

Evaluation of a Vegetable and Fruit Behavioural Intervention:

Take 5: 5-10 a day...your way

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Summary of Highlights

Program Retention

- Of the 152 women who completed the pre-intervention questionnaire, 115 women or 76% completed the end of program questionnaire and 110 women or 72% completed the 3 month post program questionnaire.
- Of the 98 women who completed all three questionnaires, 91 women were in the target age-range of 25 – 45 years.

Change in Vegetable and Fruit Consumption

- Total vegetable and fruit consumption increased from 3.6 times per day on average at program start to 5.6 times per day on average at end of program
- The difference in consumption between start and end of program amounts to 2 servings of vegetables and fruit per day on average
- The literature indicates that an increase of 0.6 servings following the completion of an intervention indicates success
- Increased consumption was 3 times higher than expected to achieve at end of program
- Total vegetable and fruit consumption increased to 5.8 times per day three months after the program – more than 3.5 times higher than expected to achieve post program

Movement Along the Stages of Change Continuum

- Start of the program
 - 1.6% were at pre-contemplation stage
 - 0.8% were at the contemplation stage
 - 71% were at the preparation stage
 - 1.6% were at the action stage
 - 24.6% were at the maintenance stage
- End of program: large majority of participants had advanced from the preparation stage to the action stage
 - 1% were at the pre-contemplation stage
 - 15% were at the preparation stage
 - 55% were at the action stage
 - 29% were at the maintenance stage
- 3 month post program: large majority of participants remained in the action and maintenance stage
 - 2.3% were at the pre-contemplation stage
 - 9.2% were at the preparation stage
 - 59.8% were at the action stage
 - 28.7% were at the maintenance stage

Self-Efficacy

- The majority of the participants experienced an increase in self-confidence in relation to a variety of situational and emotional cues (when eating alone, on weekends, when in a hurry, when food preparation is difficult, during winter when there is less choice, etc.)

Statistical Analysis

Correlation analysis revealed a number of small significant associations between changes in vegetable and fruit consumption and various independent variables.

- Participants who reported lower levels of vegetable and fruit consumption at program start experienced greater increases in consumption by the end of the program. They also experienced greater increases in consumption between the end of the program and 3 months after the program.
- A small negative correlation was found between overall situational self-confidence in consuming vegetables and change in consumption which suggests that lower levels of self-efficacy in vegetable consumption at program start are associated with greater changes in consumption at 3-month post program.
- A small positive correlation was found between personal income and change in frequency of consumption at 3 month post program which suggests that higher levels of personal income are associated with greater changes in consumption of vegetables and fruit at the 3 month program stage.
- The correlation between level of education and change in consumption was not statistically significant which indicates that participants in this study group were able to achieve similar results regardless of education level.

Stepwise multiple regression was used to assess the extent to which the relationships observed between individual independent variables and the dependent variables held true while controlling for other independent variables.¹

- The most important predictor of change in vegetable and fruit consumption between **program start and end of program** is seasonality which accounts for 42% of the variability in results. Seasonality combined with frequency of consumption at program start accounts for 50% of the total variability.
- The most important predictor of change in vegetable and fruit consumption between **program start and 3 month post program** is personal income which accounts for 43% of the variability in results.

Participant Profile (based on 152 women)

The participant profile data was compared to similar data at the provincial level to assess the representativeness of the study group.

- Age: average age = 36 years
 - Representation across different age cohorts was fairly consistent with the provincial profile

¹ The measure reflects the variability in the dependent variable about the origin explained by the independent variable.

- Children: 93% of the participants had at least one child 14 years of age or younger
- Country of Birth:
 - 73% (111 participants) were born in Canada – comparable to provincial profile
 - 4.6% (7 participants) were of Aboriginal identity
 - 27% were born in other countries
 - 41 participants were born outside Canada from a total of 20 different countries.
 - 7.9% born in China - the single largest group of foreign born participants
 - 3.3% born in the United Kingdom
 - The remaining 15.8% originate from 18 different countries
- Years in Canada
 - 83% have lived in Canada for more than ten years.
 - Close to 15% of participants have lived in Canada between one and ten years while
 - Approximately 1.5% have lived in Canada for less than a year
- Marital Status
 - 66% of participants are married compared to provincial average of 53%
- Language Spoken
 - 81% reported English as the language spoken most often in the home – slightly lower than the provincial average
 - Approximately 7% reported French as the language spoken most often in the home – slightly higher than the provincial average
 - 13% spoke languages other than English and French at home – slightly higher than the provincial average
 - Mandarin/Cantonese made up the largest percentage of the non-official language category followed by Urdu, Spanish, and Italian
- Education – overall, the study group has attained higher levels of education than the provincial profile
 - 6.6% had not graduated from high school
 - 15.2% graduated from high school only
 - 49.7% had completed some post-secondary education
 - 28.5% had graduated from university
- Income Distribution
 - Distribution across the \$20,000 to \$69,999 income groups is very comparable to the province
 - Higher concentration of persons in the two lowest income groups relative to the province
 - Slightly lower concentration of persons in the highest income groups relative to the province
 - 23% reported less than \$20,000 in total annual household income compared to the provincial percentage of 14%
 - At the higher income groups, approximately 25% of participants reported total annual household income of \$70,000 or more compared to the provincial percentage of 31%

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1.0 Introduction

This report represents the final evaluation of Cancer Care Ontario's (CCO) vegetable and fruit behavioural intervention pilot program: **Take 5: 5-10 a day...your way**. **Take 5** is a community based, multi-component, skill and knowledge based intervention program. The initiative for the program stems from consistent scientific evidence that points to increased vegetable and fruit consumption as an important factor in the prevention of a number of chronic diseases including cancer (World Cancer Research Fund, American Institute for Cancer Research, 1997; Steinmetz and Potter, 1996), cardiovascular disease (Ness and Powles, 1997; Joshipura et al., 2001; Gillman et al., 1995), diabetes (Ford and Mokdad, 2001) and associated risk factors including obesity.

In developing the **Take 5** program, CCO incorporated a number of 'best practices' as identified in a review of literature on nutrition interventions for cancer prevention (Sahay et al. 2001). The goal of the intervention program is to promote consumption of 5 to 10 servings of vegetables and fruit every day by informing, educating and supporting behaviour change related to vegetable and fruit acquisition, preparation, storage and eating among women aged 24-45. It is anticipated that the new behaviour adopted by the women will also have an effect on vegetable and fruit consumption patterns of their families as well.

Beyond the pilot phase of the program it is anticipated that the program will be implemented at the provincial level. It was therefore essential that the program be assessed to determine the effectiveness of the program in causing changes in consumption patterns and the appropriate methods and resources required for implementing the program at the local and provincial level.

A brief description of the program and the scope of the pilot test are provided in the following section.

2.0 Program Description

The **Take 5** program consists of six training modules that provide a behaviour change, skill development and knowledge exchange approach. The program is delivered over the course of seven to eight weeks by trained facilitators. The program focuses on increasing self-efficacy, reducing barriers to vegetable and fruit consumption through group learning exercises and experience sharing, and fostering adequate social support to facilitate these changes in the reality of women's everyday lives.

Pilot testing of the **Take 5** program began in October 2002 at 12 test sites which were chosen by CCO to represent a workable cross section of the Ontario population and reflect north/south, urban/rural, Aboriginal, Francophone and multicultural communities. In selecting the 12 test sites, consideration was also given to their capacity to support local food access programming and referral, and demonstrated experience for other nutrition-related chronic disease prevention. **Take 5** goals and objectives are outlined in the following section.

2.1 Goals and Objectives

In essence, the evaluation study identifies the extent to which the **Take 5** program caused incremental changes in behaviour, skills and knowledge that resulted in increased consumption of vegetable and fruits among women ages 25-45.

The objectives of the evaluation study were:

- to determine the extent to which the program causes change in the consumption of vegetables and fruit among program participants
- to determine the extent to which the program causes changes in behaviour, skills, and knowledge associated with the increase the consumption of vegetables and fruit
- to assure or improve the quality of the program design, materials and delivery
- to determine the practicality of the intervention being used at the local and provincial level
- to examine the organizational opportunities and barriers for implementing and evaluating the program at the local and provincial level
- to determine the appropriate resources, training and technical assistance needed for adoption, implementation and maintenance of the program at the local and provincial level

The evaluation committee determined a number of specific targets to be achieved by the **Take 5** program based on the literature which indicates that a realistic change to expect is an increase of 0.6 servings per day among adults of the population (Agency for Healthcare Research and Quality. 2001. *Efficacy of Intervention to Modify Dietary Behaviour Related to Cancer Risk.*, Chp. 3, p.56).

The **Take 5** program was measured according to the following short-term (3 month post program) indicators:

- a positive change in participants' knowledge of diet as a risk factor
- a positive change in participants' skills to adopt and maintain a diet rich in fruits and vegetables
- a positive change in the proportion of participants who believe they can adopt the **Take 5** program into their regular lifestyle
- a positive change in the proportion of participants who believe they can maintain the **Take 5** program into their regular lifestyle
- a statistically significant increase in the proportion of participants who have increased their intake of dietary fruits and vegetables by at least 0.6 servings per day

The following literature review provides an overview of the important findings from other behaviour intervention studies and illustrates how the lessons derived from these studies were used by the CCO Prevention Unit in developing the **Take 5** program.

2.2 Literature Review

In December 1999, the Prevention Unit within the Division of Preventive Oncology at Cancer Care Ontario commissioned a review of international literature on nutrition interventions. The literature review focused specifically on the areas of policies, programs and media approaches. The purpose of the review, which examined literature from January 1995 through January 2000, was to consolidate existing knowledge of nutrition intervention effectiveness to inform the development of a nutrition and healthy body weight strategy for cancer prevention for the province.

Fifteen interventions studies were included in the review, 10 of which reported positive outcomes, and 5 reporting negative outcomes, in well-designed studies (i.e. controlled trials with or without randomization). Among those reporting positive outcomes, five components were common:

- Programs were theoretically based (Sorenson et.al. 1999; Glanz et. al, 1997; Perry et. al, 1998; Liquori et. al, 1998; Nicklas et. al, 1998; Forester et. al, 1998), including an emphasis on self-efficacy (Bandura, 1982) and stages of change (Prochaska et. al, 1982)
- Programs included activities to involve family members as a source of support; (Sorenson et. al, 1999; Glanz et. al, 1997; Liquori et. al, 1998; Perry et. al, 1998; Coates et. al, 1999; Havas et. al. 1998)
- Programs were built on participatory models for planning and implementing interventions; (Perry et. al, 1998; Liquori et. al, 1998; Havas et. al. 1998; Nicklas et. al, 1998; Sorenson et. al, 1999; Glanz et. al, 1998)
- Programs that developed clear, plain-language messages were more successful; (Owen et. al, 1995; Reger et. al, 1999; Norum et. al, 1997)
- Programs were more successful if training and support were provided to intervention-delivery staff (Beresford et. al, 1997; Perry et. al, 1998; Liquori et. al, 1998; Havas et. al, 1998; Forester et. al, 1998)

A number of lessons were learned by those reporting negative study outcomes including:

- Programs must ensure sufficient intensity and duration of the intervention to bring about behaviour change and behaviour maintenance. Repeated and on-going contact is necessary throughout the intervention, including post follow-up (Glasgow et. al, 1995; Resnicow et. al. 1998; Kristal et. al, 1997; Jeffrey and French, 1999)
- Worksite and school food services policies provide "environmental support" for behaviour change (Glasgow et. al, 1995; Resnicow et. al, 1998)
- Programs must ensure participatory mechanisms for planning, such as steering committees (Glasgow et. al, 1999; Resnicow et. al, 1998), and
- Deliver school-based interventions either before the school day begins or during school hours; afterhours results in lower attendance (Resnicow et. al, 1998)

Intervention settings, such as schools (Perry et. al, 1998; Liquori et. al, 1998; Nicklas et. al, 1998; Forester et. al, 1998), workplaces (Sorenson et. al, 1999; Glanz et. al, 1998) and health care institutions (Beresford et. al, 1997), offered prime channels to employ these principles, especially when developing and implementing interventions for large groups of people. Community settings work well for women whose learning is enhanced by a family friendly atmosphere (Havas et. al, 1998; Coates et al, 1999). The review suggests that these settings should be regarded as ideal places to focus a nutrition intervention strategy within Ontario.

The principles derived from this review equipped Cancer Care Ontario with the information necessary to develop a nutrition and healthy body weight strategy for the province of Ontario. This included engaging support of a reference group, the Ontario Collaborative Group on Diet and Cancer, with a mandate to link practitioners in the areas of policy, community and public health programs and research. The CCO Prevention Unit took the lead in developing a program logic model for the overall strategy. (Based on a provincial environmental scan of existing programs, identified gaps, and stakeholder consultation, CCO was advised to develop a behaviour change program to increase vegetable and fruit consumption among women with children under the age of 14 that would complement the awareness raising occurring through the 5-to-10-a-day social marketing campaign sponsored by the Canadian Cancer Society, Canadian Produce Marketing Association, and the Heart and Stroke Foundation. Additional funding for the evaluation of the program was secured through a grant from the Ontario Women's Health Secretariat. A provincial Vegetable and Fruit Intervention Working Committee was formed with partners, stakeholders, and pilot site representatives and included representation from the Public Health Branch and the Population Health Strategies Unit of the Ontario Ministry of Health and Long Term Care, Heart and Stroke Foundation of Ontario, Canadian Produce Marketing association, Canadian Cancer Society, and the Nutrition Resource Centre.

2.3 Take 5 Program Logic Model

A program logic model is a flow chart (diagram) that represents in words and graphical images the elements necessary for the successful implementation of an intervention program. In health promotion, several approaches to program logic models have been presented. Brian Rush (Rush and Ogborne, 1991) has been active throughout Ontario in helping health programmer's use program logic models effectively. Porteous et al. (1997) provides a manual on how to use the kind of program logic models that have been adopted by the Heart Health program and by many regional and local health units across Ontario. Lipski and Ignagni's (2001) paper offers a review of program logic approaches used in nutrition program evaluation. More recently, Cameron et al. (2003) provided an example of the use of program logic models for the dissemination of cardiovascular disease prevention programming. Cummings and others (2003) have applied the Program Logic Model to results based approaches to program implementation and described it as a results chain of cause-effect relationships necessary for the success of an intervention.

The Precede/Proceed model (Green and Kreuter, 1999) is based on a social ecology approach and social cognitive theory and outlines the necessary steps in pre-intervention and post intervention associated with the development and implementation of a health intervention. The **Take 5** program used the Precede/Proceed Model (Appendix A) to design and plan the implementation of the **Take 5** intervention. The evaluation was based on Glasgow's Re-AIM framework (Appendix B). Finally, the Results Chain approach to Program Logic (Appendix C) has been used as a check on the process to ensure that all elements necessary to success of the program have been reported on, to the extent possible. Critical steps in the process are outlined below.

In the Precede stage, the design of the intervention highlights the importance of the social, epidemiological and behavioral/environmental assessment of the causes and strategies for prevention of cancer was identified. Patterns of diet known to reduce cancer risk and environmental and behavioral factors influencing consumption were identified and linked to program interventions. The factors influencing consumption were in turn linked to the predisposing, reinforcing and enabling factors for the participants. The program was designed to be implemented in the setting of public and community health organizations in Ontario and with other partners across the province.

The organizational context, or the "turning box" in the Precede/Proceed Model, was seen to be key in the development and subsequent adoption of the **Take 5** program.

The evaluation was structured using the RE-AIM framework (Appendix B) developed by Glasgow et al (Glasgow et al. 1999). The RE-AIM Framework expands assessment to five criteria - Reach, Efficacy, Adoption, Implementation, and Maintenance in order to not only determine whether an intervention works but to also identify its translatability and public health impact.

The Results Chain logic model (Appendix C) contains the following elements: Resources, Activities, Outputs, Outcomes, and Impacts. This simply describes the cause effect relationship in the **Take 5** program. To this results chain or diagrammatic representation of the program can be applied the relevant evaluation questions from RE-AIM and the evaluation literature including Reach, Efficiency, Efficacy/Effectiveness, Adoption, Implementation, Maintenance, Equity, Rationale and Impact. These are then answered in the evaluation, which follows.

By combining a number of approaches to describing and evaluating the **Take 5** program we have attempted to ensure that all aspects of the success of the intervention are reported on. The evaluation study was able to utilize a wide variety of resources which are presented in the following section.

3.0 Evaluation Resources

The evaluation drew on a number of different resources. The Evaluation Steering Committee was formed to oversee the evaluation process. The Steering Committee consisted of four representatives from Cancer Care Ontario. Melody Roberts and Myrna Wright, who were responsible for program design and implementation, represented the CCO Prevention Unit. Other representatives from the Division of Preventive Oncology included Dr. Neil Klar and Dr. Nancy Kreiger who provided additional expertise in statistical analysis and ethical considerations. Three outside evaluation consultants completed the Steering Committee. This included Dr. Fred Ashbury, Dr. Harry Cummings, and Don Murray, all from the firm Harry Cummings and Associates.

The Steering Committee worked with representatives from each of the twelve participating sites. This included the Take 5 Program facilitators who delivered the program and the evaluators who administered the evaluation tools. Representatives from three of the sites provided feedback on drafts and assisted with pre-testing the evaluation tools: Pallavi Kashyap (East End Community Health Centre), Mary Ellen Prange (Waterloo Public Health Department), and Lisa Swimmer (Toronto Public Health).

The Women's Health Council provided funding in the amount of \$125,000 for the pilot program.

4.0 Methodology and Evaluation Tools

As part of the evaluation process, the study used a multiple methods approach. Standardized evaluation tools were developed for program facilitators, agency administrators and program participants. The questionnaires were designed to collect information that would facilitate the use of the RE-AIM analytical framework. The final analysis considers multiple levels of effects including the individual program participant, program deliverers, and institutions such as health clinics. A central tenant of the RE-AIM model is that the ultimate impact of an intervention is due to its combined effects on five evaluative dimensions: reach, efficacy, adoption, implementation, and maintenance.

Pilot Sites and Program Participants:

Community Health Centres and public health units across Ontario were invited by CCO to submit proposals to apply to be a pilot site. The amount of funding available dictated the total number of pilot sites. Five CHC's and seven public health units were chosen. While not exhaustive, the 12 pilot sites were representative of the diversity, opportunities, and challenges faced by agencies in Ontario. Selection criteria included geographic profile (in order to represent the North/South, East/West, Urban/Rural dichotomies of the province) and community characteristics (Francophone, Multicultural, Aboriginal) to ensure representativeness of the participant sample. As well, the agencies had to demonstrate the establishment of community partnerships/coalitions (food security, heart health/cancer prevention) and other complementary interventions (e.g. community at-large, small group education, food service establishments) that would provide environmental support to the **Take 5** program.

In order to observe the influence of seasonality, the twelve sites were randomly divided into two groups and the start time for the program was staggered by 3 months. The first set of 5 sites (Fall Cohort) began the program in October 2002. The second set of 7 sites (Winter Cohort) began the program in January 2003.

Individual sites were responsible for recruiting participants. A variety of techniques were used to recruit the participants which are reviewed in Section 5.1.1 of this report. The participant selection criteria required that the participant be between the ages of 25-45 and that they have at least one child under the age of 14 living at home.

A standardized pre-intervention, end of program and 3 month post-behavioural evaluation survey was used to measure changes in the consumption of fruits and vegetables and the extent to which participants adopted and maintained behaviours related to the consumption of 5 to 10 servings of vegetables and fruit per day. A preliminary draft of the standardized questionnaire was pre-tested by three test sites. The results of the pre-test were used to eliminate or revise confusing or unclear wording on the questionnaire and to identify problems that respondents might have in interpreting individual items.

The revised questionnaires were administered to the **Take 5** participants by trained evaluators. All of the program participants from the Fall Cohort group and the Winter Cohort group completed the pre-intervention baseline survey in early October 2002. The Fall Cohort group initiated the program in October and completed the end of program survey in December 2002 and the 3-month post program survey in March 2003. Using the staggered start approach, the Winter Cohort group initiated the program in January 2003 and completed the end of program survey in March 2003 and the 3-month post program survey in June 2003. Incentives were provided to the participants for the completion of each of the three questionnaires.

The standardized evaluation survey featured a variety of measures that addressed:

- Socio-demographic characteristics (age, weight, marital status, education, income, country of birth, mother tongue, etc.)
- Food frequency (vegetable and fruit consumption was measured through the use of a food frequency questionnaire which combined both food frequency and food portion questions to estimate the total number of servings)
- Acquisition of knowledge (several questions assessed whether participants gained additional knowledge about the number of daily servings of vegetables and fruit required to stay healthy, the link between what they ate and their chances of getting cancer, etc.).
- Change in attitude (several questions assessed changes in attitude toward vegetables and fruit)
- Self-efficacy (a five point scale was used to measure level of confidence in eating enough vegetables and fruits in relation to a variety of situational and emotional cues)
- Change in behaviour

At the end of each session participants were given an opportunity to provide feedback on the program using a standardized comment sheet. This consisted of several general questions that asked participants to comment on how they felt about the training and to provide any suggestions for improving the session. As well, the facilitators completed weekly journals with specific questions regarding each module.

Program Facilitators and Agency Administrators

At the completion of each of the six training sessions, program facilitators at each of the 12 sites completed a Program Journal. The Journal contained a set of standard questions that asked facilitators to comment on any problems or challenges experienced in preparing for and delivering the session. Facilitators were also asked to report on any changes that they made to the program structure and/or training materials in relation to the recommended structure and materials provided in the facilitator manual. Facilitators were asked to identify the types of incentives they offered to participants to attend the program. Facilitators were asked to provide suggestions for improving the sessions and they were asked to comment on what they thought was a manageable group size.

Key Informant Interviews with Agency Administrators and Program Facilitators were conducted with each of the 12 sites at the end of the program. These interviews identified technical assistance and training needs to improve the quality of local program delivery and support province-wide adoption, implementation and maintenance of the program.

The following section of the report introduces the results of the evaluation beginning with an overview of evaluation issues and limitations.

5.0 Results

5.1 Evaluation Issues

The key question in evaluation is “Does the intervention produce the intended effect?”. Is the **Take 5** program able to increase consumption of vegetables and fruit in women ages 25-45 with at least one child under the age of 14? More recently, questions have been raised regarding the evaluation of other factors associated with the intervention. Glasgow et al designed the RE-AIM evaluation framework to expand assessment of interventions beyond efficacy to multiple criteria to better identify the translatability and public health impact of a population health intervention. The multiple criteria include:

- Reach into the target population
- Efficacy or effectiveness
- Adoption by target settings
- Implementation – consistency of delivery of the intervention
- Maintenance of intervention effects in individuals and populations over time.

