the total as fixed costs) and adding in care related variable costs, for each client, using contact time noted in the formal care provider diaries. Time would be multiplied by unit costs to derive a variable cost estimate. The fixed and variable cost estimates would be added together to derive a unique cost for *each* residential care client. The average cost per

level of care, across all clients at a given care level, would become the care level specific, estimated monthly or annual cost for each level of residential care to be used in the analysis.

In addition to the above, cost analyses will also be conducted using facility rates paid by VAC for beds, and care level specific per diem rates for jurisdictions with case mix funding, where available. Finally, analyses of the comparative costs of home care with the costs of facility care in both contracted facilities and community care facilities will also be conducted. As noted above, conducting a cost-effectiveness study is complex (and time consuming). Appendix B provides an overview of the methods used for economic evaluations (including cost-effectiveness analysis) and how such studies should be conducted.

As part of Substudy 1, utilization analysis will also be conducted, to the extent possible, to determine the proportions of OSV VIP and residential care clients using VIP and/or residential care services, based on all OSV clients, for three periods of time: the two years prior to the OSV VIP Pilot; the time period between when the Pilot was started and when it became part of the national program of benefits; and the two years after it became national policy to offer VIP services to eligible OSVs.

A number of supplementary analyses will also be conducted, as appropriate, to answer the research questions for this study. For example, a number of analyses to better understand the factors which relate to the decision to seek institutionalization will be conducted such as comparing characteristics at admission to care, critical incidents (e.g., incontinence, hospitalization, loss of a family caregiver) length of time in home care, and other factors, to better understand how, if at all, people on home care differ from people in residential care and why people seek residential care. The findings from these analyses may allow VAC to develop policies and programs to maintain people at home, as appropriate.

Finally, it should be noted that in order to conduct a study of this depth and magnitude, the cooperation of Veterans Affairs Canada and the Government of Ontario will be required to facilitate access to care providers, and to their administrative data sets and to the staff of these two organizations, in order to obtain the data, and cooperation required.

4.5 Detailed Questions/Indicators

Table 4 provides an overview of the detailed questions and/or indicators to be used to answer each of the 11 research questions. It also provides information on design/methods, data sources and the proposed analysis to be conducted.

5. CONCLUSIONS AND STRENGTHS AND WEAKNESSES OF THE PROPOSED PROJECT

The main strengths of the proposed project are that it will provide a reasonable level of information to answer the eleven study questions, and to achieve the goals set out for the project by VAC and the GO. Where possible, standard, validated measures will be used. Thus, it will be possible to compare, the findings from this project to other published studies. The project also builds

on leading edge research conducted in Canada, and the findings can be compared to the results from Substudy 5 of the National Evaluation of the Cost-Effectiveness of Home Care. The research team will try to identify, and use, the best possible, validated research instruments.

A particular strength of this study is that considerable effort will be expended to derive a standard classification system, based on client needs, so that "apples to apples" comparisons can be made across clients in home care and residential care. In addition, as noted in the literature review, there are very few rigorous studies on the topics of the cost-effectiveness of home care, and assisted living, and on their ability to delay institutionalization. Thus, the proposed project should add important new knowledge in these areas which can have an impact on "the weight of the evidence" regarding the cost-effectiveness of long term home care (including home support) and assisted living.

In regard to the weakness of the proposed approach, a more ideal study, but one which would take much longer, would be to conduct a multi-year longitudinal study on people, at a given level of care. People with similar care needs would be identified and would be randomly assigned to home care or residential care and at the beginning of the study and their patterns of utilization, costs and outcomes would be tracked over several years. This proposed study will, instead, have an approximation of matched samples, matched on functional ability and, as appropriate, on demographic characteristics. While valid, this approach is not methodologically as strong as randomized assignment to home care and residential care on admission to care. However, there may be ethical consideration which would significantly reduce the acceptability of using such a random assignment procedure. In addition, asking clients and family members about their perceptions about what precipitates admission to a care facility (before or after the fact) is not as strong as directly investigating what is occurring when a placement to facility care actually takes place, which could be done in a longitudinal study.

Given the realities of conducting original research in the real world, and time and budget consideration, the proposed Substudies should still be able to provide scientifically valid findings which can be used, with confidence, to inform decision-making. It is also likely that the proposed project will raise additional question, and/or lay the groundwork for a future longitudinal study. VAC and the GO will decide on what, if any, further research on the cost-effectiveness of home care and assisted living they may wish to sponsor, based on the results of the proposed study.

