RESEARCH REPORT

A FRAMEWORK FOR COST-BENEFIT ANALYSIS OF HASI AND RRAP-D VOLUME 1

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A Framework for Cost-Benefit Analysis of HASI and RRAP-D

Final Research Report
Volume 1

Prepared

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Glossary

Benefit-cost analysis. A procedure that evaluates the desirability of a program or project by weighing the **benefits** against the **costs**.

Benefit-cost ratio. The ratio of **benefits** to **costs**. It should be calculated using the present values of each, discounted at an appropriate accounting rate of interest. The ratio should be at least 1.0 for the project to be acceptable. Inconsistent benefit-cost ratios may arise because they are dependent on arbitrary accounting conventions.

***Constant dollars*.** Dollars of constant purchasing power. The units of purchasing power are fixed by stating the base year, for example, 100 in 1995 constant dollars. Constant purchasing-power units. A better term is **real dollars**.

***Contingent valuation*.** A method of inferring the value of **benefits** and **costs** in the absence of a market. What people would be willing to pay to gain a benefit (or willing to accept in recompense for a loss) if a market existed for the good.

Cost. An expense related to purchase of **inputs**, including capital equipment, buildings, materials, labour and public utilities. Costs such as environmental damage or injuries to health are sometimes referred to as negative **externalities**.

Cost-effectiveness analysis. A type of analysis commonly used to compare alternative projects or project designs when the value of **outputs** (benefits) cannot be measured adequately in dollars. If it can be assumed that the benefits are the same for all alternatives being considered, then the task is to minimize the cost of obtaining them through cost-effectiveness analysis. Synonymous with *least-cost analysis*.

***Delphi method*.** A technique for obtaining subjective judgmental values through iterative estimations by a group of experts.

***Deterministic model*.** A **benefit**-**cost** model that uses single fixed values for each **input** (rather than a range of values and **probabilities**).

Distributional gain or loss. A change in the distribution of wealth or income.

Discounted cash flow. The **costs** and **benefits** (**cash flows**) discounted to present values to give a common basis for comparison.

Discounting. The process of adjusting future values to an equivalent present value at a stated point in time by a discount rate.

Discount rate. The interest rate at which future values are discounted to the present and vice versa. Either the **opportunity cost of capital** (applied to investment dollars) or the time preference for consumption (applied to consumption dollars).

Expected value*.** The sum of all possible outcomes, each multiplied by its ***probability. For example, if there are two possible outcomes, \$100 and \$200, and their respective probabilities are 0.3 and 0.7, then the expected value is (\$100 $\times$ 0.3) + (\$200 $\times$ 0.7) = \$170. Synonymous with *certainty equivalent*.

Incremental. Additional or **marginal**.

Inflation. A general increase in **market price** levels (a fall in the general purchasing power of the currency unit).

Input. That which is consumed by the project (as opposed to the project's **output**). Usually refers to the physical inputs used by the project, including materials, **capital**, labour and public utilities. Inputs like environmental quality, foreign exchange and workers' health are usually termed **externalities**.

Investment horizon. The period over which **benefits** and **costs** will be compared.

Marginal. Last, in the sense of the last additional unit. For example, the marginal benefit is the value of one more (or one less) unit of **output**. Synonymous with **incremental**.

Model. A representation or **simulation** of a system or process showing how parameters, benefits and **costs** interact to produce a bottom-line result by which the project can be judged.

Net present value (NPV). The net value of an investment when all **costs** and benefits expressed in standard units of value (**numeraires**) are summed up. Synonymous with net present worth.

Nominal dollars, nominal prices. Prices prevailing in a particular year. Synonymous with **budget-year dollars**.

Numeraire. The standard unit of value that makes it possible to add and subtract **costs** and benefits that are otherwise expressed in unlike units. For example, apples and oranges, as everyone knows, should not be added up. But if they are expressed in terms of a common numeraire, such as pieces of fruit, kilograms or dollars, it is then possible to say that we have 20 pieces, three kilograms, or $4 worth of fruit. Common numeraires in **benefit-cost analysis** are dollars of investment, dollars of consumption, and dollars of foreign exchange.

Opportunity cost. The value of something foregone. For example, the direct opportunity cost of a person-day of labour is what the person would otherwise have produced had the person not been taken away from his or her best alternative occupation to be employed in the project.

Present value. A future value discounted to the present by the appropriate discount rate.

Probability. The quantified likelihood of something occurring.

Real dollars, real prices. Standard units of purchasing power, defined by stating a base year.

Risk. The degree to which outcomes are uncertain. The extent of possible variation in the outcome.

Risk analysis. A **benefit-cost analysis** that recognizes the simultaneous variation of the values of several **inputs**, according to specified ranges and **probabilities**, and analyses the resulting variability in the bottom line.

Sensitivity analysis. An examination of the effect that a change in a single variable (parameter, **cost** or benefit) has on the outcome of a project.

Transfer payments. Payments that redistribute wealth but do not use up resources or create them.

Willingness to pay*.* What consumers are willing to pay for a good or service. Consumers willing to pay substantially more than the actual market price enjoy a consumer surplus (the amount they would pay minus the amount they actually have to pay).

ABSTRACT

The objective of this study was to develop a framework for the cost-benefit analysis of two programs of Canada Mortgage and Housing Corporation (CMHC), the Residential Rehabilitation Assistance Program for Persons with Disabilities (RRAP-D) and Home Adaptations for Seniors Independence Program (HASI). The framework includes all the effects of these programs on applicants, their caregivers and their community.

The study team developed a logic model for the two programs, and a quantitative model of potential impacts of the renovations over time. The team listed all of the costs and benefits that might potentially be relevant and discussed how each might be measured. It made recommendations about the general approach to a major study of the two programs and about various technical aspects of the cost-benefit analysis methodology. In particular, the report describes the use of "contingent valuation" by beneficiaries and the alternative approach which is to quantify and value changes in the quality of life of program beneficiaries and their caregivers.

The study was funded by CMHC and Health Canada.

EXECUTIVE SUMMARY

Introduction

The objective of this study was to develop a framework for the cost-benefit analysis of two programs of Canada Mortgage and Housing Corporation (CMHC), the Residential Rehabilitation Assistance Program for Persons with Disabilities (RRAP-D) and Home Adaptations for Seniors Independence Program (HASI). The framework includes all the effects of these programs on applicants, their caregivers and their community.

RRAP-D was established in 1981 in response to the International Year of the Disabled. It provides financial assistance for the repair, improvement or modification of existing housing to better meet the needs of people with disabilities. The assistance is provided to eligible homeowners and landlords in the form of a forgivable loan of up to 100% of total costs, to the maximum allowable for the zone in which the disabled individual lives. The maximum loan for an individual homeowner ranges from $16,000 to $24,000, and for a landlord, from $24,000 to $36,000. During the five years, 2000 to 2004, under RRAP-D, 6792 loans were made and $61,296,000 was committed.

HASI provides low income persons over 65 years of age with a forgivable loan up to $3,500 to help pay for minor renovations that contribute to them being able to remain in their own homes. During the five years, 2000 to 2004, under HASI, 15,850 loans were made and $34,575,000 was committed.

Methodology

The development of this framework for a cost-benefit analysis of HASI and RRAP-D included input by a cost-benefit analysis expert on the study team, a document and literature review, the development of trial questionnaires for direct beneficiaries and their caregivers (family and friends), and fifteen case studies to gain knowledge of the people who have received contributions from either program at three sites: Ottawa; Edmonton; and Calgary.

A focus group was convened to discuss the issues related to the development of the framework. Members of the focus group included professionals and practitioners in economics, occupational therapy, physiotherapy, home inspection, nursing, home care, social work, health care, housing, and home renovation programs.

The study team reviewed the policy framework for cost-benefit analysis by the Government of Canada, as set out by the Treasury Board Secretariat in its *Benefit-Cost Analysis Guide*, and identified three topics that required particular attention in the context of HASI/RRAP-D. These were:

- Defining the point (s) of view
- Selecting the correct discount rate, and
- Methods to cope with uncertain data.

The new Framework draws to a limited extent on an existing cost-benefit framework which had been developed to examine the Residential Rehabilitation Assistance

Program (RRAP) for homeowners and the Emergency Repair Program (ERP) (*A Framework for Cost Benefit Analysis of the RRAP and ERP Programs*).

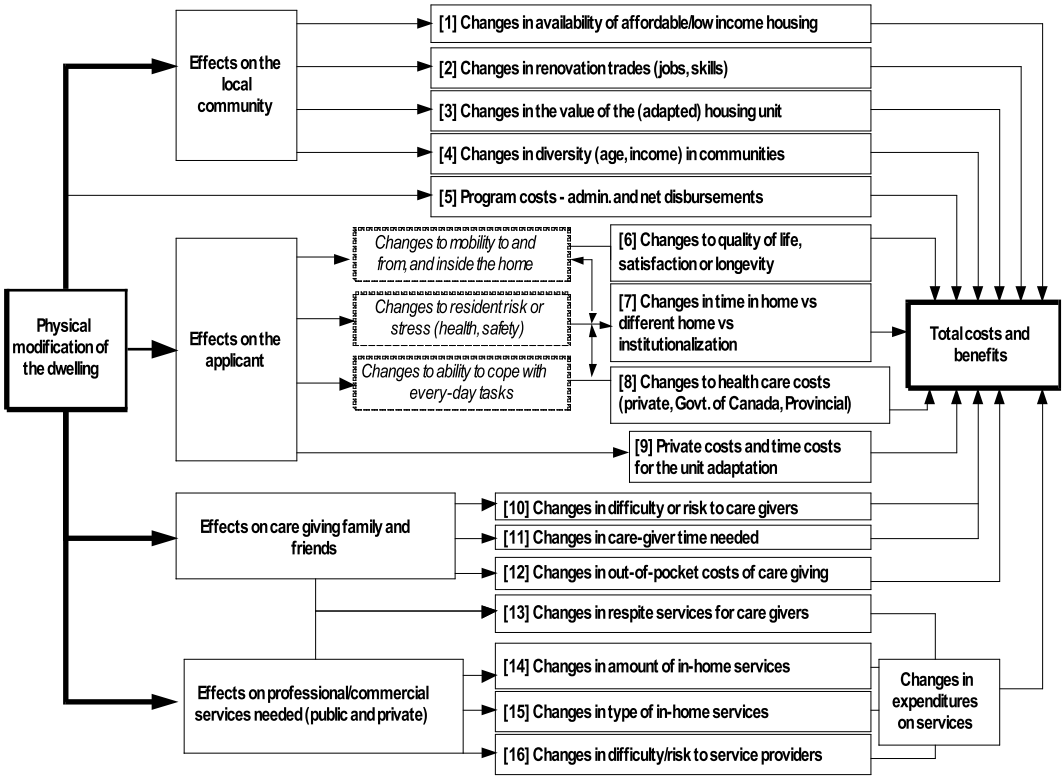
Findings

The study team developed a logic model for the two programs, and a quantitative model of potential impacts of the renovations over time. The team listed all of the costs and benefits that might potentially be relevant and discussed how each might be measured. It made recommendations about the general approach to a major study of the two programs and about various technical aspects of the cost-benefit analysis methodology.

Logic Model

The logic model for HASI and RRAP-D showed sixteen possible program effects in four categories (see figure 1).

Figure 1: RRAP-D and HASI Effects



Effects of the Renovations over Time

The study team developed a model of the possible patterns of beneficiary experience over time. There were two main scenarios. In the first, the applicant's quality of life was in gradual decline and continues without any sudden change until a move to a different dwelling and/or managed care is necessary. In the second, the gradual decline in quality of life was interrupted by an adverse event leading to an immediate change in

accommodation/care. The benefits from the HASI/RRAP-D intervention were explored for each scenario. They included:

1. An improvement in the person's quality of life during the period in which he or she would have remained in the dwelling anyway

2. The quality of life in the present dwelling minus the quality of life in the alternative dwelling to which the person would have moved in the absence of HASI/RRAP-D

3. The postponement of moving costs

4. Occupancy costs savings – that is, occupancy costs in a changed dwelling minus occupancy costs in the present dwelling.

The key parameters that would need to be known to calculate these benefits are:

- The increment of quality of life that results from the renovation
- The extension of tenure in the existing dwelling that results from the renovation
- The quality of life in an alternative dwelling chosen to accommodate aging and/or disability
- The probability of an adverse event precipitating an immediate move to alternative accommodations.

Extended Tenure in the Present Dwelling

The model of incremental effects made it clear that estimating the effect of the renovations on the length of tenure of the beneficiary in the present dwelling is important to calculating the benefits of HASI/RRAP-D. There are three types of data that will help assess the contribution of HASI/RRAP-D to extending the tenure of the beneficiary in the present dwelling. These are:

- Self-reports by beneficiaries on their tenure intentions before and after the renovations.

- Information on how long beneficiaries actually remained in their dwellings, based on a survey that includes beneficiaries of renovations up to five years ago.

- Information on the tenure patterns of persons who applied for HASI/RRAP-D but had to spend time on a waiting list because of program budget constraints.

None of these data are definitive in themselves; but, together, they should enable the evaluation team to make reasonable estimates of the tenure increment in the present dwelling.

Period of Analysis and Sample Size

The study team suggests sampling approved loans in a particular year and then investigate the experience of those beneficiaries and the history of the dwelling unit for some time thereafter – perhaps three to five years. For example, one could take a dollar-unit-weighted random sample of 20% of the 2600 HASI loans and 1108 RRAP-D loans made in the year 2000. This would result in a sample of approximately 500 HASI loans and 400 RRAP-D loans. A sub-sample of about 10% (roughly 90-100) might be chosen for the intensive analysis of quality of life impacts recommended in this report.

The Costs of HASI/RRAP-D

The report discusses how each of seventeen costs of HASI/RRAP-D might be calculated. These costs are:

1. Loan forgiveness (and minor write-offs)
2. Administrative costs
3. Time costs to make a HASI/RRAP-D application (applicant)
4. Time costs for contracting and supervision (applicant)
5. Time costs for activities of daily living
6. Over-runs
7. Associated living costs
8. Stress and disruption costs
9. Possible social isolation
10. Time costs to make a HASI/RRAP-D application (caregivers)
11. Time costs for contracting and supervision (caregivers)
12. Financial contribution by the applicant, if any
13. Time/caregiving costs due to extension of tenure in the present dwelling
14. Stress costs
15. Fees - Changes in type or amount of in-home services.
16. (Under)utilization of the housing stock
17. Specific or unsightly external adaptations

The Benefits of HASI/RRAP-D

The report describes two ways to estimate the benefits of HASI/RRAP-D. The first method is to make detailed measurements, benefit by benefit. The second is to focus on the beneficiary's willingness to pay as a measure of total benefits. The two approaches are substantially different but should provide similar results.

Benefits Method 1: Direct Estimates of Benefits in Detail

The report describes methods of measuring benefits in detail. The benefits discussed include:

1. Improved quality of life in home (including increased independence)
2. Avoidance of moving expenses and higher costs of alternative accommodation
3. Lower stress and less risk in present home (fewer/less serious adverse events)
4. Improvement in the market value of the (adapted) housing unit.
5. Time gained from efficiencies in activities of daily living
6. Less risk or difficulty of caregiving

7. Less time needed for caregiving
8. Less out-of-pocket expenses of caregiving
9. Less need for respite services for caregiver(s)
10. Decreases in the amount or type of in-home services
11. Decreases in difficulty or risk to service providers
12. Improved availability of affordable housing for elderly or disabled people
13. Contribution to the renovation trades (jobs, skills)
14. Maintenance of the market value of surrounding housing
15. Improvement in community diversity (age, disability, income)
16. Lessened public costs of health services and related support services

Quality of Life

One benefit that was paid particular attention was the improvement of the quality of life of the beneficiary, other residents of the dwelling and caregivers. In all fifteen case studies it was clear from observation and from reports by the beneficiary and his or her caregiver(s) that there had in fact been a positive impact on their quality of life. The quality of life of a person who is elderly or disabled is intimately connected with his or her independence. "Independence" is difficult to define fully, but clearly has to do with being able to remain in his or her own home and being able to conduct the activities of daily living as much as possible without assistance.

Of course quality of life is difficult to measure. Therefore the report considers in detail how this might be done. Specifically the report considers how the concept of "quality adjusted life years" (QALY), that is familiar in other health intervention contexts, might be used. It describes a methodology by which a well informed panel of experts might make quantitative estimates of quality-of-life impacts, using the Delphi Method, and benchmarks from the health research literature.

Risk or Difficulty in Caregiving, and the Need for Respite Services

In addition to time saved, there may be benefits in less difficulty or less risk in caregiving. The renovations may result in less stress to the caregiver, with less need for respite services, and fewer accidents to both beneficiary and caregiver. Among the five cases of caregiving observed, one reported that the caregiving tasks had been made easier by the renovation. Neither of the two cases of professional and paid caregiving reported any easing of the caregiving tasks.

Nevertheless there are likely to be cases among the larger population of HASI/RRAP-D recipients where the renovations have lessened the difficulty, risk and stress of the caregiving. This will be hard to measure. The general picture observed among the small sample of case studies is that the caregiver is often elderly and/or suffers from a disability, and is directly benefited by the renovations along with the applicant. It is expected, in addition, that some caregiving tasks are made easier.

Benefits Method 2: Indirect (Contingent) Estimation of the Benefits of HASI and RRAP-D

In situations where benefits are not priced in an ordinary market, some cost-benefit analysts have posed hypothetical (contingent) questions to the interested parties to

calculate benefits indirectly. The contingent value method assumes that the value of a renovation is what beneficiaries are willing to pay, and that this "willingness to pay or to accept compensation" can be ascertained by asking them.

The small sample of case studies tested the willingness-to-accept-compensation question phrased as "what would you accept in cash rather than in program benefits."

The researchers formed the opinion, from the case studies, that one would have to make the situation as realistic as possible if one were to obtain sensible and reliable answers to this type of hypothetical question.

They described a cash-or-program experiment could be carried on for a limited period of time, say six months, that appears to have a good chance of obtaining reliable data, but which would involve considerable extra effort by the program administrators – at least in respect to a small sample of cases.

The Case Studies

The small sample of 15 beneficiaries was not representative of the whole population of HASI and RRAP-D recipients. One must be cautious about generalizations from such limited data. However some points stand out. The beneficiaries and their partners/caregivers were more disabled than one might have expected. All fifteen were disabled, not only the RRAP-D recipients, and a large majority (80%) reported multiple disabilities. All fifteen beneficiaries reported mobility impairments. Arthritis was the second most common disability. During the second round of interviews, some beneficiaries reported that their disabilities had gotten worse, sometimes significantly. This highlights the instability of their health.

The disabilities had several impacts on the study that are relevant to future planning. First, it was difficult to schedule interviews because of constraints related to their disabilities. Second, disabilities often made interviews more time-demanding than expected (vision/hearing difficulties, cognitive disabilities, and lack of energy or feeling actively ill), and had an impact on the ability of the beneficiary to cope with complex questions. Finally, in all cases where the beneficiary had a primary caregiver the caregiver participated in the same interview as the beneficiary, at the beneficiary's request.

Based on the interviews, it was clear that the beneficiaries will try to stay in their homes as long as possible. This appears to be an emotional decision as much as a cost/benefit decision.

There were eight urban beneficiaries and seven rural beneficiaries. The most striking difference between them, particularly in the case of the more remote rural locations, was the inability of the beneficiaries to obtain three competitive quotations from contractors to undertake the renovations. There simply were not three qualified contractors within a reasonable distance. This resulted in compromises that led to difficulties, such as poor quality of work and costs overruns.

One third of the fifteen beneficiaries had a caregiver. The amount and nature of caregiving varied from extreme dependency to help with a few daily activities.

Despite their poor health, none of the beneficiaries were receiving home care nursing services. However, some beneficiaries were very ill and were going back-and-forth to doctors' offices or the hospital frequently. In all cases, primary caregivers (family and friends) were affected in some way by the modifications supported by the CMHC programs, although the nature of these impacts was complex. The primary caregivers, all of whom live with the beneficiary, often benefit from the renovations directly, especially when they have to do with building code (safety and health) issues. In several cases, the caregivers themselves had health problems and disabilities which the renovations helped them deal with. Some caregivers noted that the renovations help them to help the beneficiary better. However, they did not believe that the time and effort they need to invest in the beneficiary's care had lessened in any substantial way because of the renovations.

General Lessons on Data Collection

The research team was able to reach and interview almost all of the people in the case studies sample, but at considerable time expense that probably could not be duplicated in a larger study. The beneficiaries were cooperative and willing to spend time answering questions. All the caregivers identified participated as well. However, it was clear in some cases that the process of being interviewed was stressful for the interviewee. Reasons may have included tiredness, lack of endurance, and perhaps discomfort with discussing their disability with a stranger. At the same time, several persons clearly enjoyed meeting the interviewer and talking about their situation and about the renovation.

The initial assumption that beneficiaries could be interviewed separately from their caregiving family and friends generally proved unfounded. Most often the caregiver was present and contributed significantly to the responses to questions.

The beneficiaries' deteriorating health was a complicating factor in many cases. A beneficiary's general health may deteriorate significantly between the initial contact, the first formal interview, and the follow-up interview. This point is relevant to the practicalities of surveying, but is also relevant to reasonable expectations of results that should be expected from HASI and RRAP-D.

Lessons Learned: Beneficiary Questionnaire

Respondents found most of the questions straightforward. However they struggled with the more complex and hypothetical questions.

One third of the beneficiaries among the fifteen in the sample reported that they have a caregiver. The most frequent kind of care reported was assistance with mobility – moving from one room to another or up and down stairs. The interactions between caregiving and the renovation of the physical dwelling are important; however it is a complex matter, made more complex by difficulties in defining "caregiving."

In the five cases where a primary caregiver was identified and interviewed, the HASI/RRAP-D beneficiary made it clear that he or she believed that the caregiver's work was needed if they were to remain independent and in their homes. In no case did either the beneficiary or the caregiver believe that less caregiving time was required

after the renovation. In one case out of five they thought that the caregiving had been made easier. The research team distinguished between "primary" and "secondary" caregivers on the basis of beneficiary's designation and/or the caregiver's self-designation. This distinction is not fully satisfactory conceptually; but it did not seem to raise any practical difficulties for the respondents. In the first round of interviews, the research team found only two beneficiaries who had additional help beyond that given by a "primary" caregiver. In both cases the family relied on assistance from social agencies. However that assistance was not closely related to any aspect of the physical dwelling unit. The researchers found it remarkable, given the disabilities, that the families interviewed were receiving so few formal home care services.

Beneficiaries were asked eleven questions about the impact of the renovations on their quality of life. Five of those were direct questions about their quality of life and the impact of the renovations. Six questions were couched as before/after comparisons. These were asked of both beneficiaries and caregivers. The respondent was asked to rate on a scale of 0-10 the beneficiary's situation before the renovation and afterwards, on each of the following items:

- Mobility into and out of the dwelling
- Mobility inside the dwelling
- Ability to do usual daily activities, such as using the kitchen to cook
- Ability to look after oneself, such as using the bath and toilet independently
- Physical and mental health
- Overall quality of life

The largest aggregate gains were reported in the category "overall quality of life". Almost the same gains were reported in "mobility into and out of the house." The lowest gains were in "ability to do usual daily activities, such as using the kitchen to cook." However, in reporting these findings one must emphasize that this is not a representative sample. Therefore the findings of a comprehensive survey might be quite different.

The researchers found that beneficiaries have different concepts of what makes for a better "quality of life." Future research teams need to be aware of this. It seems that what constitutes poor or improved quality of life depends crucially on what the beneficiary values most, and this varies.

All beneficiaries strongly indicated that they intend to remain in their homes until their health makes this impossible. The second round of interviews confirmed that the beneficiaries, without exception, have no intention of leaving their homes until absolutely necessary – and certainly not in the short or medium term.

Without exception, the beneficiaries and their caregivers were appreciative of CMHC support. Most could not have afforded the renovations themselves, without this support.

The beneficiaries were asked open-ended questions about what they liked best and least about the program and the renovation. In general they were complimentary about the CMHC staff and/or delivery agent, with two notable exceptions. Their comments about the renovation were favourable, and diverse. The aspects of the program that

they liked least were poor estimating by the contractors and over-runs. In one case the beneficiary was displaced from the home for several months. In several cases there was a misunderstanding about what the renovation budget would cover. Nearly everyone commented on the disruption caused by the renovations, but most thought that it was inevitable.