Reach and efficacy are individual-levels of impact whereas adoption and implementation are organizational-levels of impact. Maintenance can be both an individual and organizational level of impact. Assessment of the impact on the individual and the institution is important as it provides independent information on the intervention impact. The intervention’s overall impact is a product of all five criteria. An intervention can have a large impact in terms of reach and efficacy at the individual-level but if it is adopted, implemented, and maintained at only a small number of organizations, the overall health impact is minimized. Conversely, if an intervention is adopted, implemented, and maintained by a large number of organizations, but has minimal reach or efficacy, the overall health impact is minimized.

The study process had several limitations. The method of selecting participants for the program did not involve a random selection process (subjects were recruited through newspaper ads, word of mouth etc.). As well, several of the individual sites had low sample sizes. This has influenced the analysis completed as well as the statistical power of the analyses. A further consideration is the study effect (Hawthorne effect) of the participants knowing that they were being studied in connection with the outcomes measured. Take 5 participants were exposed to the evaluation process in completing 3 lengthy survey questionnaires which were monitored by trained evaluators. Draper (March 2003) suggests that as a methodological heuristic it is useful to acknowledge the effect but as an exact predictor of effects, it is not. Draper further notes that the most important aspect of this is how the participants interpret the situation and suggests interviewing participants after the intervention/experiment to investigate any possible effect. This approach could be considered for future assessment.

5.1.1 Overview of Recruitment Strategies

Each of the test sites was responsible for recruiting participants from their respective catchment area. Sites were encouraged to recruit a sufficient number of participants to compensate for dropouts based on their dropout rates in other programs. Most sites recruited

between 10 and 20 participants. Sites were also instructed to specifically target women aged 25 to 45, with children under the age of 14.

The 12 pilot sites used a variety of recruitment strategies. Some sites used several strategies in combination while others relied on only one or two strategies. Cancer Care Ontario provided the sites with recruiting materials that included a poster and a telephone recruiting script for directly contacting potential participants. A number of sites established informal contact with other sites to share recruiting strategies and ideas. Many of the sites considered dissemination by word of mouth to be an important factor in generating awareness of the program, especially in smaller communities. Some of the more common recruitment strategies used include:

- Media releases
- Newspaper ads and columns
- Radio ads
- Community cable spots
- Emails to Municipal employees
- Community newsletters
- Community forums
- Request public health nurses to promote the program by word of mouth in family programs
- Flyers/Posters displayed at partner agencies, Community Centres, Grocery Stores, Doctors offices and other social services
- Direct contact with participants in other groups - request that they contact two friends and tell them about the program
- Flyers sent home to parents through schools
- Promote the program in other centre related programs and “let word of mouth do the rest”

Effective recruitment strategies varied from community to community. For example, newspaper ads were effective in some sites but had little impact in others. Using displays in waiting rooms was noted as being effective as was asking public health nurses to promote the program in family programs. One facilitator suggested that she would advertise by presenting to various community and women’s groups if offering the program again.

In many cases, facilitators were unable to comment on the effectiveness of the various strategies as there was no formal follow-up completed to determine which strategies were most/least effective in reaching the community and raising awareness other than whether or not there was over-recruitment which resulted in waiting list for program participants.

In addressing the Reach aspects of the evaluation, the next section of the report provides a socio-demographic profile of the Take 5 participants and assesses the representativeness of the study group in relation to the provincial population. This is followed by a section that reviews participant completion/attrition rates for each stage of the evaluation.

5.2 Participants within Target Group

5.2.1 Reach

Reach is defined as the absolute number, proportion, and representativeness of individuals who are willing to participate in a given initiative. (Glasgow et al, 1999). A key component of the reach criterion is the representativeness of the study sample. The question here is, “Are there similarities or differences between those who participate and those who are eligible but do not?” If there are differences between those who participate and those who are eligible but do not, it suggests that the recruitment strategies used were not as effective or that the intervention may not be as generalizable as originally intended.

5.2.1.1 Profile of All Program Participants and Representativeness

A socio-demographic profile of all **Take 5** participants (both within and outside the target group) was developed from an analysis of the baseline survey data. The results are presented below. As applicable, the participant profile data is compared to similar data at the provincial level to assess the representativeness of the study group. Individual site profiles have been developed using the same base line survey data and are presented in Appendix C.

Age

The average participant age was 36 years. The youngest participant was 18 years of age and the oldest was 58. The target group for the program was women between the ages of 25 and 45 years with one or more children under the age of 14. Approximately 86% of the participants fell within the desired age range (Table 1).

Although the program was designed and promoted for women between the ages of 25 and 45, there was some flexibility in accepting women outside this age range if their children met the criteria. Some communities included women outside this age range because the women had children earlier or later in life, some grandparents were caretakers of their grandchildren – who were 14 years of age or younger, and some women came with friends outside the age group. Some sites wanted to increase the size of the group and included women beyond the age range of 25 to 45. Nevertheless, participants outside the 25 – 45 age range are not included in the final analysis.

Table 1: Distribution of Program Participants by Age Cohort

Age Cohort	Number of participants	%
18 to 24	9	5.9%
25 to 29	20	13.2%
30 to 34	36	23.7%
35 to 39	40	26.3%
40 to 44	32	21.0%
45	3	2.0%
46 to 49	9	5.9%
50 and over	3	2.0%
Total	152	100.0%

As shown in Table 2, the distribution of participants across four target age cohorts is fairly consistent with the provincial profile. The only difference of note is the 25-29 age cohort and the 30-34 age cohort where the study group percentage is slightly smaller than the provincial percentage.

Table 2: Distribution of Program Participants by Age Cohort Compared to Province of Ontario

Age Group	Program Participants		Ontario ^a	
	Total	%	Total	%
25-29 years	20	15.6%	373,475	20.8%
30-34 years	36	28.1%	424,325	23.7%
35-39 years	40	31.3%	502,235	28.0%
40-44 years	32	25.0%	493,440	27.5%
Total 25-44 years	128	100%	1,793,475	100%

^a Statistics Canada. Population Census 2001.

Marital Status

A large majority of program participants are married. Approximately 66% of the program participants are married which is higher than the provincial average of 53% (Table 3). Twenty-one percent of participants reported being single and 7.9% reported being separated. Compared to the province, there is a lower percentage of single participants and a higher percentage of separated participants. The low number of widowed participants is expected considering the participant selection criteria that focused on women between the ages of 25 to 45 years.

Table 3: Distribution of Program Participants by Marital Status Compared to Province of Ontario

Marital Status	Program Participants		Ontario ^a	
	Total	%	Total	%
Married	100	65.8%	4,897,095	53.4%
Single (never married)	33	21.7%	2,793,080	30.4%
Separated	12	7.9%	311,385	3.4%
Divorced	6	3.9%	597,595	6.5%
Widowed	1	0.7%	578,150	6.3%
Total population 15 years and over	152	100.0%	9,177,300	100.0%
Not in a common-law relationship	136	89.5%	8,592,795	93.6%
In a common-law relationship	16	10.5%	584,505	6.4%

^a Statistics Canada. Population Census 2001.

Persons in the Home 14 Years of Age or Younger

Ninety-three percent of the participants (142) have at least one child 14 years of age or younger living in the home while 3.3% of participants (5) indicated that their children are between 15 and 18 years of age. Three percent of other participants (5) reported that there are no children living at home. Eighteen percent of the participants reported having three or more children in their home, which is consistent with the provincial average (Table 4). Approximately 44% of the participants reported having two children in their home while 34.2% reported having only one child in their home. The percentage of participants reporting one or two children in their homes is not too dissimilar from the provincial average. Program

participants have an average of 1.9 children living at home compared to the provincial average of 1.2 children per home. The higher average for program participants is expected considering the participant selection criteria for participants to have children.

Table 4: Distribution of Program Participants by Number of Children at Home Compared to Province of Ontario

	Program Participants		Ontario ^a	
	Total families	%	Total families	%
Total Families	152		3,190,985	
Total families without children at home	5	3.3%	1,110,095	34.8%
Total families with children at home	147	96.7%	2,080,890	65.2%
Families with 1 child at home	52	34.2%	858,700	41.3%
Families with 2 children at home	67	44.1%	839,170	40.3%
Families with 3 or more children at home	28	18.4%	383,020	18.4%
Total children at home	284		3,809,265	
Average number of children at home per family	1.9		1.2	

^a Statistics Canada. Population Census 2001.

Country of Birth, Ethnicity and Years in Canada

The large majority of program participants, 73%, were born in Canada while 27% were born in other countries (Table 5). The 41 participants who were born outside Canada came from a total of 20 different countries. The 12 participants born in China represent the single largest group of foreign born participants (7.9%) followed by the 5 participants born in the United Kingdom (3.3%). The remaining 24 foreign-born participants originate from 18 different countries (Table 6).

The percentage of program participants born in Canada compared to participants born in foreign countries is comparable to the provincial profile. The small size of the study group is problematic for drawing comparisons to the province at the level of individual countries. For example, there are 13 different countries that are represented by a single participant each. As well, it would appear the persons born in China are over represented in the study group where they make up 7.9% of all participants. This compares to the provincial percentage of just 1.5%.

Table 5: Distribution of Program Participants by Country of Birth Compared to Province of Ontario

Country of Birth	CCO Participants		Ontario ^a	
	Total	%	Total	%
Canada	111	73.0%	8,164,860	72.9%
Total Foreign Born	41	27.0%	3,030,075	27.1%
China	12	7.9%	164,885	1.5%
United Kingdom	5	3.3%	342,900	3.1%
Sri Lanka	3	2.0%	72,990	0.6%
India	2	1.3%	174,560	1.6%
Pakistan	2	1.3%	60,385	0.5%
Russia	2	1.3%	83,620	0.7%
Barbados	2	1.3%	10,320	0.1%
Australia	1	0.7%	5,595	0.1%
Brazil	1	0.7%	6,895	0.1%
Chile	1	0.7%	9,120	0.1%
Columbia	1	0.7%	8,085	0.1%
Germany	1	0.7%	82,530	0.7%
Guatemala	1	0.7%	5,820	0.1%
Guyana	1	0.7%	75,275	0.7%
Italy	1	0.7%	210,540	1.9%
Korea	1	0.7%	38,440	0.3%
Netherlands	1	0.7%	65,430	0.6%
Syria	1	0.7%	6,010	0.05%
USA	1	0.7%	98,190	0.9%
Vietnam	1	0.7%	71,900	0.6%
Other	0	0.0%	1,436,585	12.8%
Total	152	100.0%	11,194,935	100.0%

^a Statistics Canada. Population Census 2001.

Aboriginal women also make up a higher percentage of the participants relative to the provincial profile. First Nations women represent 4.6% of the total participants. In Ontario, persons of Aboriginal identity represent 1.7% of the total population (Statistics Canada, Population Census 2001). The high representation of Aboriginal women is the result of an active recruitment strategy by this organization to ensure representation of that particular community.

A majority of participants (60%) reported belonging to an ethnic or cultural group other than Canadian. The more common cultural groups identified by participants included French (15 participants), English (13), Irish (12), Chinese (10) Aboriginal (7), Metis (6), Italian (4), Polish (4), Scottish (3), Sri Lankan (3) German (3), and Ukrainian (3). The participants identified belonging to one of over 15 different cultural groups in total.

The majority of participants (83%) have lived in Canada for more than ten years. Close to 15% of participants have lived in Canada between one and ten years while approximately 1.5% have lived in Canada for less than a year.

Language Spoken Most Often in the Home

Eighty-one percent of the participants reported English as the language spoken most often in the home while approximately 7% of the participants reported French as the language spoken most often in the home (Table 6). Approximately 11% of participants spoke languages other than English and French at home. Mandarin/Cantonese made up the largest percentage of the non-official language category (10 participants) followed by Urdu (3), Spanish (2) and Italian (1).

Compared to the study group, the Ontario population reported a larger percentage of persons speaking English in the home (88.7%) and a smaller percentage of persons speaking French. The Ontario population also reported a slightly smaller percentage of persons speaking a non-official language in the home (9.5%).

Table 6: Distribution of Program Participants by Language Spoken Most Often in the Home Compared to Province of Ontario

Language	Program Participants		Ontario ^a	
	Total	%	Total	%
English	121	81.8%	8,456,585	88.8%
French	11	7.4%	164,550	1.7%
Non-Official Languages	16	10.8%	905,770	9.5%
Italian	1	0.7%	70,350	0.7%
Mandarin/Cantonese	10	6.8%	116,440	1.2%
Spanish	2	1.3%	38,250	0.4%
Urdu	3	2.0%	23,875	0.2%
Total	148	100.0%	9,526,905	100.0%

^a Statistics Canada. Population Census 2001.

Level of Education

Approximately 7% of participants had not graduated from high school while 15% graduated from high school only (Table 7). Forty-nine percent of participants had completed some post-secondary education, and 24.5% had completed a Bachelor's degree and 4% had a post-graduate university degree.

Overall, the study group has attained higher levels of education than the Ontario profile. Seventy-eight percent of participants have received some level of post secondary education compared to 54% for the province. The percentage of participants that graduated from University is twice that of the provincial profile. The study group had a much smaller percentage of people who did not complete high school compared to the province.

Table 7: Distribution of Program Participants by Highest Level of Education Compared to Province of Ontario

Level of Education	Program Participants		Ontario ^a	
	Total	%	Total	%
Did not complete high school	10	6.6%	1,205,380	30.1%
High school graduation only	23	15.2%	636,910	15.9%
Some post secondary training/education	75	49.7%	1,568,570	39.1%
Graduated from University	43	28.5%	598,820	14.9%
Total	151	100.0%	4,009,680	100.0%

^a Women 20 years of age and over. Statistics Canada. Population Census 1996. Education data for the 2001 Population Census was not available from Statistics Canada at the time of this report.

Household and Personal Income

Participants were asked to report on their total household and personal income for the year ending December 31, 2001. Personal income is defined as the income earned by the women. Household income is the combined incomes of family and non-family persons residing in a private household.

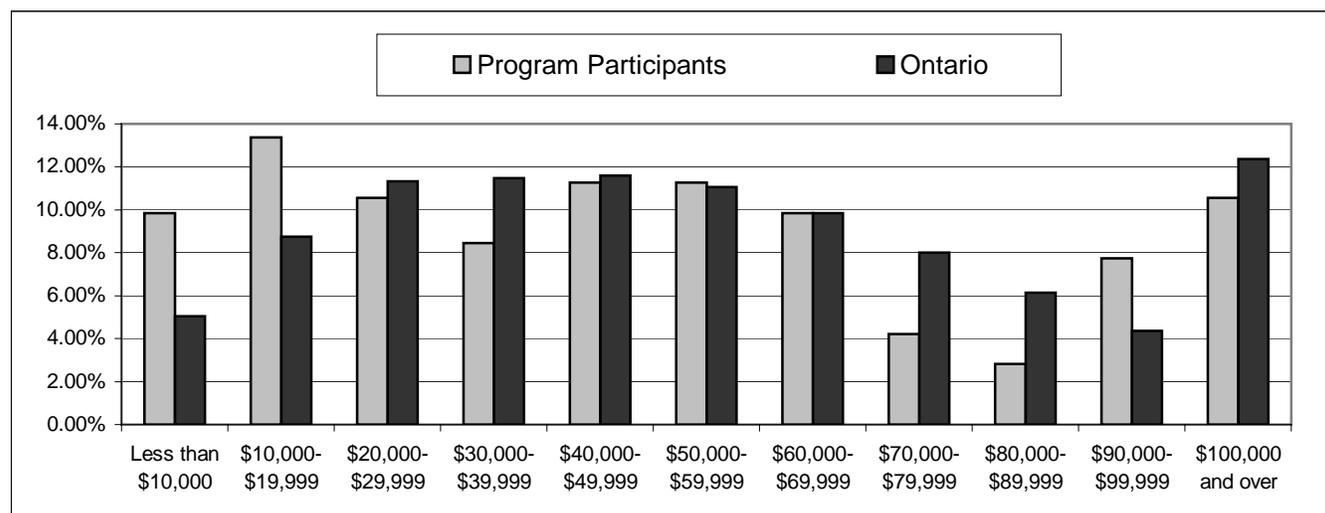
As shown in Table 8 and Figure 1, the distribution of program participants across various household income groups is fairly consistent with the provincial profile. In particular, the distribution of participants across the \$20,000 to \$69,999 income groups is very comparable to the province. The study group has a higher concentration of persons in the two lowest income groups and a slightly lower concentration of persons in the highest income groups relative to the province. Twenty-three percent of participants reported less than \$20,000 in total annual household income compared to the provincial percentage of 14%. At the higher income groups, approximately 25% of participants reported total annual household income of \$70,000 or more compared to the provincial percentage of 31%.

Table 8: Distribution of Program Participants by Household Income Compared to Province of Ontario

Income Groups	Program Participants		Ontario ^a	
	Total families	%	Total families	%
Less than \$10,000	14	9.9%	148,050	5.0%
\$10,000 - \$19,999	19	13.4%	256,625	8.7%
\$20,000 - \$29,999	15	10.6%	332,130	11.3%
\$30,000 - \$39,999	12	8.4%	336,440	11.5%
\$40,000 - \$49,999	16	11.3%	340,325	11.6%
\$50,000 - \$59,999	16	11.3%	324,370	11.1%
\$60,000 - \$69,999	14	9.9%	289,155	9.9%
\$70,000 - \$79,999	6	4.2%	235,015	8.0%
\$80,000 - \$89,999	4	2.8%	179,900	6.1%
\$90,000 - \$99,999	11	7.7%	127,945	4.4%
\$100,000 or more	15	10.6%	362,760	12.4%
Total families	142	100.0%	2,932,715	100.0%

^a Statistics Canada. Population Census 1996. Household Income data for the 2001 Population Census was not available from Statistics Canada at the time of this report.

Figure 1: Distribution of Program Participants by Household Income Compared to Province of Ontario^a



^a Statistics Canada. Population Census 1996. Household Income data for the 2001 Population Census was not available from Statistics Canada at the time of this report.

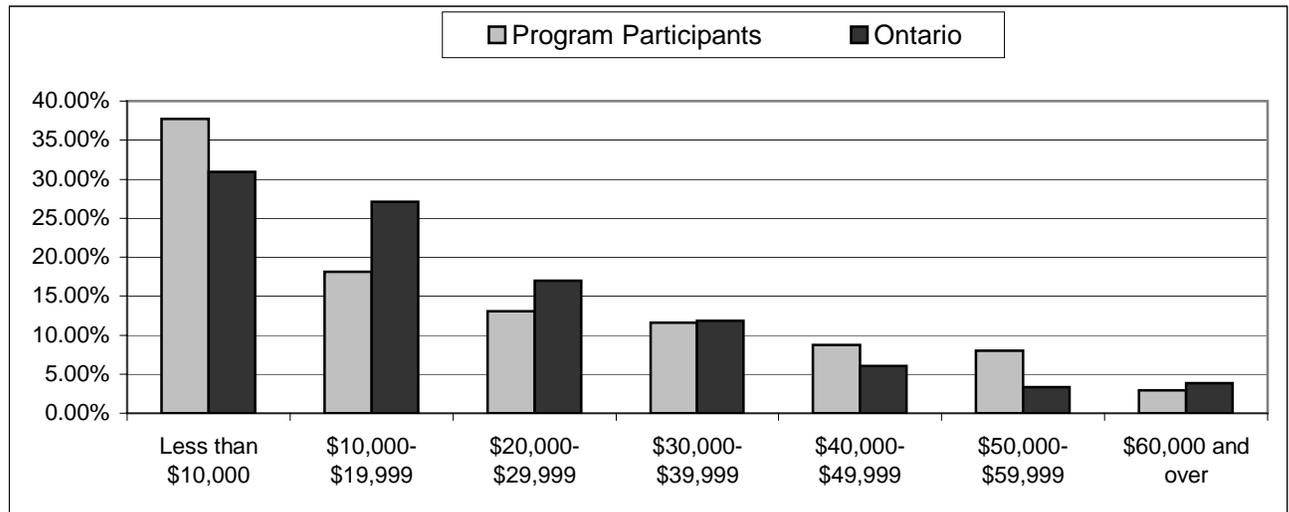
The participant profile for personal income also shows some consistencies with the provincial profile, particularly in the \$30,000 to \$49,999 income range and the \$60,000 and over income range. Notable differences include a higher percentage of participants earning less than \$10,000 annually and a lower percentage of participants in the \$10,000 to \$29,999 income range. Additional details are provided in Table 9 and Figure 2.

Table 9: Distribution of Program Participants by Personal Income Compared to Province of Ontario

Income Groups	Program Participants		Ontario ^a	
	Total	%	Total	%
Without income	4	2.8%	428,035	9.8%
With income	138	97.2%	3,920,225	90.2%
Less than \$10,000	52	37.7%	1,211,330	30.9%
\$10,000-\$19,999	25	18.1%	1,063,750	27.1%
\$20,000-\$29,999	18	13.0%	665,130	17.0%
\$30,000-\$39,999	16	11.6%	462,910	11.8%
\$40,000-\$49,999	12	8.7%	236,455	6.0%
\$50,000-\$59,999	11	7.9%	130,915	3.3%
\$60,000 and over	4	2.9%	149,735	3.8%
Total women	142	100.00%	4,348,260	100.00%

^a Women 15 years of age and over. Statistics Canada. Population Census 1996. Personal Income data for the 2001 Population Census was not available from Statistics Canada at the time of this report.

Figure 2: Distribution of Program Participants by Personal Income Compared to Province of Ontario^a



^a Women 15 years of age and over. Statistics Canada. Population Census 1996. Personal Income data for the 2001 Population Census was not available from Statistics Canada at the time of this report.

Incidence of Low Income

Low Income Cut-offs (LICO's) refer to income levels at which economic families or unattached individuals spend 20% or more than average on food, shelter and clothing. LICO's were first introduced in Canada in 1968 based on 1961 Census income data and 1959 family expenditure patterns. At that time, expenditure patterns indicated that Canadian families spent approximately 50% of their total income on food, shelter and clothing. It was arbitrarily estimated that families spending 70% or more of their income (20% percentage points more than the average) on these basic necessities would be in "strained" circumstances. With this assumption, low income cut-off points were set for five different sizes of families.

Subsequent to these initial cut-offs, revised LICO's were established by Statistics Canada based on national family expenditure data from 1969, 1978, 1986 and 1992. These data indicated that Canadian families spent, on average, 42% in 1969, 38.5% in 1978, 32.6% in 1986 and 34.7% in 1992 of their total income on basic necessities. Since 1992, data from the expenditure survey have indicated that this proportion has remained fairly stable. By adding the original difference of 20 percentage points to the basic level of expenditure on necessities, new LICO's were set at income levels differentiated by family size and degree of urbanization. Since 1992, these cut-offs have been updated annually by changes in the consumer price index. Statistics Canada emphasizes that LICO's are not measures of poverty. Rather, LICO's identify those who are substantially worse-off than average.