Table 4: Overall Research Approach

Key Research Questions	Design/Methods	Evidence/Indicators	Data Sources
1. To what extent have people, who originally would have only received facility care, embraced the VIP home option? [1]	A separate interview schedule will be added to the Case Study to obtain information about perceptions of clients of the OSV VIP initiative.	· Level of satisfaction with the OSV VIP initiative overall, for clients and informal caregivers · Level of satisfaction with the program design for clients and informal caregivers · Level of satisfaction with implementation, for clients and informal caregivers · Level of satisfaction with receiving care in the home, for clients and informal caregivers	· Satisfaction with OSV VIP questionnaire for clients and informal caregivers
	Trend analysis to demonstrate the uptake of VIP by OSV client for the two years before OSV VIP, the two years from the initial pilot to the national implement of OSV VIP and the two year period post-implementation.	Comparative, empirical analysis of the uptake of the VIP option by OSV clients. · % utilization of residential care over time · % utilization of VIP over time · % utilization of residential care and VIP over time	· Utilization analysis from VAC administrative data
2. What are the comparative systems costs i.e., overall costs, for OSV clients before and after introducing the VIP home option, on a cost standardized basis? [1]	Conduct a series of before and after cost analysis using 2004/05 standardized dollar costs. a) analysis of costs to VAC for two years before the OSV Pilot and the utilization rate (OSV veterans in care as a percentage of all OSV veterans, standardized by age and sex if required) compared to costs and utilization for the two years after OSV VIP was adopted nationally (for residential and VIP services) and the two years between the pilot and national adoption of OSV VIP.	· System costs for residential care over time · System costs for VIP over time · System costs for residential care and VIP over time · Costs standardized for utilization ratios for VAC (after implementation costs applied to the utilization rate before implementation – this will tell if costs are higher on a standardized basis because more people receive service).	· VAC administrative data · Diaries for formal and informal care services, out of pocket expenses, and care related time by informal caregivers
	b) From the logs and more detailed data add in clients and caregiver costs. Use the ratios of VAC costs to overall costs to develop more comprehensive cost estimates for the six year period noted above.	· Comparison of estimated total costs (VAC, provincial government, clients and informal care givers) before and after OSV VIP. · Estimated average overall costs per person before and after OSV VIP (after implementation costs include residential and VIP veterans). · Overall costs standardized for utilization ratios (after implementation costs applied to the utilization rate before implementation – this will tell if costs are higher on a standardized basis because more people receive service).	

Table 4: Overall Research Approach (Continued)

3. How satisfied are VAC staff and managers with the new approach, what do they see as its strengths and weaknesses, and how would they rate the success of the program? [1]	In-person and/or telephone interviews with VAC staff and managers. A separate interview schedule would be developed for this component of the study	· Level of satisfaction using a five point scale for each key group, overall. · Satisfaction with OSV VIP program design · Satisfaction with the implementation of the OSV VIP · Perceptions , by VAC staff and managers, of satisfaction among clients and informal caregivers of the OSV VIP · Information on strengths and weaknesses and suggestions for improvement. · Rating of the overall success of the program (and reasons for the score given) for each key group.	Satisfaction with OSV VIP by VAC staff and managers
4. How satisfied are comparable clients in VIP, assisted living, and residential care, and their informal caregivers, and how do they rate their quality of life? [2]	Interviews with veterans and informal care givers across a number of dimensions of satisfaction.	· Satisfaction of clients across several dimensions and reasons for the scores given (for example, satisfaction with: quality of care; competence of staff; timeliness of response; attention to client needs etc.) · Satisfaction of informal caregivers across several dimensions and reasons for the scores given (for example, satisfaction with: quality of care; competence of staff; timeliness of response; attention to client needs etc.)	Client and informal caregiver questionnaires and/or scales on satisfaction with care services
	Scores on quality of life questions and/or scales by clients and informal caregivers.	· Quality of life scores of clients across several dimensions and reasons for scores given (for example, quality of health, well being, social relations etc). · Quality of life scores of informal caregivers across several dimensions and reasons for the scores given (for example, quality of health, well being, social relations etc).	Client and informal caregiver questionnaires on the client's quality of life
5. What proportion of home care services (VIP and health services) are provided by home support services? [2]	Analysis, from caregiver logs, or diaries, client interviews, and administrative data regarding the use of health services including: hospital care, medical care, drugs, professional services, home support services and other services.	· Percent of costs for each component of care. · Home support costs as a percent of overall costs. · Home support costs as a percentage of home and community care costs.	· Utilization questionnaire and diaries · Administrative data from VAC and the GO on service utilization by different types of care providers

Table 4: Overall Research Approach (Continued)

6. Which home care and home support services are the most instrumental in keeping people out of facility care? [2]	Interviews with veterans in each group to be studied.	· Analysis of responses and scoring of the frequency of responses for each reason given for clients (for example, availability of home support services, presence of informal caregivers, and home adaptations).	Questionnaires/focus groups for clients
	Interviews with informal caregivers for each group.	· Analysis of responses and scoring of the frequency of response for each reason given for given informal caregivers (for example, availability of home support services, presence of informal caregivers, home adaptations).	Questionnaires/focus groups for informal caregivers
	Analysis of other data	· Comparative analysis of the characteristics of clients at admission, and their pattern of service utilization, to determine which characteristics of clients and/or their service use lead to institutionalization	Analysis of assessment and service utilization data
7. What factors contributed to community and assisted living clients entering residential care? [2]	Interviews with veterans in each group to be studied.	· Analysis of responses and scoring of the frequency of response for each reason given for clients (for example, onset of incontinence, hospitalization, termination of informal support).	Questionnaires/Focus Groups for clients and informal care providers
	Interviews with informal caregivers for each group.	· Analysis of responses and scoring of the frequency of response for each reason given for informal caregivers (for example, onset of incontinence, hospitalization, termination of informal support).	
	Analysis of other data	· Comparative analysis of the characteristics of clients at admission, and their pattern of service utilization, to determine which characteristics of clients and/or their service use lead to institutionalization	Analysis of assessment and service utilization data
8. What have been the positive and negative impacts on family caregivers? [2]	Interviews with family caregivers and use of a standardized burden scale for each group to be studied.	· Rank ordering of positive responses and reasons for the responses (for example, benefits of caring for a family member, assistance received such as babysitting from the care recipient). · Rank ordering of negative responses and the reasons for the responses (for example, increased stress, increased costs). · Caregiver burden scale score and analysis of the overall score and component scores.	Questions and/or scales on caregiver burden