Conclusions

Summary of the Suggested Approach to Cost-Benefit Analysis

The report considers two cost-benefit methodologies in depth:

1) Direct estimation, which is based on a combination of quality of life estimation and estimation of costs avoided by prolonging tenure in the existing dwelling; and

2) Contingent value analysis, which is based on self-reported willingness-to-accept cash compensation instead of the program. Each has advantages and disadvantages.

If one method had to be chosen, the researchers recommend the direct estimation method. However, given sufficient research resources, both methods could be used to estimate costs and benefits of HASI and RRAP-D, with gains in accuracy and reliability from being able to compare the results of both methods.

There were many detailed findings from the case studies that should be helpful in designing a wider study. Some of the more important findings include:

1. The Clientele. The HASI and RRAP-D beneficiaries and their caregivers are a special clientele that pose challenges to data collection. Many of the people in the sample, beneficiaries and caregivers, were perceptive about the program(s), and cooperative with the study, but were also challenged by disability and age. Consequently interviews were difficult to arrange and time consuming to conduct. However they are probably the only practical means of collecting in-depth and reliable information about the effects of the renovations.

2. Needs Analysis. There was little professional needs analysis before the renovation. Beneficiaries reported having different levels of understanding prior to the renovation of what was needed and what the renovation contract would cover.

3. The Caregivers. About one third of the program beneficiaries had caregivers, and the caregivers themselves had disabilities. The renovation, in these cases, often benefited the caregiver as well as the program applicant. The renovation did not materially lessen the amount of time spent caregiving, but the caregiving was made easier and safer in several cases. Few of the HASI/RRAP-D applicants were receiving formal home care; and where there was homecare it was unaffected by the renovations.

4. The Difficulty of the Questions about Costs and Benefits. The respondents were able to answer complex and detailed questions about the impact of the renovations on their quality of life, for example, but the more abstract the

question the more difficulty they had in addressing it. In general they were more comfortable with concrete questions about the effects of the renovations than with questions that asked them to value those effects in dollars.

5. Timing of Data Gathering. Any future study should take into account that the time that elapses between applications, approvals and completion of the renovations varies a great deal from one case to another. Therefore, any design for a cost-benefit study or HASI and RRAP-D will need to allow for this individual variation of the timing of cases. That is, before/after data collection would be difficult and expensive because it would be individual.

The researchers observed from the review of the literature and from the widespread interest in the present study that a cost-benefit analysis of these programs would be broadly useful not only in regard to HASI and RRAP-D but also as an example of how the effectiveness of similar programs related to the physical environment of people who are elderly or have disabilities could be assessed.

RÉSUMÉ

Introduction

Il est ici question d'une étude qui visait à élaborer un cadre destiné à l'analyse coût-avantages de deux programmes offerts par la Société canadienne d'hypothèques et de logement (SCHL), en tenant compte de tous les effets de ces programmes sur les demandeurs, les aidants naturels et leur collectivité. Ces programmes sont : le Programme d'aide à la remise en état des logements pour personnes handicapées (PAREL-PH) et le programme Logements adaptés : aînés autonomes (LAAA).

Le PAREL-PH a été créé en 1981 dans la foulée de l'Année internationale des personnes handicapées. Il fournit de l'aide financière pour les travaux de réparation, d'amélioration ou de modification de logements existants afin de mieux répondre aux besoins des personnes handicapées. L'aide est offerte aux propriétaires-occupants et aux propriétaires-bailleurs sous la forme d'un prêt-subvention pouvant couvrir jusqu'à 100 % des coûts totaux, jusqu'à concurrence du plafond admissible pour la zone dans laquelle vit la personne handicapée. Le prêt maximal se situe entre 16 000 et 24 000 $ pour un propriétaire-occupant et entre 24 000 et 36 000 $ pour un propriétaire-bailleur. Au cours des cinq années allant du début 2000 à la fin 2004, le PAREL-PH a autorisé 6 792 demandes et dépensé (en subventions) 56 608 000 $.

Le programme LAAA offre aux personnes de 65 ans et plus à faible revenu un prêt-subvention d'un maximum de 3 500 $ pour les aider à financer les petits travaux de rénovation qui leur permettent de continuer à vivre dans leur logement. Au cours des cinq années allant du début 2000 à la fin 2004, le programme LAAA a autorisé 15 850 demandes et dépensé (en subventions) 32 926 644 $**.**

L'étude a bénéficié du financement conjoint de la SCHL et de Santé Canada.

Méthode

L'équipe de chercheurs a élaboré le cadre destiné à l'analyse coût-avantages des programmes LAAA et PAREL-PH après avoir : consulté un spécialiste de l'analyse coût-avantages intégré à l'équipe; passé en revue la documentation sur le sujet; mis au point des questionnaires provisoires destinés aux bénéficiaires directs et aux aidants naturels; et mené quinze études de cas dans le but de recueillir des données sur les bénéficiaires de l'un ou l'autre programme dans les villes d'Ottawa, d'Edmonton et de Calgary.

Un groupe de discussion a été convoqué pour aborder des sujets liés à l'élaboration du cadre. Le groupe de discussion réunissait des professionnels et des praticiens dans les domaines de l'économie, de l'ergothérapie, de la physiothérapie, de l'inspection en bâtiment, des soins infirmiers, des soins à domicile, du travail social, des soins de santé, du logement, et des programmes de rénovation résidentielle.

Après avoir étudié le cadre stratégique du gouvernement du Canada en matière d'analyse coût-avantages, tel que ce cadre est établi par le Secrétariat du Conseil du Trésor dans son *Guide de l'analyse avantages*, l'équipe de chercheurs a cerné les trois aspects suivants qui méritaient une attention particulière dans le contexte des programmes LAAA et PAREL-PH :

- Précision du ou des points de vue;
- Choix du bon taux d'actualisation;
- Méthodes pour faire face au manque de fiabilité des données.

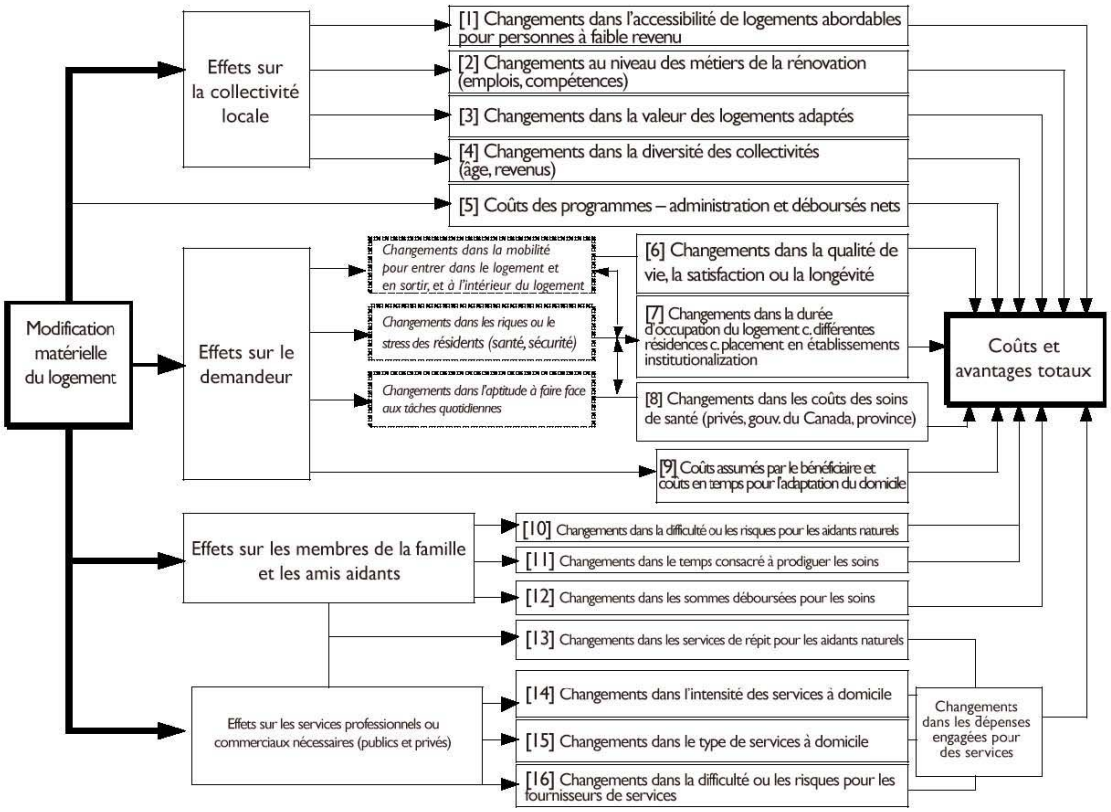
Le nouveau cadre s'inspire un peu d'un cadre d'analyse coût-avantages existant qui avait été élaboré pour examiner le Programme d'aide à la remise en état des logements (PAREL) pour propriétaires-occupants et le Programme de subventions de recherche (PSR) (Cadre de l'analyse coût-avantages des programmes PAREL et PSR).

Résultats

L'équipe de chercheurs a élaboré un modèle logique applicable aux deux programmes et un modèle quantitatif des effets éventuels des rénovations au fil du temps. L'équipe a dressé une liste de tous les coûts et avantages qui pouvaient éventuellement être pertinents et s'est demandée comment chacun pouvait être évalué. Elle a fait des recommandations relativement à la méthode générale à appliquer à une étude d'envergure des deux programmes et relativement à différents aspects techniques de la méthode d'analyse coût-avantages.

Modèle logique

Le modèle logique élaboré pour les programmes LAAA et PAREL-PH présente seize effets possibles des programmes, effets regroupés dans quatre catégories (voir figure 1).



Effets des rénovations au fil du temps

L'équipe de chercheurs a élaboré un modèle représentant les schèmes d'expérience possibles des bénéficiaires au fil du temps. Deux principaux scénarios se dégagent. Dans le premier, la qualité de vie du demandeur se détériore graduellement et la détérioration se poursuit sans changement subit jusqu'au moment où un déménagement vers un logement différent et/ou des soins gérés deviennent nécessaires. Dans le deuxième scénario, la détérioration graduelle de la qualité de vie est freinée par un événement malheureux provoquant un changement immédiat dans le logement ou les soins. Les chercheurs ont étudié les avantages d'une intervention des programmes LAAA ou PAREL-PH dans chaque scénario. Ces avantages comprennent :

1. une amélioration de la qualité de vie de la personne pendant la période où elle doit de toutes façons continuer à occuper son logement;

2. l'écart positif entre la qualité de vie dans le logement actuel et la qualité de vie dans le logement de remplacement où la personne aurait dû déménager en l'absence des programmes LAAA et PAREL-PH;

3. le report des coûts de déménagement;

4. les économies au chapitre des coûts d'occupation, c.-à-d. les coûts d'occupation dans un logement de remplacement diminués des coûts d'occupation dans le logement actuel.

Les paramètres clés à connaître pour évaluer les avantages qui précèdent sont les suivants :

- l'amélioration de la qualité de vie amenée par les rénovations;
- la prolongation de la durée d'occupation du logement actuel attribuable aux rénovations;
- la qualité de vie dans un logement de remplacement conçu pour des personnes vieillissantes et/ou handicapées;
- la probabilité d'un événement malheureux précipitant le déménagement dans un logement de remplacement.

Prolongation de la durée d'occupation du logement actuel

Le modèle des effets différentiels illustre bien que l'estimation des effets des rénovations sur la durée d'occupation du logement actuel par le bénéficiaire est importante dans l'évaluation des avantages des programmes LAAA ou PAREL-PH. Trois types de données aident à évaluer l'apport des programmes LAAA et PAREL-PH à la prolongation de la durée d'occupation du logement actuel par le bénéficiaire. Ce sont :

- les auto-évaluations faites par les bénéficiaires eux-mêmes de leurs intentions d'occupation avant et après les rénovations;

- l'information recueillie sur la durée d'occupation réelle du logement par le bénéficiaire au moyen d'un sondage auprès, notamment, des personnes ayant bénéficié des programmes de rénovation au cours des cinq dernières années;

- l'information sur les schèmes d'occupation par les personnes qui ont fait une demande en vertu des programmes LAAA ou PAREL-PH, mais qui ont dû être mises sur une liste d'attente en raison des contraintes budgétaires imposées aux programmes.

Même si, individuellement, ces données ne sont pas concluantes, lorsqu'elles sont prises globalement, elles donnent quand même une bonne idée à l'équipe chargée de l'évaluation de l'augmentation possible de la durée d'occupation du logement actuel.

Période d'analyse et taille de l'échantillon

L'équipe de chercheurs suggère d'échantillonner les prêts autorisés au cours d'une année donnée, puis de se pencher sur l'expérience des bénéficiaires visés et sur les décisions qu'ils ont prises en matière de logement jusqu'à trois à cinq ans après avoir bénéficié du programme. Par exemple, on pourrait, suivant la technique de l'échantillonnage en unités monétaires, constituer un échantillon aléatoire correspondant à 20 % des 2 600 prêts LAAA et des 1 108 prêts du PAREL-PH consentis en 2000. Il en résulterait un échantillon d'environ 500 prêts LAAA et 200 prêts PAREL-PH. Un sous-échantillon d'environ 10 % (à peu près 90-100) pourrait

servir à l'analyse intensive des conséquences sur la qualité de vie recommandée dans le présent rapport.

Les coûts des programmes LAAA et PAREL-PH

Le rapport traite de la façon de calculer les coûts des programmes LAAA et PAREL-PH rattachés à chacune des dix-sept catégories de coûts suivantes :

1. Remises de prêt (et radiations mineures);
2. Frais d'administration;
3. Coûts en termes de temps mis par le demandeur pour remplir la demande de prêt en vertu des programmes LAAA et PAREL-PH;
4. Coûts en termes de temps mis par le demandeur pour attribuer les contrats et superviser les travaux;
5. Coûts en termes de temps consacré aux activités de la vie quotidienne;
6. Dépassements de coûts;
7. Frais de subsistance connexes;
8. Indemnités liées au dérangement et au stress;
9. Risque d'isolement social;
10. Coûts en termes de temps mis par les aidants naturels pour remplir la demande de prêt en vertu des programmes LAAA et PAREL-PH;
11. Coûts en termes de temps mis par les aidants naturels pour attribuer les contrats et superviser les travaux;
12. Contribution financière, le cas échéant;
13. Coûts en termes de temps et de soins résultant de la prolongation de l'occupation du logement actuel;
14. Coûts en termes de stress;
15. Frais inhérents aux changements apportés dans le type et l'intensité des services à domicile;
16. Sous-utilisation du parc de logements;
17. Adaptations spécifiques ou externes peu esthétiques.

Les avantages des programmes LAAA et PAREL-PH

Le rapport décrit deux façons d'évaluer les avantages des programmes LAAA et PAREL-PH. La première méthode consiste à procéder à une analyse détaillée, avantage par avantage. La seconde méthode évalue les avantages en fonction de la somme que les bénéficiaires seraient prêts à payer pour les rénovations. Les deux méthodes sont passablement différentes, mais devraient déboucher sur des résultats comparables.

Méthode I : Évaluation directe et détaillée des avantages

Le rapport décrit des façons d'évaluer en détail les avantages. Les avantages évalués sont les suivants :

1. Amélioration de la qualité de vie (et de l'autonomie) à la maison;

2. Élimination des frais de déménagement et des coûts accrus d'un logement de remplacement;
3. Réduction du stress et des risques dans le logement actuel (incidents moins fréquents et moins graves);
4. Hausse de la valeur marchande du logement une fois adapté;
5. Gain de temps au niveau des activités de la vie quotidienne;
6. Réduction de la difficulté ou des risques pour les aidants naturels;
7. Réduction du temps consacré à prodiguer les soins;
8. Réduction des sommes déboursées pour les soins;
9. Diminution des besoins de répit des aidants naturels;
10. Diminution de l'intensité des services à domicile ou des types de services à domicile;
11. Réduction de la difficulté ou des risques pour les fournisseurs de services;
12. Accroissement de la disponibilité de logements abordables destinés aux personnes âgées ou handicapées;
13. Apport aux métiers de la rénovation (emplois, compétences);
14. Maintien de la valeur marchande des logements avoisinants;
15. Amélioration de la diversité de la population (âge, état de santé, revenus);
16. Réduction des coûts publics des services de santé et des services de soutien connexes.

Qualité de vie

L'un des avantages ayant particulièrement retenu l'attention des chercheurs a été l'amélioration de la qualité de vie des bénéficiaires, des autres résidents du logement et des aidants naturels. Dans chacun des quinze cas à l'étude, les observations des chercheurs et les témoignages des bénéficiaires et des aidants naturels ont clairement établi une amélioration de la qualité de vie. La qualité de vie d'une personne âgée ou handicapée est intimement liée à son degré d'autonomie. Le terme « autonomie » est difficile à définir, mais il est clair que cette notion est liée à la possibilité pour une personne de rester chez elle et de pouvoir poursuivre ses activités quotidiennes le plus possible sans aide.

Il est évidemment difficile d'évaluer la qualité de vie. Aussi, le rapport s'attarde-t-il longuement à la façon de s'y prendre. Le rapport traite plus précisément de la façon dont pourrait être utilisée la notion d'« années-personnes sans invalidité » applicable à d'autres contextes d'interventions en santé. Le rapport décrit ainsi une méthode grâce à laquelle un groupe d'experts pourrait produire des évaluations quantitatives des effets sur la qualité de vie en s'appuyant sur la méthode Delphi et les repères établis dans les comptes rendus de recherche en santé.

Risque ou difficulté à prodiguer les soins et besoin de services de répit

En plus des économies de temps, il peut aussi y avoir des avantages liés à la réduction des risques ou de la difficulté à prodiguer les soins. Les rénovations peuvent contribuer à réduire le stress imposé à l'aidant naturel et faire en sorte que celui-ci ait moins besoin de répit et que les accidents dont peuvent être victimes à la fois le

bénéficiaire et l'aidant naturel soient moins nombreux. Selon l'un des cinq aidants naturels ayant fait l'objet d'une étude de cas, les rénovations avaient facilité ses tâches d'aidant naturel. Aucun des deux fournisseurs de soins professionnels rémunérés n'a signalé de facilité accrue à prodiguer les soins. Aucun changement dans le besoin de services de répit n'a été signalé par l'un ou l'autre des quinze aidants naturels interrogés.

Il n'en reste pas moins probable qu'il y ait, sur l'ensemble des bénéficiaires des programmes LAAA et PAREL-PH, des cas où les rénovations ont atténué la difficulté, les risques et le stress liés au fait de prodiguer des soins. Ce point restera cependant difficile à évaluer. L'impression générale qui se dégage de l'étude de ce petit échantillon de cas est que l'aidant naturel, qui est souvent une personne âgée et/ou ayant une déficience, bénéficie lui-même directement des travaux au même titre que le demandeur. L'on s'attend, en outre, que certains des soins se trouvent facilités du fait des rénovations.

Méthode 2 : Évaluation indirecte des avantages des programmes LAAA et PAREL-PH (étude des préférences exprimées)

Lorsque les avantages ne sont pas quantifiables en dollars sur un marché ordinaire, certains auteurs d'analyses coût-avantages posent des questions hypothétiques aux parties intéressées de manière à évaluer les avantages indirectement (d'après les préférences exprimées). Les études de préférences exprimées prennent la forme d'un sondage qui vise à déterminer le montant que les bénéficiaires seraient prêts à payer pour les rénovations ou la somme qu'ils accepteraient en remplacement des avantages procurés par les programmes.

Ainsi, dans le petit échantillon de cas à l'étude, on a posé la question comme suit : « Quelle somme accepteriez-vous en argent en remplacement des avantages du programme? ».

Selon les chercheurs, il faut que la situation soit présentée de la façon la plus réaliste possible pour que les réponses à ce genre de questions hypothétiques soient significatives et fiables.

Les chercheurs ont donc décrit une expérience où le choix entre l'argent ou le programme serait offert pendant une période limitée, disons de six mois, qui paraît une durée suffisante pour avoir de bonnes chances d'obtenir des données fiables, mais qui occasionnerait un surcroît de travail considérable aux administrateurs des programmes, à tout le moins en ce qui concerne un petit échantillon de cas.

Études de cas

Le petit échantillon de quinze bénéficiaires n'était pas représentatif de l'ensemble de la population bénéficiaire des programmes LAAA et PAREL-PH. Il faut donc se garder des généralisations hâtives à partir de données aussi limitées. L'étude a quand même fait ressortir certains points. Les bénéficiaires et leurs compagnons ou aidants naturels

étaient plus lourdement handicapés qu'on ne s'y serait attendu. Tous les quinze, et non seulement les bénéficiaires du PAREL-PH, étaient handicapés, et la grande majorité d'entre eux (80 %) avaient des déficiences multiples. Chacun des quinze bénéficiaires a déclaré devoir composer avec une mobilité réduite. L'arthrite venait au deuxième rang des limitations les plus courantes. Au cours de la deuxième série d'entrevues, certains bénéficiaires ont déclaré que leurs déficiences s'étaient aggravées, parfois de manière importante, ce qui fait ressortir l'instabilité de leur état de santé.

Les déficiences ont eu plusieurs conséquences sur l'étude, conséquences dont il faudra tenir compte à l'avenir dans la planification. D'abord, il a été difficile de fixer les rendez-vous en raison des contraintes liées aux déficiences. Ensuite, les limitations (problèmes visuels ou auditifs, déficiences cognitives, manque d'énergie ou malaise constant) ont souvent été la cause d'entrevues plus longues que prévu et ont nui à la capacité des bénéficiaires de faire face à des questions complexes. Enfin, dans tous les cas où les bénéficiaires avaient un aidant naturel primaire, celui-ci a participé à la même entrevue que le bénéficiaire, à la demande de ce dernier.

Il est ressorti clairement des entrevues que les bénéficiaires essaieront de rester chez eux le plus longtemps possible. Ce choix tient à des considérations affectives autant qu'aux coûts et avantages en jeu.

L'échantillon comprenait huit bénéficiaires vivant en milieu urbain et sept vivant en milieu rural. La différence la plus frappante entre ces deux catégories de bénéficiaires était l'impossibilité pour les bénéficiaires vivant en milieu rural, et d'autant plus pour ceux qui vivaient dans les régions les plus reculées, d'obtenir trois estimations concurrentes de la part d'entrepreneurs aptes à effectuer les rénovations. Le fait qu'il n'y avait tout simplement pas trois entrepreneurs compétents dans un rayon raisonnable a obligé les bénéficiaires à faire des compromis qui ont compliqué les travaux et entraîné des dépassements de budget et une qualité de travail inacceptable.

Le tiers des quinze bénéficiaires avaient un aidant naturel. Le type et l'intensité des soins variaient selon les besoins des bénéficiaires, qui allaient de besoins inhérents à une dépendance extrême à des besoins d'aide dans certaines activités quotidiennes. Malgré leur piètre état de santé, aucun des bénéficiaires n'avait d'infirmière ou d'infirmier résidant. Cependant, certains bénéficiaires, très malades, faisaient fréquemment l'aller-retour entre leur domicile et les cabinets des médecins ou l'hôpital. Dans tous les cas, les aidants naturels primaires étaient touchés d'une façon ou d'une autre par les modifications apportées grâce aux programmes de la SCHL, même si la nature de ces effets était complexe. Les aidants naturels primaires, qui, tous, vivaient auprès du bénéficiaire, ont souvent profité eux-mêmes directement des travaux, surtout lorsque ceux-ci portaient sur des améliorations visant la salubrité et la sécurité, exigées par le code du bâtiment. Dans plusieurs cas, les aidants naturels eux-mêmes éprouvaient des problèmes de santé et présentaient des déficiences que les rénovations ont rendu plus faciles à supporter. Des aidants naturels ont déclaré que les rénovations leur ont permis de mieux aider le bénéficiaire. Cependant, ils n'avaient pas l'impression que les rénovations avaient sensiblement réduit le temps et l'énergie qu'ils devaient consacrer au bénéficiaire.