Table 10 presents the 2000 matrix of low-income cut-offs:

Table 10: Low Income Cut-offs (LICO's) for Economic Families and Unattached Individuals, 2000

Family Size	Size of Area of Residence				
	500,000 or more	100,000 to 499,999	30,000 to 99,999	Small urban regions ^a	Rural (farm and non-farm)
1	\$18,371	\$15,757	\$15,648	\$14,561	\$12,696
2	\$22,964	\$19,697	\$19,561	\$18,201	\$15,870
3	\$28,560	\$24,497	\$24,326	\$22,635	\$19,738
4	\$34,572	\$29,653	\$29,448	\$27,401	\$23,892
5	\$38,646	\$33,148	\$32,917	\$30,629	\$26,708
6	\$42,719	\$36,642	\$36,387	\$33,857	\$29,524
7+	\$46,793	\$40,137	\$39,857	\$37,085	\$32,340

^a Small Urban regions includes cities with a population of 15,000 to 30,000 and small urban areas (under 15,000)

Source: Statistics Canada, 2001.

The twelve **Take 5** program test sites cover all five urbanization categories (Table 11). The largest percentage of participants, 46% are in the 100,000 to 499,999 population category, followed by 25% of participants in the 500,000 or more population category. Eight percent of participants are in the 30,000 to 99,999 population category and 12% of participants are in the Small Urban Region category. Nine percent of participants are in the Rural category which is below the provincial population average. At the provincial level, 15.3% of the population is rural based and 84.7% is urban based (Statistics Canada, 2001 Population Census). ²

Based on 2000 LICOs, 70% of participant households were above the low-income cut-off point while 30% were below the low-income cut-off point (Table 12). The LICO for the study group is considerably higher than the provincial average of 17.7%. ³ This is partly explained by the purposeful recruitment strategies of the participating Community Health Centres which have a mandate to serve lower income community members. Thirty percent of the participants involved in the pilot program were below LICO and therefore were spending more or their total income on the necessities of life and may be more likely to experience financial strain. This speaks to the need for emphasis on budget-conscious material within the program.

² As defined by Statistics Canada, rural areas are sparsely populated lands lying outside urban areas. Urban areas have minimum population concentrations of 1,000 and a population density of at least 400 per sq. km., based on the previous census population counts. All territory outside urban areas is considered rural.

³ The provincial average is based on 1996 Population Census, Statistics Canada. 2001 Census data was not available at the time of this report.

Table 11: Take 5 Program Test Sites by Urbanization Categories

Size of Area of Residence				
500,000 or more	100,000 to 499,999	30,000 to 99,999	Small urban region	Rural
<ul style="list-style-type: none"> ▪ East End CHC (Toronto) ▪ Somerset CHC (Ottawa) ▪ Toronto PHU 	<ul style="list-style-type: none"> ▪ Sudbury & District HU ▪ Kingston HU ▪ NorWest CHC (Thunder Bay) ▪ Hamilton Region HD ▪ Waterloo Region HD 	<ul style="list-style-type: none"> ▪ North Bay & District HU 	<ul style="list-style-type: none"> ▪ Porcupine HU (Timmins) 	<ul style="list-style-type: none"> ▪ NorWest CHC (Longlac) ▪ West Elgin CHC (Elgin County)

Table 12: Program Participants by LICO Status

LICO Status	Number of Participants	%	Provincial Comparison
Above the low income cut-off point	99	70.2%	82.3%
Below the low income cut-off point	42	29.8%	17.7%
Total valid responses	141	100.0%	100.0%

5.2.1.2 Participant Completion/Attrition

In the original Program Design, six of the twelve test sites were to begin the **Take 5** program in October 2002 (known as the Fall Cohort Group) while the remaining six sites were to begin in January 2003 (known as the Winter Cohort Group). The sites were divided in order to examine the influence of seasonality. One site that had been originally scheduled to start in October requested to start in January due to other program pressures within their organization. This site was permitted to initiate the Program in January.

The original Program Design called for each site to recruit for participants in September and early October. Each of the sites, regardless of whether they started in October 2002 or January 2003, collected baseline data on participants using the pre-intervention survey in the Fall 2002.

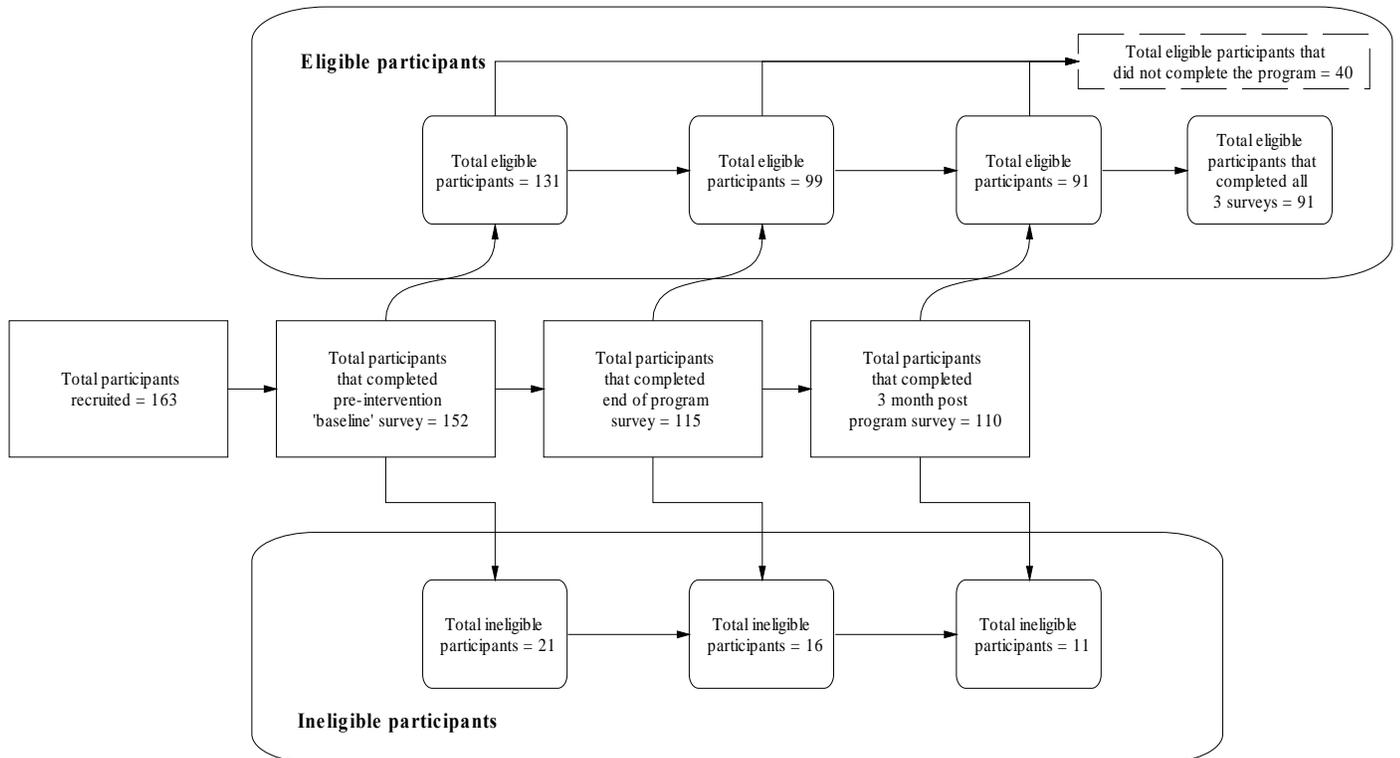
Across the twelve sites, a total of 133 participants completed the pre-intervention survey in October or November 2002. Four of the Winter Cohort sites were allowed additional time to recruit more participants. By the end of December, the twelve sites had recruited a total of 163 women. Of the 152 women who completed the pre-intervention questionnaire, 115 women (76%), completed the end of program questionnaire and 110 women (72%) completed the 3 month post program questionnaire (Figure 3).

As noted earlier, the program was designed and promoted for women between the ages of 25 and 45. However, there was some flexibility in accepting women outside this age range if their children were 14 years of age or under. Some communities included women outside this age range because the women had children earlier or later in life, some grandparents were caretakers of their grandchildren – who were 14 years of age or younger, and some

women came with friends outside the age group. Some sites wanted to increase the size of the group and included women beyond the age range of 25 to 45.

A total of 131 of the 152 participants that completed the pre-intervention (baseline) questionnaire were eligible based on the age criteria. By the end of program there were 99 women remaining who met the age criteria. A total of 91 women who met the age criteria completed the 3 month post program survey.

Figure 3: Eligible and Ineligible Participants in the Take 5 Program and Status of Completion



The five Fall Cohort sites delivered the **Take 5** program between October and early December 2002. As shown in Table 13, the Fall Cohort sites recruited a total of 69 women. Of the 61 women who completed the pre-intervention questionnaire, 48 women (79.7%) finished the Program and completed the end of program questionnaire and 46 women (75%) completed the 3 month post program questionnaire.

The seven Winter Cohort sites delivered the **Take 5** program between January and early March 2003. As shown in Table 13, the Winter Cohort sites recruited a total of 94 women. Of the 91 women who completed the pre-intervention questionnaire, 67 women (73.6%) finished the Program and completed the end of program questionnaire and 64 women completed the 3 month post program questionnaire.

Table 13: Participant Recruitment and Program Completion for the Twelve Test Sites

Site	Total number recruited	# of Participants attending first session and completing pre-intervention questionnaire	# of Participants completing end of program questionnaire	Completion rate between recruitment and end of program	Completion rate between 1st and last session	# of Participants completing 3 month post program questionnaire	Completion rate between recruitment and 3 month post program
Fall Cohort							
1. East End CHC (Toronto)	15	15	15	100.0%	100.0%	15	100.0%
2. Somerset West CHC (Ottawa)	8	5	5	62.5%	100.0%	4	50.0%
3. Sudbury and District Health Unit	10	10	5	50.0%	50.0%	5	50.0%
4. Toronto Public Health Department	18	18	12	66.7%	66.7%	12	66.7%
5. NorWest CHC, Ogden East End (Thunder Bay)	18	13	11	61.1%	84.6%	10	55.6%
<i>Sub-total</i>	<i>69</i>	<i>61</i>	<i>48</i>	<i>69.6%</i>	<i>78.7%</i>	<i>46</i>	<i>66.7%</i>
Winter Cohort							
6. Kingston, Frontenac, Lennox & Addington HU	16	16	12	75.0%	75.0%	12	75.0%
7. North Bay and District Health Unit	12	12	10	83.3%	83.3%	10	83.3%
8. NorWest CHC, Longlac (3 hrs north of Thunder Bay)	8	8	5	62.5%	62.5%	4	50.0%
9. Porcupine Health Unit (Timmins)	9	9	6	66.7%	66.7%	6	66.7%
10. Hamilton Regional Health Department	11	8	5	45.5%	62.5%	3	27.3%
11. Waterloo Region Health Department	23	23	17	73.9%	73.9%	17	73.9%
12. West Elgin CHC (Elgin County)	15	15	12	80.0%	80.0%	12	80.0%
<i>Sub-total</i>	<i>94</i>	<i>91</i>	<i>67</i>	<i>71.3%</i>	<i>73.6%</i>	<i>64</i>	<i>68.1%</i>
TOTAL	163	152	115	70.6%	75.7%	110	67.5%

As noted earlier, the program was designed and promoted for women between the ages of 25 and 45. The final analysis focuses only on those participants that met the age criteria and completed all three questionnaires. This size of the final **Take 5** study group is 91 participants as shown in Table 14.

Table 14: Number of Participants in the Final Study Group by Site

Site	Number of participants
Fall Cohort	
1. East End Community Health Centre (Toronto)	15
2. Somerset West Community Health Centre (Ottawa)	4
3. Sudbury and District Health Unit	5
4. Toronto Public Health Department	7
5. NorWest CHC, Ogden East End (Thunder Bay)	6
<i>Sub-total</i>	<i>37</i>
Winter Cohort	
6. Kingston, Frontenac, Lennox & Addington Health Unit	12
7. North Bay and District Health Unit	9
8. NorWest CHC, Longlac (3 hrs north of Thunder Bay)	3
9. Porcupine Health Unit (Timmins)	6
10. Hamilton Regional Health Department	1
11. Waterloo Region Health Department	15
12. West Elgin CHC (Elgin County)	8
<i>Sub-total</i>	<i>54</i>
Total	91

5.2.2 Efficacy

Efficacy is defined as the impact of an intervention on outcomes, including unintended effects, both positive and negative, quality of life, and economic outcomes. Within the RE-AIM framework, effects/effectiveness is measured at the level of the individual and is reflective of the success of the intervention when implemented as per the protocol. Efficacy is a key criterion; if the intervention is not efficacious, there is no need to evaluate its reach or any of the other criteria. In evaluating **Take 5**, pre-post testing was used to assess vegetable and fruit consumption and movements along the Stages of Change.

5.2.2.1 Knowledge and Attitude

Change in Knowledge

Participants were asked to indicate what they thought were enough daily servings of vegetables and fruit to stay healthy. At the start of the program, participants indicated that an average of 6 daily servings were needed to stay healthy. In reviewing the results from the Ontario Nutrition and Cancer Prevention Survey (Cancer Care Ontario, 2003) a higher percentage of Take 5 participants indicated that 5 or more daily servings were required to stay healthy - 78% of ONCP respondents indicated that 5 or more daily servings were required to stay healthy compared to 82.5% of Take 5 participants.

A total of nine participants did not know how many servings of vegetables and fruit they required to stay healthy. At the completion of the program all of the participants were able to respond to the question with a value and indicated that an average of 7.5 daily servings were needed to stay healthy. This is consistent with the mid-range for the correct answer of 5 to 10 servings per day. Three months after completing the program the participants indicated that an average of 7.4 daily servings were needed to stay healthy which is very near the mid range noted above.

Change in Attitudes

Several questions in the survey were designed to assess whether the participants experienced a change in their attitude toward vegetables and fruit. The survey also featured a summary question that addressed how participants viewed the importance of other members in the household consuming vegetables and fruits.

Analysis of the baseline data reveals that 89% of participants viewed household consumption of vegetables as very important while 11% viewed vegetable consumption as somewhat important. Similar findings were recorded for fruit where 86% of participants viewed household consumption of fruit as very important and 14% viewed fruit consumption as somewhat important.

At the end of program, 92% of participants viewed household consumption of vegetables as very important while 8% viewed vegetable consumption as somewhat important. Similar findings were recorded for fruit where 90% of participants viewed household consumption of fruit as very important while 10% viewed fruit consumption as somewhat important.

Three months after the end of the program, 86% of participants continued to view household consumption of vegetables as very important while 14% viewed vegetable consumption as somewhat important. With respect to fruit, 89% of participants continued to view household consumption of fruit as very important while 11% viewed fruit consumption as somewhat important.

Comparisons on individual participants across baseline, end of program and 3 month post program reveal that a large majority of participants did not experience a change in their view regarding the importance of household consumption.

5.2.2.2 Behaviour Changes in Vegetable and Fruit Consumption

Vegetable and fruit consumption was measured through the use of a food frequency questionnaire (FFQ). The original survey design combined both food frequency and food portion questions to estimate the total number of servings. Cancer Care Ontario, the City of Toronto, and McGill University conducted a separate calibration study for the FFQ instrument (Gray and Johnson-Down, 2003). It revealed that a large number of respondents were correctly estimating the frequency or number of times per day that they were eating vegetables and fruit but were overestimating their portions of fruits and vegetables. Preliminary analysis of the **Take 5** data revealed a similar pattern. Therefore, the behaviour analysis reports the frequency, i.e. the number of times per day that the participants ate their

vegetables and fruit. Because the questionnaire and algorithm to assess Stage of Change was asked in servings, an adjustment factor was derived by the Calibration Scientists and has been applied to this section of the analysis.

The difference in consumption between start and end of program amounts to 2 times per day of vegetables and fruit on average (Table 15). A very recent meta-analysis of the vegetable and fruit intervention literature indicates that an average increase of 0.6 servings following the completion of an intervention.⁴ This program has produced 3 times the level of increased consumption that was expected to be achieved post-program. The 3 month post program data indicates that the increase in consumption was maintained at 2 times per day and that on average there was actually a small increase in consumption beyond the level reported at end of program (Table 16).

Table 15: Food Frequency Questionnaire Results, Pre-intervention vs. End of Program (n=91)

	Pre-intervention	End of Program	Difference
<i>Raw Data</i>			
Frequency of vegetable times per day	2.0	2.8	0.8
Frequency of fruit times per day	1.6	2.8	1.2
Total frequency of vegetable and fruit times per day	3.6	5.6	2.0

Table 16: Food Frequency Questionnaire Results, Pre-intervention vs. 3 Month Post Program (n=91)

	Pre-intervention	3 month post	Difference
<i>Raw Data</i>			
Frequency of vegetable times per day	2.0	2.9	0.9
Frequency of fruit times per day	1.6	2.9	1.3
Total frequency of vegetable and fruit times per day	3.6	5.8	2.2

In reviewing the results from the Ontario Nutrition and Cancer Prevention Survey the Take 5 participants had a lower median value in terms of frequency of consumption per day at program start compared to the province - ONCP respondents reported a median value of 4.3 times per day compared to the median value of 3.3 for Take 5 participants. As shown in Table 17, the Take 5 group had a much higher percentage of participants in the lower intake categories at program start than the provincial profile.

Table 17: Summary of Take 5 Participant Vegetable and Fruit Intake at Program Start Compared to Province.

Vegetable and fruit intake	Take 5 participants	Province of Ontario ^a
0-2 times per day	42%	9%
3-4 times per day	31%	55%
5 or more times per day	27%	36%
Total	100%	100%

^a Ontario Nutrition and Cancer Prevention Survey, 2003.

⁴ Agency for Healthcare Research and Quality. (2001). *Efficacy of Intervention to Modify Dietary Behaviour Related to Cancer Risk*. Chapel Hill: Research Triangle Institute.

The same meta-analysis of cancer and nutrition intervention literature regarding the impact of vegetable and fruit behaviour change programs, reports that greater increases are seen in fruit consumption rather than vegetable consumption. The results of the Take 5 program at both the end of program and 3 month post program stage are consistent with the literature - there was a greater increase in the fruit consumed as compared to vegetables consumed.

Cluster level analysis was conducted on the difference in mean values for each site using the Wilcoxon Signed Ranks Test to estimate overall significance.⁵ The significance of the test was reported as 0.0005 which indicates that a significant difference exists between the mean vegetable and fruit consumption rates at the start and end of program. A significant difference was also found between the mean vegetable and fruit consumption rates at the start of program and 3 months post program.

Tests were also conducted on the individual sites as there was considerable variation between sites with respect to the number of participants.⁶ Four of the twelve sites, Kingston, Waterloo, West Elgin and North Bay, reported significant differences between the mean vegetable and fruit consumption rates at the start and end of program as well as the start and 3 month post program.

In addition to the FFQ, participants were asked to provide a general estimate of the average number of servings of fruit and vegetables they eat each day. Responses from the baseline data ranged from 1 serving per day to 10 servings per day. The average estimated consumption rate at the start of the program was 3.6 servings of fruit and vegetables per day. Most participants reported eating fewer than five servings of vegetables and fruit each day at the start of the program. The average estimated consumption rate at the end of the program and 3 month post program was 6 servings of fruit and vegetables per day. Responses from these data sets ranged from 2.5 servings per day to 10 servings per day. Most participants reported eating five or more servings of vegetables and fruit each day at the end of the program. The difference in estimated consumption between start and end of program and 3 month post program amounts to 2.4 servings of vegetables and fruit per day on average, which is slightly lower than the consumption estimate derived from the FFQ.

Participant Belief of Program Contribution Toward Behaviour Change

As part of the end of program and 3 month post program survey, participants were asked to identify changes in their food consumption behaviour as a result of taking the **Take 5** program. Approximately 58% of participants indicated that the **Take 5** program was the factor of greatest importance that contributed to their change in food consumption. Another 33% of participants reported that the program was an important factor in their change in food consumption. Ninety-one percent of these participants reported that their consumption of

⁵ Wilcoxon Matched-Pairs Signed Ranks Test.

http://fonsg3.let.uva.nl/Service/Statistics/Signed_Rank_Test.html

⁶ Three of the sites had more than 10 participants while three sites had fewer than 5 participants. The validity of using non-parametric methods such as Wilcoxon Signed Ranks Test, even when cluster size is highly variable, is discussed in Donner, A. Donald, Analysis of data arising from a statistical design with cluster as unit of randomization. *Statistics in Medicine* 1987;6:43-52.

vegetables and fruits had increased as a result of the program. At the 3 month post program stage 45% of the participants indicated that the **Take 5** program was the factor of greatest importance that contributed to their change in food consumption and 90% of the participants reported that their consumption of vegetables and fruits had increased as a result of the program (Table 18).

Table 18: Importance of Program in Contributing to Behaviour Change – Participant Self-Assessment

Importance of Program in Contributing to Behaviour Change	End of program		3 month post program	
	Number of Participants	%	Number of Participants	%
1 = no importance	0	0.0%	0	0.0%
2	0	0.0%	2	2.2%
3	8	9.0%	7	7.9%
4	29	32.6%	40	44.9%
5 = greatest importance	52	58.4%	40	44.9%
Total valid responses	89	100.0%	89	100.0%
Missing Data	2		2	

Other findings...

- 90% of participants reported using the Personal Goal Sheets and 90% of these participants indicated that the Goal Sheets were helpful in enabling them to eat more vegetables and fruit.
- 89% of participants reported that the Vegetable and Fruit Checklist was helpful in enabling them to eat more vegetables and fruits.
- 96% of participants reported that they shared what they learned from the **Take 5** Program with friends and family.

Change in Participant Risk Perception

Several questions in the survey were designed to assess whether the participants gained additional knowledge about the causes of cancer. Participants were asked if they thought there was a link between what they ate and their chances of getting cancer. The responses from the baseline survey revealed that a large majority of participants (71.4%) associate diet with their chances of getting cancer (Table 19). The baseline data also revealed that 6.6% of participants did not associate cancer with the types of food they ate.

The end of program and 3 month post program analysis reveals an overall increase in the number of participants that associate diet with their chances of getting cancer. By the end of the program and 3 month post program over 80% of participants linked diet to their chances of getting cancer. There continued to be a small group of participants that did not associate diet with cancer by the 3 month post program stage. However, the proportion of participants that were uncertain if cancer is linked to diet declined to 10% by the end of the program (Table 19).