Table 4: Overall Research Approach (Continued)

9. What is the cost-effectiveness of home care compared to residential care? [2]	Conduct a comparative cost analysis for costs to VAC, costs to government, and overall societal costs, for each group, by level of care.	· Estimated annual costs to VAC, by level of care, for each study group, by cost item and total. · Estimated annual costs to government, by level of care, for each study group, by cost item and total · Estimated annual costs for costs to VAC, government , clients and informal care givers, by level of care for each study group, by cost item and total	· Formal and informal caregiver and out-of-pocket costs diaries · Administrative data on costs and utilization · Service utilization questionnaire · Outcome questions and/or scales
	Conduct an analysis of outcomes related to satisfaction, quality of life and caregiver burden.	See Evidence/Indicators for questions 4 and 8	
	Compare costs and outcomes for each group.	Comparative analysis of costs and outcomes for each group by level of care.	
10. To what extent is "Assisted Living" an appropriate alternative to home care and residential care? [3]	Separate interview schedules will be developed for each of the three groups (with similar questions) to enquire about the perceived advantages and disadvantages of assisted living and whether or not, or what degree, it could be a viable substitute for home care and residential care.	· Rank ordering of responses regarding positive and negative aspects of assisted living, by group (for example, provision of needed support, opportunities for socialization, lack of isolation, convenience of service). · Qualitative analysis of responses regarding assisted living.	Client and informal caregiver questionnaires and/or focus groups
11. To what extent would adding "Assisted Living" contribute to an enhanced, and cost-effective, continuum of care for VAC clients? [3]	Analysis of all relevant data from the study.	An extrapolation from, and policy interpretation of, the data.	· Analysis of costs and outcomes · Client and informal caregiver questionnaires and/or focus groups

Notes:
[1] Questions primarily of interest to VAC
[2] Questions primarily of interest to VAC *and* the GO
[3] Questions primarily of interest to the GO
Substudy 1 incorporates questions 1-9
Substudy 2 incorporates questions 4-11

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APPENDIX A:

Benefits Provided Under the Health Benefits Program and the Veterans Independence Program

Table 1: Benefits Provided to Eligible Veterans by the Health Benefits Program

Type of Benefit	Description of the Benefit
1. Aids For Daily Living	This program provides devices and accessories, including necessary repairs, designed to assist the activities of daily living. Examples of covered devices/accessories are: -walking aids such as canes and walkers; -self-help aids for dressing and/or feeding; -bedroom aids such as foot boards or over-bed tables; and -bathroom aids such as raised toilet seats or bath benches.
2. Ambulance / Medical Travel Services	Ambulance - This program covers the use of ambulance services to or from a medical facility when it is required due to an emergency or medical condition. Medical Travel Services - This program covers travel costs incurred in order to receive certain treatment benefits. These benefits include: medical, surgical, or dental examinations or treatment by a health professional. Costs of travel incurred by escorts may be paid as well.
3. Audio (Hearing) Services	This program offers benefits to compensate for hearing impairment. Examples of covered benefits are: -analog hearing aids; -basic digital hearing aids; -basic programmable analog aids; -telephone amplifiers, infrared devices; -hearing accessories; and -dispensing and fitting fees.
4. Dental Services	This program offers basic dental care and pre-authorized comprehensive dental services. Examples of covered benefits are: -annual basic treatment (cleanings and fluoride treatments); and -fillings
5. Hospital Services - Inpatient and Outpatient Services	This program offers benefits for treatment services provided in an acute care, chronic care, or rehabilitative care hospital. It includes both inpatient and outpatient services provided to a Veteran in an accredited provincial hospital or health facility.
6. Medical Services	In the case of a VAC disability pensioner, this program offers medical services provided by a licensed physician. The costs of medical examinations, treatment, or reports specifically requested by VAC are also covered by this program. For most VAC clients, physicians' services are the responsibility of the provincial health care programs and are not normally paid for under this program.
7. Medical Supplies	This program offers medical and surgical equipment and supplies normally used by an individual in a non-hospital setting. Examples of covered medical and surgical equipment are: -inhalers; -bandages; and -incontinence supplies.
8. Nursing Services	This program offers services provided by a registered nurse, or for basic foot hygiene by a registered nurse or a qualified licensed/certified nursing assistant. Examples of covered services are: -administering medications; -application of dressings; -counselling Veterans or caregivers in the use of medical supplies and health care; and -foot care.