Grandes leçons tirées de la collecte des données

L'équipe de chercheurs a pu joindre et interviewer presque toutes les personnes composant l'échantillon de cas à l'étude, mais au prix d'une dépense en temps considérable qui ne pourrait pas être engagée à nouveau dans une étude de plus grande envergure. Les bénéficiaires se sont montrés coopératifs et disposés à prendre le temps de répondre aux questions. Tous les aidants naturels désignés ont aussi participé. Malgré tout, il a été clair dans certains cas que l'entrevue était une source de stress pour la personne interviewée. La fatigue, le manque d'endurance et peut-être la gêne d'avoir à parler de sa déficience à un étranger peuvent expliquer ce stress. En revanche, plusieurs personnes ont visiblement apprécié de rencontrer l'intervieweur et de parler de leur situation et des rénovations.

L'hypothèse de départ voulant que l'on puisse interroger les bénéficiaires séparément des membres de leur famille et de leurs amis qui tiennent auprès d'eux le rôle d'aidants naturels s'est en général révélée non fondée. Le plus souvent, l'aidant naturel était présent et enrichissait considérablement les réponses aux questions. Dans bien des cas, la détérioration de la santé des bénéficiaires était une source de complications. L'état de santé général d'un bénéficiaire peut se détériorer considérablement entre le moment du premier contact, celui de l'entrevue à proprement parler et celui de l'entrevue de suivi. Ce point est pertinent en ce qui a trait au côté pratique du processus d'entrevue, mais il est aussi pertinent eu égard aux résultats qu'il est raisonnable de s'attendre des programmes LAAA et PAREL-PH.

Leçons tirées quant au questionnaire destiné au bénéficiaire

Les répondants ont trouvé que la plupart des questions étaient claires. Toutefois, les questions plus complexes et les questions hypothétiques leur ont donné du fil à retordre.

Le tiers des quinze bénéficiaires ont déclaré avoir un aidant naturel. Le plus souvent, celui-ci aide le bénéficiaire au niveau de ses besoins de mobilité (pour aller d'une pièce à l'autre ou monter ou descendre un escalier). Les interactions entre les soins et les rénovations dans les logements sont importantes, mais la question est complexe, d'autant plus qu'il est difficile de définir ce qu'on entend par « soins ».

Dans les cinq cas où un aidant naturel primaire a été identifié et interviewé, le bénéficiaire des programmes LAAA et PAREL-PH a clairement indiqué qu'il estimait que le travail de l'aidant naturel était indispensable s'il devait rester autonome et continuer d'habiter son logement. En aucun cas, le bénéficiaire ou l'aidant naturel n'avait l'impression que les travaux avaient réduit le temps alloué à prodiguer les soins. Dans un cas sur cinq, ils estimaient que les soins étaient plus faciles à prodiguer du fait des rénovations. L'équipe de chercheurs a fait la distinction entre aidant naturel « primaire » et aidant naturel « secondaire » sur la foi de la désignation faite par le bénéficiaire et/ou de l'auto-désignation par l'aidant naturel. Cette distinction n'est pas entièrement satisfaisante sur le plan notionnel; mais elle ne semble pas avoir soulevé de difficultés pratiques pour les répondants. Dans la première série d'entrevues, l'équipe de chercheurs n'a trouvé que deux bénéficiaires qui avaient de l'aide supplémentaire en plus de celle qui était fournie par l'aidant naturel « primaire ». Dans

les deux cas, la famille comptait sur l'aide des services sociaux. Toutefois, cette aide n'était liée de près à aucun aspect du logement à proprement parler. Compte tenu des limitations observées, les chercheurs ont été surpris de voir que les familles interviewées reçoivent aussi peu de services officiels de soins à domicile.

Onze questions ont été posées aux bénéficiaires au sujet des effets des rénovations sur leur qualité de vie. Cinq de ces questions portaient directement sur leur qualité de vie et les effets des rénovations. Six questions comparaient la situation avant et après les travaux. Ces dernières s'adressaient à la fois aux bénéficiaires et aux aidants naturels. Le répondant devait attribuer une cote sur une échelle de 0 à 10 à la situation du bénéficiaire avant et après les travaux au regard de chacun des points suivants :

- Mobilité pour entrer dans le logement et en sortir;
- Mobilité à l'intérieur du logement;
- Aptitude à s'adonner aux activités habituelles de la vie quotidienne, comme l'utilisation de la cuisine pour préparer les repas;
- Aptitude à s'occuper de soi, notamment pour prendre un bain et aller aux toilettes;
- Santé physique et mentale;
- Qualité de vie globale.

C'est le point « Qualité de vie globale » qui a reçu la cote globale la plus haute, devançant de peu le point « Mobilité pour entrer dans le logement et en sortir ». La cote globale la plus basse a été attribuée au point « Aptitude à s'adonner aux activités habituelles de la vie quotidienne, comme l'utilisation de la cuisine pour préparer les repas ». Ces résultats, rappelons-le, n'ont pas été obtenus au moyen d'un échantillon représentatif. Une enquête exhaustive aurait peut-être donné des résultats passablement différents.

Il est apparu aux chercheurs que les bénéficiaires n'avaient pas tous la même idée de ce qui constitue une meilleure « qualité de vie ». Les chercheurs qui mèneront d'autres études sur la question devront garder ce fait à l'esprit. Il semble que ce qui constitue une piètre qualité de vie ou une meilleure qualité de vie dépend essentiellement de ce qui importe le plus au bénéficiaire, et cela varie de l'un à l'autre.

Tous les bénéficiaires ont dit avoir la ferme intention de rester dans leur logement jusqu'à ce que leur santé le leur interdise. La deuxième série d'entrevues a confirmé que les bénéficiaires, sans exception, n'ont pas l'intention de quitter leur logement tant que cela ne deviendra pas absolument nécessaire, et certainement pas à court ou moyen terme.

Sans exception, les bénéficiaires et les aidants naturels se sont dits reconnaissants du soutien offert par la SCHL. La plupart n'auraient pas eu les moyens de faire faire les travaux sans cette aide.

On a posé des questions ouvertes aux bénéficiaires sur ce qu'ils ont le plus et le moins aimé au sujet du programme et des rénovations. En général, ils ont été élogieux à l'endroit du personnel de la SCHL et/ou de son mandataire, à deux exceptions près. Leurs remarques au sujet des rénovations ont été positives et variées. Les aspects du programme qu'ils ont le moins aimé ont trait aux mauvaises estimations faites par les entrepreneurs et aux dépassements de coûts. Dans un cas, le bénéficiaire a dû vivre

ailleurs que dans son logement pendant plusieurs mois. Dans plusieurs cas, il y a eu un malentendu sur ce que couvrait le budget de rénovations. Presque tous les répondants ont déploré les perturbations occasionnées par les travaux, bien que la plupart les aient jugées inévitables.

Conclusions

Résumé de la méthode d'analyse coût-avantages suggérée

Le rapport étudie en profondeur les deux méthodes d'analyse coût-avantages que voici :

1. l'évaluation directe et détaillée des avantages, qui combine une évaluation de la qualité de vie et une évaluation des coûts évités par la prolongation de l'occupation du logement actuel; et
2. l'évaluation fondée sur l'étude des préférences exprimées, qui repose sur la détermination du montant que les bénéficiaires accepteraient en remplacement des avantages procurés par le programme. Chaque méthode comporte des avantages et des inconvénients.

S'ils devaient choisir une méthode, les chercheurs recommanderaient celle de l'évaluation directe. Toutefois, s'ils disposaient de ressources suffisantes pour la recherche, ils utiliseraient les deux méthodes pour évaluer les coûts et les avantages des programmes LAAA et PAREL-PH, ce qui leur permettrait d'obtenir une évaluation plus précise et plus fiable en raison de la possibilité de confronter les résultats obtenus par les deux méthodes.

Les études de cas ont donné lieu à bon nombre de constatations qui pourraient se révéler utiles dans la conception éventuelle d'une étude plus vaste. Voici certaines de ces constatations parmi les plus importantes :

1. Clientèle. Les bénéficiaires des programmes LAAA et PAREL-PH et les aidants naturels forment une clientèle particulière qui présente des défis au niveau de la collecte des données. Même si bon nombre des personnes comprises dans l'échantillon, bénéficiaires et aidants naturels confondus, ont bien saisi la nature du ou des programmes et ont fait preuve d'un esprit de coopération, ces personnes n'en étaient pas moins affectées et par leur déficience et par leur âge. Il a donc été difficile de fixer un moment pour les entrevues et celles-ci ont pris un temps considérable. Les entrevues restent quand même le seul moyen pratique de recueillir de l'information détaillée et fiable sur les effets des rénovations.

2. Analyse des besoins. Peu d'analyses des besoins avaient été faites par des professionnels avant les travaux. De leur propre aveu, les bénéficiaires avaient des niveaux de compréhension différents des travaux nécessaires et de ce que les contrats de rénovation devaient couvrir.

3. Aidants naturels. Environ un tiers des bénéficiaires des programmes avaient des aidants naturels, et ceux-ci étaient eux-mêmes handicapés. Les rénovations, dans ces cas, ont souvent profité non seulement au demandeur mais également à l'aidant naturel. Les rénovations n'ont pas réduit sensiblement le temps consacré à prodiguer les soins, mais dans plusieurs cas, les soins ont pu être dispensés plus facilement et d'une manière plus sécuritaire. Un petit nombre seulement des demandeurs dans le cadre des programmes LAAA et PAREL-PH bénéficiaient de services à domicile officiels. Dans les cas où de tels services étaient dispensés, ceux-ci n'ont pas été influencés par les rénovations.

4. Difficulté des questions portant sur les coûts et les avantages. Les répondants ont pu répondre à des questions complexes et détaillées au sujet des effets des rénovations, sur leur qualité de vie par exemple, mais plus la question était abstraite, plus ils ont eu du mal à y répondre. En général, ils étaient plus à l'aise avec des questions concrètes sur les effets des rénovations qu'avec les questions qui leur demandaient d'évaluer les effets en termes de dollars.

5. Moment de la collecte des données. Toute étude future devrait prendre en considération le fait que le laps de temps qui s'écoule entre la demande, son autorisation et la fin des travaux de rénovation varie considérablement d'un cas à l'autre. Par conséquent, la conception de toute étude portant sur l'analyse coût-avantages des programmes LAAA et PAREL-PH devra prévoir cette variation d'un cas à l'autre. C'est dire qu'il serait très difficile et coûteux de recueillir des données sur la situation avant et après, car la collecte devrait se faire en fonction des situations individuelles.

À en juger par l'ampleur de la documentation sur le sujet et l'intérêt général suscité par la présente étude, les chercheurs estiment qu'une analyse coût-avantages des programmes LAAA et PAREL-PH non seulement serait utile aux programmes, mais qu'elle fournirait un exemple de la façon dont peut être évaluée l'efficacité de programmes liés à l'environnement matériel des personnes âgées ou handicapées.

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A Framework for a Cost-Benefit Analysis of HASI and RRAP-D Final Report

1.0 PROFILE

1.1 Introduction

Many seniors and people with disabilities prefer to remain in their own homes, even when they are frail or severely disabled. The benefits they receive from being able to stay in their own homes can make a difference to their health, their independence (quality of life) and possibly their longevity.

Sometimes a person's age or disability does not necessitate institutional care, and the alternative housing is another private dwelling that is more appropriate than the present dwelling. In such cases there may be social and economic benefits from a renovation to the present dwelling that makes a move unnecessary or enables the person to postpone moving. Low income people may not have the financial resources, without assistance, to undertake renovations.

Although the physical environment must be supportive, it is not the only factor that influences the ability of a person to undertake the activities of daily living and to stay in the present home. Help from relatives, friends and professional service-providers is often also important. The physical environment of the dwelling may make care-giving easier or safer; and the care-giver, him or her, if elderly or living with a disability, may also benefit from renovations.

The theme of this report is how to assess whether assistance with renovations to enable an elderly or disabled person to remain in their present dwelling is cost-effective, given alternatives. This is a complex matter since different costs and benefits are borne by different parties.

1.2 Two CMHC Renovation Programs Targeted at Overlapping Populations

Two housing renovation programs are the subject of this study: the Residential Rehabilitation Assistance Program for Persons with Disabilities (RRAP-D), and Home Adaptations for Seniors Independence Program (HASI). They are designed to help low-income seniors and those with disabilities remain in their homes by providing them with financial support to modify their physical dwellings.

Table 1.2.1 Numbers of Loans, 2000-2004, HASI and RRAP-D

Year	HASI		RRAP-D	
	Number of Loans	Forgiveness	Number of Loans	Forgiveness
2000	2600	$5,496,000	1108	$10,027,000

2001	4425	$8,381,000	1231	$11,433,000
2002	4975	$10,068,000	1515	$10,990,000
2003	1750	$3,157,644	1250	$7,322,000
2004	2100	$5,824,000	1688	$16,836,000

Source: CMHC, Canadian Housing Statistics, 2001, 2002, 2003, and 2004

Table 1.2.2 Loan Approvals, 2003, HASI and RRAP-D, by Household Income

Household Income	HASI	RRAP-D
Zero		6%
1 to 25,000	77%	79%
25,001 to 50,000	23%	15%
Total:	100%	100%

Source: CMHC Special Tabulations

The programs are funded and delivered in three different ways across the country:

(i) Federal/provincial/territorial cost-sharing with CMHC program delivery;
(ii) Federal/provincial/territorial cost-sharing, with provincial/territorial program delivery; and
(iii) Direct delivery by CMHC through delivery agents.

1.3 The Residential Rehabilitation Assistance Program for Persons with Disabilities (RRAP-D)

RRAP-D is part of Canada Mortgage and Housing Corporation's Residential Rehabilitation Assistance Program (RRAP). This program helps low-income Canadians with disabled individuals maintain decent, affordable housing. In 2003, for example, CMHC approved 723 RRAP-D applications and forgave $7,716,384 in contributions. Of these 124 (17%) and $1,194,740 (15.5%) were for First Nations applicants. Most (73%) of the dwellings were single houses. Forty percent of the approved applicants were senior citizens.

RRAP-D was established in 1981 in response to the International Year of the Disabled. It provides financial assistance for the repair, improvement or modification of existing housing to better meet the needs of individuals with disabilities. The assistance is made available to eligible homeowners and landlords in the form of a forgivable loan of up to 100% of total costs, to the maximum allowable for the zone in which the disabled individual lives. The types of renovations that have been funded include: modified bathrooms or kitchens, improved street access, installation of easy-to-open doors and windows; modified bedroom or living room areas; and installation of elevators or lift devices. According to the 2002 evaluation, 90% of RRAP-D recipients felt that the renovations paid for by the program had improved their ability to carry out their daily activities safely.

Homeowners qualify if the value of their house is below a specified figure and their household income is at or below established ceilings based on household size and the area in which the recipient resides. Landlords are eligible if their units are rented at or below established levels, and are occupied by tenants with incomes at or below the income ceilings. To receive the maximum-allowable loan, landlords must ensure that

the units will continue to be affordable, and that new occupants will not exceed the income ceilings established by the program.

The maximum loan for an individual homeowner ranges from $16,000 to $24,000, and for a landlord, from $24,000 to $36,000, depending on location (southern Canada, northern Canada, and the Far North). During the five years, 2000 to 2004, RRAP-D approved 6792 applications and committed $61,292,000.

An evaluation in 2002 of the Residential Rehabilitation Assistance Program found that it is appropriately targeted to the needy and the disabled, is meeting its objectives, and is contributing to the quality and availability of housing. Consultations by CMHC have indicated that there is widespread support for these programs.

1.4 Home Adaptations for Seniors Independence Program (HASI)

The Home Adaptations for Senior Independence Program (HASI) provides low income seniors with financial assistance to help pay for minor renovations that contribute to them being able to remain in their own homes. Renovations must be permanent and fixed, and might include such things as handrails, easily-accessible work and storage areas, lever door and window handles, walk-in showers with grab bars, and bathtub grab bars and seats. Homeowners and landlords are eligible for assistance if the occupant is 65 or over; has difficulty with daily living activities because of ageing; has a total household income at or below a specified limit for the given area; and is living in their permanent residence.

Assistance is given as a forgivable loan of up to $3,500 which does not have to be repaid as long as the homeowner agrees to continue to occupy the dwelling for at least six months after the renovation. If the work is being done on a rental unit, the landlord must agree that rents will not increase as a result of the renovation. In 2003, CMHC approved 1145 HASI applications and forgave $3,157,644. Of these, 114 (10%) and $334,096 (10.5%) were first nations applicants. During the five years, 2000 to 2004, HASI approved 15,850 loans and committed $34,575,000.

1.5 Caregiving, Home Care and the Physical Environment of the Home

In 1996, 2.85 million Canadians provided care to at least one person with a chronic health problem or disability.[1] Most caregivers were middle-aged women, employed full time, caring for more than one person, caring for a parent (but significant proportions cared for distant kin or friends), caring for more than two years, and not living with the person for whom they cared. This was not the pattern observed in the very small sample of HASI/RRAP-D cases in this present study, but it may hold for the wider population of program beneficiaries.

Many caregivers are juggling work and caregiving responsibilities while at the same time incurring out-of-pocket expenses. Fast and Keating[2] estimated that more than half of the caregivers made adjustments to their employment at an estimated cost to each employed caregiver of more than $1.2 million in lost current and future income. More

than 40% incurred extra expenses that they estimated at $30,630 per employed caregiver, because of their caring responsibilities. Men and women averaged between 3 and 5 hours per week on eldercare tasks; it would have taken 276,509 full time employees, at a cost of $5 - 6 billion, to replace the work of the 2.1 million Canadians who cared for seniors in 1996. Caregivers' physical, social and psychological health also were affected

How to best support primary caregivers (family and friends) in their caregiving role has become an important policy priority for governments. Assistance with physical renovations to the home to help beneficiaries be more independent and aid caregivers in their caregiving role is one possibility.

Initial indications are that programs such as HASI and RRAP-D that provide such assistance may be very cost-effective when all of the costs and benefits are taken into account. This paper is focused on a framework for a study to establish whether this is in fact the case.

2.0 Study Objectives and Methodology

2.1 Study Objectives

It is generally believed that helping seniors and persons with disabilities to stay in their homes is cost-effective. However this is a complex matter with many types of costs and benefits to many different parties. Therefore CMHC has commissioned this methodology study to set out a framework for a full cost-benefit analysis of the two programs. In summary, the purpose of the study was twofold:

(i) To develop a framework to assess the costs and benefits of HASI and RRAP-D, and

(ii) To test the framework (and a survey questionnaire designed with the framework in mind) by conducting case studies of renovations to enable seniors and people with disabilities to remain in their homes.

A Project Advisory Committee was established to review and comment on the deliverables, and a CMHC Project Manager[3] coordinated all aspects of the study.

2.2 Methodology

In preparation for the development of the cost-benefit Framework we undertook a document and literature review, which examined the general literature as well as key CMHC reports, documents and files (Appendix A).

In addition, a focus group was convened to provide feedback and advice on issues related to the development of the Framework, and on preparations for the case studies that were to test the framework. Members of the focus group included key professionals and practitioners in relevant fields, including: economics, occupational therapy, physiotherapy, home inspection, nursing, home care, social work, health care, housing, and home renovation programs. The focus group met in advance of the development of the preliminary framework.

The new Framework draws to a limited extent on an existing cost-benefit framework which has been developed to examine the Residential Rehabilitation Assistance Program (RRAP) for homeowners and the Emergency Repair Program (ERP) (*A Framework for Cost Benefit Analysis of the RRAP and ERP Programs*). However this Framework takes new directions.

2.2.1 Evaluation Issues

These complex and interesting programs raise many issues that would be addressed in a cost-benefit analysis. Some issues were identified at the start of this study.[4]

2.2.2 Framework Development

The Framework includes the following:

A Profile of the Programs

The Profile is a description of the characteristics and needs of the clients served; the types and costs of renovations that have been undertaken; the quality and effectiveness of the renovations in responding to the needs and preferences of the occupants and service providers.

Logic Models/Causal Models of the Programs

The logic/causal model includes the main factors that impinge on its outcomes, and describes how effects would be measured and quantified. The causal/logic model considers the potential impacts of the renovations on: occupants (independence, health, safety, comfort level, quality of life, etc.), and on caregivers (efficiency and effectiveness, safety, etc.). It also looks at the potential impacts on health and social service agencies (types, amount, frequency required; ease/difficulty/ costs of providing services, etc.); on the renovated homes (improving quality, reducing utility costs/ maintenance, increasing/reducing property value, etc.); and other possible areas (e.g., quality of family life).

Cost/Benefit Framework

The cost/benefit framework builds upon the logic model/causal model and upon the previous cost/benefit framework developed for CMHC. The Framework is compatible with other such frameworks developed by the Government of Canada. It considers, among other things, how effects would be monetized, the time frame for comparisons, discount rates, the use of uncertain variables and parameters, intangible costs and benefits, and all of the other technical aspects of such a framework. It also considers how different perspectives of different stakeholder groups can be taken into account. Finally, it links with the 'full-costing' methodologies of CMHC and the Government of Canada, and describe show the cost-benefit analysis could be used to inform decision makers.

2.2.3 Case Development

We tested the preliminary framework in fifteen cases. Each of the case households was interviewed twice. For each visit per household, the physical state of the home, the health of the renovation recipient(s), and the interaction between the renovation recipient(s) and their physical environment was assessed using carefully-structured interview questionnaires (Appendix B).

Renovation recipients were interviewed in person, in their homes, and on the telephone. Each interviewee received an explanation of the study, was asked whether he or she wished to participate voluntarily, and signed a consent form.

2.2.4 Site and Case Selection

Three sites were chosen for the cases: Ottawa and environs; Edmonton and environs; and Calgary and environs. These sites have the advantage of being in different areas of the country and within jurisdictions where the programs are delivered directly by

CMHC. Moreover, they are different from the sites that were part of the earlier RRAP evaluation, so the burden on CMHC offices was less.

In considering the options for additional case study sites we took into account the fact that the RRAP-D program has different allowable maximum grants, depending on whether the recipient is in the southern, northern or far northern part of Canada.

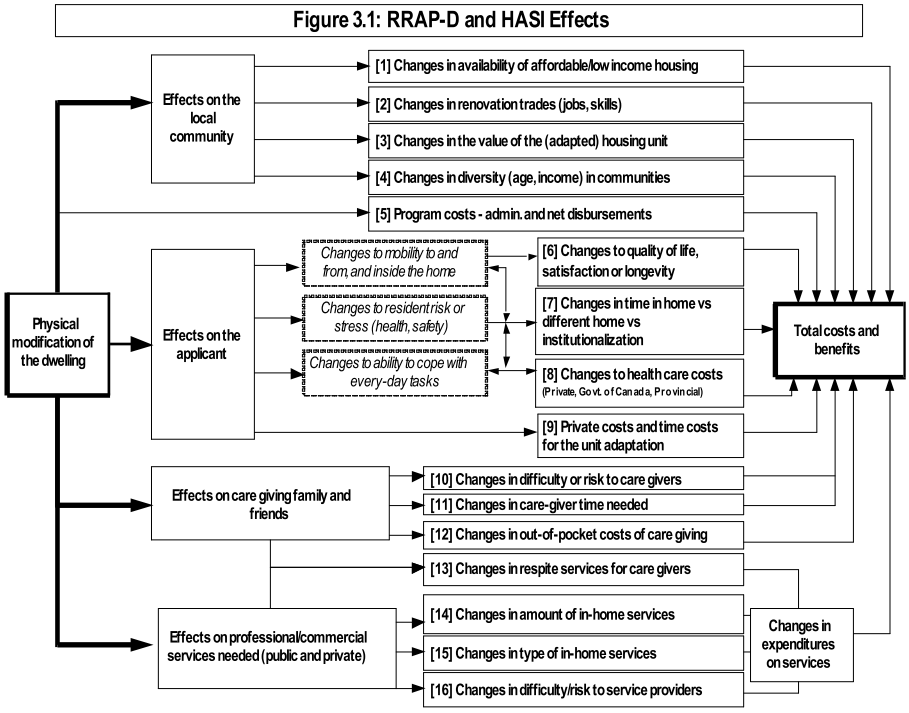
Final case selection took several variables into account. First, there clearly needed to be case examples from both programs at each site in proportion, if possible, to the relative numbers of cases of each program in the selected area. Second, the selection of sites took into account whether the housing unit is owned or rented. Third, the major types of adaptation or renovation were represented. Nevertheless it is important to be clear that the cases are few and do not claim to be representative of the whole program(s).