Five of the twenty participants who were uncertain if cancer was linked to diet at the start of the program remained uncertain three months after the program. The five other participants

who were uncertain at the three month post program stage had indicated at the start of the program that they thought their chances of getting cancer was linked to what they ate.

Table 19: Change in Participant Knowledge – Baseline vs. End of Program and 3 Month Post Program

Do you think what you eats affects your chances of getting cancer?	Pre-intervention		End of program		3 month post program	
	Number of participants	%	Number of participants	%	Number of participants	%
Yes	65	71.4%	76	83.5%	77	84.6%
No	6	6.6%	6	6.6%	4	4.4%
Don't know	20	22.0%	9	9.9%	10	11.0%
Total valid responses	91	100.0%	91	100.0%	91	100.0%

5.2.2.3 Stages of Change

The Transtheoretical Model of Change, a theoretical model of behavior change that was developed in the addictions field, has been the basis for developing effective interventions to promote health behavior change. The core construct is the Stages of Change. The Stages of Change represent categories of behaviour change along a field that varies due to differences in motivational readiness and time. These categories are non-linear and cyclical and reflect the potential for recidivism.

Transitions between the stages of change are effected by a set of independent variables known as the processes of change. The model also incorporates a series of intervening and outcome variables. These include decisional balance (the pros and cons of change), self-efficacy (confidence in the ability to change across problem situations), situational temptations to engage in the behavior, and behaviors which are specific to the addresses area (Glanz et al., 1997). A four-question algorithm was developed to ascertain participant's readiness for behaviour change and was included among the questions participants were asked to complete.⁷ Using this algorithm, the data was used to determine the participant stage of readiness to change her vegetable and fruit consumption.

At the start of the program approximately 74% of the participants were at the preparation stage while 1.3% were at the action stage and 25% percent of the participants were at the maintenance stage (Table 20).

In reviewing the results from the Ontario Nutrition and Cancer Prevention Survey, 11% of the respondents in the provincial survey were at the pre-contemplation stage and 3% were at the contemplation stage. The majority of respondents in the provincial survey, 62%, were at the maintenance stage (Table 20).

Results from the end of program survey reveal that a large majority of participants had advanced from the preparation stage to the action stage. At the end of the program 59% of the participants were at the action stage while 28% were at the maintenance stage. Only 12%

⁷ California State Health Department. 5-A-Day Algorithm, 1998.

of participants were at the preparation stage by the end of the program. One participant indicated that they were at the pre-contemplation stage. There appeared to be only a minor variation in participant stage of change between the end of program and 3 month post program.

Table 20: Stage of Change

Stage of Change	Province of Ontario ^a (%)	Pre-intervention		End of program		3 month post program	
		Number of participants	%	Number of participants	%	Number of participants	%
Stage 1: Pre-contemplation	11%	0	0.0%	1	1.2%	2	2.3%
Stage 2: Contemplation	3%	0	0.0%	0	0.0%	0	0.0%
Stage 3: Preparation	16%	56	73.7%	10	12.0%	8	9.2%
Stage 4: Action	8%	1	1.3%	49	59.0%	52	59.8%
Stage 5: Maintenance	62%	19	25.0%	23	27.8%	25	28.7%
Total participants with valid responses		76	100%	83	100%	87	100%
Missing data		15		8		4	

^a Ontario Nutrition and Cancer Prevention Survey, 2003.

Analysis of the paired pre-intervention and end of program data for each participant reveals that almost two-thirds (64%) of the participants advanced one stage of motivational readiness on the stage of change scale while 22% of participants experienced no change. Approximately 14% of the participants regressed a stage of motivational readiness on the stage of change scale (Table 21).

Table 21: Participant Stage of Change by Paired Analysis

	From program start to end of program		From end of program to 3 month post program	
	Number of participants	%	Number of participants	%
Advanced one stage	47	64.4%	16	21.9%
No change	16	21.9%	47	64.4%
Regressed one stage	10	13.7%	10	13.7%
Total valid responses	73	100.0%	73	100.0%
Missing data	18		18	

Of the 47 participants that advanced a stage between program start and end of program 5 participants advanced an additional stage by 3 month post program while 33 participants experienced no change and 9 participants regressed a stage.

Of the 16 participants that experienced no change between program start and end of program 5 participants advanced an additional stage by 3 month post program while 10 participants experienced no change and 1 participant regressed a stage.

Of the 10 participants that regressed a stage between program start and end of program 6 participants advanced an additional stage by 3 month post program while 4 participants experienced no change.

5.2.2.4 Self-Efficacy

Self-efficacy is defined as “the belief in one’s capabilities to organize and execute the sources of action required to manage prospective situations.” (Bandura, 1986) It has two parts – confidence and temptation. Confidence, the primary construct in self-efficacy, is the situation – specific confidence people have that they can cope with high-risk situations without relapsing into to their unhealthy or high-risk habits. Temptation describes the intensity of urges to engage in a specific habit when in the midst of difficult situations. The three most common types of tempting situations are negative affect or emotional distress, positive social occasions, and cravings (Glanz, et al., 1997). Self-efficacy is a context-specific assessment of competence to perform a specific task or a range of tasks in a given domain. The survey featured a number of questions that asked participants to report on their level of confidence in eating enough vegetables and fruits in relation to a variety of situational and emotional cues (such as when eating alone, on weekends, when in a hurry, when food preparation was difficult, during winter when there is less choice, etc.). The survey also featured questions that addressed the participants overall confidence in consuming enough vegetables and fruits in a variety of situations.

Self-Efficacy and Fruit Consumption

Baseline data from the 91 participants reveal that 38.5% of participants were very confident that they could consume enough fruit in different situations while 50.5% of participants indicated they were somewhat confident they could eat enough fruit in different situations. Approximately 5.5% of participants indicated that they were somewhat unconfident and 1% were very unconfident they could eat enough fruit in different situations. A small number of participants did not have an opinion on the question (Table 22). By the end of program the study group showed an improvement in self-efficacy in that 63.7% of participants reported they were very confident they could consume enough fruits in different situations. Furthermore, the proportion of participants who reported a high level of confidence increased to 66% at three months post program.

Table 22: Self-Efficacy Related to Combined Situational/Emotional Cues for Fruit Consumption – Baseline Compared to End of Program and 3 Month Post Program

Confidence level	Pre-intervention		End of program		3 month post program	
	Number of participants	%	Number of participants	%	Number of participants	%
Very confident	35	38.5%	58	63.7%	60	65.9%
Somewhat confident	46	50.5%	27	29.7%	26	28.6%
No opinion	4	4.4%	0	0.0%	3	3.3%
Somewhat unconfident	5	5.5%	5	5.5%	2	2.2%
Very unconfident	1	1.1%	1	1.1%	0	0.0%
Total valid responses	91	100.0%	91	100.0%	91	100.0%

Analysis of the paired pre-intervention and end of program data for each participant reveals that 39.6% of the participants advanced one level of confidence on the confidence scale while 49.5% of participants experienced no change. Approximately 11% of the participants regressed a level of confidence (Table 23).

Table 23: Change in Participant Self-Efficacy Related to Fruit Consumption – Baseline vs. End of Program and 3 Month Post Program

	From program start to end of program		From end of program to 3 month post program	
	Number of participants	%	Number of participants	%
Experienced an increase in their confidence level	36	39.6%	13	14.3%
Experienced no change in their confidence level	45	49.5%	67	73.6%
Experienced a decrease in their confidence level	10	11.0%	11	12.1%
Total valid responses	91	100.0%	91	100.0%

Of the 36 participants that advanced a level between program start and end of program 1 participant advanced a further level 3 months after the program while 26 participants experienced no change and 9 participants regressed a level.

Of the 45 participants that experienced no change between program start and end of program 6 participants advanced a level 3 months after the program while 37 participants experienced no change and 2 participants regressed a level.

Of the 10 participants that regressed a level between program start and end of program 6 participants advanced a level 3 months after the program while 4 participants experienced no change.

Self-Efficacy and Vegetable Consumption

Baseline data from the 91 participants reveal that 32% of participants were very confident that they could consume enough vegetables in different situations while 50% of participants indicated they were somewhat confident they could eat enough vegetables in different situations. Approximately 14% of participants indicated that they were somewhat unconfident and 1% were very unconfident they could eat enough vegetables in different situations. Only two participants did not have an opinion on the question (Table 24). By the end of program the study group showed an improvement in self-efficacy in that 55% of participants reported they were very confident they could consume enough vegetables in different situations. Furthermore, the proportion of participants who reported a high level of confidence increased to 64% at three months post program.

Table 24: Self-Efficacy Related to Combined Situational/Emotional Cues for Vegetable Consumption – Baseline Compared to End of Program and 3 Month Post Program

Confidence level	Pre-intervention		End of program		3 month post program	
	Number of participants	%	Number of participants	%	Number of participants	%
Very confident	29	32.2%	50	54.9%	58	63.7%
Somewhat confident	45	50.0%	40	44.0%	26	28.6%
No opinion	2	2.2%	1	1.1%	4	4.4%
Somewhat unconfident	13	14.4%	0	0.0%	3	3.3%
Very unconfident	1	1.1%	0	0.0%	0	0.0%
Total valid responses	90	100.0%	91	100.0%	91	100.0%

Analysis of the paired pre-intervention and end of program data for each participant reveals that 45% of the participants advanced one level of confidence on the confidence scale while 45% of participants experienced no change. Approximately 10% of the participants regressed a level of confidence (Table 25).

Table 25: Change in Participant Self-Efficacy Related to Vegetable Consumption – Baseline vs. End of Program and 3 Month Post Program

	From program start to end of program		From end of program to 3 month post program	
	Number of participants	%	Number of participants	%
Experienced an increase in their confidence level	41	45.1%	18	19.8%
Experienced no change in their confidence level	41	45.1%	59	64.8%
Experienced a decrease in their confidence level	9	9.9%	14	15.4%
Total valid responses	91	100.0%	91	100.0%

Of the 41 participants that advanced a level between program start and end of program 6 participants advanced a further level 3 months after the program while 26 participants experienced no change and 9 participants regressed a level.

Of the 41 participants that experienced no change between program start and end of program 8 participants advanced a level 3 months after the program while 28 participants experienced no change and 5 participants regressed a level.

Of the 9 participants that regressed a level between program start and end of program 4 participants advanced a level 3 months after the program while 5 participants experienced no change.

The general statements on confidence as derived from the above analysis are supported by more detailed analysis on specific environmental or emotional situations from Table 26. Overall, the majority of the study group experienced an increase in self-efficacy as outlined below.

a) The majority of program participants increased in general self-efficacy in the following situations when eating vegetables:

- when in a hurry
- when preparation is difficult
- when there is less choice during the winter
- when family members don't want to eat them
- when at work
- when dining out
- when other foods are less expensive
- when highly anxious or emotionally upset

b) The majority of program participants experienced no change in self-efficacy in the following situation when eating vegetables:

- when eating alone
- when eating on weekends

c) The majority of program participants experienced no decrease in self-efficacy for vegetables in any of the situations probed for in the questions. However, it is noted that 9% of the participants did experience a decrease in self-efficacy by the end of the program which increased slightly to 11% of the participants three months after the program.

d) The majority of program participants increased in self-efficacy in the following situations when eating vegetables:

- when in a hurry
- when eating on weekends
- when preparation is difficult
- when there is less choice during the winter
- when family members don't want to eat them
- when dining out
- when other foods are less expensive
- when highly anxious or emotionally upset

e) The majority of program participants experienced no change in self-efficacy in the following situation when eating vegetables:

- when eating alone
- when at work

f) The majority of program participants experienced no decrease in self-efficacy for fruit in any of the situations probed for in the questions. However, it is noted that 11% of the participants did experience a decrease in general self-efficacy by the end of the program, which declined to 8% of the participants three months after the program.

Table 26: Changes in Self-Efficacy (SE) Related to Specific Environmental and Emotional Cues for Vegetable and Fruit Consumption.

Cues ^a	Vegetables (N=91)				Fruit (N=91)				
	Increase SE (%)	No change SE (%)	Decrease SE (%)	Missing data (n)	Increase SE (%)	No change SE (%)	Decrease SE (%)	Missing data (n)	
When eating alone	37.4%	45.1%	17.6%	0	41.1%	48.9%	10.0%	1	Baseline vs. end of program
	42.2%	47.8%	10.0%	1	45.6%	48.9%	5.6%	1	Baseline vs. 3 month post program
On weekends	39.6%	51.6%	8.8%	0	39.6%	53.8%	6.6%	0	Baseline vs. end of program
	45.6%	44.4%	10.0%	1	50.5%	39.6%	9.9%	0	Baseline vs. 3 month post program
When in a hurry	44.9%	36.0%	19.1%	2	52.7%	33.0%	14.3%	0	Baseline vs. end of program
	54.5%	34.1%	11.4%	3	50.5%	40.7%	8.8%	0	Baseline vs. 3 month post program
When preparation is difficult	51.6%	31.9%	16.5%	0	50.5%	28.6%	20.9%	0	Baseline vs. end of program
	59.3%	31.9%	8.8%	0	59.3%	29.7%	11.0%	0	Baseline vs. 3 month post program
When there is less choice during the winter	52.7%	33.0%	14.3%	0	54.9%	34.1%	11.0%	0	Baseline vs. end of program
	57.1%	34.1%	8.8%	0	52.7%	40.7%	6.6%	0	Baseline vs. 3 month post program
When family don't want to eat them ^b	49.5%	34.1%	16.5%	0	41.1%	41.1%	17.8%	1	Baseline vs. end of program
	56.0%	31.9%	12.1%	0	54.4%	35.6%	10.0%	1	Baseline vs. 3 month post program
When at work	52.2%	33.3%	14.4%	1	40.0%	48.9%	11.1%	1	Baseline vs. end of program
	49.4%	37.1%	13.5%	2	38.9%	51.1%	10.0%	1	Baseline vs. 3 month post program
When dining out	48.9%	40.0%	11.1%	1	41.8%	42.9%	15.4%	0	Baseline vs. end of program
	45.6%	43.3%	11.1%	1	46.2%	40.7%	13.2%	0	Baseline vs. 3 month post program
When it seems that other foods are less expensive	49.4%	38.2%	12.4%	2	47.2%	41.6%	11.2%	2	Baseline vs. end of program
	52.8%	42.7%	4.5%	2	53.3%	36.7%	10.0%	1	Baseline vs. 3 month post program
When highly anxious or emotionally upset	46.1%	34.8%	19.1%	2	44.0%	38.5%	17.6%	0	Baseline vs. end of program
	50.6%	36.0%	13.5%	2	56.0%	37.4%	6.6%	0	Baseline vs. 3 month post program
Overall situational confidence ^c	45.6%	45.6%	8.9%	1	39.6%	49.5%	11.0%	0	Baseline vs. end of program
	45.6%	43.3%	11.1%	1	38.5%	53.8%	7.7%	0	Baseline vs. 3 month post program

^a Cues stem from the questions “How confident are you that you can eat enough vegetables...?” or “How confident are you that you can eat enough fruit...?”

^b Questions asked, “How confident are you that you can serve enough vegetables...?” or “How confident are you that you can serve enough fruit...?”

^c Question asked about participants assessment of their overall situational confidence to more vegetables and fruit.

5.2.2.5 Food Security

Several food security questions were included in the baseline questionnaire. Participants were presented with general statements on food security and asked to indicate how true the statements were based on their personal situation during the last 12 months. As shown in Table 27, approximately 8% of participants had often run out of food because of insufficient funds while 31% had sometimes run out of food. The majority of participants, 61.5%, had never run out of food.

A related question on eating balanced meals indicated that 3% of participants often couldn't afford to eat balanced meals while 30% sometimes couldn't afford to eat balanced meals. The majority of participants, 67%, were always able to afford balance meals.

Table 27: Participant Food Security Status

Statements on food security	In the last 12 months was this statement...						Total valid responses
	Often true		Sometimes true		Never true		
	n	%	n	%	n	%	#
"I ran out of the food I bought and I didn't have money to get more"	7	7.7%	28	30.8%	56	61.5%	91
"I couldn't afford to eat balanced meals"	3	3.3%	27	30.0%	60	66.7%	90

The data reveals that a substantial number of participants are encountering food security issues. The extent to which food security and other independent variables are associated with changes in vegetable and fruit consumption will be examined in the following section on statistical analysis.

5.2.2.6 Statistical Analysis

The correlation and regression analysis results speak first of all about the results obtained for those participating in the study. We are unable to determine if these results are significant for the province as a whole since participants were not selected at random from the eligible provincial population.

Bivariate Analysis

Pearson's correlation coefficient was used to determine association between dependent and independent variables and to identify variables for consideration in developing a regression model. The test examined the association between the change in frequency of vegetable and fruit consumption at two time periods (end of program and 3 month post program) in relation to several independent variables including age, weight, general health, personal and household income, level of education, food security, smoking activity, stage of change, level of self-efficacy, frequency of vegetable and fruit consumption at start of program, place of residence (urban vs. rural), and seasonality (time of participation in the program, fall vs. winter). An overview of the dependent and independent variables including descriptive statistics is presented in Table 29.

Table 29: Dependent and Independent Variables and Descriptive Statistics

Variable Name and Description	Scale	Mean	Std. Dev.	N
Dependent Variables				
Difference in frequency of consumption of vegetables and fruit: Pre-intervention vs. End of Program		1.94	2.7	91
Difference in frequency of consumption of vegetables and fruit: Pre-intervention vs. 3 Month Post Program		2.19	2.61	91
Independent Variables				
Age - <i>age at program start</i>	Years	35.8	5.05	91
Weight - <i>weight at program start</i>	Pounds	168.15	99.19	87
General Health - <i>self-assessment of general health compared to same age cohort</i> <i>Five point Likert scale from excellent (1) to poor (5)</i>	1-5	2.75	0.79	89
Household Income - <i>combined income from all members of the household</i> <i>Eleven income categories</i> (1) Less than \$10,000 (7) \$60,000 - \$69,999 (2) \$10,000 - \$19,999 (8) \$70,000 - \$79,999 (3) \$20,000 - \$29,999 (9) \$80,000 - \$89,999 (4) \$30,000 - \$39,999 (10) \$90,000 - \$99,999 (5) \$40,000 - \$49,999 (11) \$100,000 or more (6) \$50,000 - \$59,000	1-11	5.9	3.15	84
Personal Income - <i>Eleven income categories</i> (1) Less than \$10,000 (7) \$60,000 - \$69,999 (2) \$10,000 - \$19,999 (8) \$70,000 - \$79,999 (3) \$20,000 - \$29,999 (9) \$80,000 - \$89,999 (4) \$30,000 - \$39,999 (10) \$90,000 - \$99,999 (5) \$40,000 - \$49,999 (11) \$100,000 or more (6) \$50,000 - \$59,000	1-11	2.76	1.81	82
Education - <i>highest level of education, seven education categories</i> (1) less than high school (5) some university (2) secondary school graduation (6) completed Bachelor's degree (3) some non-university trades (7) completed Master's degree or Ph.D. certificate or diploma (4) completed non-university certificate or diploma	1-7	4.23	1.56	90
Food Security 1 - <i>frequency of running out of food due to lack of money</i> <i>Three point Likert frequency scale = often (1), sometimes (2), never (3)</i>	1-3	2.54	0.64	91
Food Security 2 - <i>frequency of not eating balanced meals due to lack of money</i> <i>Three point Likert frequency scale = often (1), sometimes (2), never (3)</i>	1-3	2.63	0.55	90
Smoking Habit - <i>frequency of smoking</i> <i>Three point Likert frequency scale = daily (1), occasionally (2), not at all (3)</i>	1-3	2.68	0.68	91
Stage of Change at Program Start - <i>Five point scale</i> (1) pre-contemplation (4) action (2) contemplation (5) maintenance (3) preparation	1-5	3.49	0.89	76
Self-efficacy related eating more Vegetables at program start <i>Five point Likert scale from very unconfident (1) to very confident (5)</i>	1-5	3.98	1.02	90
Self-efficacy related to eating more Fruit at program start <i>Five point Likert scale from very unconfident (1) to very confident (5)</i>	1-5	4.20	0.85	91
Vegetable and Fruit consumption at program start <i>Frequency of vegetable and fruit consumption per day using FFQ</i>		1.96	1.52	91
Place of Residence - <i>Five population categories</i> (1) Rural (4) 100,000 to 499,999 (2) Small urban region (5) 500,000 or more (3) 30,000 to 99,999	1-5	3.69	1.59	91
Seasonality - <i>time of program delivery, Fall (1) vs. Winter(2)</i>	1-2	1.59	0.49	91

Table 30 presents the intercorrelations among dependent and independent variables. Small significant correlations were found with several variables with respect to the change in frequency of vegetable and fruit consumption between **program start and end of program**. A negative relationship was found between frequency of consumption at program start and change in consumption at end of program ($r = -.32$, $n = 91$). The correlation suggests that lower levels of vegetable and fruit consumption at program start are associated with higher levels of consumption at end of program. This association was also found to be significant between **program start and 3 month post program** ($r = -.25$, $n = 91$).

Place of residence also appears to be associated with the change in consumption observed at the end of program. Place of residence speaks to the degree of urbanization associated with the location of the test site. The variable used a 5 point ordinal scale from 1 for most rural to 5 for most urban.⁸ The small significant negative correlation ($r = -.27$, $n = 91$) suggests that the more rural the site the greater the change. The absence of a significant correlation by the 3 month post stage suggests that the participants were able to overcome the effects of place of residence.

A small significant correlation ($r = .22$, $n = 91$) was found between change in consumption observed at end of program and seasonality. The winter sites experienced a greater increase in consumption than the fall sites. Seasonality refers to the time of year the program was offered. Five test sites offered the program in the fall (coded 1) and seven sites offered the program in the winter (coded 2). A number of possible factors could be contributing to this observation. The difference could be the result of external factors such as seasonal variation associated with vegetable and fruit availability and cost. We would have anticipated lower rates of consumption with the winter cohort group when availability of fresh vegetables and fruit is more limited and produce is more expensive. However, in comparing the frequency of consumption data for the fall and winter cohorts, the winter cohort participants actually had a higher vegetable and fruit consumption level on average than the fall cohort participants and experienced a greater increase in consumption than the fall group. As shown in Table 31, winter cohort participants reported an average increase of consumption of 2.4 times per day by the end of the program compared to an average increase of 1.2 times per day for fall cohort participants. By the 3 month post program stage the level of changed consumption between the fall and winter group is less noticeable and not statistically significant (Table 31).

⁸ The degree of urbanization scale as shown in Table 29 was derived from the five urbanization categories used by Statistics Canada in estimating Low Income Cut-offs. It should be noted that within the scale 'Small urban regions' refers to cities with a population of 15,000 to 30,000 and small urban areas under 15,000. The term 'Rural' refers to the farm and non-farm population living in rural areas.