Type of Benefit	Description of the Benefit
9. Oxygen Therapy	This program offers oxygen and accessories, as well as the rental or purchase of other respiratory supplies and equipment. Examples of covered benefits are: -oxygen concentrators; -compressors; and -oxygen gas.
10. Prescription Drugs	This program provides drug products and other benefits dispensed by a pharmacist. Standard Benefits include many over-the-counter and prescription drugs, plus medical devices that are considered by VAC to represent "common" therapies. Special Authorization Benefits provides drugs for eligible clients with less common or higher cost therapies approved by VAC.
11. Orosthetics And Orthotics	This program provides necessary prosthetics or orthotics in addition to accessories and repairs for these benefits. Examples of covered benefits are: -prosthetic and orthotic appliances; -custom-built footwear; -modifications to regular footwear; and -necessary accessories and repairs.
12. Related Health Services	This program offers alternative benefits and services from health professionals. Examples of covered services (requiring referral by physician) are: -occupational therapy; -physiotherapy; -massage therapy; -acupuncture; -hearing & speech therapy; and -psychological counseling. Examples of covered services (directly obtained services) are: -chiropractic services.
13. Special Equipment	This program provides special equipment required for the care and treatment of disabled VAC clients. These benefits must be prescribed by a doctor. Examples of covered benefits are: -hospital beds; -lifts; -home adaptations; -wheelchairs; and -driving aids.
14. Vision (Eye) Care	This program offers lenses, frames, and accessories to correct sight impairments, as well as low vision aids available from the Canadian National Institute for the Blind. Examples of covered benefits are: -basic single and bifocal lenses; -frames; and -eye examinations.

Note: Not all of the above services are available to all veterans. Eligibility for services depends on benefits groupings as established by Veterans Affairs Canada.

Table 2: Benefits Provided to Eligible Veterans by the Veterans Independence Program

Type of Benefit	Description of the Benefit
1. Grounds Maintenance	Grounds Maintenance include activities regularly required to maintain the grounds immediately surrounding the client's principal residence. Examples of covered services are: -snow removal from steps, walkways, and driveways to allow safe access to the principal residence; -snow and ice removal from roofs and eavestroughs when such conditions pose a threat to safety and access; and -lawn mowing and raking.
2. Housekeeping	Housekeeping services are routine tasks or domestic chores required to support the client in remaining self-sufficient at their principal residence. Certain non-routine tasks or domestic chores may also be covered, with pre-authorization by VAC, if they are required as a result of the client's health and safety being at risk. Examples of covered services are: -laundry, including ironing and mending; -vacuuming; -cleaning floors (sweeping, washing, waxing, etc.); -dusting and general picking up; and -meal preparation.
3. Personal care	Personal care services are approved services provided by individuals other than those defined as Health Care Professionals (i.e., an attendant as opposed to nurse). These services include assistance in the performance of the activities of daily living and supervision required by clients who cannot be left unattended. Examples of covered services are: -eating; -dressing; -washing; -grooming; -adjusting prosthetic appliances; -attending to toileting; -ambulation; and -respite care.
4. Home Adaptations	Home adaptations can be made to a client's principal residence. For example, bathrooms, kitchens, and doorways can be modified to provide access for basic everyday activities such as food preparation, personal hygiene, and sleep. Home adaptations do not include general renovations or repairs. Examples of covered services are: -handrails on stairways; and -ramps.
5. Nutrition Services	Access to nutrition services is aimed at ensuring that clients access nutritional food, whether it is delivered to the client's principal residence, offered in the community, or served at a local restaurant. Examples of covered services are: -the cost of delivering food to the home i.e., Meals on Wheels; and -transportation cost to bring the client to a local restaurant or community facility to obtain meals i.e., Wheels to Meals, or a taxi to the restaurant.
6. Health and Support Services Provided by Health Professionals	Health and support services are health assessments and diagnostic services, care, maintenance, and related personal care provided by health professionals and approved by VAC. These can be provided only when they are not insured services under a professional health care system or available to clients as residents of a province.
7. Ambulatory Health Care	Ambulatory health care covers certain health and social services provided outside the home such as adult day care and travel costs to access these services.
8. Intermediate Care Services	Intermediate Care Services may be provided when living at home is no longer practical and a greater level of nursing and personal assistance is needed.

Type of Benefit	Description of the Benefit
9. Social Transportation	Transportation service may be approved to allow clients to participate in social activities, in response to the client's basic social, recreational, or personal needs. These may include transportation to: church services; and occasional visits to friends/relatives, community centres, banks, and grocery stores, when transportation is not otherwise available.

Note: Not all of the above services are available to all veterans. Eligibility for services depends on benefits groupings as established by Veterans Affairs Canada.