3.0 A Framework for Cost-Benefits Analysis

3.1 The Effects of HASI and RRAP-D

A Logic Model[5] for HASI and RRAP-D (Figure 3.1) shows 16 possible program effects in four categories: effects on the applicant; effects on caregiving family and friends; effects on the use of professional and commercial services (public and private); and effects on the local community (Figure 3.1).

Figure 3.1: RRAP-D and HASI Effects



The logic model was developed and refined cooperatively with CMHC and Health Canada staff, and benefited from comments from an interdisciplinary focus group of government and non-government professionals working in housing, health, disability and aging (See Appendix C). It is the first stage of the process of identifying and measuring costs and benefits of HASI and RRAP-D.

3.2 Effects over Time

In case studies of HASI/RRAP-D, we observed two patterns of beneficiary experience over time. In the first type of case, the applicant's quality of life was in gradual decline and continues without any sudden change until a move to a different dwelling and/or managed care is necessary. In the second type of case the gradual decline in quality of life was interrupted by an adverse event leading to an immediate change in accommodation/care. Figure 3.2 shows these patterns of incremental benefit over time for each type of case, and the two main types are discussed below.

[Case 1] Gradual Decline in Quality of Life in Present Dwelling, with the Decline Slowed by HASI/RRAP-D

In the first case, the beneficiary receives an intervention at time t_1 when his/her quality of life is Q_3.

- Without the HASI/RRAP-D intervention the beneficiary's quality of life would decline from quality of life Q_3 along (the B-C) line until it reached the point when a change of dwelling became preferable (when the existing quality of life falls below the quality of life in alternative accommodations). He or she would reach this decision to move at time t_3.

- With the HASI/RRAP-D intervention, the beneficiary's quality of life declines along (the A-D line) at the same rate but from a higher point (Q_4). The beneficiary reaches a decision to move later than otherwise – that is at t_5.

In this case, there are four benefits from the HASI/RRAP-D intervention:

1. An improvement in the person's quality of life during the period in which he or she would have remained in the dwelling anyway (that is, up to t_3 where the person would have changed dwellings in the absence of a HASI/RRAP-D intervention). Geometrically this benefit is represented by the area Q_3Q_4CE.

2. The quality of life in the present dwelling from t_3 to t_5 (that is the area T_3T_5ED) minus the quality of life in the alternative dwelling to which the person would have moved in the absence of HASI/RRAP-D (T_3T_5CD). Geometrically this is represented by the triangle ECD.

3. The postponement of transition costs from t_3 to t_5 (real estate commissions, moving costs, etc.)

4. Occupancy costs savings – that is, occupancy costs in a changed dwelling minus occupancy costs in the present dwelling from t_3 to t_5.

We cannot tell from the small number of cases which we have examined whether this is a typical pattern or not. However given the fragility of the health of many of the beneficiaries whom we interviewed, we think it is likely that the intervention of an adverse event might frequently force a change of dwelling earlier than "normal" declining health might otherwise have dictated.

[Case 2] Same as Case 1, but gradual decline in quality of life is interrupted by a sudden adverse event, such as a fall, stroke, or heart attack, which makes necessary an immediate move to different accommodation (and perhaps a different level of care). The adverse event can happen before or after the beneficiary would have moved anyway; and the new accommodation might be the same as, or different from, that to which the beneficiary would have moved in the absence of the adverse event.

Case 2A If the adverse event happens before the beneficiary would have moved anyway (that is, before t_3) then the only HASI/RRAP-D benefit that will be realized is

the improvement in quality of life while in the first dwelling (that is, from time t_1 to t_2). Geometrically this is equal to the area Q_3Q_4AB.

Case 2B If, instead, the adverse event occurred at t_4, after the person would have moved without HASI/RRAP-D but before he/she would have moved with HASI/RRAP-D, then the benefits would be:

1. An improvement in the person's quality of life during the period in which he or she would have remained in the dwelling anyway (that is, up to t_3 where the person would have changed dwellings in the absence of a HASI/RRAP-D intervention). Geometrically this benefit is represented by the area Q_3Q_4CE.

2. The quality of life in the present dwelling from t_3 to t_4, minus the quality of life in the alternative dwelling to which the person would have moved in the absence of HASI/RRAP-D. Geometrically this is represented by ECGF.

3. The postponement of transition costs from t_3 to t_4 (real estate commissions, moving costs, etc.)

4. Occupancy costs savings – that is, occupancy costs in a changed dwelling minus occupancy costs in the present dwelling from t_3 to t_4.

Of course if the adverse event happens later than t_5 then it has no relevance to an examination of the effects of HASI/RRAP-D.

In summary, the key parameters of the incrementality model (Figure 3.2) are as follows:

- The increment of quality of life that results from the renovation (Q_4-Q_3)
- The extension of tenure in the existing dwelling that results from the renovation (t_5-t_3)
- The quality of life in an alternative dwelling chosen to accommodate aging and/or disability (depicted by the line Q_2-D)
- The probability of an adverse event precipitating an immediate move to alternative accommodations.

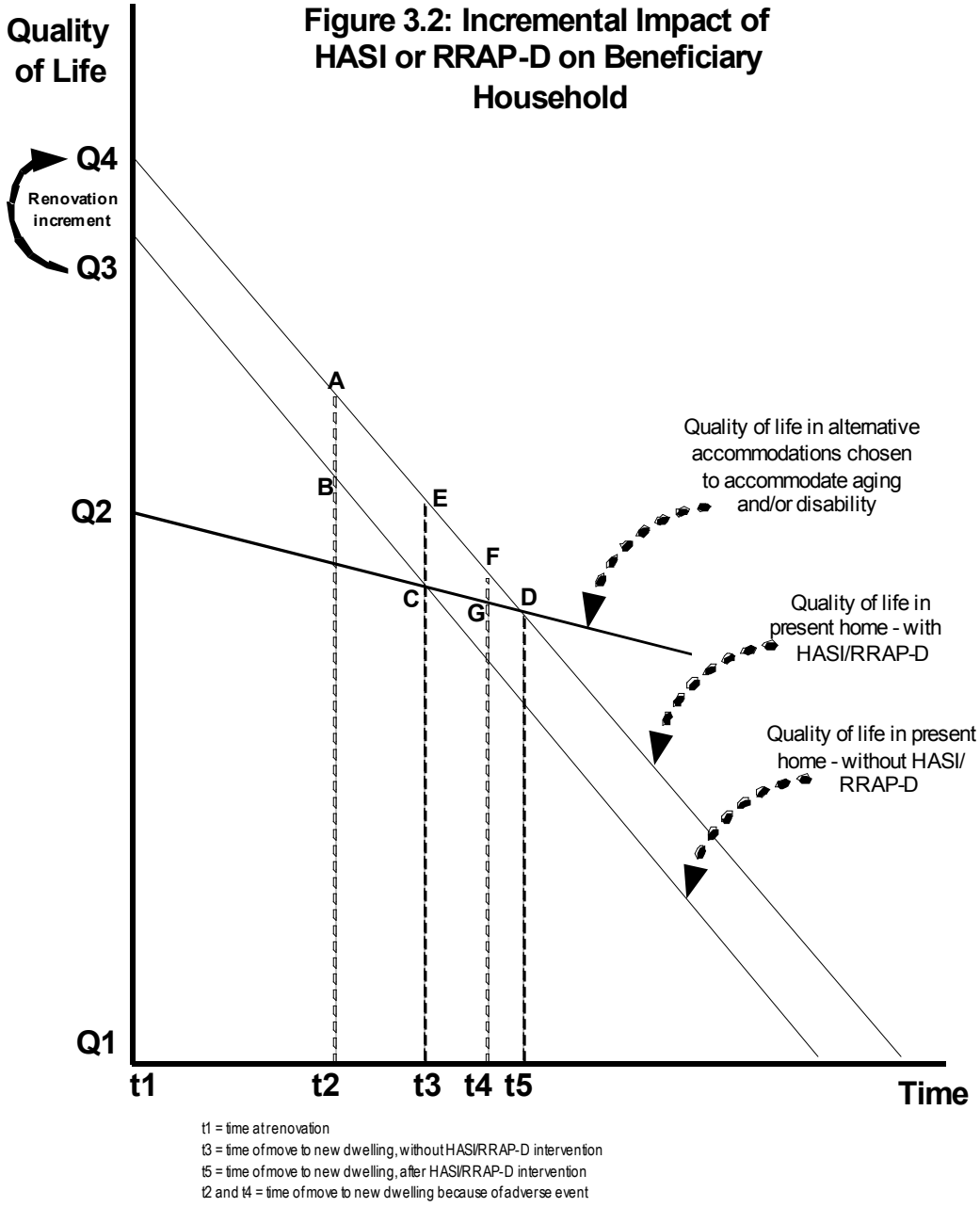


Figure 3.2: Incremental Impact of HASI or RRAP-D on Beneficiary Household
Quality of Life
Q4
Renovation increment
Q3
Q2
Q1
A
B
C
D
E
F
G
Quality of life in alternative accommodations chosen to accommodate aging and/or disability
Quality of life in present home - with HASI/RRAP-D
Quality of life in present home - without HASI/ RRAP-D
t1
t2
t3
t4
t5
Time
t1 = time at renovation
t3 = time of move to new dwelling, without HASI/RRAP-D intervention
t5 = time of move to new dwelling, after HASI/RRAP-D intervention
t2 and t4 = time of move to new dwelling because of adverse event

3.3 Extended Tenure in the Present Dwelling

The tenure of the beneficiary in the present dwelling is important to estimates of almost all of the benefits. For example, it is a key determinant of the aggregate quality of life benefits. It also determines the aggregate costs avoided (transition costs and tenure costs in more expensive housing/care). In summary, tenure issues are relevant to the following items in the Logic Model (Figure 3.1):

- The market value of the adapted housing unit. (#3)
- Diversity in the community. (#4)
- Quality of life. (#6)
- Changes in health care costs. (#8)
- Changes in difficulty or risk to caregivers. (#10)
- Changes in care-giver time spent. (#11)
- Changes in out-of-pocket expenses. (#12)
- Changes in use of respite services by caregivers. (#13)
- Changes in aggregate costs of in-home services. (#14, #15 and #16)

There are three types of data that will help assess the contribution of HASI/RRAP-D to extending the tenure of the beneficiary in the present dwelling. These are:

- Self-reports by beneficiaries on their tenure intentions before and after the renovations.

- Information on how long beneficiaries actually remained in their dwellings, based on a survey that includes beneficiaries of renovations up to five years ago.

- Information on the tenure patterns of persons who applied for HASI/RRAP-D but had to spend time on a waiting list because of program budget constraints.

None of these data are definitive in themselves; but, together, they should enable the evaluation team to make reasonable estimates of the tenure increment in the present dwelling. For those persons who did move, it is relevant whether they moved in due course or moved unexpectedly upon the occurrence of an adverse event involving themselves, a caregiver, or another member of the household (see Figure 3.2 above). In summary, in order to calculate the accommodation/care costs avoided because of RRAP-D/HASI, we need to know two things: First, how much longer do the persons stay in their initial dwelling? That is, what is the time period t_3 to t_5 (Figure 3.2)? Second, what is the difference between their present cost of accommodation and the cost of accommodation after their eventual move ($Y - $X)?

3.4 Period of Analysis

A cost-benefit analysis of RRAP-D/HASI will cover a certain time period. A common period for the analysis of program costs and benefits is one year. This suits many government programs but would not be long enough for HASI and RRAP-D, because the benefits of the programs, and some costs, are typically spread over several years.

Indeed the duration of the benefits, given the uncertain health and economic status of beneficiaries, is likely to be a key parameter of the analysis.

There are various ways to define the "period" for cost-benefit analysis. We suggest that the best method, in this case, is to sample from approved loans in a particular year and then investigate the experience of those beneficiaries and the history of the dwelling unit for some time thereafter – perhaps three to five years. For example, one could draw a dollar-unit-weighted random sample of loans made in 2000 - say 20% of the 2600 HASI loans (520) and the weighted equivalent sample of 1108 RRAP-D loans (about 400).[6] Thereafter, a sub-sample of about 10% (roughly 90-100) might be chosen for the intensive analysis of quality of life impacts recommended in this report.[7]

If the data collection for cost-benefit analysis were undertaken in 2006, then about five years would have elapsed after these renovations. This is sufficient time to enable the analysts to gather good information about what happened to the beneficiary and to the dwelling unit subsequent to the renovation.

3.5 The Costs of HASI/RRAP-D

The costs of HASI/RRAP-D are summarized in Table 3.5

Table 3.5 Cost Items and Their Measurement, by Effect Group

Effect Group	Cost Item	Measurement
Program	A. Loan forgiveness (and minor write-offs)	Known (CMHC administrative database)
	B. Administrative costs	Known (CMHC administrative database)
Applicant(s)	C. Time costs to make a HASI/RRAP-D application	Hours x average hour costs for all applicants, both approved and denied.
	D. Time costs for contracting and supervision	Hours x average hour costs for approved applicants.
	E. Time costs for activities of daily living	Hours x average hour costs for approved applicants
	F. Over-runs	Dollars, reported by the beneficiary
	G. Associated living costs	Rent or imputed rent. Utilities costs.
	H. Stress and disruption costs	Qualitative, reported by the recipient.
	I. Possible social isolation	Qualitative, reported by the recipient
Caregivers (family and friends)	J. Time costs to make a HASI/RRAP-D application	Hours x average (leisure) hour costs for all applicants, both approved and denied. A higher rate per hour might be used for applicants' helpers who experience displacement of employed time.
	K. Time costs for contracting and supervision	Hours x average hour costs for approved cases.
	L. Financial contribution, if any	Dollars, reported by the caregiver or beneficiary
	M. Time/caregiving costs due to extension of tenure in the present dwelling	Hours x average costs per hour
	N. Stress costs	Qualitative, reported by the beneficiary and caregivers (family and friends).
Professional and commercial in-home services	O. Fees (Changes in type or amount of in-home services.)	Dollars, reported by the beneficiary if paid and by the public agency providing the service if unpaid.
Community	P. Underutilization of the housing stock	Opportunity cost of "excess" space.
	Q. Specific or unsightly external adaptations	Contingent valuation by neighbours. Direct observation by researchers.

3.5.1 Construction/Renovation Costs

On the basis of the small sample of (15) case studies which we have undertaken, it appears that the largest cost involved in the programs is the construction cost of the

renovations. This is measured by the amount of loan forgiveness, plus any over-run costs that are borne by the program beneficiaries or their families. (Table 3.5 Items A and F also includes costs to obtain quotations from construction contractors and to supervise the contractor during the work. (Items D and K)

In several instances during the 15 case studies we conducted, we observed a dispute between the program beneficiary and the contractor in regard to billings over and above the HASI/RRAP-D contribution. This raises two subsidiary issues in cost/benefit costing: first, is the total cost of the renovation a legitimate measure of value, or is the contractor over-charging; and, second, is the quality of the renovation adequate or is the contractor under-performing?

When the renovation project involves significant expenditures to bring the dwelling up to (health and safety) standards required by the building code, these costs have a somewhat different status from the costs of the renovations that relate strictly to aging or disability. In brief, we will call them 'code costs'. If code costs are counted as costs, then there must be a balancing benefit on the other side of the equation. The benefit would have two components – first, the normal benefits of having a dwelling that meets the minimum standards of the building code (no particular link to aging or disability); and, second, the market value of the dwelling will, in most cases, be significantly improved by bringing it up to code standards, although the increase in market value may be less than the cost to bring the dwelling up to standard. In some cases renovations to bring the dwelling to code standard may be a *sine qua non* of selling the property at all.

Therefore renovation costs for the renovations relevant to aging and disability are:

> Renovation costs = $\sum(A+D+F+K)$, or
>
> Renovation costs = $\sum(1.15)(A+F)$
>
> Where A. D, F and K are defined in Table 3.5; and 1.15 assumes 15% loading for contractor supervision by the applicant and/or caregivers.

Renovation costs not relevant to aging and disability but rather to meet code requirements are additional, and we suggest that they be treated as pure transfers – that is, as income redistribution but not as a cost of HASI/RRAP-D.

3.5.2 Administrative Costs

The second largest cost is likely to be public and private administrative costs. This is measured by: (1) CMHC administration costs, including programs administrative costs and agency/delivery fees; and (2) private administration costs. (Table 3.5 Items B, C and J).

The CMHC administration costs (including agency/delivery fees) vary from year to year. In 2004/05 the actual costs to administer RRAP-D were approximately $2,100,000, and HASI $1,000,000.[8]

The latter may include costs for the beneficiaries to apply for HASI/RRAP-D assistance. The applicant's costs to engage and manage the contractor could be counted as part of the construction cost or as an administrative cost. There is no difference to the 'bottom line'. However counting them as administrative costs might make it seem that the program is expensive to administer. Therefore we suggest counting them as construction costs (as noted above).

We note that the beneficiaries interviewed in the case studies were generally unable to give a good estimate of how much time they or their caregivers had spent in obtaining quotes from contractors and in supervising the contractor during the construction phase. (Appendix F, Table 64, Questions 93-99) Approximately two-thirds of the respondents said that they spent full-time supervising the contractor while the work was going on. In most cases this appears to be based on their being in the dwelling and available to consult with the contractor, during the construction period. It clearly doesn't mean that they spent forty hours per week actively supervising the contractor. In our opinion, this question is unlikely to provide useful information no matter how much it is explained in detail to the respondents. They do not typically keep track of their time in such a manner.

Time costs for the beneficiaries and their families are difficult to measure. We found in the case studies that many beneficiaries and caregivers (family and friends) found it difficult to estimate the time they had spent. Frequently they tended to answer in duration (months) rather than in working hours, or to say "full time". The question to them can be made more specific to working hours, but they do not necessarily keep close track of the amount of time spent. Nevertheless it may be possible to make an estimate of the average time spent by beneficiaries and their caregivers (for HASI and for RRAP-D) and generalize this to the whole program.

Therefore, given the unlikelihood of obtaining good estimates from direct questions about time spent, it may be preferable to add a standard percentage to the renovation costs for contracting and supervision costs, based on industry norms for construction contract management of small renovation jobs – approximately 15%, in our opinion.

The second challenge is monetizing the value of the time spent by the beneficiary and caregiver(s). In most instances in the small sample of case studies, neither beneficiaries nor primary caregivers (family and friends) had paid employment and few caregivers stated that they would be working if not for caregiving responsibilities. It is worth nothing, however, that there was one case where the wife had stopped running her own business to provide care to her husband (lung cancer).

In the economics literature, when time gained or displaced is mostly leisure time, the opportunity cost of leisure time is generally taken to be much less than the opportunity cost of time on activities that displace employed and paid activities.

In a small number of cases the caregiver may have opportunity costs arising from lost employment time or lost promotion opportunities as a result of the caregiving responsibilities. In such cases the financial impact could be estimated by the number of hours of employment displaced multiplied by the expected salary and benefits per hour. There might also be an effect on the level of remuneration per hour if withdrawal

from the work force, resulting from taking time for caregiving, led to fewer promotions, for example.

The evaluation team would have to make a decision on the value of time, both leisure time and paid time in employment. There is a broad literature to draw upon, including estimates by the Government of Canada (for example, Transport Canada's "Guide to Cost Benefit Analysis" contains estimates[9] of the value of time savings in commuting, http://www.tc.gc.ca/Finance/BCA).

Public administrative costs, as recorded by the programs administrator, are, we assume, unloaded operating costs. If so, the costs will need to be loaded with an 'overhead' factor. This factor should include facilities costs. If CMHC is the direct administrator then its general overhead factor should be applied. If another organization is the direct administrator, the research team would need to obtain an appropriate figure to use as an overhead factor, depending on the reimbursement arrangements between CMHC and the program administrator. We assume that agency/delivery fees are already fully loaded and therefore need no additional overhead to be added. Therefore administrative costs for the renovations relevant to aging and disability are:

> Administration costs = $\sum(B)*\partial + C$ Where B and C are defined in Table 3.5 and ∂ is the overhead factor.

3.5.3 Costs to Caregivers (Family and Friends)

There are potentially two types of costs to caregivers that arise from the renovations. First, there are the application and supervision costs discussed above. We found the caregivers frequently bear these costs rather than the direct beneficiary of the HASI/RRAP-D contribution. One has to be careful not to double count.

> Caregiver administration costs = $\sum J + K$ (if K is not counted previously under construction costs). Where J and K are defined in Table 3.5. No overhead is expected.

The second cost that caregivers (family and friends) may potentially bear is the cost of continued caregiving that results from the extension of the beneficiary's tenure in the existing dwelling. Given the declining health of persons in the households we observed during the case studies, we expect that caregiving costs would increase over time. The renovations may extend and continue those caregiving costs, which otherwise may have been lessened by the beneficiary moving to different accommodations.

> Caregiving costs = $\sum M + N$ Where M and N are defined in Table 3.5.

The costs of increased stress (or alternatively the benefits of decreased stress) could be captured in quality-of-life calculations and in long-term changes in direct health costs.

3.5.4 Costs of Professional and Health/Social Services

If the renovations result in the beneficiary remaining in his or her home longer than otherwise expected, there might be an incremental cost in terms of professional and health/social services. These might be extended in time. The cost-benefit analysts will need to be careful that the costs of professional and health/social services after the HASI or RRAP-D renovations are properly compared with the baseline case (moving to another dwelling, in many instances).

It would be relatively rare, but not impossible, that the renovations themselves might lead to greater demand for more professional and health/social services (that is, in addition to simply extending the use of existing services further into the future). Disruption and stress, for example, were externalities or byproducts in some cases that might result in the use of more services, such as respite. One beneficiary and his wife had to move out of his house for four months while the renovations were underway. This was unanticipated and resulted in significant stress and consequent costs. In other cases cost over-runs and/or disputes with the contractor or with the program administrator may have created significant stress. Older people and persons with disabilities may find this more difficult than younger persons and persons without disabilities might.

The costs of additional professional and health/social services resulting from the decision to undertake renovations rather than move to a new dwelling were not significant in more than one or two of our fifteen case studies. However they may be more significant in a full sample of HASI/RRAP-D cases.

In addition, an evaluation team might find that a professional “needs assessment” at the time of HASI/RRAP-D application is desirable for an effective program. If so, then these assessments would entail additional costs, which should be taken into account in a cost-benefit analysis.

> Professional and health/social services costs = $\sum O$ Where O is defined in Table 3.5.

3.5.5 Community Costs

Community costs are sometimes called “externalities.” These are costs that are indirectly associated with the program. Encouraging an elderly and disabled person, who lives alone, to stay in his or her established dwelling may have costs as well as benefits, from the point of view of the community – for example, it may to some degree perpetuate underutilization of the housing stock if the home is substantially larger than the existing household requires. We did not observe any instances of egregious underutilization of the dwelling, although, of course, these may exist in the wider population of HASI/RRAP-D beneficiaries. There may be intangible costs as well. For example, an elderly and/or disabled person, living alone, and encouraged to stay in his or her own home, may suffer some degree of social isolation; and the public costs to provide services may be higher than they would be in alternative accommodation. Some externalities could be quantified and monetized (for example, rent in temporary accommodations) but some are intangible and can only be described qualitatively.

> Community costs = $\sum P + Q$ Where P and Q are defined in Table 3.5.

3.6 Direct Estimation of the Benefits of HASI/RRAP-D

The benefits of HASI/RRAP-D are summarized in Table 3.6

Table 3.6 Benefits and Their Measurement, by Effect Group

Effect Group	Benefit Item	Measurement
Applicant(s) and other residents	A. Improved quality of life in home (including increased independence)	Number of QALY (Quality Adjusted Life Years) gained (monetized by the average Canadian value of a QALY)
	B. Avoidance of moving expenses and avoidance of higher costs of alternative accommodation	Average moving expenses. Extended tenure in present home by increment of lower accommodation costs.
	C. Lower stress and less risk in present home (fewer and less serious adverse events)	Positive contribution to heath status and fewer costs associated with health and safety.
	D. Improvement in the market value of the (adapted) housing unit.	Dollar value of improvement (by appraisal).
	E. Time gained from efficiencies in activities of daily living	Hours x average hour costs for approved applicants.
Caregivers (family and friends)	F. Less risk or difficulty of caregiving	Number of caregiver QALY gained (monetized by the average Canadian value of a QALY).
	G. Less time needed for caregiving	Decrease in hours of caregiving (monetized by the average $value of an employed hour).
	H. Less out-of-pocket expenses of caregiving	Changes in expenses as reported by caregivers.
	I. Less need for respite services for caregiver(s)	Changes in frequency and duration of respite services (monetized by the respite services fee).
Professional/commercial in-home services	J. Decreases in the amount or type of in-home services	Dollar fees, reported by the beneficiary or the service provider(s).
	K. Decreases in difficulty or risk to service providers	Changes in dollar fees, reported by the beneficiary or the service provider(s)
Community	L. Improvement in the availability of affordable housing for elderly or disabled people	Number of housing units adapted less the number reconverted later. (No monetary measure possible.)
	M. Contribution to the renovation trades (jobs, skills)	Number of contracts with small and medium size renovation enterprises. (No monetary measure possible.)
	N. Maintenance of the market value of surrounding housing	Dollar value of improvement (by appraisal).
	O. Improvement in community diversity (age, disability, income)	Extended tenure of elderly or disabled people in the community (integrated) rather than in special purpose housing (segregated). (No monetary measure possible.)
	P. Lessened public costs of health services and related support services	Changes in type, frequency or duration of services, monetized by average costs of public agency services.