Table 30: Correlations Among Dependent and Independent Variables (N= 71-91)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Dependent Variables																		
1	Difference in frequency of consumption of vegetables and fruit: pre-intervention vs. end of program	1																
2	Difference in frequency of consumption of vegetables and fruit: pre-intervention vs. 3 month post program	.665**	1															
Independent Variables																		
3	Age	-.104	.014	1														
4	Weight	-.057	.128	.160	1													
5	General Health	-.005	.000	-.142	.328**	1												
6	Household Income	.107	.023	.130	-.156	-.119	1											
7	Personal Income	.199	.228**	.041	-.081	-.040	.692**	1										
8	Education	-.064	-.106	.014	.052	-.088	.282**	.122	1									
9	Food Security 1	-.008	-.162	.051	-.254*	-.340**	.457**	.229*	.276**	1								
10	Food Security 2	.024	-.054	-.109	-.192	-.232*	.431**	.197	.073	.575**	1							
11	Smoking	-.023	-.118	.047	-.114	-.273**	.157	.036	.383**	.323**	.071	1						
12	Stage of Change	-.215	-.069	-.164	.084	-.092	-.057	-.163	-.037	.037	.096	.099	1					
13	Self-efficacy Vegetables	-.183	-.230*	.121	-.044	-.346**	.021	-.001	.053	.088	.106	.040	.022	1				
14	Self-efficacy Fruit	.132	.082	-.130	.036	-.144	-.046	-.121	-.002	-.035	-.058	.033	.215	.382**	1			
15	Vegetable and Fruit Consumption at Program Start	-.316**	-.254*	.117	.094	-.062	-.108	-.154	.255*	.173	-.047	.263*	.188	-.072	.254*	1		
16	Place of Residence	-.267*	-.045	.053	.087	.040	-.382**	-.385**	-.047	-.202	-.200	-.100	-.027	-.154	.269*	.115	1	
17	Seasonality	.222*	-.113	-.143	-.165	-.078	.198	.161	.020	.279	.075	.205	.127	.140	-.108	-.069	-.653**	1

* Correlation is significant at the 0.05 level

** Correlation is significant at the 0.01 level

Inconsistencies in program delivery between the fall and winter test sites also have to be considered as a factor that has possibly influenced the outcomes observed at the end of program. As noted in Section 5.6.1 of this report, program facilitators reported on some program items/activities being omitted or reducing the amount of time spent on activities.

While inconsistencies in delivery between the fall and winter sites may have contributed to the differences in consumption observed by the end of program, the statistical analysis reveals that there is no association between change in consumption and seasonality at the 3 month post program stage. The absence of a significant correlation by the 3 month post stage suggests that the participants were able to overcome the effects of seasonality differences.

Table 31: Fall Cohort and Winter Cohort Food Frequency Comparisons.

Fall Cohort (n=37)			
	Pre-intervention vs. End of Program		
	Pre-intervention	End of Program	Difference
Frequency of vegetable times per day	2.1	2.6	+0.5
Frequency of fruit times per day	1.5	2.2	+0.7
Total frequency of fruit and vegetable servings per day	3.6	4.8	+1.2
	Pre-intervention vs. 3 Month Post Program		
	Pre-intervention	3 Month Post	Difference
Frequency of vegetable times per day	2.1	3.2	+1.1
Frequency of fruit times per day	1.5	3.0	+1.4
Total frequency of fruit and vegetable servings per day	3.6	6.2	+2.5
Winter Cohort (n=54)			
	Pre-intervention vs. End of Program		
	Pre-intervention	End of Program	Difference
Frequency of vegetable times per day	1.9	2.8	+1.0
Frequency of fruit times per day	1.8	3.3	+1.5
Total frequency of fruit and vegetable servings per day	3.6	6.1	+2.4
	Pre-intervention vs. 3 Month Post Program		
	Pre-intervention	3 Month Post	Difference
Frequency of vegetable times per day	1.9	2.7	+0.8
Frequency of fruit times per day	1.8	2.9	+1.1
Total frequency of fruit and vegetable servings per day	3.6	5.6	+1.9

Personal income also appears to be associated with the change in consumption observed at the 3 month post program. The personal income variable was measured using 11 income categories (Table 29). A small positive correlation was found between personal income and change in frequency of consumption at 3 month post program ($r = .23$, $n=82$). The correlation suggests that higher levels of personal income are associated with greater changes in consumption of vegetables and fruit at the 3 month program stage. Although not statistically significant at the end of program stage, personal income was found to have one of the larger correlation values ($r = .20$, $n=82$) relative to the other independent variables.

The observed coefficients for age, weight, general health, household income, food security, smoking activity, and stage of change were not found to be statistically significant. While it

was anticipated that an association would be found between level of education and change in consumption, the correlation was not statistically significant. This is an indication that the participants in this study group were able to achieve similar results regardless of education level. From a program design perspective, the **Take 5** program appears to work well in addressing differences in educational backgrounds.

Level of self-efficacy was found to be associated with changes in vegetable consumption. The self-efficacy variable used a 5 point Likert scale from very unconfident (code 1) to very confident (code 5). A small significant correlation was found between overall situational self-confidence in consuming vegetables and change in consumption ($r = -.23, n=90$). The negative association suggests that lower levels of self-efficacy in vegetable consumption at program start are associated with greater changes in consumption at 3 month post program.

The general observation on confidence as derived from the above analysis is supported by more detailed analysis on specific environmental and emotional situations. An overview of the specific independent self-efficacy variables including descriptive statistics is presented in Table 32.

Table 32: Independent Self-efficacy Variables and Descriptive Statistics

Variable Name and Description	Scale	Mean	Std. Dev.	N
Dependent Variables				
Difference in frequency of consumption of vegetables and fruit: pre-intervention vs. end of program		1.94	2.7	91
Difference in frequency of consumption of vegetables and fruit: pre-intervention vs. 3 month post program		2.19	2.61	91
Independent Variables				
Self-efficacy related to eating enough vegetables in relation to the following environmental or emotional situations. Five point Likert scale from very unconfident (1) to very confident (5)				
when eating alone	1-5	3.7	1.38	91
on weekends	1-5	3.6	1.17	91
when in a hurry	1-5	2.7	1.19	89
when preparation is difficult	1-5	2.6	1.25	91
during the winter when there is less choice	1-5	3.4	1.23	91
when other family members don't want to eat them	1-5	2.9	1.42	91
when at work	1-5	3.2	1.25	89
when dining out	1-5	3.4	1.17	90
when it seems that other foods are less expensive	1-5	3.4	1.18	89
when highly anxious or emotionally upset	1-5	2.3	1.09	89
Self-efficacy related to eating enough fruit in relation to the following environmental or emotional situations. Five point Likert scale from very unconfident (1) to very confident (5)				
when eating alone	1-5	3.8	1.33	90
on weekends	1-5	3.7	1.23	91
when in a hurry	1-5	3.4	1.32	91
when preparation is difficult	1-5	3.1	1.28	91
during the winter when there is less choice	1-5	3.4	1.19	91
when other family members don't want to eat them	1-5	3.3	1.31	90
when at work	1-5	3.6	1.15	90
when dining out	1-5	2.5	1.22	91
when it seems that other foods are less expensive	1-5	3.4	1.21	90
when highly anxious or emotionally upset	1-5	2.5	1.25	91

Table 33 presents the intercorrelations among the two dependent variables and the specific independent variables associated with environmental or emotional situations.

Small significant correlations were found with several environmental and emotional cues associated with vegetable consumption. All of these correlations were negative which suggests that the lower the level of self-efficacy reported at program start, the higher the level of consumption at the end of the program. Specifically, higher levels of consumption at the end of the program were associated with lower levels of vegetable-related self-efficacy at program start in the following situations:

- when preparation is difficult ($r = -.250$, $n=91$)
- during winter when there is less choice ($r = -.318$, $n=91$)
- when at work ($r = -.268$, $n=89$)
- when it seems other foods are less expensive ($r = -.267$, $n=89$)
- when highly anxious or emotionally upset ($r = -.413$, $n=89$)

By the 3 month post program stage only two of the above vegetable-related variables maintained a small significant correlation with change in consumption. The two situations are:

- when it seems other foods are less expensive ($r = -.286$, $n=89$)
- when highly anxious or emotionally upset ($r = -.275$, $n=89$)

No significant correlations were found with the environmental and emotional cues associated with fruit consumption.

Table 33: Correlations Among Dependent and Self-efficacy Related Independent Variables (N= 87-91)

	1	2	3	4	5	6	7	8	9	10	11	12
Dependent Variables												
1	1											
2	.665**	1										
Independent Variables												
Self-efficacy related to eating enough vegetables in relation to the following environmental or emotional situations.												
3	-.150	-.181	1									
4	-.201	-.019	.534**	1								
5	-.103	-.057	.469**	.391**	1							
6	-.250*	-.140	.498**	.310**	.548**	1						
7	-.318**	-.173	.383**	.304**	.268*	.466**	1					
8	-.171	-.077	.339**	.168	.374**	.525**	.367**	1				
9	-.268*	-.157	.337**	.207	.359**	.304**	.357**	.283**	1			
10	-.137	-.044	.072	.141	.207	.261*	.302*	.212	.098	1		
11	-.267*	-.286**	.212*	.046	.131	.365**	.468**	.420**	.277**	.333**	1	
12	-.413**	-.275**	.421**	.348**	.347**	.459**	.383**	.364**	.247*	.301**	.282**	1
Self-efficacy related to eating enough fruit in relation to the following environmental or emotional situations.												
3	-.021	-.009	1									
4	-.069	.093	.772**	1								
5	.148	.133	.648**	.611**	1							
6	-.040	-.050	.590**	.494**	.556**	1						
7	-.080	-.101	.473**	.499**	.485**	.484**	1					
8	-.045	.088	.223*	.227*	.216*	.396**	.362**	1				
9	.072	.057	.428**	.450**	.640**	.365**	.493**	.265*	1			
10	-.099	-.051	.407**	.418**	.322**	.404**	.356**	.267*	.333**	1		
11	-.030	-.072	.330**	.334**	.345**	.364**	.668**	.352**	.434**	.242*	1	
12	-.071	-.042	.529**	.604**	.522**	.547**	.429**	.339**	.300**	.496**	.307**	1

* Correlation is significant at the 0.05 level

** Correlation is significant at the 0.01 level

Regression Analysis

Stepwise multiple regression was used to assess the extent to which the relationships observed between individual independent variables and the dependent variables held true while controlling for other independent variables. Table 34 presents the results of two separate regression analyses corresponding to each of the dependent variables and shows the results that were statistically significant. In each analysis, all 15 independent variables (from Table 29) were included as potential explanatory variables.

Table 34: Stepwise Multiple Regression

Dependent Variable	R	R ² ^a	Independent Variable	Step	β	t
1. Difference in frequency of consumption of vegetables and fruit: pre-intervention vs. end of program	0.65	0.42	Seasonality	1	0.65	6.87
	0.71	0.50	Seasonality Vegetable and Fruit Consumption at Program Start	2	0.96 -0.42	7.25 -3.17
2. Difference in frequency of consumption of vegetables and fruit: pre-intervention vs. 3 month post program	0.66	0.43	Personal Income	1	.66	7.12

^a A zero intercept or constant was forced.

The most important predictor of change in vegetable and fruit consumption between **program start and end of program** is seasonality which accounts for 42% of the variability in results.⁹ Seasonality combined with frequency of consumption at program start accounts for 50% of the total variability. Both of these variables were observed as statistically significant in the bivariate analysis. While the place of residence variable was observed to be statistically significant in the bivariate analysis, it was eliminated once the controlling influence of the other independent variables was introduced.

The most important predictor of change in vegetable and fruit consumption between **program start and 3 month post program** is personal income which accounts for 43% of the variability in results.¹⁰ While the frequency of consumption at program start variable and the overall vegetable self-efficacy variable were observed to be statistically significant in the bivariate analysis, they were eliminated once the controlling influence of the other independent variables were introduced.

The mean average residual from regression for each of the 12 sites (difference between regression predicted outcomes and actual outcomes) was analyzed using the Wilcoxon Signed Ranks Test to estimate overall significance. The test indicates that the differences between predicted vegetable and fruit consumption and actual consumption are not

⁹ The measure reflects the proportion of the variability in the dependent variable about the origin explained by the independent variable.

¹⁰ As above.

significant. As well the 3 month post program predicted increases using regression were not significantly different from the actual values. This indicates that caution should be used in interpreting the regression equations because of the small number of participants and the small cluster number impacting the findings.

5.2.2.7 Unintended Effects - Positive

Based on the key informant interviews, the reach, profile, and prestige of the host organization were enhanced by participation with the **Take 5** pilot program. A number of Agency Administrators felt that the **Take 5** program extended the reach of the organization by bringing in first-time clients and connecting with different cultural groups, and increased community awareness of the other programs offered. For the winter cohort, the pilot was ready to deliver at a time of the year (New Year) when people were more conscious or committed to making some changes to their diet and were looking for this type of program. Agency administrators indicated that the program produced a very positive response from participants. In one case, the **Take 5** program received the most positive comments of any program bring offered. As well, facilitators noted that many women left the program with a positive view of the Health Unit/ CHC.

The **Take 5 Program** provided CHC/Health Unit staff exposure to a comprehensive evaluation process that was “great for staff growth.” The program was also seen as an excellent learning experience for the Community Food Advisors, students and volunteers that assisted in delivering the program. One Administrator viewed the program as a good public relations exercise by demonstrating the Centre’s interest in research.

The program resulted in networking, establishing and/or reinforcing links between the host agency and other community service providers as part of the recruitment and program delivery process. One facilitator indicated that the program prompted a local grocery store to stock more exotic fruits and vegetables based on requests from program participants and their friends. At another site, the program contributed to the establishment of two new locations of good food boxes and a cooking class was started to teach women how to prepare veggies. Several sites expressed interest in developing a post-program support group or self-help process that would allow the participants to continue to network and work on changing their fruit and vegetable consumption patterns.

5.2.2.8 Unintended Effects - Negative

At the organizational level, one of the negative outcomes was that existing programs (i.e. Community Kitchen Program, Baby Food workshop) had to be rescheduled to accommodate the pilot because of limited human resources. Many of the administrators commented that the time requirements of the program resulted in staff working longer hours than anticipated.

5.3 Other Participants

5.3.1 Participants Outside the Target Group

5.3.1.1 Differences Between Eligible and Ineligible Participants

As noted earlier in the report some of the test sites included women outside the program target age range of 24 to 45. A total of 21 participants were in this ineligible group which consisted of women who had children earlier or later in life, grandparents who were caretakers of their grandchildren (who were 14 years of age or younger), and some women who came with friends outside the age group. Nine of the participants were under the age of 25 and 12 participants were over 45 years of age.

In reviewing the results from the Ontario Nutrition and Cancer Prevention Survey the ineligible Take 5 participants had a lower median value in terms of frequency of consumption per day at program start compared to the province - ONCP respondents reported a median value of 4.3 times per day compared to the median value of 2.1 for ineligible Take 5 participants. The ineligible participants also reported a lower median value in relation to the eligible group (median value = 3.3). As shown in Table 35, the ineligible Take 5 group had a much higher percentage of participants in the lower intake categories at program start compared to the eligible group and the provincial profile.

Table 35: Summary of Take 5 Participant Vegetable and Fruit Intake at Program Start Compared to Province.

Vegetable and fruit intake	Ineligible Take 5 participants (n=21)	Eligible Take 5 participants (n=91)	Province of Ontario ^a
0-2 times per day	71%	42%	9%
3-4 times per day	29%	31%	55%
5 or more times per day	0%	27%	36%
Total	100%	100%	100%

^a Ontario Nutrition and Cancer Prevention Survey, 2003.

As shown in Table 36, the difference in pre-program and end of program consumption experienced by this group amounts to 2.9 times per day of vegetables and fruit on average. In comparison to the eligible participants, the ineligible group started with a lower average consumption level at program start and had a higher consumption level by end of program and at 3 month post program. The 3 month post program data indicates that the increase in consumption was maintained at 2.8 times per day on average (Table 37).

Table 36: Food Frequency Questionnaire Results for Ineligible Participants, Pre-intervention vs. End of Program (n=16)

	Pre-intervention	End of Program	Difference
<i>Raw Data</i>			
Frequency of vegetable times per day	1.3	2.5	1.2
Frequency of fruit times per day	0.7	2.5	1.7
Total frequency of vegetable and fruit times per day	2.0	5.0	2.9

Table 37: Food Frequency Questionnaire Results for Ineligible Participants, Pre-intervention vs. 3 Month Post Program (n=13)

	Pre-intervention	3 month post	Difference
<i>Raw Data</i>			
Frequency of vegetable times per day	1.3	2.5	1.2
Frequency of fruit times per day	0.7	2.3	1.6
Total frequency of vegetable and fruit times per day	2.0	4.8	2.8

The data presented on the small group of ineligible participants suggests that there could be different consumption patterns associated with women who are younger than 25 or older than 45. The results point to greater increases in consumption associated with lower levels of consumption at program start. Further research with a larger group of participants is required to determine if there are significant differences between the two groups.

5.3.2 Participants Lost to Attrition (Did Not Complete the Program)

5.3.2.1 Differences Between Participants who Completed and Did Not Complete

Of the 152 participants that began the program 40 participants from ten different test sites did not complete (DNC) the program. The number of DNC participants was almost evenly split between the fall cohort (18 participants) and winter cohort (22 participants) groups. A socio-demographic profile of the DNC group was developed from an analysis of the baseline survey data. The results are presented below and comparisons are made to the group that completed the program.

Age

The average age of DNC participants was 36 years which is the same average age for the group that completed the program. All 40 DNC participants were within the target age range of program. As shown in Table 38, the distribution of DNC participants across four target age cohorts is fairly consistent with the group that completed the program as well as the provincial profile.

Table 38: Distribution of Program Graduates and DNC Participants by Age Cohort ^a

Age Group	Program Graduates		DNC Participants		Ontario ^b
	Total	%	Total	%	Provincial average
25-29 years	13	14.3%	7	17.5%	20.8%
30-34 years	27	29.7%	9	22.5%	23.7%
35-39 years	28	30.8%	12	30.0%	28.0%
40-45 years	23	25.3%	12	30.0%	27.5%
Total 25-45 years	91	100.0%	40	100.0%	100.0%

^a DNC = did not complete the program.

^b Statistics Canada. Population Census 2001.

Marital Status

A smaller majority DNC participants were married compared to the group of participants that completed the program. Approximately 57% of the DNC participants were married compared to 74% for the group of program graduates (Table 39). Single and divorced women made up a larger percentage of the DNC group relative to the group that completed the program.

Table 39: Distribution of Program Graduates and DNC Participants by Marital Status ^a

Marital Status	Program Graduates		DNC Participants		Ontario ^b
	Total	%	Total	%	Provincial average
Married	67	73.6%	23	57.5%	53.4%
Single (never married)	15	16.5%	10	25.0%	30.4%
Separated	7	7.7%	3	7.5%	3.4%
Divorced	1	1.1%	4	10.0%	6.5%
Widowed	1	1.1%	0	0	6.3%
Total	91	100.0%	40	100.0%	100.0%

^a DNC = did not complete the program.

^b Statistics Canada. Population Census 2001.

Persons in the Home 14 Years of Age or Younger

All of the DNC participants have children at home with the exception of one participant. The DNC group had a greater proportion of single child families and a smaller proportion of families with 2 and 3 or more children compared to the graduating group (Table 40). Both groups had approximately 2 children living at home on average which is higher than the provincial family average of 1.2. This difference is expected considering the participant selection criteria to have children.

Table 40: Distribution of Program Graduates and DNC Participants by Number of Children at Home ^a

	Program Graduates		DNC Participants		Ontario ^b
	Total	%	Total	%	Provincial average
Total Families	91		40		
Total families without children at home	1	1.1%	1	2.5%	34.8%
Total families with children at home	90	98.9%	39	97.5%	65.2%
Families with 1 child at home	26	28.9%	16	41.0%	41.3%
Families with 2 children at home	45	50.0%	17	43.6%	40.3%
Families with 3 or more children at home	19	21.1%	6	15.4%	18.4%
Total children at home	183		70		
Average number of children at home per family	2		1.8		1.2

^a DNC = did not complete the program.

^b Statistics Canada. Population Census 2001.

Country of Birth and Years in Canada

A slightly larger proportion of DNC participants, 75%, were born in Canada compared to 70% of the participants that completed the program (Table 41). The large majority of DNC participants (84%) have lived in Canada for more than ten years which is similar to the graduating group with 81% of participants living in Canada for more than ten years. The balance of the participants in both groups have lived in Canada for 1 to 10 years.

Table 41: Distribution of Program Graduates and DNC Participants by Country of Birth ^a

Country of Birth	Program Graduates		DNC Participants		Ontario ^b
	Total	%	Total	%	Provincial average
Canada	64	70.3%	30	75.0%	72.9%
Total Foreign Born	27	29.7%	10	25.0%	27.1%
China	7	7.7%	4	10.0%	1.5%
United Kingdom	4	4.4%	1	2.5%	3.1%
Sri Lanka	1	1.1%	1	2.5%	0.6%
India	1	1.1%	1	2.5%	1.6%
Pakistan	2	2.2%	0	0.0%	0.5%
Russia	1	1.1%	1	2.5%	0.7%
Barbados	2	2.2%	0	0.0%	0.1%
Australia	0	0.0%	1	2.5%	0.1%
Brazil	1	1.1%	0	0.0%	0.1%
Chile	1	1.1%	0	0.0%	0.1%
Columbia	1	1.1%	0	0.0%	0.1%
Guatemala	1	1.1%	0	0.0%	0.1%
Guyana	1	1.1%	0	0.0%	0.7%
Italy	1	1.1%	0	0.0%	1.9%
Korea	1	1.1%	0	0.0%	0.3%
Netherlands	1	1.1%	0	0.0%	0.6%
Syria	1	1.1%	0	0.0%	0.05%
Vietnam	0	0.0%	1	2.5%	0.9%
Other	0	0.0%	0	0.0%	14.0%
Total	91	100.0%	40	100.0%	100.0%

^a DNC = did not complete the program.

^b Statistics Canada. Population Census 2001.

Language Spoken Most Often in the Home

A smaller majority of DNC participants, 71%, reported English as the language spoken most often in the home compared to 82% for the graduating group (Table 42). Approximately 18% of the DNC participants reported French as the language spoken most often in the home. The only non-official language group represented in the DNC group was Mandarin/Cantonese.