APPENDIX B:

An Overview of Economic Evaluation, Including Cost-Effectiveness Analysis, and its Relationship to Continuing Care

AN OVERVIEW OF ECONOMIC EVALUATION, INCLUDING COST-EFFECTIVENESS ANALYSIS, AND ITS APPLICATION TO CONTINUING CARE

1. AN OVERVIEW OF ECONOMIC ANALYSIS

There is a growing literature on the techniques of economic analysis in health care. A number of excellent books and articles have been published on this topic (Donaldson, 1990; Drummond, O'Brien, Stoddart and Torrence, 1997; Drummond, Stoddart and Torrence, 1987; Eisenberg, 1989; Ganiats and Schneiderman, 1988; Stoddart and Drummond, 1984a, 1984b; Weinstein, 1990). Drummond et al. (1987) note that economic analysis deals with two aspects: the inputs and outputs, or costs and consequences, of activities; and, choices between alternatives. Thus, economic analysis can be defined as: "the comparative analysis of alternative courses of action in terms of both their costs and consequences" (Drummond et al., 1987, p. 8). Drummond et al. (1987) have developed a typology for the different types of economic analysis based on the dimensions of inputs and outputs, and choices about alternatives. This schematic is presented in Figure 1. The primary area of interest for this study is box 4 in Figure 1, full economic evaluation, particularly cost-minimization and cost-effectiveness analysis.[1] Finally, it is important to note that cost-effectiveness analysis is not only about costs. Equal weight is given to the outcomes or consequences of the services in question. This includes outcomes such as satisfaction with care, and the quality of the life of the client, from the perspectives of clients and informal caregivers.

2. THE TECHNIQUES OF ECONOMIC EVALUATION[2]

2.1 Design Issues

Methodologically, most of the more advanced techniques of economic analysis have similar characteristics to quasi-experimental research, clinical trials and outcome evaluation. All of these approaches have certain common elements. Some type of program or experimental condition is introduced and applied to some set of subjects, and the consequence of this act is analyzed to determine the nature of the outcome of introducing the program or experimental condition. There is a temporal dimension to this approach such that the intervention is typically done at one point in time and the consequences of that action are studied over time. Programs receiving the experimental condition, are usually compared to control groups or to, other, alternative programs.

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[1] In contrast to Drummond et al. (1987), some researchers consider cost-minimization analysis to be a variant of cost-effectiveness analysis. This is an important distinction for continuing care because it uses an ongoing "care," rather than a short term "cure" model of service. Thus, it may be that the "effects" of care are similar, that is, similar levels of satisfaction, similar rates of deterioration and so on. To the extent this is true one could actually do a cost-minimization study instead of a cost-effectiveness study.

[2] There are a number of issues to be addressed in doing an economic analysis. This section provides an overview of some of the most common issues. For a detailed protocol for doing economic analysis the reader is referred to the report *Guidelines for Economic Evaluation of Pharmaceuticals*: *Canada*, published by the Canadian Coordinating Office for Health Technology Assessment CCOHTA (1997). For an excellent review of economic analysis the reader is referred to the book *Methods for the Economic Evaluation of Health Care Programmes* (Drummond, Stoddart and Torrence, 1987; Drummond, O'Brien, Stoddart and Torrence, 1997).

Figure 1: Types of Economic Evaluation

Is there a comparison of two or more alternatives?	Are both costs (inputs) and consequences (outputs) of the alternatives examined?		
	NO		YES
	Examines only consequences	Examines only costs	
NO	1A PARTIAL EVALUATION Outcome description	1B Cost Description	2 PARTIAL EVALUATION Cost-outcome description
YES	3A PARTIAL EVALUATION Efficacy or effectiveness evaluation	3B Cost Analysis	**4 FULL ECONOMIC EVALUATION** **Cost-minimization analysis** **Cost-effectiveness analysis** **Cost-utility analysis** **Cost-benefit analysis**

(Source: Adapted from Drummond et al., 1987, p. 8)

The types of evaluations noted in the above schematic are as follows:

- **Outcome Description**: A description of the program or service provided.
- **Cost Description**: A description of the cost components of the service provided.
- **Cost-Outcome Description**: A description of both the costs and outcomes of a single service.
- **Efficacy or Effectiveness Evaluation**: An analysis in which only the consequences of the alternatives are compared.
- **Cost Analysis**: An analysis in which only the costs of the alternatives are compared.
- **Cost-Minimization Analysis**: An analysis in which the costs of the alternatives are compared and the consequences of service are deemed to be equivalent, for example, a search for the lowest cost alternative.
- **Cost-Effectiveness Analysis**: An analysis in which the costs and consequences of programs are measured in comparable, appropriate, natural physical units, for example, costs are related to a single effect which may differ in magnitude across alternatives.
- **Cost-Utility Analysis**: An analysis in which the costs and consequences of programs are measured in time units adjusted by health utility weights, for example, costs are related to one or more effects, which are not necessarily common to each alternative, by a standardized utility measure such as quality-adjusted life years.
- **Cost-Benefit Analysis**: An analysis in which the costs and consequences of programs are both valued in monetary terms, for example, costs are related to one or more effects, which are not necessarily common to each alternative, by the standardized measure of money.