Table 3.6 is derived from the Logic Model (Figure 3.1) which shows four groups of potential benefits of HASI/RRAP-D. These include benefits to the applicant and other residents in the dwelling (Logic Model Items # 6-8); benefits that are specific to caregivers (Logic Model Items # 10-13); benefits to service providers (Logic Model Items # 14-16); and benefits to the community (Logic Model Items # 1-4).

3.6.1 Improvements in Quality of Life (Applicant and Caregivers)

One objective of HASI and RRAP-D is to improve the beneficiary's quality of life. In all fifteen cases that we explored it seemed clear from observation and from reports by the beneficiary and his or her caregiver(s) that there had in fact been a positive impact on the beneficiary's quality of life. This is likely to make the existing accommodations more attractive than alternative accommodations for longer than might otherwise have been the case.

The quality of life of the wider family may be affected, in addition to the direct beneficiary of HASI or RRAP-D financial assistance. Caregivers are likely to benefit from an improved quality of life in the short term, particularly when they themselves have disabilities that are ameliorated by the renovations, but also, perhaps, in making their care giving safer and easier. On the other hand their longer term quality of life may be impacted negatively if an onerous care giving role is prolonged. This is an individual matter that varies from case to case and is affected by many complex variables.

The quality of life of a person who is elderly or disabled is intimately connected with his or her independence. "Independence" is difficult to define fully, but clearly has to do with being able to remain in his or her own home and being able to conduct the activities of daily living as much as possible without assistance.

It is worth exploring further the idea that RRAP-D and HASI improve the quality of life of the persons in their existing dwelling and thereby enable them to stay in that dwelling for longer (Figure 3.2 shows them staying till t_5 instead of t_3). Their quality of life immediately after the modifications to their dwelling will be Q_4. This will deteriorate over time till it reaches Q_2 at which time they will move to a different dwelling just as they did in the baseline scenario. This will happen at t_5.

These improvements may have second-order effects, including reducing demands on service providers and care givers, and/or reducing pressure on the beneficiary to change dwellings, either to another autonomous dwelling or to a managed-care institution. However it will be difficult to quantify and monetize those changes in quality of life. To do so will require a measure of the change in quality of life (of the beneficiary, of care givers, and, where relevant, of service providers); a measure of what the change in quality of life is worth in dollars; and a measure of how long the beneficiary is likely to be able to enjoy the improved quality of life.

There is a substantial literature devoted to measuring the impact of health interventions that improve the quality of life. In this literature, the amount of "quality of life" is generally measured as "quality adjusted life years" (QALY).[10] That is, the measure of benefit is an increment of time (life) and/or an increment of quality of life.[11] Quality of life is measured in various ways. In one methodology, perfect health is given a value

1.0 and death a value of 0.0. A questionnaire presents a 'standard gamble' or 'time trade off' question. In the 'standard gamble', the respondent is asked to imagine a hypothetical situation in which he or she has a certain chronic disease and is offered a medical treatment that has some chance of curing and some chance of killing. Does he or she take the treatment? If the person accepts the gamble at 50:50, for example, he or she is thereby valuing their quality of life (hypothetically) at 0.5. This is a 'preference score' and preference scores can be derived for any condition of life by asking what risk of death is acceptable to obtain a cure for all the deficiencies of that condition. These preference scores have been documented for various populations, including Canada.[12]

This methodology works best (results in reliable "preference scores") when the health condition is well defined (a defined illness whose effects are fully known) and where the respondents are capable of making sophisticated judgments about risk.

Where these conditions do not apply, as they do not among many HASI/RRAP-D beneficiaries, it may be possible to substitute the judgment of a professional panel for that of the beneficiaries themselves. In this approach, the panel would be asked to consider a sample of HASI/RRAP-D cases, and to rank the improvement in quality of life of each case against a standard list of known "preference scores" for curing various illnesses/disabilities.

To do this ranking the panel members would need detailed information on each case. This information would come from files and from a survey of RRAP-D/HASI beneficiaries, similar to the one that was used in the case studies already completed.[13] The Delphi Method is the methodology of choice, given the likely uncertainty in the data.[14]

Once one has a preference score for the quality of life increments of beneficiaries, and knows the relevant expectancy of tenure in the dwelling, then QALYs can be calculated. QALYs can be converted into dollar measures of benefits by using the average $/QALY for a range of medical treatments, or, perhaps more accurately, for treatments that resemble renovations in their impact on beneficiaries.

3.6.2 Quality of Life Benchmarks

There is a large research literature on the cost-effectiveness of medical procedures. One of the most important branches of this literature bases cost-effectiveness analysis of medical procedures on their impact on quality of life.[15] Preferences for different health states are assigned scores and these preference scores are then related to costs. The preference scores that form the basis for "quality of life" measurement have been judged by the researcher, by the beneficiary or by a panel of clinicians.

Since there is now a large number of "benchmarks" of preference scores for different health states, it is possible to assign a value to almost any health state by comparison with existing preference scores. The Harvard School of Public Health has made this easier by compiling preference scores from many different studies. There are about 350 health states listed in its Cost-Effectiveness Analysis Registry and Catalogue of Preference Scores.[16] One could choose a sub-set of these health states that would provide a reasonable benchmark for considering changes in the quality of life of

persons in households that benefit from HASI or RRAP-sponsored renovations. For example, consider the following preference scores for three health states corresponding to different stages of amyotrophic lateral sclerosis (Lou Gehrig's disease).

Table 3.6.2 Preference Scores for Three Health States, Corresponding to Difference States of Amyotrophic Lateral Sclerosis (ALS, Lou Gehrig's disease).

Preference Score	Health State
0.89	ALS. Speech normal with some slurring. Can dress/feed/live independently. Able to work full time. Some diet limitations. Medical procedures only diagnostic.
0.82	ALS. Speech intelligible more than 75% of the time. Restricted diet. Needs minimum care for feeding/dressing. Uses mobility aids such as crutches and occasionally a wheelchair. Can work part time.
0.41	ALS. Speech intelligible less than 50% of the time. Soft food only. Some breathing impairment. Needs caretaker to assist with transfer/dressing/feeding. Uses a wheelchair most of the time. Unable to work. Some pain medications. Unexpected hospitalizations.

Source: Harvard School of Public Health, Cost-Effectiveness Analysis Registry, Preference Scores 1998-2001 (Phase III 2001-2005 in preparation).

There are many other preference scores for health states that might provide benchmarks for HASI/RRAP-D interventions in particular cases. For example, the state of having 20/40 vision with no three-line visual loss is scored at 0.81; 20/200 vision with no three-line visual loss at 0.52; and 20/200 vision with three-line visual loss at 0.40. A person with modest Alzheimer's disease living in the community is scored at 0.54 and living in a nursing home at 0.48. A person with significant depressive symptoms is scored at 0.63 and with depression in full remission at 0.89.

The preference scores, once determined, are combined with life expectancy information to calculate the number of quality-adjusted life years (QALYs) resulting from the intervention. These QALYs can then be expressed in dollars by using average values that people do in fact pay to gain one QALY by a medical intervention.

3.6.3 Avoidance of Moving Expenses and Higher Costs of Alternative Accommodation

Postponed costs of moving and postponed costs of more expensive accommodation and care are the largest potential benefit of extending tenure in the present dwelling. To measure this benefit, one would have to know how much longer the beneficiary stays in the present dwelling because of the HASI/RRAP-D intervention (see above). In addition to improving the beneficiary's quality of life while he or she remains in the modified dwelling, RRAP-D and HASI are expected to have the following effects:

1. Savings in the financial costs of formal services and/or care giving
2. Savings that come from postponing a change of residence

The 'baseline', without the modifications to the dwelling, is that the disabled and/or elderly person(s) would remain in their dwelling for a period of time (Figure 3.2, t_1 to t_3), at a certain quality of life (which declines to Q_2 at t3) that may deteriorate because of advancing age or disability. This period may be terminated at t_3 by death or by the person moving to another dwelling.

The costs in the baseline scenario = $[(t_3-t_1)*X] + [(t_5-t_3)*Y]$ Where the persons' accommodation costs from t_1 to t_3 are \$X per month; and from t_3 to t_5 and thereafter to t_n in another dwelling, they are \$Y per month.

Similarly, the total costs in the incremental scenario (with HASI/RRAP-D intervention) = $[(t_5-t_3)*X$

Therefore the accommodation costs saved as a result of the HASI/RRAP-D intervention =

$[(t_3-t_1)*X] + [(t_5-t_3)*Y] - [(t_5-t_3)*X$

3.6.4 Risk and Stress

Avoiding adverse health events is an important component of quality of life. However, it will be difficult to measure them without longitudinal data (panel data over time) and a comparison group. One could ask in a survey of HASI/RRAP-D beneficiaries what adverse events had occurred before and after the renovation, and whether the beneficiary believed that he or she was safer after the renovation. One could also put this in context of the general experience of the age group over a similar period (say a year). However quantifying and monetizing that benefit, on the basis of survey data alone, is not possible. Therefore this benefit might need to be treated partly quantitatively and partly qualitatively.

3.6.5 Improved Market Value of the Dwelling Unit

In the case studies we asked whether the respondent thought that the renovation had had an impact on the market value of the dwelling. In ten of the fifteen cases, respondents thought that there had been a positive impact. No one thought that there had been a negative impact. The largest impact on the market value of the dwelling may have been in cases where extensive work was done to bring the dwelling up to building code standards.

We do not believe that beneficiaries (applicants and caregivers) can provide reliable estimates of the financial impact of the renovation on the market value of the dwelling. We see two possible ways to obtain this information. The most accurate method would be for CMHC to send a qualified appraiser to examine a sample of the dwellings and to estimate the effect of the renovations on the market value. This would be accurate but expensive.

An alternative method would be for CMHC to make estimates of the average increment of market value that results from different types of renovations. There are also commercial sources of such estimates, including the annual survey of *Remodeling* magazine.[17] In general bathroom and kitchen improvements fare well in terms of market values (9 instances and 5 instances among the 15 case studies, Appendix F, Table 36) as do basic improvements to bring the dwelling up to standard (11 instances in 15 cases). However specialized improvements to cope with aging or disability, such as access ramps (11 instances in 15 cases), often add little to market value and can sometimes detract from it.

3.6.6 Time Gained from Efficiencies in the Activities of Daily Living

The renovations may result in the applicant and his or her caregivers spending less time to successfully conclude certain activities of daily living. It should be kept in mind that both the applicant(s) and the caregivers tend to have disabilities. Therefore the renovations may result in certain activities being less time consuming, including cooking, bathing and toilet, and moving around the dwelling and into/out of the dwelling.

The evaluation researchers can ask both the applicants and the caregivers whether the renovations have resulted in a gain in time. Among our 15 case studies there were 5 cases where caregiving was a significant daily matter. In four of these cases care was essentially continuous all day. In the other case care was provided for two or three hours per day. In no case did the beneficiary/caregiver believe that less time was spent on caregiving after the renovations. However, the sample is very small and the renovations may show a greater impact in this regard when using a larger sample.

“Hours saved” would be monetized in the same manner as discussed above in Section 3.5 Sub-Section “Administrative Costs”).

3.6.7 Risk or Difficulty in Caregiving, and the Need for Respite Services

In addition to time saved, there may be benefits in less difficulty or less risk in caregiving. The renovations may result in less stress to the caregiver, with less need for respite services, and fewer accidents to both beneficiary and caregiver. Among the five cases of caregiving we observed one reported that the caregiving tasks had been made easier by the renovation. Neither of the two cases of professional and paid caregiving reported any easing of the caregiving tasks. The caregiver interviewees informed us that their need for respite services has so far been unaffected by the renovations.

Nevertheless there are likely to be cases among the larger population of HASI/RRAP-D recipients where the renovations have lessened difficulty, risk and stress of the caregiving. This will be hard to measure. The general picture we observed among our small sample of case studies is that the caregiver is often elderly and/or suffers from a disability, and is directly benefited by the renovations along with the beneficiary. Some renovations clearly resulted in less lifting by the caregiver, for example, when easier wheelchair access to a bathroom, or a chair-lift on a stairway was provided.

This effect can be captured, in part, by the cost-benefit analysis as part of the quality of life impacts. (See Section 3.6.1 above.) Information on the health history of the caregiver might be helpful in assessing these kinds of impacts of the renovations.

These impacts apply also to certain kinds of professional and commercial service providers. However, we did not observe any decrease in such services, or in the difficulty of providing them, among our case studies.

3.6.8 Out-of-pocket Expenses of Caregiving

In the short term, we expect that the HASI/RRAP-D renovations might lessen the out-of-pocket expenses of caregiving. For example, a live-out caregiver might have to visit less frequently if the elderly or disabled person is coping better with the activities of daily living because of the renovations. Of course, this could be a "two-edged sword," so to speak, if it resulted in greater social isolation of the beneficiary.

In the longer term, if care giving was prolonged by the disabled person staying longer in the existing dwelling, the out-of-pocket costs of care giving (compared with the baseline – alternative accommodation) might be greater.

However, we did not find any instance among our 15 case studies where out-of-pocket costs were significantly affected by the renovations, but it might be a factor in the broader population of beneficiaries.

3.6.9 Improvement in the Availability of Affordable Housing Suitable for Elderly or Disabled People

An evaluation of HASI/RRAP-D could investigate whether the improvements made by HASI/RRAP-D in the suitability of the housing unit for elderly or disabled persons endure when the unit is sold or rented to someone else. If they did endure to benefit another household, then the benefit should be counted.

This would require investigating a sample of housing units that received HASI/RRAP-D assistance some years ago. It could be combined with an examination of the length-of-tenure issue.

3.6.10 Contribution to the Renovation Trades (Jobs, Skills)

It is reasonable to suppose that HASI/RRAP-D support of renovations to assist elderly and disabled people to cope in their existing dwellings may have spin-off effects in terms of the skills of the tradespersons involved in the renovations. We expect than an evaluation team might investigate whether there are tradespersons who have undertaken a large volume of such renovations, and interview them to find out whether the renovations had indeed spin-off effects in their industry. However, the effects on skills or on the availability of work (jobs) would be unmeasurable. Therefore, this effect would be treated qualitatively in a cost-benefit analysis.

3.6.11 Improvement or Maintenance of the Market Value of Surrounding Housing

In several cases among the 15 we observed, the renovations had a positive effect on the face of the dwelling in the neighborhood. In one case the house was essentially derelict before renovation and a general fire hazard. Renovation of a house in such a condition is likely to improve the amenity of the neighborhood, and the improvement will be reflected in higher housing prices. On the other hand some renovations, such as a badly built or out-of-scale ramp to the front door, may detract from the amenity of the neighborhood.

There is no way to measure or monetize this effect, so an evaluation would deal with it qualitatively. It would require talking with neighbors in a sample of cases where the renovation involved changes to the exterior of the dwelling or to the yard.

3.6.12 Maintenance of Community Diversity (Age, Disability, Income)

By enabling low-income elderly or disabled persons to remain in their homes longer, HASI and RRAP-D contribute to community diversity. This is a valuable effect but not one that can be quantified or monetized. Therefore the evaluation team would deal with it qualitatively on the basis of interviews in a sample of communities.

3.6.13 Lessened Public Costs of Health Services and Related Support Services

If HASI and RRAP-D result in better health for the beneficiaries and their caregivers, some of this benefit will be reflected in lower public costs of the health system. This is also true of subsidized supportive housing alternatives that minimize the need for institutional long-term care. That is, the government benefits from less frequent use (or postponed use) of the public health system.

This can be a substantial benefit. For example, a fall by an elderly person may result in a serious injury and subsequent major expenditures in the health system. It may be possible to identify the degree to which HASI and RRAP-D can influence these types of outcomes by comparing cases where the renovation was approved and completed promptly with cases where it was delayed or not carried out. One could ask: Were there differences in the frequency and type of adverse incidents and in the subsequent use of the public health system? If so, these can be quantified and monetized. Health Canada's Economic Burden of Illness provides detailed costs for a wide range of treatments of illnesses and disabilities.[18]

3.7 Indirect (Contingent) Estimation of the Benefits of HASI and RRAP-D

In situations where it is difficult to ascertain benefits directly because they are not priced in an ordinary market, some cost-benefit analysts have posed hypothetical (contingent) questions to the interested parties to ascertain benefits indirectly. The contingent value method assumes that the value of a renovation is what beneficiaries are willing to pay, and that this "willingness to pay" can be ascertained by asking them.

The first part of this assumption is incontrovertible. The second part is debatable. Although the contingent valuation method has been widely used for the past two decades, there is considerable controversy over whether it is a reliable methodology. Researchers have noted several issues, including: (1) strategic valuations;[19] (2) appropriate scale of assistance;[20] warm glow effect;[21] positive and negative associations;[22] the irresponsibility effect;[23] the cruel choice effect;[24] the possible disjunction between expressed willingness to pay and willingness to accept compensation;[25] the embedding effect;[26] the ordering or framing problem;[27] mode of payment effects;[28] starting bid effects;[29] information bias;[30] and non-response bias.[31]

There are three ways to pose a contingent value question:[32]

- "What would you be willing to pay (in taxes) to ensure that people who are elderly or disabled have access to HASI and RRAP-D?" (posed to taxpayers at large)

- "What would you be willing to pay for the proposed modifications if you were required to pay the whole cost?" (posed to the beneficiary household, applicants and caregivers)

- "What amount of cash would you be willing to accept instead of having the modifications?" (Posed to the program applicant).

The first type of contingent question was recommended to CMHC by the consultants who produced a *Cost-benefit Framework[33] for the Residential Rehabilitation Assistance Program* in 2003.[34] This Framework was presented as a working paper towards the end of a two-phase evaluation study of RRAP[35]. (See Appendix H) It suggested that the willingness-to-pay question be asked of the population at large. However this approach does not seem ideal because, while there are some benefits to the general community, they are likely minor compared with the benefits to the beneficiary household. Also the methodology is not well developed when in situations where the respondents are essentially responding from altruism. Lastly, the general population is probably largely unaware of the program because few communities have a significant number of HASI and RRAP-D renovations that are visible.

Another approach to assigning a monetary value to HASI/RRAP-D benefits is to ask the individual beneficiaries (not the community at large) what they would be willing to pay. This can be done using one of the two contingent value questions for beneficiaries listed above.

In our small sample of case studies we tested the willingness-to-accept-compensation question phrased as "what would you accept in cash rather than in program benefits". In twelve of fifteen cases, the beneficiary stated that he or she would not accept a lesser cash grant instead of the renovation assistance. One beneficiary said that he or she would have accepted 60% of the cost, in cash, in lieu of the renovation. Another two beneficiaries said that they would have accepted 80%.

We tested the "willingness-to-accept-compensation question", instead of the direct willingness-to-pay question, because we thought it more appropriate to the beneficiaries. They are elderly, disabled and low-income people. Asking them what they would be willing to pay for the modifications if they had the money is to ask them to make a complex leap of imagination.[36]

The question "What payment would the beneficiary accept in lieu of the HASI or RRAP-D award?" is still hypothetical, of course, but it is a question that a beneficiary can plausibly be asked to address. It could be asked before and\or after the renovations. Asked before the renovation, the question could be: "What would you say if you were offered a no-strings-attached cash payment of $X instead of the (HASI, RRAP-D) assistance with the renovation?"

Obviously one could not simply ask how little the applicant would be willing to accept in cash instead of the renovation assistance with any hope of getting useable answers. If the policy were to offer any cash payment less than 100% of the renovation assistance, then the appropriate strategic response by applicants would be to say they would accept 99% in cash. Why would they say less?

As well, some beneficiaries might well be willing to pay more than the cost of the renovation (assuming they had the money). How could they be expected to estimate this? If only those willing to pay less than 100% were counted, and those willing to pay more than 100% not counted, there would be an obvious bias in the estimates.

This choice (cash or program assistance) could be made more real for applicants in various ways. The program administrator could, for instance, offer the choice to all approved applicants after bids had been received for the work. People could be offered sums that varied between say 50% of the HASI/RRAP-D assistance and 100%.[37] Who got offered what amount would be determined by a random-number generator.

To illustrate, consider the situation where the applicant was offered 60% of the expected cost of the renovation in cash, instead of the HASI/RRAP-D assistance. If he or she accepted the cash, then one can safely assume that the renovations were not worth more, in the eyes of the beneficiary (and the program administrator would have saved some money). If the beneficiary rejected the cash, in favour of the renovation assistance, then one can assume that the renovation assistance was worth more than the 60%, in the eyes of the beneficiary. If a beneficiary rejected a 70% cash payment, then one would know that the perceived value is between 71% and 100%.

The cash-or-program assistance decisions by the applicant do not pinpoint exactly how much each renovation is worth in the eyes of the beneficiary. However they do indicate bands of value. Given a reasonable number of cases, one could do a statistical analysis of the results that would identify the band of value on average. For instance, one might find that, on average, the beneficiaries value the renovation assistance as equal to a cash grant of between 55% and 68% of the potential cost of the renovation.

This cash-or-program experiment could be carried on for a limited period of time, say six months. Also, the offer could be made to all recipients or only to a sample. Probably the most acceptable design would be to make the offer to all applicants, and to conduct the experiment for a limited period of time at each program administration site. If it were explained to applicants that the point of the exercise was research by the program administrator, and that they had a free choice between the program support and a specified cash payment, then we believe that there would be no grounds for complaint.[38]

Alternatively, the question could be asked hypothetically after the renovations. In this case it would be phrased: “Knowing what you now know about how useful the renovations are to you, what would you have said if you had been asked to choose between having the renovations or, instead, receiving a cash payment of $ ---.” At this stage the beneficiary has nothing to lose financially, whatever his or her response. They have the renovations complete and paid for by HASI/RRAP-D. Nevertheless they might be embarrassed to say to a representative of the program that, say, they would have accepted 50% in cash even if they knew that to be the case. And, of course, they

might not be sure. Estimating what payment one would have accepted and actually facing the choice are two different things.

In a different type of program, one could ask what cash payment would be accepted to compensate for discontinuing the benefit. For example, consider an elderly person receiving a daily meal-on-wheels. The question of a cash pay payment (lump sum or daily sum) in lieu of the meals might make sense. However it would not make sense to ask a HASI/RRAP-D beneficiary what cash payment would be acceptable in return for having the renovations torn out and the dwelling returned to its original state.
In the case of HASI/RRAP-D there is an additional complexity. Some of the benefits of a renovation may be gained by caregivers rather than by the applicant. To what degree would the caregiver and primary beneficiary be expected to take the wellbeing of the other into account in making the "cash or renovations" choice? A research team could encourage the primary program beneficiary and caregivers to consult before making the "cash or renovations" choice, but could not insist on it.

Before the beneficiary could make a reasoned choice between cash and the renovations, he or she would need to have a clear and comprehensive picture of the benefits of the renovation to them and to their caregivers. This is asking a lot. The benefits, in this case, are improvements in the quality of life of the beneficiary and/or reductions in the costs of maintaining an acceptable quality of life. This is a complex matter because HASI and RRAP-D can have multiple impacts. Modifications can improve the beneficiary's in-home mobility (home access, ability to move around in the dwelling, and ability to get out of bed or chairs). They can also improve the beneficiary's ability to use facilities and systems in the home (bathroom, kitchen and storage, electrical and heating systems). Is the beneficiary likely to have a clear grasp of the value of improvements in all these areas?