Table 42: Distribution of Program Graduates and DNC Participants by Language Spoken Most Often in the Home ^a

Language	Program Graduates		DNC Participants		Ontario ^b
	Total	%	Total	%	Provincial average
English	73	82.0%	27	71.1%	88.8%
French	4	4.5%	7	18.4%	1.7%
Non-Official Languages	12	13.5%	4	10.5%	9.5%
Italian	1	1.1%	0	0.0%	0.7%
Mandarin/Cantonese	6	6.7%	4	10.5%	1.2%
Spanish	2	2.2%	0	0.0%	0.4%
Urdu	3	3.4%	0	0.0%	0.2%
Total	89	100.0%	38	100.0%	

^a DNC = did not complete the program.

^b Statistics Canada. Population Census 2001.

Level of Education

Approximately 32% of DNC participants graduated from University which is similar to the proportion associated with the group of participants that completed the **Take 5** program (Table 43). Both groups have twice as many University graduates as the provincial average of 15%. Both groups also had a lower percentage of participants that did not complete high school compared to the province. However, in comparison to the group that completed the program, the DNC group had a higher proportion of participants that did not complete high school and a higher proportion of participants that only graduated from high school.

Table 43: Distribution of Program Graduates and DNC Participants by Highest Level of Education ^a

Level of Education	Program Graduates		DNC Participants		Ontario ^b
	Total	%	Total	%	Provincial average
Did not complete high school	5	5.6%	4	10.0%	30.1%
High school graduation only	8	8.9%	6	15.0%	15.9%
Some post secondary training/education	50	55.6%	17	42.5%	39.1%
Graduated from University	27	30.0%	13	32.5%	14.9%
Total	90	100.0%	40	100.0%	100.0%

^a DNC = did not complete the program.

^b Women 20 years of age and over. Statistics Canada. Population Census 1996. Education data for the 2001 Population Census was not available from Statistics Canada at the time of this report.

Household and Personal Income

The distribution of DNC participants and program graduates across various household income categories reveals that the DNC group has a higher proportion of participants in the lower household income categories (Table 44). Approximately 38% of DNC participants reported less than \$30,000 in total household income compared to 27% for the group that completed the program. The profile of the graduating group followed the provincial profile more closely than did the DNC group profile.

Table 44: Distribution of Program Graduates and DNC Participants by Household Income ^a

Household Income Groups ^c	Program Graduates		DNC Participants		Ontario ^b
	Total families	%	Total families	%	Provincial average
Less than \$10,000	5	6.0%	4	10.8%	5.0%
\$10,000 - \$19,999	10	11.9%	4	10.8%	8.7%
\$20,000 - \$29,999	8	9.5%	6	16.2%	11.3%
\$30,000 - \$39,999	7	8.3%	4	10.8%	11.5%
\$40,000 - \$49,999	11	13.1%	3	8.1%	11.6%
\$50,000 - \$59,999	11	13.1%	3	8.1%	11.1%
\$60,000 - \$69,999	7	8.3%	5	13.5%	9.9%
\$70,000 - \$79,999	4	4.8%	2	5.4%	8.0%
\$80,000 - \$89,999	3	3.6%	0	0.0%	6.1%
\$90,000 - \$99,999	8	9.5%	3	8.1%	4.4%
\$100,000 or more	10	11.9%	3	8.1%	12.4%
Total families	84	100.0%	37	100.0%	100.0%

^a DNC = did not complete the program.

^b Statistics Canada. Population Census 1996. Household Income data for the 2001 Population Census was not available from Statistics Canada at the time of this report.

^c Household income is the combined incomes of family and non-family persons residing in a private household

The distribution of DNC participants and program graduates across various personal income categories reveals that the DNC group has a lower proportion of participants earning less than \$10,000, 25% compared to 36.6% for program graduates (Table 45). The DNC group had a lower percentage of participants in the under \$10,000 category than the provincial average of 31% while the group that graduated had a higher percentage of participants in the lowest income category. Both groups had a similar proportion of participants earning less than \$30,000 in personal income at approximately 65%.

Table 45: Distribution of Program Graduates and DNC Participants by Personal Income ^a

Personal Income Groups ^c	Program Graduates		DNC Participants		Ontario ^b
	Total	%	Total	%	Provincial average
Without income	0	0.0%	0	0.0%	9.8%
With income	82	100.0%	36	100.0%	90.2%
Less than \$10,000	30	36.6%	9	25.0%	30.9%
\$10,000-\$19,999	15	18.3%	6	16.7%	27.1%
\$20,000-\$29,999	9	11.0%	8	22.2%	17.0%
\$30,000-\$39,999	11	13.4%	5	13.9%	11.8%
\$40,000-\$49,999	10	12.2%	1	2.8%	6.0%
\$50,000-\$59,999	5	6.1%	5	13.9%	3.3%
\$60,000 and over	2	2.4%	2	5.6%	3.8%
Total persons	82	100.0%	36	100.0%	100.0%

^a DNC = did not complete the program.

^b Statistics Canada. Population Census 1996. Personal Income data for the 2001 Population Census was not available from Statistics Canada at the time of this report.

^c Personal income is defined as the income earned by the single respondent.

Site Population

The largest percentage of DNC participants, 42% reside in urban centres where the population is between 100,000 and 499,999 (Table 46). This is comparable to the graduating group. The next largest percentage of DNC participants, 25%, reside in urban centers with a population of 500,00 or more which is also fairly consistent with the graduating group. At 20%, the percentage of DNC participants living in rural areas is almost twice as large as the graduating group. This is also higher than the provincial average with 15% of the population living in rural areas (Statistics Canada, 2001 Population Census).

Table 46: Distribution of Program Graduates and DNC Participants by Site Population ^a

	Population category										Total persons
	500,000 or more		100,000 to 499,999		30,000 to 99,999		Small urban regions ^b		Rural (farm and non-farm)		
	n	%	n	%	n	%	n	%	n	%	
Program Graduates	26	28.6%	39	42.9%	9	9.9%	6	6.6%	11	12.1%	91
DNC Participants	10	25.0%	17	42.5%	2	5.0%	3	7.5%	8	20.0%	40

^a DNC = did not complete the program.

^b Small Urban regions includes cities with a population of 15,000 to 30,000 and small urban areas (under 15,000)

Incidence of Low Income

Based on 2000 LICOs, 73% of DNC households were above the low-income cut-off point while 27% were below the low-income cut-off point (Table 47). The LICO for the graduating group was very similar. Both groups have a higher percentage of participants below the low income cut-off point in comparison to the provincial average of 17.7%.

Table 47: Distribution of Program Graduates and DNC Participants by LICO Status with Provincial Comparison^a

LICO Status	Program Graduates		DNC Participants		Provincial Comparison ^b
	n	%	n	%	
Above the low income cut-off point	62	74.0%	27	73.0%	82.3%
Below the low income cut-off point	22	26.0%	10	27.0%	17.7%
Total valid responses	84	100.0%	37	100.0%	100.0%

^a DNC = did not complete the program.

^b The provincial average is based on 1996 Population Census, Statistics Canada. Census data for 2001 was not available at the time of this report

Other Baseline Data Comparisons

Self-Efficacy and Fruit Consumption

Baseline data reveals that DNC participants were more confident in their ability to consume enough fruit in different situations. Approximately 52% of DNC participants reported that they were very confident at the start of the program compared to 38% of the participants that went onto complete the program (Table 48). The DNC group also had a higher percentage of participants that were somewhat or very unconfident.

Table 48: Self-Efficacy Related to Combined Situational/Emotional Cues for Fruit Consumption – Distribution of Program Graduates and DNC Participants at Baseline^a

Confidence level	Program Graduates		DNC Participants	
	Total	%	Total	%
Very confident	35	38.5%	21	52.5%
Somewhat confident	46	50.5%	12	30.0%
No opinion	4	4.4%	2	5.0%
Somewhat unconfident	5	5.5%	4	10.0%
Very unconfident	1	1.1%	1	2.5%
Total persons	91	100.0%	40	100.0%

^a DNC = did not complete the program.

Self-Efficacy and Vegetable Consumption

Baseline data reveals that DNC participants were also more confident in their ability to consume enough vegetables in different situations. Approximately 42% of DNC participants reported that they were very confident at the start of the program compared to 32% of the participants that went onto complete the program (Table 49). There was only a slight difference between the groups with respect to the proportion of participants that were somewhat or very unconfident.

Table 49: Self-Efficacy Related to Combined Situational/Emotional Cues for Vegetable Consumption – Distribution of Program Graduates and DNC Participants at Baseline ^a

Confidence level	Program Graduates		DNC Participants	
	Total	%	Total	%
Very confident	29	32.2%	17	42.5%
Somewhat confident	45	50.0%	16	40.0%
No opinion	2	2.2%	2	5.0%
Somewhat unconfident	13	14.4%	5	12.5%
Very unconfident	1	1.1%	0	0.0%
Total valid responses	90	100.0%	40	100.0%

^a DNC = did not complete the program.

Stage of Change

At the start of the program approximately 66% of the DNC participants were at the preparation stage while 74% of the program graduates were at this stage (Table 50). While none of the program graduates were at the pre-contemplation or contemplation stage when they entered the program, two DNC participants were at these stages. At the start of the program approximately 25% of the participants in both groups were at the maintenance stage.

Table 50: Stage of Change – Distribution of Program Graduates and DNC Participants at Baseline ^a

Stage of Change	Program Graduates		DNC Participants	
	Total	%	Total	%
Stage 1: Pre-contemplation	0	0.0%	1	2.9%
Stage 2: Contemplation	0	0.0%	1	2.9%
Stage 3: Preparation	56	73.7%	23	65.7%
Stage 4: Action	1	1.3%	1	2.9%
Stage 5: Maintenance	19	25.0%	9	25.7%
Total participants with valid responses	76	100.0%	35	100.0%
Missing data	15		5	

^a DNC = did not complete the program.

Actual Vegetable and Fruit Consumption

The DNC group reported consuming vegetables and fruit more times per day on average at the start of the program than the group that went onto complete the program. At the start of the program DNC participants reported consuming vegetables 2.6 times per day and fruit 2 times per day on average (Table 51). The graduating group reported consuming vegetables 2 times per day and fruit 1.6 times per day on average at the start of the program (Table 51).

Table 51: Food Frequency Questionnaire Results, Program Graduates and DNC Participants at Baseline ^a

<i>Raw Data</i>	Program Graduates	DNC Participants
Frequency of vegetable times per day	2.0	2.6
Frequency of fruit times per day	1.6	2.0
Total frequency of vegetable and fruit times per day	3.6	4.6
Total valid responses	91	40

^a DNC = did not complete the program.

Food Security

The results from several food security questions included in the baseline questionnaire indicate that a larger percentage of DNC participants have more severe food security issues. As shown in Table 52, approximately 12% of DNC participants reported that they often run out of food because of insufficient funds compared to 8% for the group that completed the program. A related question on eating balanced meals indicates that 12% of DNC participants reported that they often cannot afford to eat balanced meals in comparison to 3% of the group that completed the program.

Table 52: Participant Food Security Status - Program Graduates and DNC Participants at Baseline ^a

Program Graduates							
Statements on food security	In the last 12 months was this statement...						Total valid responses
	Often true		Sometimes true		Never true		
	n	%	n	%	n	%	n
"I ran out of the food I bought and I didn't have money to get more"	7	7.7%	28	30.8%	56	61.5%	91
"I couldn't afford to eat balanced meals"	3	3.3%	27	30.0%	60	66.7%	90
DNC Participants							
Statements on food security	In the last 12 months was this statement...						Total valid responses
	Often true		Sometimes true		Never true		
	n	%	n	%	n	60	n
"I ran out of the food I bought and I didn't have money to get more"	5	12.5%	11	27.5%	24	61.5%	40
"I couldn't afford to eat balanced meals"	5	12.5%	9	22.5%	26	65.0%	40

^a DNC = did not complete the program.

Summary Findings

The above analysis provided an overview of the differences in socio-economic characteristics between the group of participants that completed the program and the group of participants that did not complete the program.

The following summary observations speak to the differences between the two groups as revealed in the data collected from the baseline questionnaires. Relative to the group of participants that completed the **Take 5** program, *the group of participants that did not complete the program* had:

- A higher proportion of single and divorced participants and a lower proportion of married participants.
- A higher proportion of single child families.
- A higher proportion of participants using French as the language spoken most often in the home.
- A higher proportion of participants that did not complete high school as well as a higher proportion of participants that only graduated from high school.
- A higher proportion of participants with lower household incomes.
- A higher proportion of participants from rural areas.
- A higher proportion of participants with high levels of self-efficacy.
- At lower proportion of participants at the preparation stage and a higher proportion at the contemplation and pre-contemplation stage at the start of the program.
- A higher frequency of both vegetable and fruit consumption.
- A higher proportion of participants with more severe food security issues.

5.4 Efficiency

Cost, or cost-effectiveness and cost-benefit, influences several RE-AIM dimensions in addition to adoption; for example, cost is usually related to intensiveness of intervention which is often related (positively) to efficacy and (negatively) to Implementation. It is important to remember that many agencies devote their resources to programs that have not been evaluated to demonstrate their efficaciousness.

5.4.1 Investment by Cancer Care Ontario

Cancer Care Ontario provided seed money for the twelve pilot sites to implement and deliver the **Take 5** program. Approximately \$25,866 in seed funding was utilized by the 12 sites. As shown in Table 53, the seed funding covered a variety of costs associated with all three phases of the pilot program: initial organization, program implementation, and post program implementation (3 month post evaluation). Seed funding associated with the organization and implementation phases alone amounted to approximately \$23,000.

Table 53: Program Costs and Staff/Volunteer Time at Twelve Pilot Sites

	Total amount of seed money spent	Total value of in-kind contributions	Total cost	Average cost per site	Average cost per participant recruited
Initial Organization Phase					
Staffing/Human Resources	\$180	\$18,744	\$18,924	\$1,577	\$116
Printing/Supplies	\$1,128	\$900	\$2,028	\$169	\$12
Recruitment of participants (advertising)	\$2,556	\$1,440	\$3,996	\$333	\$25
Other	\$348	\$60	\$408	\$34	\$3
TOTAL	\$4,212	\$21,144	\$25,356	\$2,113	\$156
Implementation Phase					
Staffing/Human Resources	\$936	\$21,072	\$22,008	\$1,834	\$135
Printing/Supplies	\$2,364	\$600	\$2,964	\$247	\$18
Meeting Space (rental or in-kind)	\$1,308	\$4,068	\$5,376	\$448	\$33
Transportation	\$1,248	\$12	\$1,260	\$105	\$8
Childcare	\$4,752	\$432	\$5,184	\$432	\$32
Other incentives	\$4,284	\$0	\$4,284	\$357	\$26
Other (food)	\$3,852	\$216	\$4,068	\$339	\$25
TOTAL	\$18,744	\$26,400	\$45,144	\$3,762	\$277
TOTAL - Organization & Implementation Phase	\$22,956	\$47,544	\$70,500	\$5,875	\$433
Post-Implementation Phase					
Staffing/Human Resources	\$804	\$2,556	\$3,360	\$280	\$21
Printing/Supplies	\$0	\$216	\$216	\$18	\$1
Meeting Space (rental or in-kind)	\$168	\$504	\$672	\$56	\$4
Transportation	\$96	\$12	\$108	\$9	\$1
Childcare	\$408	\$144	\$552	\$46	\$3
Other incentives	\$1,236	\$0	\$1,236	\$103	\$8
Other (food)	\$192	\$36	\$228	\$19	\$1
TOTAL	\$2,904	\$3,468	\$6,372	\$531	\$39
TOTAL - All Phases	\$25,860	\$51,012	\$76,872	\$6,406	\$472

5.4.2 Investment by Pilot Site Organizations

The pilot test sites contributed goods/services in-kind. The total value of the in-kind contributions provided by the 12 pilot sites amounted to approximately \$51,000. This represents 66% (\$51,012/\$76,872) of the total PILOT costs. Within the in-kind contribution component, 83% (\$42,372/\$51,012) of the contribution was in the form of staffing which was provided by the host agency. The balance of in-kind contributions, 17%, included items such as use of meeting space, office supplies and food.

When you consider the in-kind contribution of staff relative to the total value of staff (in-kind + seed money) over the 3 phases, 95% (\$42,372/\$44,292) of the staffing cost was covered by the in-kind contribution.

Public health units and Community Health Centres are the agencies that were targeted in the pilot test and they represent the most likely agencies to offer the **Take 5** program. Public Health units and CHC's have staff time paid as part of their overall, ongoing budget, and this is a fixed cost of running the agency, for the most part. Since the staff time is paid for regardless of what types of program the agency is running, the cost of offering the **Take 5** program is reduced considerably when you factor these costs out of the delivery.

A reasonable estimate of the agency cost to offer the **Take 5** program has been approximated using only the organization and implementation phase costs from the pilot sites. The average cost to offer the program is \$5,875 per session. The average cost per participant recruited is \$433 per session (Table 53).

There is little in the literature in which to compare these costs. They are provided as a baseline measure of costs and it is hoped that future evaluations of program will measure these types of costs in a consistent manner so that comparisons can be made.

5.5 Adoption

Adoption of health behaviour interventions is defined as the absolute number, proportion, and representativeness of settings and intervention agents who are willing to initiate a program. In order for an intervention to have any impact, it must first be adopted at the organizational level. Adoption of interventions varies among settings based on the number of resources, level of expertise, and commitment to intervention programs.

Using the learnings from best practices (Sahay, Rootman, Ashbury, 2002) and using a participatory planning approach, the development of the **Take 5** program was undertaken with local, provincial and national stakeholders to identify complementary initiatives and resources in vegetable and fruit promotion. While the 5-to-10 a day: are you getting enough? social marketing campaign, sponsored by the Canadian Cancer Society, Heart and Stroke Foundation, and the Canadian Produce Marketing Association, was under way to promote in vegetable and fruit consumption, stakeholders indicated a resounding need for a complementary behaviour change program. A provincial working committee of pilot sites and partner organizations met together with one mutually desired outcome: an evaluated behaviour change intervention shown to increase vegetable and fruit consumption that would be adopted and implemented by many partners.

As the **Take 5** program was a population-based program focusing on the primary prevention of chronic disease, it was piloted with agencies known for offering population-based programming focusing on the primary prevention of chronic disease - public health units and community health centres (CHC's). Subsequent determinations of **Take 5** adoption should

include agencies with a similar mandate and demonstrated ability to conduct population-based programming within their community.

CHC's and public health units across Ontario were invited to submit proposals to apply to be a pilot site. Selection criteria included geographic profile (in order to represent the North/South, East/West, Urban/Rural dichotomies of the province) and community characteristics (Francophone, Multicultural, Aboriginal) to ensure representativeness of the participant sample. As well, the agencies had to demonstrate the establishment community partnerships/coalitions (food security, heart health/cancer prevention) and other complementary interventions (e.g. community at-large, small group education, food service establishments) that would provide environmental support to the **Take 5** program. Twelve pilot sites were chosen out of fifteen submissions. Other determining factors included stable staffing complement since the focus group part of the pilot phase was over one year in length. They represented the diversity, opportunities, and challenges faced by agencies in Ontario. The amount of funding available dictated the total number of pilot sites. Five CHC's (out of a total of 55 CHC's in Ontario) and seven public health units (out of a total of 37 in Ontario) were chosen. Differences in adoption may occur due to agency capacity in establishing and maintaining these important environmental supports. As well, differences may also occur due to the number and availability of resources and local level of expertise in recruiting and facilitating population-based programs. As this was a pilot program, the absolute number or proportion of sites that will adopt **Take 5** cannot be predicted with certainty. However, 9% of the CHC's were involved and 19% of the public health units were involved in the pilot provincially. Criteria that indicated an agency would be a good candidate for participating in the pilot program also indicate the capacity for an agency to adopt and implement the program with success. Constituents in both CHC's and public health units have been apprised of the **Take 5** developments over the course of the pilot through newsletter articles and presentations at conferences. To date, no population health nutrition intervention has been as extensively and rigorously evaluated in Ontario, so considerable awareness and expectation has developed over the past two years that has elapsed in the program development and pilot. A "buzz" has developed among agency personnel through formal and informal communication networks in anticipation of the evaluation results and, if the evaluation demonstrates success, the provincial dissemination of the program.

Key informant interviews with agency administrators indicated that many of the sites regularly conduct community needs assessments and/or strategic reviews and/or work with external agencies/service providers to identify community needs. The decision to proceed with a program was made based on the capacity to respond based on human and physical resources, availability of time, and ability to provide the service within budget and through discussions with staff to determine interest. .. Agency administrators indicated **Take 5** was a 'good fit' with their organization mandate, was well received by staff, and complimented other food and nutrition-related programs being offered at the various sites. Staff monitored attendance in other programs and assessed what participants are interested in and this information was used to determine whether or not to continue to offer the program. Program attendance and retention was high across all the pilot sites, based on each agencies local experience and local dropout rates. Based on key informant interviews with the facilitators

and review of feedback provided by the participants, both the facilitators and participants found the program stimulating and a rewarding experience.

A higher probability of adoption of **Take 5** exists for Ontario public health units as they are mandated to provide their communities with programming according to the Mandatory Health Programs and Services Guidelines. While these Guidelines are currently under revision, **Take 5** does address the directional disease, behavioural and policy objectives of a recent draft which include “(t)o increase the proportion of youth and adults (12 years and over) consuming five or more servings of vegetables and fruit daily to 75 per cent by 2010” (Draft #11. Provided by Dr. Robert Kyle to the Ontario Collaborative Group on Diet and Cancer). **Take 5** is the only program conducted and evaluated in Ontario that will facilitate reaching this goal. While that does not negate the use of other programs, it does demonstrate that the pilot program has worked with a diversity of health units and communities throughout Ontario.

While not mandated to provide specific services under the Mandatory Health Programs and Services Guidelines, CHC’s are vehicles for health promotion including primary care, health education, individual advocacy, community development, social action, building healthy public policy, and creating supportive environments. CHC’s provide accessible primary health care and health promotion services in communities where many people have a high risk of ill health or to individuals and families with significant access issues their ethnicity, income or other determinants of health. Health centres serve all people within their catchment area but have particular expertise in serving people who have difficulty accessing other health services. Regardless of the type of isolation or access issues, communities served by CHC’s often have broader food and nutrition concerns. In the context of community development and creating a supportive local environment for health, a program that encourages increased consumption of vegetables and fruit, such as **Take 5**, is attractive for CHC’s to offer and the pilot demonstrates a successful program among catchment areas.

5.6 Implementation

In the RE-AIM framework, implementation considers three components: fidelity to the various elements of an intervention's protocol (including the consistency of delivery as intended), the time invested in the intervention, and cost of the intervention. Implementation goes beyond the reporting on what process objectives were achieved. The implementation criterion has a greater focus on the intervention setting and what staff delivering the program did rather than on what the individual participant did. While both are important, RE-AIM places emphasis on the organizational level impact and potential implications for delivering intervention in applied settings, and on assessing implementation for different components of the program and across diverse intervention staff. Assessment of cost and specific staff time commitments associated with intervention implementation is important for other agencies in determining whether to try a program initially and then continue to offer it.