2.2 Perspective

Perhaps the most essential feature of an economic analysis is the perspective inherent in the question being asked. Perspective has significant implications for analysis. Ideally, the widest range of costs and benefits should be considered in doing an economic analysis, that is, the perspective of society as a whole. However, this is often not done in actual studies. Rather, writers often consider costs and benefits from a more restrictive perspective, for example, the government, the agency, or the client. Even within a government or funder perspective one may only consider a given agency, or type of service, rather than the whole system of care. By not adopting a comprehensive perspective one may, however, come to erroneous conclusions. For example, consider 1) clients who pay a user fee for homemaker services but who pay no fee for home nursing care services, 2) a government which wishes to reduce costs, and 3) a home care agency which wants to maximize profits. Government may ask for an economic analysis of a new program where certain functions typically provided by nurses are transferred to homemakers through a transfer of function agreement. An economic analysis is conducted, from the government perspective, which shows that 20 percent of the volume of work can be transferred and that homemakers are paid half as much as home care nurses. This finding tells government that it can save 10 percent of the costs of its home nursing care program by instituting the transfer of function program.

The client sees it differently. Clients who are affected may pay more for the added homemaker service (for which they may pay a user fee) than they would if nurses, for which no user fee is required, continue to provide the service. The position of the agency in this scenario is determined by its comparative profit margins for nurses versus homemakers. Depending on the relative ratios of user fees, and staff specific profit margins, the result of adopting the program, when all matters are considered together, could be: no actual change but a cost-shift from government to clients and/or agencies; an actual overall saving, but less than projected from the government perspective alone; or, an actual increase in overall costs, particularly if homemakers take longer to provide the service than nurses.

There is also a fourth group which could be affected, that is, informal caregivers such as family members. Homemakers may provide care to the client but may not teach family members how to care for the client in a correct and efficient manner. To the extent that nurses do so, there could be a differential impact on the amount of time and resources family members would have to devote to caring for the client. Time may constitute real direct costs to family members if they take non-paid leave from work. Thus, the decision to transfer nursing functions to homemakers may have economic impacts not only on the government, the agency, and the client, but also, on the client's family.

2.3 Determining Costs

As noted above, one must properly consider what is the appropriate range of costs and benefits to be included in a given study. Table 1 presents definitions for a number of different types of costs used in economic analysis. Table 1 and the other tables in this section are presented to provide the reader with a sense of the complexity of appropriately calculating costs.

Table 1: Types of Costs

Name	Definition
Total Costs	Costs of producing a particular quantity of output.
Fixed Costs	Costs which do not vary with the quantity of output in the short run (about one year), for example, rent, equipment lease payments, some wages and salaries. These are costs which vary over time, rather than quantity.
Variable Costs	Costs which may vary with the level of output, for example, supplies, food, fees for service, salaries and wages for non-core staff.
Capital Costs	Costs required to purchase the major capital assets required by an agency such as land, buildings and equipment. To the extent that consistent payments are made on an annual basis, capital costs are a sub-set of fixed costs.
Operating Costs	Cost which are not capital costs
Overhead Costs	An accounting term for resources which serve many different departments or programs, for example, hospital administration, central laundry, medical records, cleaning, electricity/power.
Average Costs	The average cost per unit of output.
Marginal Costs	The additional, or extra, cost of producing one extra unit of output.
Per Diem Costs	The average cost per client per day. Per diem rates can be calculated for total costs but are more typically calculated for operating costs as capital costs are often handled separately.
Opportunity Costs	The value of foregone benefits because the resource is not available for its best alternative use. In efficient markets the opportunity cost is the market price.
Non-Market/Indirect Costs	Costs which do not have an existing, or direct, market value, for example, volunteer time, family time, leisure time.

Source: Adapted from Drummond et al., 1987.

An important issue in costing is how to assign costs for non-market goods such as the time of family members. Drummond et al. (1987) note that there are four possible approaches, the first two of which are the most common. The four approaches are:

- **Market valuations**—taking actual valuations where these exist (for example, for most resource items) or imputing valuations by reference to the market price of similar commodities (for example, the value of housewives' time could be imputed by reference to the wages paid to domestic staff) [*sic*].

- **Client's willingness-to-pay estimates**—assessed directly (by asking them) or indirectly (by observing their behaviour) (for example, asking people what they would pay for a quicker form of travel, or observing the trade-offs they make between expenditures and travel time savings).

- **Policy-makers views**—either explicitly stated or implicit in their actions (for example, the decisions made about building safety regulations could be used to impute policy-makers' valuations of human life).

- **Practitioners' views or professional opinions**—such as those on the appropriateness of different forms of care for given categories of patients (for example, court awards might be used to impute the value of the unpleasantness of a disfiguring injury).

(Adapted from Drummond et al., 1987, pp. 149-150)

Donaldson (1990) provides a very useful checklist for costing health care in economic evaluations. This checklist is presented in Table 2.

Another important aspect of costing is that of **discounting**. In economic analysis, future costs, and benefits, are discounted back to present values. Thus, the further out in time a cost or benefit occurs, the lower is its present value because it is discounted at a given annual rate e.g., 5 percent. Discounting is done because it is believed that people have a "time preference," that is, goods received now have a higher value than goods received in the future. If an inflation factor is added to "time preference" discounting, one is said to be using an inflation adjusted discount rate.