An alternative would be to ask the primary caregiver (family and friends) to make the 'cash or renovations' decision (where there was a primary caregiver). Or perhaps one could reasonably assume that the primary caregiver would in fact make the decision in those cases where the elderly or disabled person's necessary reliance on the caregiver was high. However there would obviously be some (unmeasurable) risk that the caregiver would make the decision in light of his or her own self-interest rather than in the interest of the elderly or disabled person.

3.8 The Government of Canada's Policy Framework for Cost-Benefit Analysis

The policy framework for cost-benefit analysis in the Government of Canada is set out by the Treasury Board Secretariat in its *Benefit-Cost Analysis Guide*.[39]

3.8.1 Point of View

One thing the TBS Guide[40] stresses is that the point of view of the analysis must be explicit. Costs and benefits are only such from the point of view of a particular person or organization. The Guide also states that the primary point of view to be taken by the analyst in assessing costs and benefits is that of Canada as a whole – costs and benefits are to be counted to whomsoever they may accrue.

A cost-benefit analysis of HASI/RRAP-D might present results from several points of view, including Canada, an individual household receiving assistance, and governments (federal and provincial).

3.8.2 Discount Rate

The discount rate is the interest rate that is used to convert the dollar values of costs and benefits that occur in different years to a common base year, so that they can be added and subtracted legitimately. The choice of discount rate is determined by the point of view of the cost-benefit analysis. It is the opportunity cost of funds for that person or organization. The TBS Guide states that the discount rate, from the point of view of Canada, will be in the range of 7.5% real to 10% real (after adjustment for inflation).

Discount rates for the Government of Canada, or for individual beneficiaries, would be lower than this at present because interest rates on borrowed funds have in recent years been at historic lows. The nominal discount rate (including inflation) for the Government of Canada is best taken to be the Consolidated Revenue Fund Lending Rate which is in the range of 3% to 4% in mid-2005.

3.8.3 Using Uncertain Data

The TBS Guide describes methods of cost-benefit analysis in situations where data is uncertain. Sometimes a general parameter, such as the discount rate, is uncertain. Sometimes a specific parameter, such as the impact of renovations on the quality of life of the residents of the dwelling or the impact on neighbouring property values, needs to be estimated. A cost-benefit analysis of HASI and RRAP-D would encounter both situations.

The uncertainty in the data can arise in various ways. For example, an estimate of the value of a variable for the population may be based upon a small sample, which allows only an estimate within a broad range. Alternatively estimates by experts, such as those made during Delphi exercises, are likely to be expressed as ranges and probabilities.

Uncertain data is made manageable by incorporating Monte Carlo simulation into the cost-benefit framework.[41] Of course this does not eliminate the uncertainty. The "bottom line" of the cost-benefit analysis will be expressed as a range and probabilities. Nevertheless the technique makes cost-benefit analysis possible where otherwise it might be impractical.

4.0 Testing the Framework – Case Studies

4.1 Purpose of the Case Studies

This study included fifteen case studies of HASI and RRAP-D contributions in 2004 and 2005 (See Appendix D for detailed descriptions). The purpose of the case studies was to test approaches to cost-benefit analysis. It should be emphasized that the case studies were too few to be representative of HASI and RRAP-D. They were exploratory only. Their purpose was to enable the study team to familiarize itself with the program in more depth than would have been possible from documents alone; to talk at length with beneficiaries in their homes; and to test various types of questions that might be asked about the program's costs and benefits.

The cases enabled the research team to test the cost-benefit framework in two ways. First the field work resulted in a better understanding of HASI/RRAP-D client groups. The researchers observed how beneficiaries and caregivers might be best approached and what the limitations and constraints were. Second, the team asked questions in various ways to test different approaches to obtaining information about the costs and benefits of HASI and RRAP-D.

4.2 Methodology of the Case Studies

The main instruments of the case studies were detailed questionnaires administered in person and on the telephone. They covered personal information (gender, age, income, and health and living conditions) as well as information that could contribute to an analysis of the costs and benefits of HASI/RRAP-D. For example, the questionnaires covered the feasibility of direct estimation of costs/benefits by asking about the amount of time needed to complete an application, to get competitive bids, and to supervise the contractor. Similarly, the "contingent valuation" approach to cost-benefit analysis was tested by asking the beneficiary what cash payment he or she would regard as equivalent to the program assistance (or, more specifically, if given a choice, what was the lowest cash payment the beneficiary would accept in lieu of the program assistance?)

The cases were in three locations, Ottawa, Calgary and Edmonton, and the rural areas surrounding these cities.[42] In selecting sites and cases, the research team considered the relative numbers of cases of each program and the average size of the financial support provided in each. The selection of sites also took into account whether the housing unit was owned or rented (all of the dwellings in the test cases were owned by the beneficiary or family broadly defined). The selection of cases also ensured that the major types of adaptation or renovation were represented. The test cases did not include on-reserve housing.

Originally, the study team originally considered four possible test sites in some depth – Ottawa and region, Calgary and region, Edmonton and region, and Charlottetown and region. In the end, only the first 3 sites were involved; Charlottetown and region was not included because it did not have enough case studies readily available. The researchers spoke to thirty recipients of HASI or RRAP-D. Consideration was given to the best mix of cases (although it was clear that fifteen cases were too few to be

representative). A mix of urban, rural and remote cases was chosen. However none of the cases were extremely remote. At most they were one half day's drive from a city.

Each case involved personal interviews with the beneficiaries and, where appropriate, with their caregivers. They were interviewed in person in their homes in the first round of data collection and interviewed by telephone in the second round.[43]

Initially the research team intended to conduct the first round of interviews before the renovation and the second round after the renovation. This proved impractical because of the long periods typical between initial approval of an application, final approval to proceed with the work, and completion of the renovation.[44] It would be possible to design a before-after study but such a study would take a long time to complete and would be expensive because the timing of data collection would be individual to each case. It might be possible to conduct the "before" survey of a significant number of cases within a reasonable period of time, but follow-up after the completion of renovations might be spread over a year or more, and, if the methodology was personal interviews, these would involve travel by the interviewers that could not be clustered but would have to be done when individual cases completed their renovation.

The fact that beneficiaries' health was in many cases rapidly deteriorating was another complicating factor. The health status of the beneficiary at the time of application and his or her health status a year later might differ significantly.

The in-person interviews in the study took a considerable amount of time. They covered what might otherwise have been discussed in two interviews if a before/after methodology had been feasible. The initial interview covered the situation before the renovation, the experience with the renovation, and the results after the renovation. The second round of interviews was shorter and conducted by telephone. It was conducted by the same interviewers who had met the interviewees in their homes in the first round. The trust established in the in-person interview was probably essential to the success of the subsequent interview on the telephone. The telephone interview focused on changes in the beneficiaries' condition (and that of their caregivers, where appropriate) and in their perceptions of the usefulness of the renovations. A few new questions were added to the questionnaire to help clarify the beneficiaries' needs and their caregiving relationships.

Reaching the interviewees was often difficult. It required multiple telephone calls to set up a visit or to do a telephone interview. This was the case, especially, during the spring and summer months when some beneficiaries were visiting relatives or otherwise occupied away from home. Nevertheless in all but two cases the beneficiaries and their care givers were willing and able to cooperate fully with the study team. In two cases, the beneficiary and/or the relevant caregiver were hospitalized which made participation in the study impossible.

4.3 Pre-Test Findings

The questionnaire and interview procedures were pre-tested in three cases, and revisions were made before the main group of case studies was undertaken. Some

lessons from the pre-test were:

[A] The beneficiary interviews took longer than expected, partly because the questionnaire was long and partly because the interviewees tended to explain their situations at length. The interviews took an hour–and-a-half to two hours each, not counting time to tidy up the data on the questionnaire afterwards. Without exception, the beneficiaries and their care givers explained their situations more fully than necessary to answer the questions. Since they were volunteering their time, often under difficult conditions for them, the research team were not directive or demanding that they keep to a strict sequence of questions.

[B] Beneficiaries were generally willing to have us visit the house to undertake the interview. However in one case this was not possible because the beneficiary was about to enter hospital for three-months and could not be interviewed in person before or during his hospitalization. However he offered to complete the interview by phone; and did so successfully. This was an example of the unusual lengths to which several of the participants were willing to go to contribute to the study, without obvious benefit to them.

[C] The research team found that it was often not possible to maintain a clear distinction between the beneficiary's responses and those of the caregiver. Interviewing caregivers independently from beneficiaries was not always possible. For example, in one of the test cases, the primary caregiver (the wife) had to help the beneficiary answer his questionnaire because the beneficiary could not speak easily due to serious shortage of breath. He did indicate, by expression and body language, that he agreed with her answers. In the same case, the care giver responded to her own questions in the beneficiary's presence because his condition requires that she be close by most of the time.

[D] The beneficiaries' deteriorating health may be a complicating factor. The research team found that the beneficiary's general health may deteriorate significantly even between initial contact and the formal interview. In two of the test cases, the beneficiaries' health was very precarious. One of them was dying of lung cancer – which was related to, but not the main reason for, the renovations supported by CMHC. The other had a condition that could flare up at any time, resulting in a more severe handicap or death. This point was relevant to the practicalities of surveying, but also has implications for the HASI/RRAP-D program requirements and the results that can reasonably be expected.

[E] Some beneficiaries were better able to manage the renovations than others. For example, one of the beneficiaries had been a building contractor before he stopped working because of his disabilities. In contrast another had no experience in dealing with contractors and there was a serious misunderstanding about what the construction estimate covered and what it did not cover. Consequently the cost of the renovation exceeded the CMHC contribution by a large amount. Another couple was displaced from their home for an unnecessarily extended time while the renovation was underway.

4.4 Results of the Case Studies

4.4.1 The Beneficiaries

Nine cases were RRAP-D, three were HASI, and three had received contributions from both programs. Nine of the beneficiaries were female and six were male. All were low income, none were working and none planned to return to work, with the exception of one caregiver who might return to work if her caregiving responsibilities ended.

As noted above, the small sample of 15 beneficiaries was not representative of the whole population of HASI and RRAP-D recipients. Therefore one must be cautious about generalizations from the data. However, some points stand out. The beneficiaries and their partners/caregivers had more disabilities and complications than one might have expected. All fifteen had a disability and a large majority (80%) reported multiple disabilities (Appendix F, Tables 7-10). This was true of both RRAP-D and HASI recipients (where disability was not a requirement of program eligibility). All fifteen beneficiaries reported mobility impairments. Arthritis was the second most common disability. Other serious disabilities were common. During the second round of interviews, some beneficiaries reported that their disabilities had gotten worse, sometimes significantly. This highlights their relative instability with respect to health and, ultimately, to their ability to remain in their homes.

The disabilities had several impacts on our study. This is relevant when planning a future study. First, it was difficult to schedule interviews because of constraints related to their disabilities (e.g., a beneficiary[45] going into hospital, making an in-person interview impossible). Second, disabilities often made interviews more time-demanding than expected (vision/hearing difficulties, cognitive disabilities, and lack of energy or feeling actively ill), and had an impact on the ability of the beneficiary to cope with complex questions. Finally, in all cases where the beneficiary had a primary caregiver the caregiver participated in the same interview as the beneficiary, at the beneficiary's request.

Independence in the home

Based on this first round of interviews, it was clear that the beneficiaries will try to stay in their homes to the bitter end, so long as they can find help (with the exception of Beneficiary 04, noted above). It appears to be an emotional decision more than a rational cost/benefit decision. Also, it was unlikely that their ability to stay in their homes in any case can be attributed solely to having the renovations done. There are many other factors. If they end up going elsewhere, it will likely be because they will have run out of ways to deal with their health issues and/or their caregiver can no longer deal with their disabilities.

Urban/Rural Beneficiaries

There were eight urban beneficiaries and seven rural beneficiaries. The most striking difference between them, particularly in the case of the more remote rural locations, was the inability of the beneficiaries to obtain three competitive quotations from contractors to undertake the renovations. There simply were not three qualified contractors within a reasonable distance, so beneficiaries made compromises that led to difficulties with the work – both overruns in the budget and unacceptable quality of work. The research team did not have any case of a beneficiary on a First Nations

reserve in our sample.

4.4.2 The Caregivers

For the purposes of this study a "caregiver" was anyone who self-defined as a caregiver to the HASI/RRAP-D beneficiary. The principal interest was the provision of care that was related to age or disability in a way that was relevant to HASI or RRAP-D (i.e., where the care giving or the caregiver was affected by the renovations supported by one or both of the CMHC programs). One third of the fifteen beneficiaries had a caregiver. Most of the caregivers were unpaid primary caregivers (family members or friends). An exception was case 04. Initially, two beneficiaries also identified service provider/caregivers.[46] During the second round, the research team learned that one beneficiary[47] was now being visited on a weekly-basis by a nurse whose primary task was to assess his condition. One of the service provider/ caregivers was paid by the beneficiary's primary caregivers[48]; the others are paid, in whole or part, by a social service agency.[49]

Despite their increasingly-poor health, none of the beneficiaries were receiving home care nursing services, with one exception where the beneficiary was receiving limited care from a social services organization.[50] However, some beneficiaries were very ill and were going back-and-forth to doctors' offices or the hospital regularly. The frequency and duration of the hospital visits were expected to increase as their health worsens.

In all cases, primary caregivers were affected in some way by the modifications supported by the CMHC programs,[51] although the nature of these impacts was complex.

- The primary caregivers, all of whom live with the beneficiary, often benefit from the renovations directly, especially when they have to do with building code issues (e.g., a new roof, flooring, new windows, electrical upgrade).

- In two cases (A9, A13), the caregivers themselves had health problems and disabilities which the renovations helped them deal with. For example, Caregiver A9a (who had an injured arm) benefited from the railings and non-slip stair surface that has been put in to help her husband move in and out of the home.

- Some caregivers noted that the renovations help them to help the beneficiary better. However, they did not believe that the time and effort they need to invest in the beneficiary's care had lessened in any substantial way because of the renovations. The beneficiaries indicated that they concur with this assessment. For example, Caregiver 01a reported that the new flooring helps her keep the home cleaner, thus making easier for her husband to breathe, but that her caregiving responsibilities and the time needed to fulfil them have increased over time. [It was not always clear how well based these judgments were. The interviewers had the impression that some beneficiaries and caregivers were concerned to communicate their need for further assistance.]

Beneficiaries reported that the importance of the help received from their primary caregivers with respect to maintaining their independence ranged from important (1

case) to essential (3 cases). With respect to helping them stay in their homes, beneficiaries reported that their help was either very important (2) or essential (3). Interviews with the primary caregivers indicated that they believed this to be accurate. Where relevant, beneficiaries reported that the importance of the help received from their service provider/caregivers with respect to maintaining their independence ranged from very important (1 – unpaid secondary) to essential (1 unpaid + 1 paid). With respect to helping them stay in their homes, beneficiaries reported that their help was essential (both paid and unpaid).

As noted above, three of the primary caregivers were related to the beneficiary and live with him or her. Two were spouses (both wives), and one was the beneficiary's son. In one case, the disabled persons in the family were children of foster parents. The foster parents were technically the beneficiaries of CMHC financial support. The children both had severe mental and physical disabilities. The fifth caregiver in our sample was a beneficiary's long-term housemate. In this case, the caregiver owned the home in which the beneficiary lived. In the second round of interviewing, the research team learned that this caregiver had broken a hip and was in hospital. Friends and neighbours have stepped in to help until he was able to take up his role again. It was likely to take some time, however, before he can return to his caregiver's role, which involves lifting and was physically taxing. In most cases the roles of 'beneficiary' and 'caregiver' were intertwined, since both had disabilities and they provided care to each other.

In two cases at the time of the first interviews, and three at the time of the second interviews,[52] the beneficiary was receiving care from a social services organization.[53] Two of the organizations providing care were home care services programs, one of which was paid and the beneficiary's guardians were reimbursed in part. One was a provincial government ministry; and one came from a local government health care unit. According to the beneficiaries, the nature, amount and costs of external services were unaffected by the renovations. Also the individuals providing the care from these agencies changed frequently, so it may be impractical to expect to interview this type of caregiver about the effects of changes in the physical dwelling. In some cases a caseworker will provide more continuity but this was not the sort of information that one might expect a caseworker to keep on file routinely.

The amount and nature of caregiving varied (one beneficiary[54] received help with virtually everything she did) to a relatively minor part of daily activities (for example, help navigating the chairlift[55] or help with dressing when required[56]). In one unusual case[57], service provider/caregivers provided a wide range of help to the foster parents in support of their care of their disabled children. In another case a beneficiary[58] receives bathing and cleaning services weekly.[59]

In three of the five cases, the caregiver had one or more disabilities.[60] One caregiver[61] required surgery for a medical problem during the interview period. Whether the condition of this caregiver was exacerbated by her husband's illness, or affected by the renovation, was unknown. During the second round of interviews the research team learned that a caregiver[62] has recently broken a hip. The beneficiary reports that his caregiver, who was blind, was talking and not paying attention to where he was on the stairs.

Four of the primary caregivers did not work. One had given up earning a living to care for the beneficiary.[63] She was self-employed and will be able to re-establish her house-cleaning business when he no longer needs her help, being hospitalized permanently or no longer alive.

4.4.3 General Lessons on Data Collection

The research team was able to reach and interview almost all of the people in its sample, but at considerable time expense that probably could not be duplicated in a larger study. The beneficiaries were generally cooperative and willing to spend time answering questions. All the caregivers identified participated as well. However, it was clear in some cases that the process of being interviewed was stressful for the interviewee. Reasons may have included tiredness, lack of endurance, and perhaps discomfort with discussing their disability with a stranger. At the same time, several persons clearly enjoyed meeting the interviewer and talking about their situation and about the renovation.

The first round of beneficiary interviews took a lot of time, partly because the questionnaire was long, as discussed above, and partly because the interviewees tended to explain their situations at length. Most interviews took an hour–and-a-half to two hours, not counting the travel involved, or the time needed to tidy up the data on the questionnaire afterwards. Without exception, the beneficiaries and/or their caregivers explained their situations more fully than strictly necessary to answer the questions.

The second round of interviews went more quickly, mostly because there were not a great many changes to be reported and discussed. However, as noted above, it was sometimes took a significant number of telephone calls to reach beneficiaries.[64] Four of the five caregiver interviews[65] were done in conjunction with the corresponding beneficiary interview. This was at the request of both beneficiary and caregiver.

Beneficiaries were generally willing to have us (the research consultants) visit the house to undertake the interview. There were two cases where the interview did not take place at the recipient's home. In one case[66] the beneficiary was about to enter hospital for three-months and could not be interviewed in person beforehand. The interview with this beneficiary was completed by telephone. This took approximately 45 minutes. In the second case[67] the beneficiary asked that the research team not come to visit her in her home, but rather interview her daughter in the daughter's home in another town. She gave no reason for the request. The daughter indicated, in her interview, that her mother distrusts strangers.

The beneficiaries and their caregivers were generally glad to hear from the interviewer again in the second round. The second round of interviews gave the researchers a chance to see how the beneficiaries were doing, and the beneficiaries the feeling that the research team cared whether the program was an on-going benefit to them.

It sometimes seemed that there had been considerable effort to make sure everything was in especially good order in the house for the interviewer's visit. The response burden involved in a researcher visiting the beneficiaries in their homes should be kept in mind in a larger study.

The researchers' initial assumption that beneficiaries could be interviewed separately from their caregiving family and friends generally proved unfounded. Most often the caregiver was present and contributed significantly to the responses to questions. In particular, in two cases[68] the beneficiaries were not well enough to answer the questionnaires directly, but needed their caregiver to respond for them. Consequently it was sometimes not possible to distinguish clearly between the beneficiary's responses and those of the caregiver. This was sometimes true of the caregiver interview and questionnaire as well. In one of the test cases[69] the primary caregiver was the spouse who had to help the beneficiary answer his questionnaire because of shortage of breath. Because she needs to stay close by him most of the time, she opted to respond to the caregiver's questionnaire in his presence. He indicated – by expression and body language – that he agreed with her answers. Another caregiver[70] responded to both questionnaires because the beneficiary was severely physically and mentally challenged. There was no way that his reactions to the questions could be gauged. Therefore there was no reliable way to distinguish the feelings and thoughts of the beneficiary from his caregivers.

In another case[71] the beneficiary wanted his daughter present when he responded to the questionnaires (both rounds of interviews) because he was hard-of-hearing. In another case[72] the interviewer was asked to interview the beneficiary's daughter in the beneficiary's home with the beneficiary present. The beneficiary's contributions to the conversation – which were minor -- and her body language confirmed the information given by her daughter. No reason was given for this request, nor was there an obvious physical or mental problem that accounted for it. The research team also spoke with the daughter in the second round at the mother's request.

The beneficiaries' deteriorating health was a complicating factor in many cases.[73] A beneficiary's general health may deteriorate significantly between the initial contact, the first formal interview, and the follow-up interview.[74] Several could have had their health take a turn for the worse at any time. For example, the researchers were informed in the second round that one beneficiary's cancer had spread to his brain. Another was facing an amputation because of circulatory problems. This point is relevant to the practicalities of surveying, but is also relevant to reasonable expectations of results that should be expected from HASI and RRAP-D.

4.4.4 Lessons Learned: Beneficiary Questionnaire

Questions for Beneficiaries

Respondents found most of the questions straightforward. However they struggled with the more complex and hypothetical questions. There were no problems with questions about the beneficiary or the dwelling unit.[75] No new questions were added to this section for Round Two. There were significant changes to the health of many beneficiaries between the two rounds of interviewing.[76] There were no changes in the dwelling units.

Questions for Caregivers

Five beneficiaries among the fifteen in our sample reported that they had a caregiver. In two of the five cases the caregiver was a spouse, in one case it was foster parents, in one case a housemate, and in one case a son.

The most frequent kind of care reported was assistance with mobility – moving from one room to another or up and down stairs. (Appendix F, Table 22)

The interactions between caregiving and the renovation of the physical dwelling are important. However it is a complex matter, made more complex by difficulties in defining "caregiving." For example, in two cases[77], the beneficiaries indicated that their daughters were their caregivers. However, when the issue was raised with the daughters, they rejected the designation, saying that they were doing nothing special that would justify it, and had done the same things for many years before their mothers became ill or disabled. However, this debate was somewhat academic because in neither case had the renovations changed the role or tasks of the daughter, whether defined as "caregiving" or not.

In the five cases[78] where a primary caregiver was identified and interviewed, the beneficiary made it clear that he or she believed that the caregiver's work was needed if they were to remain independent and in their homes. The caregiver concurred. In no case did either the beneficiary or the caregiver believe that less caregiving was required after the renovation. In one case out of five they thought that the caregiving had been made easier

In the second round of interviews, the research team discovered that the roles and responsibilities of the caregivers had changed in two cases.[79] One beneficiary[80] needed more help from his primary caregiver because of his worsening health. Another had recently had to depend on the help of his friends and neighbours on an ad-hoc basis because his caregiver had broken his hip and could not provide the assistance needed.[81] This highlights the fact that the relationship between beneficiary and caregiver can change suddenly and significantly.

Other Caregivers

The research team distinguished between "primary" and "secondary" caregivers on the basis of beneficiary's designation and/or the caregiver's self-designation. This distinction is not fully satisfactory conceptually; but it did not seem to raise any practical difficulties for the respondents. In the first round of interviews, the research team found only two beneficiaries[82] who had additional help beyond that given by a "primary" caregiver. In both cases the family relied on assistance from social agencies. However that assistance was not closely related to any aspect of the physical dwelling unit. In one case a family was providing care to several disabled foster children, and in another a household of mother and son were both extremely disabled.[83]

We found it remarkable, given their disabilities, that the families we interviewed were receiving so few home care services. We do not know why this was the case. A larger study should investigate the issue further. It may be that this self-selected group of people, who renovate their homes to enable them to live more independently, is less inclined than others to seek and accept home care services. However this observation is speculative, on the basis of a tiny sample.

In no case did the beneficiary think that the renovations supported by CMHC had any impact on the nature or amount of care from social agencies. There was no change in the ease of service-delivery and no change in the costs associated with care. This picture was unchanged in the second round of interviews.

Modifications to the Dwelling [84]

The modifications to the dwelling were completed in all cases by the time of our first interview. Ten renovation projects had been completed between August and December 2004, and five between January and May 2005.