5.6.1 Consistency in Program Delivery

As part of the evaluation of **Take 5**, facilitators completed a journal after each session, answering specific questions on session preparation regarding program delivery and content. This self-report provided the information on facilitator fidelity to the various elements of an intervention's protocol. While all facilitators indicated that they followed the program as outlined, further reading of the journals' comments indicated that some program items/activities were omitted or the amount of time spent on them was minimized.

One of the few examples of deviation in program delivery occurred in relation to the use and ongoing review of the behaviour change strategies. One facilitator noted that the weekly goal setting was “repetitive”, another didn't discuss progress with goals, and another omitted the “self-reflection” portion of an activity done by participants on the pro's and con's of eating vegetables and fruit. Among the facilitators at the twelve pilot sites, ten facilitators were Registered Dietitians, one facilitator was a paid Peer Nutrition Worker, and one was a volunteer Community Food Advisor. The background of the facilitator may have influenced fidelity as a number of facilitators did not have had much familiarity with behaviour change principles and strategies nor the experience delivering a behaviour change intervention.

The importance and need for specific training of personnel delivering the **Take 5** program is underscored. The behaviour change strategies are as important as the nutrition information in order to see an increase in overall vegetable and fruit consumption. While a one-day training session was conducted centrally with all the pilot site facilitators and evaluators before the pilot began, half of the day was focused on the evaluation component of the pilot which was essential in order to determine the programs' effectiveness and impact. Feedback from facilitators indicated that training was needed on behaviour change theory and strategies, a new approach for many, and more detailed time spent on each module and its behaviour change activities. Their input specified that they would like to receive the **Take 5** materials ahead of time to read before attending a two-day workshop; the first day would focus on behaviour change theory and concepts and the second day would be spent on the modules. Training would reinforce the necessity for review of the specific behaviour change strategies over the six sessions during class time and reinforce participant experiences (goal setting, positive reinforcement, self-monitoring, self-reflection, self-talk).

Training is particularly important when it comes to the use of positive reinforcement to reward a desired behaviour. While rewarding a person for a desired behaviour, in this case, the consumption of vegetables and/or fruit is a basic construct within behaviour change strategy, it does defy a long-standing belief of many nutrition personnel of **not** providing a reward for eating healthy food. One facilitator noted “I did not like suggesting ‘rewarding oneself (or kids) for eating vegetables, such as a movie’. That goes against all that we are aiming for! Those kinds of rewards are not sustaining! Rewards should be intrinsic.” The program recommended small **non-food** incentives to reward immediately the positive behaviour of eating vegetables and fruit. It was important for participants to identify non-food rewards that were meaningful to them. Additional time spent in training would reiterate that this extrinsic reward reinforces the desired behaviour change initially. Only once a positive connection is created from eating vegetables and fruit does the reward becomes

intrinsic. Indeed, feedback indicated that positive reinforcement challenged the strongly held belief against rewarding people for eating healthy food and many facilitators did not encourage this practice. While intrinsic rewards are eventually established with the **Take 5** program, they are initiated through extrinsic rewards. Therefore the Leader's manual is also being improved with additional information in this area.

5.6.2 Use of Program Incentives

Each pilot site received funding from Cancer Care Ontario to support the development and implementation of **Take 5** ranging from \$3,000 to \$5,000 per site. Costs such as conducting the focus group, recruitment of participants, childcare, reimbursement of transportation expenses, incentives, snacks and vegetables and fruit for the sessions were determined by the site depending on local needs and customs and were paid for with this funding. Many sites used a combination of free incentives and purchased ones.

Incentives were used in three ways during the pilot. They were given as rewards for behaviours accomplished as part of the behaviour change strategy. In the Leader's Manual, solicitation of small, free incentives was encouraged from community agencies and businesses. Because this was a pilot project, incentives were used to encourage attendance in order to provide weekly participant feedback on the sessions. Incentives also acknowledged the response burden of an in-depth questionnaire (110 questions) that was completed three times by participants – before the program began, immediately after the program was completed, and 3-months post program.

Food samples and snacks were consistently reported as a very popular incentive, especially exotic fruits. Transportation tokens and childcare were viewed as essential in a number of sites as a way of reducing barriers to participation. Cash honorariums and food vouchers/grocery store coupons for questionnaire completion were viewed as very important in attracting women from lower-income groups.

A variety of other inexpensive or free incentives were offered including: kitchen utensils such as peelers, scrub brushes, pot holders, cutting boards, oven mitts, fridge magnets, grocery store pads, lunch bags, cookbooks and recipes, and gift certificates for a variety of things including cooking classes. Participants at one site were very interested in the Good Food Boxes that were given out as incentives as well as the “multicultural meals” that were prepared and served as supper before each session started. A number of sites offered special incentives for attending the last session and/or participating in the evaluation (Mikasa Crystal dish, quality cutting board). Some sites offered a draw for a large prize (Cuisinart) as part of the final evaluation session. The amount and cost of incentives would be significantly less after the pilot is finished, as sites would only require small reward items for behaviours accomplished and not for program evaluation research. While the pilot project allowed sites, at their discretion, to provide a “Cadillac” version of incentives, many facilitators indicated that the program could be done with free or “Chevrolet” incentives.

Opinions varied on the importance of incentives in attracting and maintaining participants. Facilitators noted that many participants attended the program because they enjoyed the

program and wanted to learn about fruits and vegetables and ways to change their eating habits. As well, many women enjoyed the social support and the opportunity to meet with other women to share ideas and experiences.

5.6.3 Implementation in Relation to Other Programs

Preparation time for the program varied among facilitators and was dependent on how experienced and comfortable facilitators felt delivering programs. Facilitators noted that the delivery of most new programs require more hours than initially planned. However, many facilitators felt that less time would be required to prepare for the sessions if offered again now that they are familiar with the program and the resources needed.

5.7 Maintenance

Maintenance is defined as the extent to which a program becomes institutionalized or part of the routine organizational practices and policies. While not possible to determine during the pilot-phase of an intervention, conditions which facilitate or hinder maintenance can be determined. At the individual level, maintenance is defined as the long-term effects of a program on outcomes after 6 or more months after the most recent intervention contact. Due to funding limitations, initial plans to conduct questionnaires at 6 and 12 months post-session were not realized. However, there is a significant opportunity for subsequent research in this area at both the individual and organizational level after **Take 5** is provincially disseminated

5.7.1 Opportunities/Challenges for Subsequent Program Delivery

Key informant interviews with agency (host site) administrators and program facilitators were conducted to assist in identifying technical assistance and training needs to improve the quality of program delivery and support local and province wide maintenance of the program.

In most of the test sites the **Take 5** program was viewed as a good fit with the agency mandate. In many cases the program complimented other food-related programs being offered. As noted by one health centre administrator “the Take 5 program helped augment existing fruit and vegetable promotion activities by providing an education and skills building component related to fruits and vegetables.” Where the program was promoted among other agency staff it was well received.

The program resulted in networking and establishing/reinforcing links between Health Centres/Units and other community service providers as part of the recruitment and program delivery process. Agency administrators and program facilitators identified a number of opportunities for partnering with other local organizations in delivering the **Take 5** program. Community Health Centres and Public Health Units were the organizations identified most often as potential partner organizations for program delivery. Other potential partners for recruiting participants and/or program delivery include:

- Women's groups such Women's Institute
- Hospitals
- YWCA / Recreation Centres / Community Centres
- Local Schools, Community Education Centres, Community Colleges
- ESL Organizations
- Child Care Centres
- Multicultural Centres / Newcomer Orientation Centres
- Community Food Advisors
- Grocery Stores
- Libraries
- Other Social Service providers

Organizations that have access to volunteers could also be included in certain aspects of the program (recruiting, session preparation, transportation, childcare). However, agency administrators stressed that the volunteer activities and roles need to be delineated so that the partnership is meaningful and fits with the program and agency mandate.

Most site administrators indicated that the agency provided human resources as the largest of their in-kind contributions. However, facilitators also felt that the human resource time commitment would be reduced with subsequent offerings of the program as facilitators become more familiar with the program and resources and less time would be spent on evaluation.

Many of the test sites indicated that the **Take 5** Program created a demand for subsequent offerings of the program. As noted by one administrator "participants were very sad to see it end, they enjoyed it very much." Many of the participants indicated they would recommend the program to family members and friends. One site is considering partnering with an Early Years program if it runs the program again. There was also interest in examining opportunities for offering the program at worksites. Another site reported on men who contacted the organization to enroll but had to be turned away because of the participant criteria. Opportunities were also seen for tailoring the program to specific cultural groups.

The program was clearly popular with the participants as indicated by the participant completion rates and the many positive comments that were provided by participants. Program facilitators noted that completion rates for the **Take 5** program were equal to or better than other programs being offered. Several sites did not have a similar programs to make comparisons with but were impressed with the completion rates considering the six week commitment required to complete the program.

One administrator suggested that host sites need to ensure that the program is not limited to highly motivated members of the community. Strategies for recruiting individuals who are consuming few fruits and vegetables need to be explored and promoted.

Several sites expressed an interest in developing post program support groups or some form of self help process that would allow participants to continue to network and work on changing their fruit and vegetable consumption patterns.

5.7.2 Opportunities/Challenges for Province-wide Implementation

Agency administrators and program facilitators felt that funding would be needed for program related expenses such as food samples, childcare and transportation.

Administrators and program facilitators felt the opportunities for implementing the program on a wider basis would be limited by the number of sites that had adequate facilities and qualified staff for the various session activities. Some sites were better equipped than others in terms of providing facilities that featured a kitchen, meeting space and childcare facilities. While most organizations were able to provide these facilities at their own offices, several organizations made off-site arrangements for presenting program sessions. One site for example utilized a local grocery store as the meeting space. The store provided childcare (as part of customer service) and a kitchen area.

The **Take 5** program manual is currently being translated into French. Administrators and program facilitators identified this as an important requirement for enabling other segments of the population to access the program. It was also suggested that select elements of the program modules (i.e. recipes) could be translated into other languages based on specific community needs and demographic trends.

Agency administrators and program facilitators identified areas for improvement in training. It was suggested that program materials should be provided to organizations in advance of the training session to review and prepare questions. As well, it was suggested that more time be devoted to reviewing/discussing each individual module and behaviour change strategies at the training session. This would help to ensure consistent delivery of the program at the various sites and possibly reduce the number of questions coming in from the sites.

Administrators suggested that a firm protocol be put in place before moving to a province wide roll-out. It was suggested that the core or essential elements of each module be identified to ensure that these elements are covered in the event of time and human resource limitations.

6.0 Conclusions

Final results from the evaluation of the **Take 5: 5-10 a day... your way** program indicate a positive change in vegetable and fruit consumption. Total vegetable and fruit consumption increased from 3.6 times per day on average at program start to 5.6 times per day on average. The increase in consumption was 3 times higher than expected based on the literature, which reported an overall increase of 0.6 times per day as an indication of success. Furthermore, the increase in consumption of vegetables and fruit was increased to 5.8 times per day on average at the 3-month post program stage.

Correlation analysis revealed a number of small significant associations between changes in vegetable and fruit consumption and various independent variables. Given that the participants were not selected at random from the eligible provincial population we were unable to determine if these results are significant for the province as a whole.

Participants who reported lower levels of vegetable and fruit consumption at program start experienced greater increases in consumption by the end of the program. They also experienced greater increases in consumption between the end of the program and 3 months after the program.

Place of residence appears to be associated with the change in consumption observed at end of program. This variable speaks to the degree of urbanization associated with the location of the test site. The small significant correlation suggests that the more rural the site the greater the change. However, the absence of a significant correlation by the 3 month post program stage suggests that participants were able to eventually overcome the effects of place of residence.

The time of year the program was offered also appears to have an influence on the change in consumption by the end of the program. A small significant correlation pointed to the winter group experiencing a greater increase in consumption compared to the fall group. Once again though, the absence of a significant correlation by the 3 month post program stage suggests that participants were able to overcome the effects of any seasonal variation.

Personal income appears to be associated with the change in consumption observed at the 3 month post program. A small positive correlation was found between personal income and change in frequency of consumption at 3 month post program which suggests that higher levels of personal income are associated with greater changes in consumption of vegetables and fruit at the 3 month program stage.

A small significant correlation was found between overall situational self-confidence in consuming vegetables and change in consumption. The negative association suggests that lower levels of self-efficacy in vegetable consumption at program start are associated with greater changes in consumption at 3-month post program.

The general observation on confidence as noted above is supported by more detailed analysis on specific environmental and emotional situations. Small significant correlations were

found with several environmental and emotional cues associated with vegetable consumption. All of these correlations were negative which suggests that the lower the level of self-efficacy reported at program start, the higher the level of consumption at the end of the program. Specifically, higher levels of consumption at the end of the program were associated with lower levels of vegetable-related self-efficacy at program start in the following situations:

- when preparation is difficult
- during winter when there is less choice
- when at work
- when it seems other foods are less expensive
- when highly anxious or emotionally upset

By the 3 month post program stage only two of the above vegetable-related variables maintained a small significant correlation with change in consumption. The two situations are:

- when it seems other foods are less expensive
- when highly anxious or emotionally upset

No significant correlations were found with the environmental and emotional cues associated with fruit consumption.

The observed coefficients for age, weight, general health, household income, food security, smoking activity, and stage of change were not found to be statistically significant. While it was anticipated that an association would be found between level of education and change in consumption, the correlation was not statistically significant. This is an indication that the participants in this study group were able to achieve similar results regardless of education level. From a program design perspective, the **Take 5** program appears to work well in addressing differences in educational backgrounds.

Stepwise multiple regression was used to assess the extent to which the relationships observed between individual independent variables and the two dependent variables held true while controlling for other independent variables.

The most important predictor of change in vegetable and fruit consumption between **program start and end of program** is seasonality which accounts for 42% of the variability in results.¹¹ Seasonality combined with frequency of consumption at program start accounts for 50% of the total variability. Both of these variables were observed as statistically significant in the bivariate analysis. While the place of residence variable was observed to be statistically significant in the bivariate analysis, it was eliminated once the controlling influence of the other independent variables was introduced.

¹¹ The measure reflects the proportion of the variability in the dependent variable about the origin explained by the independent variable.

The most important predictor of change in vegetable and fruit consumption between **program start and 3 month post program** is personal income which accounts for 43% of the variability in results.¹² While the frequency of consumption at program start variable and the overall vegetable self-efficacy variable were observed to be statistically significant in the bivariate analysis, they were eliminated once the controlling influence of the other independent variables were introduced.

The mean average residual from regression for each of the 12 sites (difference between regression predicted outcomes and actual outcomes) was analyzed using the Wilcoxon Signed Ranks Test to estimate overall significance. The test indicates that the differences between predicted vegetable and fruit consumption and actual consumption are not significant. As well the 3 month post program predicted increases using regression were not significantly different from the actual values. This indicates that caution should be used in interpreting the regression equations because of the small number of participants and the small cluster number impacting the findings.

Other findings worth note are the following. The evaluation study revealed a positive change in motivational readiness as two-thirds of program participants advanced a stage on the stage of change scale by the end of the program. The study also found that the majority of participants experienced an improvement in self-efficacy in relation to consuming vegetables and fruit in different situations. The program was successful in terms of its retention and completion rate as 76% of the participants that were initially recruited for the program went on to complete the program.

¹² As above.

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Appendices

Appendix A: Precede Model

Appendix B: RE-AIM Framework

Appendix C: Program Logic Model

Appendix D: Community Profile of each Test Site

APPENDIX A: Precede Model

Phase 5: Administrative and Policy Assessment

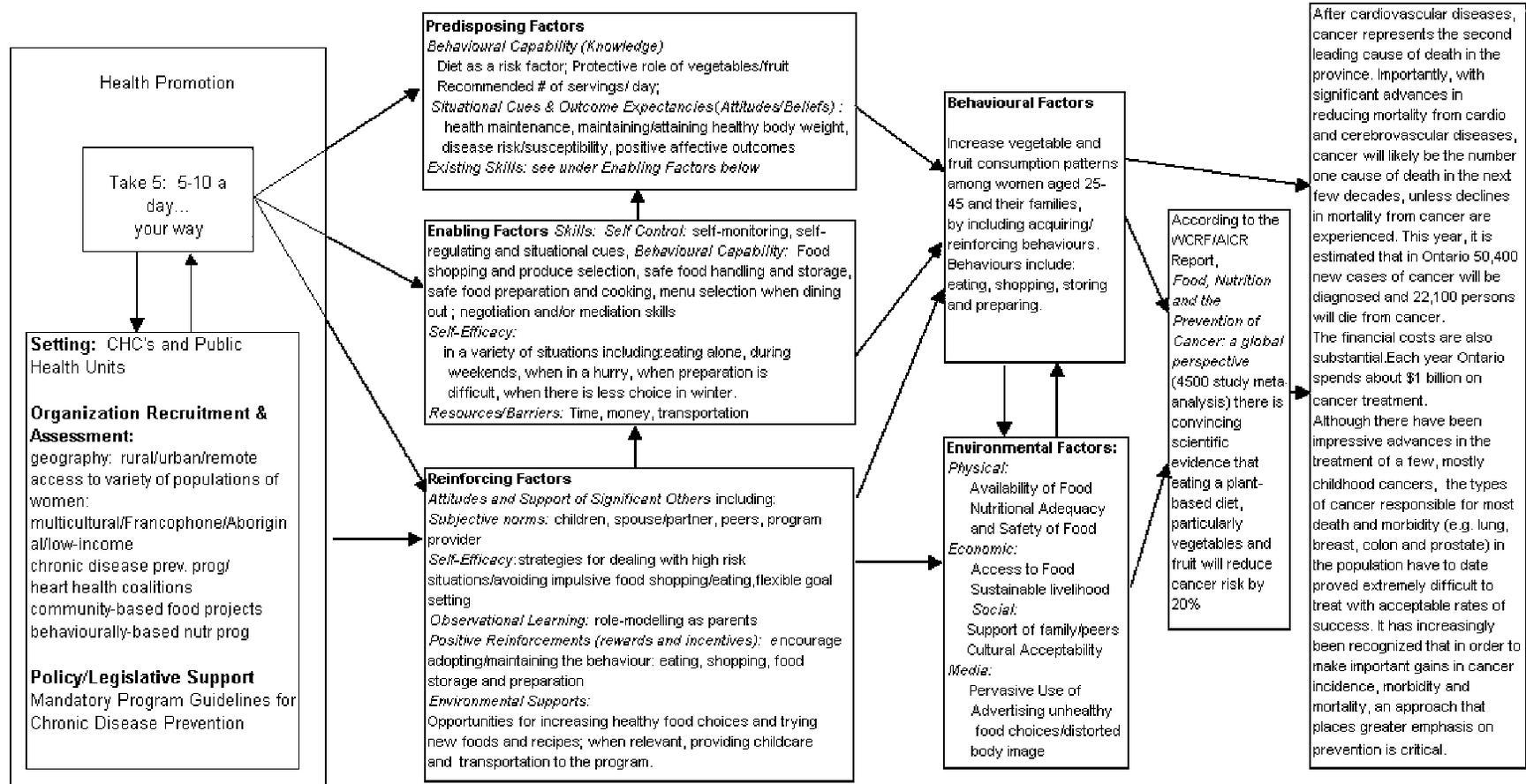
Phase 4: Educational and Ecological Assessment

Phase 3: Behavioural and Environmental Assessment

Phase 2: Epidemiological Assessment

Phase 1: Social Assessment

Precede



Proceed

Phase 6: Implementation

Phase 7: Process Evaluation

Phase 8: Impact Evaluation

APPENDIX B: RE-AIM Framework

Evaluating the Public Health Impact of Health Promotion Interventions: The RE-AIM Framework

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Abstract

Objectives and Rationale: Progress in the area of community-based and public health interventions has been hampered by the lack of a consistent, comprehensive framework appropriate to these kinds of programs. Multi-level interventions that incorporate policy and environmental interventions as well as those with an individual focus often are not amenable to classic randomized double blind, dose-response evaluations. They must be evaluated using measurements suited to their goals and purpose.

Methods and Results: This paper proposes dimensions for such measures: The RE-AIM framework focuses on Reach, Efficacy, Adoption, Implementation, and Maintenance dimensions for evaluating a public health intervention. The central thesis is that these dimensions, which occur at different levels (e.g., individual, clinic or organization, community), some of which are rarely evaluated, interact to determine the overall public health or population based impact of an intervention.

Discussion and Conclusions: We describe issues involved in using each of these dimensions, as well as methods for displaying results and combining the dimensions to determine the public health impact. Failure to adequately evaluate public health programs on all of these dimensions leads to a waste of resources, discontinuities between stages of research, and failure to improve public health to the limits of our capacity. It may also lead to harm because the potential reach of population-based programs means that negative, as well as positive, effects of programs are magnified. The discussion addresses strengths and limitations of the proposed model and areas of recommended future research and application of the RE-AIM framework..

Evaluating the Public Health Impact of Health Promotion Interventions: The RE-AIM Framework

The field of health promotion has made substantial progress over the past two decades. Important advances have been made in conceptual models and theories of human ¹⁻⁴ and in cost-effective interventions.⁵⁻⁷ Social and structural changes such as the implementation of clinical information systems and the emergence of prevention standards offer great potential to increase accountability and quality of care.^{8,9} Information technology has enormous promise for improving the delivery of personalized behavior change interventions to an unprecedented number of persons.¹⁰⁻¹³

However, our ability to recognize and respond to these advances, and to fully explore the potential of conceptual, intervention and technological innovations is limited by the methods we use to evaluate our programs. We now have the potential to evaluate comprehensively the public health and population-based (intent to treat) impact of our programs. However, with a few exceptions, most evaluations to date have restricted their focus to one or two of five “dimensions of quality” we believe to be important.

Rationale

In their comprehensive synthesis of the literature on worksite and community-based public health interventions, Sorensen, Emmons, and Dobson ¹⁴ called for the development of new methods to evaluate the public health significance of intervention programs. They presented a persuasive argument that the efficacy-based research paradigm that dominates our current research journals is limiting, and not the only, or even always the appropriate, standard to apply.

One of the consequences of our present reductionistic scientific ¹⁵⁻¹⁷ is its tendency to oversimplify intervention issues in the quest to isolate and identify efficacious treatments. In particular, the emphasis in most clinical trials on eliminating potential confounding variables results in samples of very homogeneous, highly motivated, healthy individuals without any health conditions other than the one being studied, and free of possible contraindications. There is nothing inherently wrong with this approach, but from an external validity perspective it often results in samples of predominantly highly educated, relatively affluent, and nonrepresentative white males.^{18,19}

Similarly, the emphasis on developing clinically significant, powerful, efficacious treatments often produces interventions which are intensive, expensive, and demanding of both patients and health care providers.²⁰ These interventions tend to be studied in the rarified “controlled” atmosphere of tertiary specialty treatment centers using highly standardized protocols. This “efficacy” paradigm ²¹ is not, however, the optimal way to develop and test interventions that are feasible or practical to apply in busy, underfunded and understaffed public health clinics, hospitals, or community-based programs.