Table 2: Check List for Costing Health Care in Economic Evaluation

1. What are the alternatives being costed?
2. From whose viewpoint(s) are costs being estimated?
3. What costing question is being asked?
4. What resources are used by each of the programs to be evaluated?
5. Which of these resources incur true opportunity costs?
6. Which groups in society bear the burden of the cost of these resources: health services; other social services; insurance companies; clients; clients' families?
7. Are there any production effects associated with client participation in the program?
8. Are there costs identified which would have no impact on the result of the evaluation or whose collection requires too much research effort relative to their impact?
9. Can results be expressed in terms of quantities of resources used as well as their prices?
10. Do readily available market values exist for (staffing, consumable, overhead and capital) items costed? If not, from where can imputed values be obtained?
11. Are costs spread over a number of years, thus raising the importance of:
    - counting costs in a base year?
    - discounting?
12. What is the decision context with respect to average and marginal costs? Are we talking about the introduction of a totally new program or the expansion of an existing program, or a comparison of a new with an expanded program?
13. Can patient-based costing be carried out? If not, how can accurate *per diem* costs be obtained?
14. What are the appropriate mechanisms for the allocation of overhead costs to the programs?
15. What is the appropriate length of life to apply to capital assets used in the programs?
16. Do market values accurately reflect opportunity costs?
17. Has sensitivity analysis been carried out? The most likely candidates for sensitivity analysis are:
    - production effects
    - items excluded because of effort required to collect data
    - imputed values
    - discount rate
    - lengths of life of capital items

Source: Donaldson (1990), p. 354.

2.4 Determining Benefits

It is usually difficult in a health related cost-benefit study to value the outputs of health care interventions in strictly monetary terms. One can try to ascribe costs to a life saved but determining the cost of a human life is controversial, and, analysts who have attempted to do so typically come up with a wide range of costs. One can also attempt to assign dollar values to foregone income or the willingness to pay for avoiding some condition. Currently, there appears to be little substantive consensus on the valuation of the benefits of health interventions in monetary terms.

The outcomes in cost-utility analysis are measured in Quality Adjusted Life Years (QALYs). This is an advance over cost-effectiveness analysis in that one can incorporate the quality of the life years saved into the analysis. QALY scores can be determined in a number of ways. One may wish to adopt values already published in the literature, conduct studies of persons with a given condition to obtain their utility scores for given conditions, ask experts such as physicians to assign values to different conditions, or, ask informed members of the general public to assign values. Any given set of QALY scores should be subjected to extensive sensitivity analysis, and to analyses of their validity and reliability.

In cost-effectiveness analysis, no attempt is made to place a monetary value on the quality of outcomes. The outcomes are measured in appropriate natural or physical units such as years of life gained. The result of a cost-effectiveness analysis, therefore, is a determination of the relative cost per unit, for example, cost per year of life gained. Totally different interventions, for different groups of people, can thus be compared to determine where one can have the most impact, for example, maximize the number of life years saved for a given cost. In cost-minimization analysis, the benefits are assumed to be equivalent. Therefore, no valuation is required except for the valuation of the costs of two or more programs.

2.5 Sensitivity Analysis

A sensitivity analysis is another aspect of economic analysis which allows the investigator to determine the extent to which the results of a study differ when different values, or assumptions, are used for certain key aspects of the analysis, for example, how different are the outcomes of a study if one varies the calculation of the costs of informal care from costs based on the minimum wage to costs based on market rates for similar work. Again, this discussion is provided to familiarize the reader with the methods of economic analysis.

Drummond et al. (1987) note that the steps to be taken in conducting a sensitivity analysis are as follows:

- Consider which of the estimates made in the analysis are:

  - subject to debate because no estimates were available and informed guesses were made (for example, the effectiveness of new, unproven, medical procedures);
  - subject to debate because of known imprecision in the estimation procedure (for example, hospitalization costs based on average, *per diem*, figures);

- subject to debate because of methodological controversy or the potential for different value judgements (for example, the choice of discount rate).

- Set upper and lower bounds on the possible range of estimates. Depending upon the source of uncertainty or debate surrounding the estimations, this might be done by:

  - considering empirical evidence from other research studies;

  - considering current practice in the literature;

  - soliciting judgements from those who will be making decisions based on the cost-effectiveness study.

- Calculate study results based on combinations of the "best guess", "most conservative" and "least conservative" estimates of the variables concerned.

2.6 Key Elements of an Economic Evaluation

Table 3 presents an excellent overview of the key elements which should be included in an economic evaluation, and which should be used to evaluate the quality of published studies.

3. THE APPROPRIATE USE OF COST-EFFECTIVENESS ANALYSIS

Avron (1984), notes that cost-effectiveness analysis, as opposed to cost-benefit and cost-utility, analysis, can be a potentially valuable tool if used to compare the relative efficacy of different means, or programs, for achieving a particular goal. Cost-effectiveness, and particularly cost-minimization, analysis are simpler models and do not rely to the same extent on the detailed quantification of benefits. Emery and Schneiderman (1989) present a number of situations in which cost-effectiveness analysis can be used as an appropriate technique. These are:

- **Comparing alternative treatments for an identical goal**

If outcomes are truly comparable, then cost-effectiveness analysis serves to find the most frugal way to attain an established goal (some writers would refer to this as cost-minimization analysis).