The main reasons for the renovations were to increase the beneficiary's mobility (14 cases out of 15), to improve safety in the home (9 out of 15), and to remedy violations of the building code[85] (7 out of 15). (Appendix F, Table 35)

In eleven cases the renovations are best described as upgrading the whole house, with changes to basic systems (electrical, plumbing, heating), and to major structural components of the house (foundation, roof, windows). In nine cases changes were made to the bathroom, in five to the kitchen and in five to one or more bedrooms. In nine cases special aspects of the house were modified, including installing a stairlift, adding a new exit, and converting a home office to storage.

In both rounds of interviews, the respondents tended to have most difficulty with questions about the cost of the renovations, both the renovations supported by the CMHC programs and those done with the help of other agencies or by themselves or their families.

Quality of Life [86]

Beneficiaries were asked eleven questions about the impact of the renovations on their quality of life. (See Appendix B) Five of those were direct questions about their quality of life and the impact of the renovations. Six questions were couched as before/after comparisons. These were asked of both beneficiaries and caregivers. The respondent was asked to rate on a scale of 0-10 the beneficiary's situation before the renovation and afterwards, on each of the following items:

- Mobility into and out of the dwelling
- Mobility inside the dwelling
- Ability to do usual daily activities, such as using the kitchen to cook
- Ability to look after oneself, such as using the bath and toilet independently
- Physical and mental health
- Overall quality of life

The largest aggregate gains were reported in the category "overall quality of life." Almost the same gains were reported in "mobility into and out of the house." The lowest gains were in "ability to do usual daily activities, such as using the kitchen to cook." However in reporting these findings one must emphasize that this is not a representative sample. Therefore the findings of a comprehensive survey might be quite different.

We found that beneficiaries have different concepts of what makes for a better "quality of life." the research team need to be aware of this. In one case[87] the beneficiary' foster parents reported that "quality of life" was a meaningless concept to him because of the nature of his disabilities.

It seems that what constitutes poor or improved quality of life depends directly on what the beneficiary values most at the time he or she receives CMHC support. For example, one beneficiary (07) values his contacts with his friends very highly, and chose to do renovations that would help him visit with his friends, instead of dealing with other difficulties or inconveniences (e.g., minor difficulties getting into the bathroom and shower). Thus, he judged that the renovations had improved his quality of life significantly, although other disability issues remained.

In the second round of interviews, the research team asked beneficiaries and their caregivers a few additional questions about the quality of their day-to-day living, how this has been affected by the CMHC-supported renovations, and whether they needed additional help. The intent was to get better insight into why so few of the beneficiaries had significant help from caregivers, despite their often-severe illnesses or disabilities. The responses did give us more information about the challenges the beneficiaries and their caregivers face and whether the CMHC renovations helped deal with these. The research team did not, however, discover additional or different care giving relationships among the people interviewed as a result of asking these questions.

Stability in the Existing Home [88]

All beneficiaries strongly indicated that they intend to remain in their homes until their health makes this impossible. One partial exception was beneficiary 04 whose foster parents (the recipients of CMHC program financial support) will probably have to move to a larger home if they continue to have a number of severely-disabled foster children in the home.

The second round of interviews confirmed that the beneficiaries, without exception, have no intention of leaving their homes until absolutely necessary – and certainly not in the short or medium term.

Financial impact and willingness to pay [89]

Without exception, the beneficiaries and their caregivers were delighted to receive CMHC support. Most could not have afforded for the renovations themselves, without support.

There were no changes in the responses to these questions in the second round of interviews.

What did beneficiaries like best and least about the program and the renovation? [90]

The beneficiaries were asked open-ended questions about what they liked best and least about the program and the renovation. (Appendix F, Table 71) In general they were complimentary about the CMHC staff and/or delivery agent, with two notable

exceptions who were critical. Their comments about the renovation were favourable, and diverse. (Appendix F, Table 72)

The aspects of the program that they liked least were mainly financial aspects, including the contractor's estimate for the work and over-runs. In one case the beneficiary was displaced from the home for several months. In several cases there was a misunderstanding about what the renovation budget would cover.

Nearly everyone commented on the disruption caused by the renovations, but most thought that it was inevitable. Five respondents had no negative comments about the program.[91] The few negative comments related to cost overruns that may have involved overcharging[92], to work that fell short of their expectations or was unduly protracted[93], to the attitude of a program delivery representative (although two other beneficiaries praised the same representative),[94] and to difficulties with deadlines and other application problems.[95] In one case a rejected bidder harassed the family.[96]

4.4.5 Lessons Learned: Caregiver Questionnaire

Personal data [97]

The questions describing the caregiver were straightforward and, without exception, caregivers were willing to respond to all of them. A few hesitated when asked about their annual income and sources of funds, and then responded. The questions related to paid employment in this section were inapplicable to all but two of the caregivers.[98] One caregiver[99] may re-establish her home cleaning business, once her husband is gone. Another[100] may return to work if he is able to get a heart transplant, but that has its risks and, besides, it is unlikely that he will have the operation because of his generally poor health.

Caregiving responsibilities and impact on caregiver [101]

Caregivers had no difficulties with these questions, and their responses were generally the same as, or very similar to, those of the beneficiaries. However, they sometimes rated the importance of their caregiving lower than had the beneficiaries.

With one exception[102] all of the caregivers were disabled themselves, some seriously. All primary caregivers lived with their respective beneficiaries and provided care virtually full-time every day. Therefore it was not possible to estimate the precise number of hours involved directly in caregiving tasks.

The modifications and their impact [103]

The questions were clear-cut, and the caregivers tended to agree with the beneficiaries about the nature and impact of the modifications supported by the CMHC programs

Quality of Life issues [104]

As with the beneficiaries, caregivers asked about the meaning of the term "quality of life" and had some trouble grading their responses in terms of "before and after" the renovation, and over the ten-point range. Nevertheless, their responses were very

similar to those of the beneficiaries – generally only a point of so different, on a 10 point scale.

Caregiver involvement in renovation [105]

Caregivers thought these questions were relatively straight-forward. Only one caregiver[106] did not help with the application process. Similarly virtually all were closely involved in the renovation process as well.

General probes [107]

In general, both program and renovations are well regarded by the caregivers. Their responses were similar to the beneficiaries'. (Appendix F, Table 71) With two marked exceptions the efficiency of the program was praised. There was a wide variety of aspects of the renovations that beneficiaries particularly valued. However the most frequently mentioned was increased safety and mobility.

Problems that were mentioned by caregivers were similar to those mentioned by beneficiaries above, and included difficulties in finding and handling the contractors, over-runs, and program deadlines that were difficult to meet.

4.5 A Hypothetical Illustration of a Cost-Benefit Analysis of HASI/RRAP-D

This hypothetical illustration of a cost-benefit analysis of HASI/RRAP-D is intended to show the structure of such an analysis, not to report actual numbers. The numbers in Table 4.5 are illustrative only. Table 4.5 is loosely based on three of the case studies that were written as part of this study.

The Cases

(Case A) The beneficiary and her husband are disabled. Her husband has less mobility than her. He has rheumatoid arthritis and lupus, and uses a wheelchair full time. He has benefited from the renovations because they have increased his mobility. Both also benefited from the resolution of health and safety problems (housing code issues). The renovations were done mainly to deal with code issues, and to increase the beneficiary's mobility and general comfort in the home. The CMHC-sponsored renovations cost $38,000. The RRAP-D program covered $28,000 of the amount, and the beneficiary's children paid the balance of $10,000. She and her husband had out-of pocket telephone costs which were significant ($800) and which her children helped pay. This was primarily due to the fact that they had to use a cell phone to speak with doctors and keep contact with their family when they were living in a trailer during the renovations. The beneficiaries have had financial help and non-financial help from their children (who covered the $10,000 difference between CMHC funding and the total costs of the renovations).

(Case B) The beneficiary suffers from severe allergies, occupational asthma and lung cancer. The beneficiary's primary caregiver is his wife. She helps him move in and out of the house and from room to room, helps him go up and down stairs, and drives him to medical and other appointments. During the second interview we found that his disabilities had progressed and she now had to help him use the toilet and take a bath. She continues to prepare meals, do general housekeeping, and some home maintenance chores. She owned her own house cleaning business before her husband was taken ill and had to give it up because he needs her at home full-time. The modifications affected the entire house, and included replacing the roof (a code issue) and replacing all the carpeting with laminate flooring (to ease the beneficiary's breathing). The new roof cost $6,300, and the flooring $4,373. The RRAP-D Program covered the cost except for $350 that was paid by the beneficiary.

(Case C) The beneficiary is a female over 65 years of age, who lives with her son who is her care giver and who is also disabled (heart problems). The beneficiary has mobility difficulties due to arthritis, the amputation of both her legs, and open sores on her hips. She also has had a colonoscopy. She uses a wheel chair at all times. The beneficiary also receives help from the (City) Home Care Services, which consists of nursing (3 times/week), and homemaker services (2 times/week - bathing). She does not believe that the renovations will affect the nature or frequency of the assistance needed. The renovations cost $25,000 and the full cost was covered by CMHC.

The renovations were done to improve the beneficiary's mobility, safety and security, and to deal with housing code issues (the dwelling was in very poor condition). The modifications included the entry/exit (ramp repaired); the bathroom and kitchen (counters and sinks lowered); and the house overall (new plumbing, new hot water

tank, new furnace, new roof, house rewired and additional plugs throughout, all windows replaced except in the basement where break-away frames were added).

Some Assumptions in the Cost-Benefit Analysis

The immediate financial impacts are not discounted or adjusted for inflation. They are already expressed in present values. In contrast, the follow-on costs and benefits are discounted and adjusted for inflation. We have assumed that the incremental extension in tenure in the present dwelling resulting from the renovations is two years. We have assumed that, for discounting purposes, costs and benefits occur at the end of the year - that is, costs and benefits during the first year are discounted once.

Results of the Hypothetical Cost-Benefit Analysis

The illustrative analysis of costs and benefits to these three families is as follows. We emphasize that the numbers are only illustrative. The framework for the numbers is the focus of this study.

(1) The beneficiaries' view: The immediate financial impact from the point of view of the beneficiaries and their families is positive, mainly because two major items are relevant and, of these, the increase in the value of their property outweighs wages foregone. In addition, the annual follow-on benefits far outweigh the costs. Therefore the net present value (the "bottom line" for the cost-benefit analysis) is very positive – approximately $155,246 for the three beneficiary families by the end of the first year and $179,764 by the end of the second year.

(2) The government view: The immediate financial impact on government finances is negative (-$48,898) although its costs are significantly offset by immediate savings in the costs of home care. The annual follow-on benefits to government (home care and health system) are positive. The overall net present value of the programs from the government point of view is, of course, negative (-$34,519) because the government is investing in the programs so that the public (Canada) will benefit. Over time the net costs to the government decline as follow-on benefits accumulate.

(3) The overall Canadian view (the public): From the point of view of Canada, including all stakeholders, the immediate impacts are highly positive ($100,841). As time goes by the total impact becomes even more positive - $144,802 at the end of the first year and $181,236 at the end of the second.

Overview of costs and benefits

These are only illustrative figures, not actual measurements. If the figures were real, the picture would be extremely positive. The analysis shows a government net investment of approximately $22,603 by the end of the second year. In return the public (Canada) has benefited sufficiently to cover the $22,603 in net government costs and to have an additional $181,236 in accumulated net benefits.

Table 4.5 An Illustration of a Cost-Benefit Analysis of a RRAP-D Case, from Different Points of View

PARAMETER NAME	PARAMETER VALUE
Discount rate, beneficiary	0.15
Discount rate, Government of Canada	0.035
Discount rate, Canada	0.1
Expected inflation rate, Canada	0.025
Years from t1 to t3 in absence of a RRAP-D intervention	0
Years of extended residence in present dwelling	2
Quality of life adjustment in present residence post-renovation	0.033
Dollar value of a QALY	$50,000
Change in annual probability of an adverse safety event, resulting from the renovation	0.005
Average cost of an adverse safety event, for the beneficiary's age group	$2,300
Time gained from efficiencies in activities of daily living (hours per annum)	55
Caregiver hours saved after the renovation	25
Dollar value of a beneficiary/family/friend caregiver hour	$15
Change in the cost of social services provided (per annum)	$735
Applicant hours to complete application	5.5
Applicant hourst to manage the renovation contracting	15.75
Moving expense as a % of market value	7%
Annual increment in cost for main alternative dwelling	$2,000
Market value of dwelling before renovation	$150,775
Market value of dwelling after renovation	$193,500

IMMEDIATE FINANCIAL IMPACTS t_0	Beneficiaries/families	Government	Canada
Wages foregone by a caregiver, resulting from extending existing tenure	-$77,000	N/A	-$77,000
Change in market value of the dwelling	$140,993	N/A	$140,993
Market value change in surrounding housing	N/A	N/A	$24,075
CMHC contribution (loan forgiveness and minor write-offs)	N/A	-$63,673	-$63,673
Lessening in Need for Home Care Services	N/A	$15,000	$15,000
Family capital contribution	-$10,350	N/A	-$10,350
Cost overrun	-$350	N/A	-$350
CMHC/Agent administrative cost (average per case x 3 cases)	N/A	-$225	-$225
Application costs (cost of applicant time)	-$120	N/A	-$120
Time costs for contracting and supervision	-$709	N/A	-$709
Miscellaneous applicant costs during the renovation	-$3,800	N/A	-$3,800
NET PRESENT VALUE (IMMEDIATE IMPACTS)	$125,664	-$48,898	$100,841

ANNUAL FOLLOW-ON BENEFITS	Beneficiaries/families	Government	Canada
Improved quality of life in home (including increased independence)	$9,900	N/A	$9,900
Postponement of moving expenses	$9,499	N/A	$9,499
Postponement of higher costs of accommodation	$12,000	N/A	$12,000
Lower stress/risk in present home (fewer and less serious adverse events)	$2,250	N/A	$2,250
Time gained from efficiencies in activities of daily living	$825	N/A	$825
Less risk or difficulty of caregiving	$563	$0	$563
Less time needed for caregiving	$1,875	$0	$1,875
Less out-of-pocket expenses of caregiving	$0	$0	$0
Less need for respite services for caregiver(s)	$0	$0	$0
Decreases in the amount or type of in-home services	$0	$7,350	$7,350
Decreases in difficulty or risk to service providers	$35	$0	$35
Improved availability of affordable housing for elderly or disabled people	N/A	N/A	$0
Contribution to the renovation trades (jobs, skills)	N/A	N/A	$0
Improvement in community diversity (age, disability, income)	N/A	N/A	$0
Lessened public costs of health services and related support services	N/A	$10,000	$10,000
Sub-Total (Annual Follow-On Benefits)	$36,946	$17,350	$54,296
ANNUAL FOLLOW-ON COSTS			
Opportunity costs for caregivers (lost employment opportunities)	$0	N/A	$0
Continuing stress (if any)	-$500	N/A	-$500
Possible social isolation	-$750	N/A	-$750
Time/caregiving costs due to extension of tenure in the present dwelling	$0	N/A	$0
Fees (Changes in type or amount of in-home services.)	$0	N/A	$0
Underutilization of the housing stock	$0	N/A	$0
Sub-Total (Annual Follow-On Costs)	-$1,250	$0	-$1,250
ANNUAL FOLLOW-ON BENEFITS-COSTS (nominal $ year1)	$35,696	$17,350	$53,046
ANNUAL FOLLOW-ON BENEFITS-COSTS (nominal $ year2)	$35,696	$17,350	$53,046
PRESENT VALUE OF FIRST YEAR FOLLOW-ON EFFECTS (constant$)	$29,583	$14,379	$43,962
PRESENT VALUE OF SECOND YEAR FOLLOW-ON EFFECTS (constant$)	$24,517	$11,916	$36,433
TOTAL NET PRESENT VALUES AT END OF YEAR 1 (Immediate effects plus one year of follow-on effects)	$155,247	-$34,519	$144,802
TOTAL NET PRESENT VALUES AT END OF YEAR 2 (Immediate effects plus two years of follow-on effects)	$179,764	-$22,603	$181,236

5. CONCLUSIONS

5.1 Summary of the Suggested Approach to Cost-Benefit Analysis

We have considered two methodologies in depth: (1) direct estimation, which is based on a combination of quality of life estimation and estimation of costs avoided by prolonging tenure in the existing dwelling, and (2) contingent value analysis, which is based on self-reported monetary values. Each has advantages and disadvantages.

In the case of HASI/RRAP-D, contingent valuation methods applied to individual beneficiaries should use willingness-to-accept compensation as the best formulation of the method. As well, it is our opinion that the contingent value question is best asked in a real situation where program beneficiaries are actually given a choice between program support and a lesser cash grant. How this might be done is described in Section 3.6.

The direct measurement methodology has fewer problems than the contingent valuation methodology, but has some. It requires more detailed measurements of costs and benefits than contingent value methods do. If it is to work well, it requires measures of the improvement in quality of life of beneficiaries, measures of the costs of alternative accommodations, and measures of how much tenure is extended in the present dwelling.

If one method had to be chosen, we would recommend the direct estimation method. However, given sufficient research resources, both methods could be used to estimate costs and benefits of HASI and RRAP-D, with gains in accuracy and reliability from being able to compare the results of both methods.

5.2 Summary of Lessons Learned from the Field Work

This study included fifteen case studies of HASI and RRAP-D contributions in 2004 and 2005. The purpose of the case studies was to understand the clientele and to test various types of questions that might be asked about the program's costs and benefits.

As noted in the chapter above, there were many detailed findings from the case studies that are helpful in designing a wider study. Some of the more important findings, in our opinion, include:

1. The Clientele. The HASI and RRAP-D beneficiaries and their caregivers are a special clientele that pose challenges to data collection. Many of the people in our sample, beneficiaries and caregivers, were perceptive about the program(s), and cooperative with the study, but were also challenged by disability and age. Consequently, interviews were difficult to arrange and time consuming to conduct. However they are probably the only practical means of collecting in-depth and reliable information about the effects of the renovations.

2. Needs Analysis. We observed that the type of need analysis that preceded the renovation varied and that beneficiaries reported having different levels of understanding prior to the renovation of what was needed and what the renovation contract would cover.

3. The Caregivers. We found that about one third of the program beneficiaries had caregivers, and that the caregivers themselves had disabilities. We found that the renovation, in these cases, often benefited the caregiver as well as the program applicant. We found that the renovation did not materially lessen the amount of time spent caregiving, but that the caregiving was made easier and safer in several cases. We found that few of the HASI/RRAP-D applicants were receiving home care; and where there was homecare it was unaffected by the renovations.

4. The Difficulty of the Questions about Costs and Benefits. The respondents were able to answer complex and detailed questions about the impact of the renovations on their quality of life, for example, but the more abstract the question the more difficulty they had in addressing it. In general they were more comfortable with concrete questions about the effects of the renovations than with questions that asked them to value those effects.

5. Timing of Data Gathering. Any future study should take into account that the time that elapses between applications, approvals and completion of the renovations varies a great deal from one case to another. Therefore any before/after design for a cost-benefit study or HASI and RRAP-D will need to allow for this individual variation of the timing of cases.

5.3 Suggestions for Further Research

CMHC commissioned this methodology study to set out a framework for a full cost-benefit analysis of HASI and RRAP-D. In summary, the purpose of the study was twofold:

1. To develop a framework to assess the costs and benefits of HASI and RRAP-D, and

2. To test the framework (and a survey questionnaire designed with the framework in mind) by conducting case studies of renovations to enable seniors and people with disabilities to remain in their homes.

We conclude that a cost-benefit analysis of the two programs is possible and can be conducted within the framework described in this report. We also find from our review of the literature and from the widespread interest in the present study that a cost-benefit analysis of these programs would be broadly useful not only in regard to HASI and RRAP-D but also as an example of how the effectiveness of similar programs related to the physical environment of people who are elderly or have disabilities could be assessed.

Nevertheless, although it would be relatively easy to measure some of the costs and benefits, there are several challenges. First, one would have to ascertain the impact of

the programs on the length of tenure of the beneficiaries in their dwellings. One can obtain an indication of this by examining how long people who received a HASI or RRAP-D in the past did in fact remain in their dwellings. This requires contacting people who received a HASI or RRAP-D contribution some years ago. Even then the question remains how long they would have stayed in their dwelling in the absence of HASI and RRAP-D. This can only be determined by a comparison between the group that did receive a contribution and an equivalent group that did not. We expect that such comparison groups can be identified. This is a piece of research that should precede the cost-benefit analysis of HASI and RRAP-D.

Second, one would need to identify the impact of the renovations on the quality of life of the residents of the dwelling. This involves expert examination of the changes in beneficiaries' situations and comparison of these changes with known quality-of-life benchmarks. How this would be done is described in this report. It does not involve wholly new methodologies, but it does involve combining several methodologies in a novel way.

Once these two research tasks are complete, the cost-benefit analysis of HASI and RRAP-D should proceed smoothly to its conclusion.

Endnotes:

[1] Informal Caregivers in Canada: A Snapshot, Janet E. Fast, Norah C. Keating, Department of Human Ecology, University of Alberta, Edmonton, AB T6G 2N1, Executive Summary. Report to the Health Services Division Health Policy and Communications Branch , Health Canada, September 18, 2001

[2] Op. cit.

[3] Mr. Luis Rodriguez

[4] [1] Ability of applicant/recipient to apply for grant and to deal with contractor

Contributions are not given unless the recipient or a caregiver is physically and mentally capable of undertaking the renovation process and managing the contractor. This is a constraint on the 'reach' of the programs which might eliminate a significant number of possible recipients who could remain in their homes longer with the appropriate renovations.

[2] The problem of isolation from family, friends, neighbours

This is a complex issue. Research has shown that having a social network is critical to emotional well being which is, itself, a critical factor in maintaining an individual's physical and mental health. Seniors or persons with disabilities who are already close to family members, friends and neighbours, and are relatively-well integrated into the community will be far less isolated if they remain in their own homes. However, if they are already isolated, it can sometimes be better for them to have the companionship of others with similar difficulties in an appropriate institutional setting.

[3] Is the home structurally safe and sound?

It serves no purpose to undertake renovations to improve the environment with respect to the recipient's particular weakness or disability if the home itself is not structurally sound and otherwise safe.

[4] What about property values?

This is clearly an issue for homeowners, landlords and neighbours. It will be particularly important to recipients who own their own homes and who may need the sale proceeds if they eventually need to move into an institutional setting.

[5] Quality and appropriateness of the renovation

Are the appropriate controls to ensure that the renovation(s) are of the quality and nature expected? Who is responsible for ensuring that the chosen renovation has been done as it should be? Under the best of circumstances, it is difficult for a client to determine whether a particular renovation has been completed properly by the contractor. We assume that this may be even more difficult for an increasingly frail senior or an individual with disabilities. And, is the proposed renovation the most cost/effective for dealing with the particular weakness or disability?

[6] Quality and availability of needed health and social services

What is the quality and availability of appropriate health and social services? The purpose of this project is to examine the costs and benefits of appropriate services and renovations combined against those of long-term institutional care. It is critical, therefore, that the recipients interviewed have access to adequate health and social services from well-qualified sources in the right quality, quantity and mix of services. Or, if this is not the case, that the inadequacies are identified and taken into account.

[7] Nature of long-term institutional care

Different long-term arrangements will likely have different costs and benefits from one another and, as a consequence, will compare differently with the costs and benefits of seniors and individuals with disabilities staying in their own homes. This will have to be taken into account in our analyses.

[8] Impact on others

How others see the situation may differ from how the recipient may see his or her situation. For example, the potential recipient may be difficult for service providers to deal with on a one-to-one basis - which could reduce direct service in the home and therefore jeopardize the recipient's health and safety and reduce his or her quality of life, even with the desired renovation. The decision to remain in place will also have a direct impact on family members and friends. A close family member may be able to help the recipient only if he or she remains at home. Or, immediate family members may think the senior or individual with a disability should enter a long-term facility. If the family has not addressed this issue or is, in fact, not supportive of the individual's wish to remain at home, health and social services will likely need to increase because family member(s) may not wish to continue their support. An analysis of the costs and benefits of staying at home vs entering a long-term facility has to take into account the costs and benefits relative to family members, friends, service providers, as well as to recipient, the community at

large, and government. This is probably best done by assessing costs and benefits several times from different perspectives – costs to one stakeholder can be benefits to another and vice versa.