- **Determining the most effective utilization of funds earmarked for a specific population**

  As long as there is a clear target population, cost-effectiveness analysis can help to determine which one, of a set of alternative programs, provides the most of the outcome desired for a given funding envelope.

Table 3: Ten Questions to Ask of Any Published Economic Evaluation

1. Was a well-defined question posed in answerable form?
   a) Did the study examine both costs and effects of the service(s) or programme(s)?
   b) Did the study involve a comparison of alternatives?
   c) Was a viewpoint for the analysis stated or was the study placed in a particular decision-making context?

2. Was a comprehensive description of the competing alternatives given (that is, can you tell who did what to whom, where, and how often)?
   a) Were any important alternatives omitted?
   b) Was (should) a "do-nothing" alternative (have been) considered?

3. Was there evidence that the programmes' effectiveness had been established?
   Was this done through a randomized, controlled clinical trial? If not, how strong was the evidence of effectiveness?

4. Were all important and relevant costs and consequences for each alternative identified?
   a) Was the range wide enough for the research question at hand?
   b) Did it cover all relevant viewpoints (for example, those of the community or society, patients and third-party payers)?
   c) Were capital costs as well as operating costs included?

5. Were costs and consequences measured accurately in appropriate physical units (for example, hours of nursing time, number of physician visits, days lost from work or years of life gained) prior to valuation?
   a) Were any identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?
   b) Were there any special circumstances (for example, joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?

6. Were costs and consequences valued credibly?
   a) Were the sources of all values (for example, market values, patient or client preferences and views, policy makers' views and health care professionals' judgement(s)) clearly identified?
   b) Were market values used for changes involving resources gained or used?
   c) When market values were absent (for example, when volunteers were used) or did not reflect actual values (for example, clinic space was donated at a reduced rate) were adjustments made to approximate market values?
   d) Was the valuation of consequences appropriate for the question posed (that is, was the appropriate type, or types, of analysis - cost-effectiveness, cost-benefit or cost-utility - selected)?

7. Were costs and consequences adjusted for differential timing?
   a) Were costs and consequences that occurred in the future "discounted" to their present values?
   b) Was any justification given for the discount rate used?

8. Was an incremental analysis of costs and consequences of alternatives performed?
   Were the additional (incremental) costs generated by the use of one alternative over another compared with the additional effects, benefits or utilities generated?

9. Was a sensitivity analysis performed?
   a) Was justification provided for the ranges of values (for key parameters) used in the sensitivity analysis?
   b) Were the study results sensitive to changes in the values (within the assumed range)?

10. Did the presentation and discussion of the results of the study include all issues of concern to users?
    a) Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (for example, cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?
    b) Were the results compared with those of other studies that had investigated the same questions?
    c) Did the study discuss the generalizability of the results to other settings and patient/client groups?
    d) Did the study allude to, or take account of, other important factors in the choice or decision under consideration (for example, distribution of costs and consequences of relevant ethical issues)?
    e) Did the study discuss issues of implementation, such as the feasibility of adopting the "preferred" programme, given existing financial or other constraints, and whether any freed resources could be used for other worthwhile programmes?

Source: Adapted from Drummond and Stoddart (1985), p. 365.

- **Providing empirical support for the adoption of previously under-funded medical programs**

  Demonstrating that existing and exciting, but underfunded, programs are particularly cost-effective.

- **Exposing noncostworthy care**

  Noncostworthy care can be identified through cost-effectiveness analysis. Examples of noncostworthy care include: care that is relatively inefficient when compared to alternative therapies for the same goal; care that, though inexpensive, provides no benefits; and, care that provides definite benefits but at a great expense.

4. DISCUSSION

The philosophical and methodological foundations of economic analysis have implications for the application of some forms of economic analysis to the longer term care of the elderly. In long term care there may be no clear temporal dimension with a beginning and end point, because this sector of our health system uses a "care" model, not a "cure" model of treatment. The goal is the alleviation of suffering, client satisfaction, and a slowing down of the rate of deterioration in physical and mental functioning. In other words, the care provided is ongoing. The experimental and temporal assumptions of some aspects of economic analysis may not apply. There is generally no time limited intervention such as a kidney transplant, which does or does not produce positive effects over time after the intervention has been applied. To the extent that this is true, it is more difficult, under a number of circumstances, to conduct cost-benefit and cost-utility analyses in the continuing care sector. The most appropriate form of analysis for much of the continuing care sector may be cost-minimization analysis, at least until there are significant improvements in methodology. Providing appropriate care is an equivalent activity, or consequence, for persons at the same level of care, across different settings, for example, care in the home versus care in a long term care facility. Thus, the only matter of interest is the relative cost of each form of care.

If outcomes such as satisfaction with care or differential rates of deterioration in different settings can be quantified, one could engage in other forms of economic analysis, such as cost-

effectiveness analysis. It would be desirable to do more sophisticated types of economic analysis but further methodological development is required in the continuing care sector before this can readily be done. This applies not only to the quantification of outcomes, but to other basic aspects of economic analysis as well. For example, most calculations of quality-adjusted life years have a cut-off of 75 years of age. What relevance can this have to a sector where the average age of persons in long term care facilities is about 85 years?