[9] Program-related questions

Are program criteria adequate with respect to such things as the recipient's income and earning capacity; the expected value and condition of the property to be renovated; contribution limits in relation to expected costs for the most common renovations; and so on? Given how quickly property values and communities are changing, especially in certain parts of the country, how often are these criteria re-evaluated? Are the programs reaching the appropriate recipients, in the variety and numbers of those who are actually in need? What is the estimated level of unmet need?

[5] A "logic model" is a tool for showing the components and effects of a program graphically. See Centre of Excellence for Evaluation, Treasury Board Secretariat, for more information on logic models and their uses.

[6] See Table 1.2.1 "Numbers of Loans, 2000-2004, HASI and RRAP-D"

[7] See Section 4.

[8] Source: CMHC, x:\finance\MAINS\Actuals\ 04 05 Actuals\RRAP DIS AND HASI 0405 to AHD.123

[9] Transport Canada, Guide to Benefit Cost Analysis (1994), Section 7.0, "Substantial research has been undertaken in many countries to see whether an average value of time can be inferred from the choices travelers make (say by trading off a higher fare for a faster route or mode of travel). A number of different methodologies can be found, leading to wide variations in the values obtained. There is widespread agreement, however, that the average travel-time savings for business trips should be valued at the equivalent hourly cost of an employee to the employer. Transport Canada has adopted this procedure, taking into account differences in employment costs among travelers in the different modes of transportation. On this basis, the value of business travel-time savings has been estimated, in 1990 dollars, at $33.70 per hour for air travelers, $24.00 per hour for automobile travelers and $23.70 for bus and rail travelers. Implicit in this procedure is the assumption that time spent in travel is entirely wasted. However, it is clear that productive work is often done during travel. Accordingly, a lower value of time for business travelers should be used when the mode of travel allows work to be done en route, thus reducing the economic value of travel-time savings. For example, the value of time saved en route during aircraft or rail travel might not be as great to employers as savings in other circumstances (e.g., when the traveler is also the operator of the vehicle), because the air or rail passenger may be able to do productive work in a part of the time that is to be saved. In Transport Canada, the practice is to assume that no work would be done by an air traveler during landing, take-off or taxiing to/from a terminal building. In the absence of empirical evidence, the Department has adopted the practice of reducing the value of time savings for business travel by 25% in circumstances where work can be done while traveling. In regard to non-business travel, the research results suggest that there may be many reasons for the average value of travel-time savings to vary by mode and by traveler income. However, none of the research is sufficiently conclusive to warrant the adoption of a particular approach. Accordingly, Transport Canada assigns equal value to the time savings of non-business travelers, regardless of the mode used and the traveler's income level. The value of time for non-business travel by adults is set at 50 percent of the national average wage -- the approximate mid-point of research results. This value has been estimated at $7.45 per hour in 1990 dollars. A lower value of time savings for children, who account for approximately 25% of non-business travel, is considered appropriate. While children are not able to fully act on their preferences, their presence does affect the time sensitivity of accompanying adults. For children age 17 and under, Transport Canada uses a value that is 50% of the adult value for non-business travel. Where the numbers of adults and children affected are not separated, a weighted average value of travel-time savings for all non-business travelers, including children, can be used ($6.50 per hour in 1990 dollars). Similarly, where reliable information on trip purpose (i.e., business/non-business) is not available, a weighted average value of travel time can be used. The estimated hourly value in 1990 dollars is $22.70 for air travelers, $10.10 for rail travelers, $9.10 for auto travelers and $8.40 for bus travelers. It should be noted that the values for travel-time savings do not apply to reductions in the time spent in recreational activities per se, such as recreational boating or fishing, or sightseeing. Reductions in the time spent in traveling to or from these activities would constitute a benefit, because it means that more time is available for the leisure activities." (Section 7.0)

[10] The standard unit of benefit is sometimes called a HALY, or 'Health Adjusted Life Year'. This is a generic term that covers two more specific concepts - the QALY or `Quality Adjusted Life Year' and the DALY or 'Disability Adjusted Life Year'. Another similar metric is the DALY or Disability Adjusted Life Year. The DALY scale is from 0.0 for perfect health to 1.0 for dead, and it is estimated for particular diseases, instead of a health state. An even more important difference is that in this measure, the value of a healthy person's life depends on age. The DALY function has the

form $C.age^{(-age/25)}$ which is low both at low and high ages, and peaks at age = 25. The constant C (0.16243) makes the average DALY over your life expectancy equal to one.
DALYs have typically been discounted at 3% (QALYs have not traditionally been discounted, although there is no good reason why they should not be). The further in the future the benefit is, the less it is worth now. For example, a treatment that extends a person's lifespan from 75 to 85 is more cost-effective if done to a 75-year old than to a 25-year old who sees no benefit for 50 years. In both QALYs and DALYs, elderly and disabled people are treated differently because their quality of life is less than a healthy person in the prime of life. Therefore the increments that are possible from an intervention may be less than those available to the fully healthy young person. DALY seems more strongly advantageous to young adults. Does this mean they should be treated in preference to their parents and in preference to their children? The advocates of DALYs have a rejoinder that although it is true that DALYs discriminate by age, in another sense everyone is treated the same, assuming that we all move through all of the age groups over our lifetime.

[11] The QALY combines life expectancy with a quality of life measure, from 0 (dead) to 1 (perfect health). For example, say a person is 25, with a life expectancy if male of 50.6 years, and, if female, 55.5. If a medical intervention saves this person's life returning him or her to perfect health. What is the outcome gain? 50.6 or 55.5 QALYs? No. Although the person may have good health now, one can predict a period of reduced quality of life before death, so the gain would be less, say 42.6 or 47.5 QALY. If the intervention was only partially successful, and the person becomes permanently disabled, and their quality of life falls from 1.0 to 0.6, then the outcome gain would be only 25.5 or 28.5 QALYs.

[12] In one catalogue of preference scores, for example, under "Mental Disorders", the 'preference score' (quality of life) for a caregiver after six months of standard care for a demented patient is said to be 0.53, and with a caregiver support program, 0.64.

[13] An alternative to a survey might be to involve a professional, ideally an occupational therapist, in collecting information on mobility, pain, ability to perform usual daily activities, ability to look after oneself, and depression; and information on specific changes resulting from the renovations.

[14] In the Delphi Technique a group of experts are invited to estimate, for example, changes in quality of life, drawing upon partial evidence and upon their expertise. This technique has been used in long-range forecasting and strategic planning (Linstone, H. and Turoff, M. (1975). The Delphi Method: Techniques and Applications. New York: Addison-Wesley, RAND Corporation. (Updated 2003). Delphi and Long-Range Forecasting: A Bibliography. Palo Alto: RAND Corporation. The salient characteristics of a Delphi exercise include: careful marshalling of evidence beforehand on a case-by-case basis; use of diverse experts; independent estimates by each expert made separately and anonymously; iterations of estimates, with the group knowing the average results of previous rounds of estimation, until the estimates stop converging; and the use of the experts' estimates to construct probability distribution of the key variables, rather than collapsing them into a single figure. A key concept in the Delphi technique is the importance of obtaining a 'consensus estimate' from participants without problems arising from unhelpful interactions among them. The anonymity of each individual estimate minimizes the suppression of diverse views that might otherwise arise out of authority, prestige or personality dominance within the group. Two other factors are important in making a Delphi exercise a success. First, the experts should be asked to answer just one, specific, single-dimension question. Second, they should be asked to do this on a specific case-by-case basis and given carefully compiled information on which to base their opinion.

[15] For example see, Tengs et al, "Five Hundred Life-Saving Interventions and their Cost Effectiveness", Risk Analysis, 1995; 15:369-390.

[16] www.hsph.harvard.edu/cearegistry

[17] Remodeling magazine's annual cost versus value report, which looks at how much of the costs of remodeling projects are recouped in the sales price, found that on a national average, the most cost-effective remodeling jobs were bathroom additions and second-story additions. In both cases, home owners saw 94% of costs recouped.

[18] To date Health Canada has published three versions of the study of Economic Burden of Illness in Canada (EBIC 1986, EBIC 1993, and EBIC 1998). The most recent version (EBIC 1998) improved the methodology used to calculate direct and indirect costs, and analyses costs in more detail. Among other things, this version includes many diagnostic subcategories, additional information by age, sex, locality, inclusion of costs by diagnostic category for outpatient care expenditures, and better provincial and territorial data on physician care expenditures.

[19] To avoid strategic evaluations care would have to be taken to avoid providing the respondents with an incentive to inflate or deflate their true willingness to pay for the HASI/RRAP-D benefits. Phase II of the evaluation of RRAP-D showed that the dwellings in question needed considerably more modification than was completed with RRAP-D

assistance. In this situation, the recipient of assistance might exaggerate his or her hypothetical willingness to pay in hopes of receiving additional assistance.

[20] Respondents should not be asked to make too great a leap of imagination in order to be able to state the value in dollars. This means that the beneficiary should have information and experience on which to base a valuation. For example, in another context, people in Ottawa might be asked how much they would be willing to spend to use a trail in the Gatineau Park in the cross-country ski season. This is a reasonable request since the amount of money is small and the respondent can compare the option of using the park with other recreational opportunities that have market prices. In contrast, if the money involved is large relative to the beneficiary's resources, or if the benefit is complex and difficult to compare with known prices of similar goods, then "contingent valuations" might be difficult to make and might not be robust when they are made. If conditions are not conducive to good contingent evaluation then the dollar values that result might be inconsistent and inaccurate, and might be poor predictors of actual behavior. That is respondents might say they are willing to pay a certain amount, but their behavior in the event might reveal that the amount they are in fact willing to pay is less or more than their "contingent" estimate.

[21] When a program provides 'socially approved' goods or services, respondents may express a positive willingness to pay because they feel good about the social good (referred to as the "warm glow" effect). This may be particularly true when the population in general is asked about its (hypothetical) willingness to pay a small amount to subsidize a good cause such as improving the housing of older people and persons with disabilities. This is important since small dollar increments to 'willingness to pay', extrapolated over a whole population, can add up to large sums. Of course there are literally thousands of good causes and the population is not in fact willing to pay the total amount for all of them as it seems willing to do when asked about them one by one. Asking HASI/RRAP-D beneficiaries, and family and friends, how much they would be willing to pay for the dwelling modifications, or accept as compensation for not having them, might also raise issues of social approval.

[22] Respondents may state a positive willingness to pay in order to signal that they place importance on helping older people and persons with disabilities in general. Alternatively, some respondents may value the good, but state that they are not willing to pay for it, because they are protesting some aspect of the scenario, such as increased taxes or government involvement in housing. That is, respondents may base their expressed willingness to pay on associations that the researcher did not intend. For example, if asked for willingness to pay for improved mobility in and out of the dwelling, the respondent may actually answer based on the risks that he or she associates, rightly or wrongly, with being outside in a particular neighborhood.

[23] Some researchers argue that there is a fundamental difference in the way that people make hypothetical decisions relative to the way they make actual decisions. Respondents may fail to take valuation questions seriously because they will not actually be required to pay the amount they say they are willing to pay.

[24] Willingness to pay (or accept compensation) is a clear indicator of value under two conditions – first, the consumer has the ability to pay and, second, he or she values the money that would go in payment. It is a fine balance that can be upset at either extreme. For example, an elderly or disabled person who is desperate to find funds for a mortgage payment due the next week might accept a low cash payment in lieu of higher-value renovation assistance. In this instance willingness to accept compensation might not be an accurate indication of the perceived value of the renovation.

[25] The valuation question can either be phrased as 'What are you willing to pay (WTP) to receive this good or service?', or 'What are you willing to accept (WTA) in compensation for giving up this good or service?' In theory, the amounts should be identical or at least very close. However, in actually cases when the two questions have been asked of the same respondents at the same time, the WTA has often substantially exceeded WTP. From an economic point of view this is obviously irrational. Some critics have claimed that this result shows that true valuations are unlikely when the willingness to pay is hypothetical. Others, however, have pointed out that actual consumers may act in the same manner. That is, 'buyers' will resist paying more than the minimum necessary, and 'sellers' will try to obtain the maximum compensation possible. Therefore if a respondent is switched from one role to another (buyer to seller or vice versa) then his or her expressed valuation of the good or service is bound to change as well. It is only in the interaction between reluctant payers (buyers) and eager gainers (sellers) that a true value is established. That is, value is established not by people deciding in the abstract what they would be willing to pay, but by the interactions between buyers and sellers in a market, where there are many substitutes, complements and competing goods and services. In the case of HASI and RRAP-D we should keep in mind that self-reported willingness to accept compensation will be a less accurate reflection of value than actual market (or quasi-market) transactions would be.

[26] It has been shown that people are not good at disaggregating their preferences. If they are asked about their willingness to pay for one part of an improvement (say, kitchen improvements), and then asked to value a wider asset in which that improvement is embedded (say, kitchen improvements plus widening the access to the kitchen), then the expressed willingness to pay may be similar. This is the "embedding effect." A similar effect may arise when people answer according to what they think they could afford rather than what they think the good or service is worth in the abstract. If they have a certain budget in mind for home modifications then the budget might influence what they are 'willing to pay'. The idea of 'willingness to pay' in the abstract, divorced from considerations of ability to pay, is an odd notion and a difficult one for many people to deal with.

[27] In some cases, people's expressed willingness to pay for something has been found to depend on where it is placed on a list of things being valued. This is referred to as the "ordering or framing problem." For example, items at the end of a list may be subject to some accumulated resistance to saying that one is willing to pay still more. Alternatively, an item listed among expensive items might be 'pulled up' in perceived value, or if the difference in value is stark, the item might be deprecated. Context can be influential on what people are willing to pay, sometimes in ways that do not reflect true utility. For example, a person who has just purchased a new automobile may be vulnerable to being sold an expensive extended warranty plan (which may seem a small amount of money relative to the whole cost of the automobile) that in another context he or she would not consider worth the money.

[28] Respondents may express different willingness to pay, depending on the mode of payment. For example, a payment based on increased taxes, even if small, might elicit negative responses from people who do not want increased taxes in general. Other modes of payment, such as a contribution or donation, may lead people to answer in terms of how much they think their "fair share" contribution is, rather than expressing their opinion of the actual value of the good.

[29] Some researchers using contingent valuation methods have prompted respondents by suggesting a starting 'bid' (willingness to pay) and then increased or decreased the bid based upon whether the respondent agreed or refused to pay such a sum. In many cases this made the respondent more comfortable. However, it has been shown that the choice of starting bid can have a strong effect on respondents' expressed willingness to pay. To some degree this phenomenon may exist in actual markets. A seller might place a high reserve at an auction, or price a house high to affect buyers' perceptions of value. Additionally, the psychology of 'leading' the value perceptions of the respondent may operate more strongly when the valuation is entirely hypothetical.

[30] Information bias may arise when respondents are asked to value attributes with which they have little or no experience. For example, a respondent asked about willingness to pay for a bath lift might respond differently depending on his or her degree of knowledge and experience. In such cases, the amount and type of information presented to respondents may affect their answers.

[31] Non-response bias is potentially a serious concern in any research. It may be particularly problematic in research on willingness to pay if it is systematically linked with factors like wealth, location or availability to answer questionnaires.

[32] In theory, these three questions should lead to identical monetary valuations of program benefits, although, in practice, because of the inaccuracies typical of self-reporting of intentions and values, the results tend to vary

[33] Malatest and Associates, Feb 2003, "RRAP and the Emergency Repair Program: Cost Benefit '03 Framework",

[34] Although 'contingent value analysis' is the core of the cost-benefit '03 Framework described by Malatest, he covers other topics as well. One topic that is important, although it is not, strictly speaking, part of a cost-benefit '03 Framework, is "attribution" - that is, the determination of what effects are truly caused by the program. Malatest refers to the RRAP Evaluation (2003), which used before-and-after-renovation data collection, and also refers to comparisons with persons who applied for funding but did not receive it. This may be a comparable group, but it is not a control group in the rigorous sense. Malatest lists six "types of program benefits" (and measures/issues for each), namely: health improvements; safety; economic/productivity impact; extension of dwelling life; reduction in utility/maintenance costs; and reduction in homelessness. He does not construct a causal model or consider which of these factors lead to the beneficiaries remaining in independent housing longer. Also, one would have to be careful of double counting. For example, 'economic impact' depends partly on other impacts that have already been counted.

[35] Phase 1 by Malatest Associates and Auguste Solutions and Associates, "Residential Rehabilitation Assistance Program Evaluation", May 2003; and Phase 2 "Working Paper on Impacts of Accessibility Modifications on the Clients of RRAP Disability", March 2003.

[36] If they were sufficiently wealthy to afford the modifications, what would they be willing to pay for them? Well, first, this obviously depends how wealthy they were. The marginal utility of income declines as wealth increases. To put it

another way, if they were wealthier then they would be willing to pay more to improve their quality of life through modifications to their dwelling. If they were less wealthy, and therefore had other competing priorities that they could not afford in addition to the housing modifications, they would generally be willing to pay less. The specifications of 'wealth scenarios' could get quite complex. It seems unlikely that beneficiaries, being elderly and disabled people, could reasonably be expected to make these hypothetical mental calculations.

[37] In theory, percentages less than 50% could be offered. However, CMHC would likely obtain adequate information from offers of 50% and above, since, in our opinion, few people would be likely to accept less than 50%. Nevertheless this assumption could be tested by a small sample if the researchers felt it worthwhile to do so.

[38] Some applicants might be annoyed to be offered, say, 50% in cash relative to the expected cost of the renovation, especially if they knew that another applicant had been offered, say, 75%. However in a real sense they would have been treated equally (equal probabilities of being offered one percentage or another in cash value), and, of course, they would have the option of refusing the cash offer and taking the renovation assistance. There would be no legitimate grounds for complaint. Nevertheless the program administrator might be taking some risk of being perceived to be unfair.

[39] http://www.tbs-sct.gc.ca/fin/sigs/Revolving_Funds/bcag/BCA2_E.asp

[40] Treasury Board Secretariat, Benefit-Cost Analysis Guide. http://www.tbs-sct.gc.ca/fin/sigs/Revolving_Funds/bcag/BCA2_E.asp

[41] Ibid. Sections on risk analysis.

[42] The fifteen beneficiaries the research team interviewed were selected from a list identified by CMHC. Only those who agreed on the telephone to participate were interviewed. In addition, the research team made an effort to have those interviewed reflect a balance with respect to gender, geography (Ottawa, Calgary, and Edmonton), urban/rural, type of home/living conditions, and type of grant received (HASI, RAPP-D or both). 7 were from Ottawa and the surrounding area (01 through 07); 5 males / 2 females; 3 urban / 4 rural; 5 own home / 2 live in someone else's home; 3 live alone / 4 live with at least one other person; 5 RRAP-D / 2 both RRAP-D and HASI; 4 were from Calgary and the surrounding area (A9, A12, A14 – A15); 1 male / 3 females; 3 urban / 1 rural; 4 own home; 2 live alone / 2 live with at least one other person; 2 RRAP-D / 1 HASI / 1 both; 4 were from Edmonton and the surrounding area (A 8, A10, A11, A13); 0 males / 4 females; 3 urban / 1 rural; 4 own home; 1 lives alone / 4 live with at least one other person; 2 RRAP-d / 1 HASI / 1 both.

[43] In fact participants were contacted by telephone three to five times. First, they were telephoned to find out if they were willing to participate (January – early February). Second, the research team began the first round of comprehensive interviews toward the end of January into early February. The first three interviews were done in the Ottawa area as test cases so that any potential problems could be identified before doing all the interviews. The questionnaire was then altered to deal with any difficulties encountered. The Ottawa interviews were done in March and April; those done in Alberta were completed in May. These interviews took from 1 to 2 hours, not including travel and electronic recording of data. Finally, a second round of interviews was undertaken in early August by telephone, to see if conditions had changed since the first set of interviews.

[44] We found that our initial intention to do interviews before and after renovations was impractical because most beneficiaries in the cases that the research team was given by CMHC had completed the renovation, or were already actively engaged in the work. In all cases but one (A12/air-conditioning), the renovation was complete before our first full interview. Therefore the questions which otherwise would have been asked in two sessions some weeks or months apart (before and after renovation) were asked in a single session. From the information gathered from the beneficiaries, it was now clear to us that the time elapsed from application to CMHC to having the renovation underway was frequently up to a year. This complicates the possibility of a before/after research design. One can imagine CMHC gathering information at the application stage about the beneficiary and his or her situation, for example, but these people's health was changeable and sometimes deteriorating rapidly so the information might have to be gathered again before the renovation if it occurred a considerable time after the initial application and/or approval.

[45] 02

[46] Cases 04, A13

[47] 01

[48] Case 04

[49] Cases 01, 04, A13.

[50] With the partial exception of beneficiary 01 who had a visiting nurse, who started between our first interview and our second, whose job was to assess his condition but not to provide other nursing care.

[51] Related to beneficiaries 01, 03, 04, A9, A13.
[52] 01, 04, and A13 at the time of the second interview.
[53] Beneficiary 04 has two service provider/caregivers. Help from a home care support organization was paid for by his foster parents. They are then reimbursed for all or part of these costs by the Ontario Ministry of Community and Social Services (MCSS). The portion reimbursed by MCSS depends on the amount of help the foster parents need in a given period, the associated costs with such help, and the foster parents' ability to pay. MCSS itself also provides direct help to the foster parents and was classified as a service provider/caregiver. Beneficiary A13 receives help from the City of Edmonton (Edmonton Home Care Services). Because the renovations have had no impact on the types of services she receives from the City (i.e., house cleaning, bathing), it was clear that the renovations have had no effect on these pre-existing home care services. Moreover, there was no obvious candidate for further interviewing as the individuals providing care change from week-to-week. It might have been possible to interview the social worker in charge of the case, but the beneficiary was reluctant to give permission. During the second round of interviews, the research team learned that, since late July, Beneficiary 01 has had a nurse visiting on a weekly basis from a local health agency to assess his health. Prior to this his primary caregiver (his wife) was his only source of help – and she remains his primary caregiver. The renovations done in this case (new roof, new flooring) have had no direct effect on these assessment services.
[54] Beneficiary 04
[55] Beneficiary 03
[56] Beneficiary A9
[57] Beneficiary 04
[58] Beneficiary A13
[59] From the City of Edmonton Home Care.
[60] The exceptions were 01, 04.
[61] 01a
[62] 03a
[63] Case 01
[64] In particular, beneficiaries A12 and A14.
[65] Respondents 01a, 04a, A9a, A13a
[66] Beneficiary 02
[67] Beneficiary 05
[68] Beneficiaries 01 and 04.
[69] Beneficiary 01a
[70] Respondent 04a
[71] Beneficiary 07
[72] Beneficiary 06
[73] Beneficiary A8 was 83 with a failing heart, and Beneficiary A9 has progressive kidney disease with all the attendant heart, circulatory and mobility problems that, unless he receives a transplant, will kill him soon.
[74] Beneficiaries 1, 3, 4, 8 and 9
[75] Questions 1 – 31
[76] Beneficiaries 01, 02, 03, A9, A10, A11
[77] Beneficiaries 05 and 06
[78] Beneficiaries 01, 03, 04, A 9, and A13.
[79] Beneficiaries 01 and 03
[80] Beneficiary 01
[81] Beneficiary 03
[82] Beneficiaries 04 and A13
[83] Beneficiary 04 – or rather his foster parents who are the recipients of the program funds – receive help from the Ontario Ministry of Community and Social Services (no charge to the beneficiary) and Home Care services (paid for by Ontario Children's Aid). Beneficiary A13, a double amputee, receives help from the City of Edmonton Home Care Services – bathing three times/week and house cleaning two times/week (no charge to the beneficiary).
[84] Questions 56 – 73
[85] 01, 05, 06, 07, A11, A13, A14
[86] Questions 74 - 84
[87] Beneficiary 04

[88] Questions 85 – 91
[89] Questions 92 – 104
[90] Questions 105 – 108
[91] Respondents 03, A8, A9, A11, and A15
[92] Beneficiary 01
[93] Beneficiary 07
[94] Beneficiaries 02; 01 and 04
[95] Beneficiaries 06, A10, A12, A13
[96] Beneficiary 06
[97] Questions 1-13
[98] 01a and A13a
[99] Caregiver 01a
[100] Caregiver A13a
[101] Questions 14 – 23
[102] Caregiver 01a
[103] Questions 24 – 26
[104] Questions 27 – 35
[105] Questions 36 – 42
[106] Caregiver A9a
[107] Questions 44-47

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