Our cultural emphasis on producing immediate results focuses attention on interventions such as pharmaceutical agents that produce outcomes within a short period of time, and whose onset, offset and dosage can be easily defined and controlled. In contrast, there is little

research focus on identifying interventions that are long lasting, that can remain in place or become ‘institutionalized’.²²⁻²⁵ It is ironic, although understandable, that many of the most convincing demonstrations of treatment efficacy find that the interventions which prove so efficacious – and occasionally even cost-effective -- are abandoned or not maintained by the very settings in which their efficacy is demonstrated.²⁶ For example, we conducted a formal cost-effectiveness evaluation of both outpatient²⁷ and inpatient⁶ smoking intervention programs in a large HMO. Both programs were highly cost-effective, well received, and welcomed by the participants. Yet, implementation has been delayed for years after this demonstration for reasons that relate to structural and political issues more than to scientific or economic ones.²⁷

Evaluation Issues and Models

There have been discussions of several of these issues^{12,28} and some attempts to focus research efforts on representativeness of participants^{19,29} of samples. Seldom, however, is there any discussion of the representativeness of the settings -- the clinics, work sites, or communities -- in which public health interventions are evaluated. Many evaluations, such as the otherwise well-designed COMMIT trial³⁰ explicitly restricted selection of participating communities to those that were the most motivated, organized and prepared for change.³⁰ Most collaborative trials restrict participation to research centers that are most experienced and qualified, and have the best resources available. This selection results in expert, highly motivated research teams and settings, which are, by definition, unrepresentative of the settings in which their results will be applied. Most disease occurs among underserved and noncompliant populations. We found, for example, that 62% of invasive cervical cancers occur among women who have not had a pap smear in more than five years.^{27,31}

Both the NCI and the NHLBI have recognized some of the distinctions above and proposed their own ‘stages’ of research.^{14,21,32} These schemes portray a sequence moving from hypothesis generation to testing under controlled conditions, to evaluations in ‘defined populations,’ and finally, dissemination research. These models propose an orderly progression of scientific inquiry, with those interventions found to be efficacious (e.g., NCI Phase 3 research) then being selected to undergo Phase 4 ‘effectiveness’ evaluations, and programs which prove to be effective -- and especially cost-effective³³ selected for dissemination research (Phase 5).

In practice, however, there is often difficulty in making the transition across phases. We argue that this may be due to flawed reasoning in the basic sequence, and that many of the characteristics of interventions that make them efficacious (e.g., they are intensive, demanding, designed for homogeneous highly motivated populations) work against their being effective in more complex, less advantageous settings and with less motivated and more challenged populations. Such interventions tend to demand expertise, time, resources, and ongoing commitment to a particular problem or program: quantities that are difficult to find in the midst of the chaos that characterizes much of present day health care.^{8,34,35} In contrast, low intensity interventions that have small individual impacts but which can be delivered to large numbers of people may have a profound and highly cost-effective impact on public health.^{27,36,37}

Abrams and colleagues³⁸ introduced an important point when they defined the impact of an intervention as being the product of a program's reach (or percent of the population receiving the intervention) times its efficacy ($I = R \times E$). This paper expands upon this RE (Reach X Efficacy) concept by adding three dimensions that apply especially to the settings in which research is conducted (Adoption, Implementation and Maintenance-AIM) in an attempt to more completely characterize the public health impact of an intervention program.

The purpose of this paper is to present and explain the RE-AIM model, and to discuss its implications for health education and public health research.

RE-AIM Model

We propose an evaluation framework that is compatible with systems-based or social-ecological thinking and interventions^{15,39,40} as well as comprehensive community-based and public health interventions.^{41,42} Central to this framework is the concept that the “bottom line” or public health impact of an intervention is due to an interaction of the performance of a program on five separate evaluative dimensions. The RE-AIM evaluation model derives from epidemiologic thinking. This framework expands upon earlier work by Glasgow and Anderson,⁴³ Glasgow, McCaul, & Fisher,⁴⁴ and especially Abrams and colleagues.³⁸

The RE-AIM evaluation framework is summarized in Table 1, which enumerates the various factors contributing to the Public Health Impact of an intervention (which could be a policy, a community program or a person to person or small group intervention). We conceptualize the public health impact of an intervention as a function of five factors: Reach, Efficacy, Adoption, Implementation quality, and Maintenance (see Table 2).

Readers familiar with the epidemiologic concepts of population attributable risk,⁴⁵ number needed to treat,⁴⁶ positive predictive value,^{47,48} and with Bayes theorem⁴⁹ will recognize similarities and the importance of base rates and prevalence of an intervention (or a disease, etc.) in the population. The RE-AIM model also explicitly considers multiple levels of effects (individual citizens, providers of care, and institutions such as worksites and health plans/clinics).

Following a brief discussion about the lack of research on some of these factors (see also Table 2), we will describe each component or dimension of the Public Health Impact or RE-AIM model.

Complexities and relations to other criteria. Like any framework, the RE-AIM model somewhat oversimplifies reality to present an understandable equation. It also emphasizes certain factors at the expense of others. This section discusses some of these issues as well as the relationship of Public Health Impact to currently debated topics such as quality of health care and cost-effectiveness/benefit.³³

How does the RE-AIM framework address quality, accountability, medical care effectiveness, and issues involving cost-containment, cost-effectiveness/benefit/utility?^{28,33} The Public Health Impact summary score, represented as a multiplicative combination of the component dimensions (see Table 2), is probably the best overall representation of quality.

To some extent, ‘quality is in the eye of the beholder’ and ‘we all see a different part of the elephant’ -or focus on a different RE-AIM dimension. Thus, to a health care provider, quality may refer primarily to efficacy--that is, when a patient takes a medication or follows a recommendation (e.g., low saturated fat dietary plan) as prescribed, what result does it have on a physiologic outcome of interest (e.g., LDL cholesterol). To administrators, quality may refer primarily to implementation or delivery skill and consistency. From a patient perspective, quality may refer to effects of Implementation (day in and day out results when dealing with life’s multiple responsibilities and hassles). To a health services researcher, quality may be best considered as extent of a population reached, or long term maintenance of a service.

The RE-AIM model is silent on the choice of outcome or efficacy measure--except that we recommend that the outcome be quantifiable, be important to the general research and practitioner community (e.g., be accepted as relevant and generally seen as practical to collect, reliable and valid--such as HEDIS measures - NCQA), and to patients and the public at large. Examples are serum cholesterol, dietary fat intake, levels of physical activity, smoking status, and blood pressure.

The RE-AIM model is also silent concerning the time frame of evaluation. Implicit in the constructs of Implementation, and even more so, Maintenance, is that measurement be collected for a minimum of 1 year (for Implementation) and 3-5 years (for Maintenance). Frequency of assessment should of course be based on the particular issue, goals, setting, and resources. In general, we recommend that the RE-AIM dimensions, as well as the overall score be collected repeatedly over time, such as 3-6 month intervals. If this is done, then a RE-AIM profile such as that depicted in Figure 1 can be plotted. Such repeated measurement--as well as visual displays^{50,51}--can enhance our understanding of intervention effects, or be used to contrast different interventions (Figure 3).

Cost-effectiveness and economic outcomes. The RE-AIM framework does not explicitly address economic analyses. However, these issues are involved in the model in two ways. First, cost is often a major factor determining the extent to which a program or intervention will be Adopted, Implemented consistently, and/or Maintained after a formal demonstration or evaluation is completed.⁵²⁻⁵⁴ Second, cost-effectiveness and cost-benefit are certainly appropriate evaluation outcomes. They determine how well resources are being used, and whether or not more good could be accomplished by using them in alternative ways.

RE-AIM Dimensions

As illustrated in Table 1, each of the five RE-AIM dimensions is represented on a 0 to 1 scale, or 0 to 100% Reach, Efficacy, etc. A complication arises from the fact that, in addition to the absolute percent of the population, settings, or patients involved, the Public Health

Impact also depends on the characteristics of these persons or settings. For example, two worksite health promotion interventions might both reach 50% of employees, but a program that reached an equal proportion of higher risk blue collar employees would likely have more impact than one that reached primarily low risk participants with healthy behavior patterns.

Therefore, it is important to analyze risk state of participants and their representativeness in addition to overall outcomes for each of the five RE-AIM dimensions.

Participation and Representativeness

Two RE-AIM dimensions, Reach and Adoption, refer to how broad and representative a sample is that participates in a program. However, Adoption and Reach operate at different levels.⁴⁴

Reach

Reach is an individual level measure (e.g., patient or employee) of participation. Reach refers to the percent and characteristics of members of a defined population (e.g., members of an HMO, community residents) who receive or are affected by a policy or program. For complex programs having multiple or optional components, we recommend keeping it simple when evaluating reach and reporting the percent of individuals who receive any contact with a program, possibly supplemented by the percent of persons who receive the complete or entire program.

Reach is measured by comparing records of program participation to complete sample or 'census' information on an entire defined population. Examples of census information include lists of all patients in a given clinic or HMO, employees of a worksite, or residents of a community. Assuming that accurate records are kept of both the numerator (participants) and the denominator, calculation of reach is straightforward.

Assessing the representativeness of participants is more challenging.^{19,44,55} It requires at least demographic, and preferably also psychosocial, medical history, or case-mix information on nonparticipants as well as participants. Detailed information on nonparticipants is often complicated and difficult to collect and also raises ethical issues since nonparticipants have typically not given their consent to be studied.^{13,56} Solutions to this dilemma are urgently required, and may entail a health plan or worksite providing anonymous data on all employees which can then be contrasted with participant characteristics. Cooperative arrangements that permit investigation of the precise ways in which participants are and are not representative of the larger 'denominator' population should be a priority for future research.

This issue is important because studies that have investigated reach have often reported that those who participate in health promotion activities tend to be those who need it the least--e.g., the worried well,^{57,58} healthier or more affluent or physically fit, nonsmoking employees.⁵⁹ With the increasing gap between have and have nots in our country,⁶⁰ and the compelling data on the impact of SES on health status,⁶¹ understanding the degree to which a program reaches those in need is increasingly important. Collection of information on factors such as race, ethnicity, SES, medical history, occupation, age, degree of social isolation, self-reported health status, and level of self-efficacy⁶² for health behavior change is recommended. Because they are addressed to very large numbers of people, even small differences in risk levels of participants vs. nonparticipants can have great effects on the

efficiency and cost-effectiveness of public health interventions.²⁷ Data that relate to risk allow programs to be targeted to groups where maximal benefit will occur.

Adoption

Adoption is a larger social unit or organization-level variable that refers to the percent and representativeness of settings (such as worksites, clinics, health departments, or communities) that will adopt a given policy or program. The diffusion of innovation literature suggests common temporal patterns in the type and percentage of settings that will adopt an innovative change.^{63,64} Knowing where in the cycle of innovation adoption a social innovation or health program is, can provide important information about expected rapidity of further adoption and types of concerns that ‘early adopter’ vs. ‘late adopter’ settings will be likely to have. RE-AIM may also be considered an index of coverage for some set of potentially adoptive settings (hospitals, clinics), participants (researchers, patients, providers, payers, purchasers), and practices (treatment protocols, self-management activities, allocation rules).

Adoption is usually assessed either by direct observation, or by structured interviews or surveys. When assessing characteristics of settings that do not participate in an innovation, it is also important to collect information on barriers to adoption for future program planning.

Efficacy and Effectiveness

Entire textbooks and graduate and post-graduate institutes have addressed issues related to determining the efficacy and effectiveness of interventions^{55,65-67} and detailed discussion is beyond the scope of this paper. We discuss two specific issues below: the importance of assessing both positive and negative or iatrogenic consequences of programs; and the need to include behavioral, quality of life, and consumer satisfaction outcomes as well as physiologic endpoints and risk factors.

Positive and negative impacts. Most evaluations of population-based health programs are oriented to their efficacy in achieving improvement in some targeted health or risk indicator. Thus, we assessed the efficacy of treating isolated systolic hypertension by determining its impact on the incidence of stroke and mortality,⁶⁸ and the efficacy of an outpatient based tobacco intervention program by its effect on long-term smoking cessation.⁶⁹ Public health interventions are, in fact, responsible for the great majority of gains in life expectancy. These improvements have come, not from medical technology, but from public health programs and changes in individual behaviors.⁷⁰ But there is often a great difference between efficacy in an ideal setting, and the effectiveness of a program under more representative conditions and in more representative settings. Effectiveness may vary widely depending on the nature of the target group and the skill and resources available to the program.

Interventions delivered to large numbers of people can also have unanticipated negative effects. Simply labeling someone with a potential illness may have profound social and psychological consequences.^{71,72} The avalanche of tests for genetic susceptibility to various cancers that is about to descend on us will raise serious issues about the negative effects of interventions delivered to the general public. These negative effects may be subtle. For

example, if a patient who smokes responds to a public health campaign to increase breast and cervical cancer screening by deciding to get screened instead of quitting smoking, the campaign may cause more harm than good for that woman, since quitting smoking is more likely to reduce her risk of dying from cancer than is being screened regularly.

Such distinctions may seem trivial until the pattern of prevention services as they are actually delivered in our communities is examined.^{27,73} Many very effective services remain under-delivered, while others are delivered which are not necessary or effective in the groups to which they are given. Even services that cost only a few dollars can have substantial negative (as well as positive) impact when delivered to millions of people who have little need for them. Routine, repeated cholesterol screening of young, low-risk adults, for example, has little benefit.⁷⁴ The appropriate evaluation of population-based programs is critical, not only to determine benefit, but also to be certain that harm (including misplaced resources) does not outweigh that benefit.

What outcomes should we measure? Traditional clinical research has emphasized biologic measures of outcomes, in particular, risk factors such as cholesterol, glycosylated hemoglobin, or hypertension levels.^{55,75} More recently, our national health care crisis and concerns about how best to use limited resources have led to an increasing emphasis on health care utilization measures.^{8,28,76} These outcomes are certainly important to collect, but a public health evaluation should include more than just biologic and utilization measures. At least three other types of outcomes merit inclusion in public health evaluations:

- 1) Behavioral outcomes should be assessed for participants (e.g., smoking cessation, nutritional behavior changes, physical activity levels), for staff who deliver an intervention (approaching patients, delivering prompts and counseling, making follow-up phone calls), as well as for the payers and purchasers who support the intervention (adopting interventions, evaluating interventions).
- 2) A patient-centered or quality of life perspective ^{8,77} should be adopted to evaluate the ‘bottom line’ impact of interventions on patient functioning and mental health. This includes collecting measures of patient satisfaction since these provide a critical check on real world service delivery practices.
- 3) Evaluations should assess community and systems level changes in implementation, and enforcement of guidelines and policies.^{28,78}

Implementation

The term effectiveness has been used to describe the impact of a program when conducted in real world settings (see Table 4).^{32,79} Implementation refers to the extent to which a program is delivered as intended. It can be thought of as interacting with efficacy to determine effectiveness (Efficacy X Implementation = Effectiveness). Once again, there are both individual and program level implementation measures to collect. At the individual level, measures of participant follow-through, completion of homework assignments, or “adherence” to recommended medical regimens is important for interpreting study outcomes.^{80,81}

At the provider or office/setting level, the extent to which interventionists who are not research staff, but regular employees who have many other responsibilities in addition to implementing a research protocol, deliver intervention as intended is a critically important implementation outcome. For example, Stevens et al.⁸² demonstrated that part (but not all) of the reason that a brief hospital based stop-smoking program was more successful when implemented by experienced, dedicated smoking cessation counselors than when delivered by regular hospital respiratory therapy staff was due to differential levels of protocol implementation. Implementation research is crucial to determining which of a set of equally efficacious interventions may be practical enough to be effective when used in more representative, non-academic settings.

Maintenance

A major challenge at both individual and organization/community levels is long-term maintenance of behavior change.^{23,83,84} At the individual level, relapse following successful initial behavior change is a ubiquitous finding.^{85,86} Long-term behavior change--levels of targeted behaviors two or more years after a formal intervention program has ended--is important. Because of the large socio-environmental-economic-cultural influences on maintenance,^{15,87-90} it is essential that public health investigations collect long-term follow-up data.

It is equally important that program or setting-level measures are collected of the institutionalization²⁴ of a health promotion program or policy. Institutionalization refers to the extent to which a health promotion practice becomes routinely conducted and part of the everyday culture and norms of an organization. There has been a recent wave of interest in the measurement of factors related to the extent to which a program is institutionalized.²⁴ At the worksite or medical clinic level, such research is needed to address the extent to which innovative or experimental policies and practices become integrated into the organizational culture (see Table 4).²² At a community level, maintenance or institutional research is needed to document the extent to which policies are actually enforced over time (e.g., laws concerning alcohol and tobacco sales to minors, no smoking policies).

Maintenance or institutionalization can be considered as a temporal extension of the Implementation dimension discussed above. In other words, as illustrated in Figure 1, Maintenance (institutionalization at the setting level) is the level and consistency of Implementation over time. Thus, maintenance is a measure of the extent that innovations become a relatively stable, long-term part of the behavioral repertoire of an individual (or staff or organization or community).

Factors Influencing Each RE-AIM Dimension

Many factors influence the degree of program reach, efficacy, adoption, implementation, and maintenance. These are summarized in Table 3. Resource requirements are related to all five dimensions. The more something costs, the more difficult it is to implement. On the other hand, this relationship is probably not simple and linear. Costly programs, once implemented, develop a cadre of employees and consumers. Thus, changing or eliminating costly programs

in light of new evidence or the discovery of better approaches may be more difficult than for those which are less costly.

Simple programs are easy to implement, require less expertise and training and lower initial budgetary outlays. But brief interventions are also usually less efficacious, although this disadvantage may be mitigated by greater reach.^{91,92} Lack of skill and knowledge impairs implementation and efficacy in particular. For example, a brief, inpatient smoking cessation program that worked very well with skilled cessation counselors, had little impact when it was delivered by regular hospital staff.^{6,93} It would have been a costly mistake to assume that the efficacy study was directly transferable to a normal hospital setting.

Simple programs usually require less training and skill than do complex ones. They also typically require less change in existing routine and structure. Complexity will impair adoption and also effectiveness since it is more difficult to have a complex program delivered optimally. Support from professional organizations is useful in encouraging adoption, implementation, and maintenance, but is probably less critical than professional standards and consumer demand. Financial incentives are probably more important for organizations than for individuals since they are likely to be more substantial at that level. Effectiveness data are useful for overcoming skeptical views and for arguing how to re-direct resources. Marketing is probably most effective when directed at consumers who generate a demand. Accountability is a key issue in determining the degree to which an adopted program is successfully implemented and maintained.⁹⁴ If no one has a clear responsibility on which their job performance depends, then an organization is unlikely to be effective in implementing a program. Finally, other issues that may affect RE-AIM dimensions include peer models and timely feedback.

Discussion

The last several years have seen a variety of provocative and stimulating articles on changing paradigms of health and health care--for example, moving from a focus on acute disease focus on a given patient to a population-based public health model.^{8,12,35,95-99} Unfortunately, there have been far fewer discussions of evaluation models that are appropriate for this population-based, effectiveness research. Even economic analyses and outcomes research³³ do not address several of the core evaluation issues and dimensions along which these new or evolving paradigm approaches differ from the traditional medical model.

Evaluation methods and procedures must match the conceptual issues and intervention methods being studied. We are currently in the midst of a historical shift from a focus on a solely biological, reductionistic, mechanistic approach to medicine and health.^{12,27,99} The approach toward which we are evolving--albeit painfully, and at times haphazardly--is one of multiple causation, holistic or systems thinking,^{16,100} with recognition of complexity and various levels of disease determinants from micro to macro-societal.^{38,89,101,102}

A significant determinant of the problem results from unit of analysis issues.¹⁰³⁻¹⁰⁵ That is, often--the unit of assignment and analysis in more methodologically sophisticated studies is not the individual patient--but rather a 'larger social unit'¹⁰⁶ such as a clinic, a worksite, a hospital or a community.^{30,107,108} Many of the same issues of selection and representativeness,

individual differences, follow-through, behavior change, and maintenance with which we have struggled for years at the individual level also apply to these larger social units (see Table 4).⁴⁴ Although there are scattered references that address some of these issues (see Table 2),^{18,42} there is to our knowledge no overall evaluation methodology that addresses these issues in a comprehensive manner.

There is increasing recognition that while the classic randomized controlled trial (RCT) methodology has significantly advanced our knowledge about pharmacotherapy and medico-surgical interventions,^{55,109} it has limitations when applied rigidly to behavioral issues, and especially to community intervention trials.^{66,67,99,110-113} We feel that is because the classic RCT emphasizes efficacy to the defacto exclusion of other factors such as adoption, reach, or institutionalization.^{66,67,110} Expansion of the concept of health interventions beyond immediate treatment for acute conditions to encompass patient managed illness prevention and illness management activities^{12,27} requires the adoption of evaluation methods compatible with the conditions and settings in which such activities occur.

How RE-AIM Can Help to Use Health Care Resources Most Wisely

The United States has an inefficient medical care system. Despite the highest expenditure per capita on medical care of any nation, we exclude about 15% of the population from medical coverage, and provide inadequate coverage to another 15-20%.¹¹⁴⁻¹¹⁶ The U.S. is the only industrialized nation lacking universal health care coverage. In the United States, expenditures for prevention services, particularly those directed at entire populations, are small.¹¹⁷ Even more problematic, rarely, if ever are these expenditures ranked according to their relative probability of reducing morbidity and mortality. Vilnius and Dandoy¹¹⁸ proposed a basic priority rating model that consolidates multiple values into a systematic objective method for combining scientific data with political, ethical, economic, and public opinion values in assessing priorities. Because only about 3% of the health care dollar goes to public health issues,²⁷ appropriately ranked use of those resources is essential in achieving maximal impacts of public health programs. Better use of prevention resources gives countries such as the United Kingdom and Japan their better health statistics when compared to the United States. And, it is our penchant for attempting to solve our health problems with expensive, technological based solutions instead of effective, well-evaluated public health programs that makes our medical care system so expensive.

The RE-AIM dimensions provide a framework for determining what programs are worth sustained investment, and for identifying those that are and are not working effectively in their real-world environments. To the extent that these dimensions become incorporated into organizational data collection and analysis, decision makers will have better and more complete information on which to adopt and discontinue programs.

The precise nature of the relationships among the five RE-AIM dimensions or factors, and how they combine to determine the overall public health impact of a health promotion program or policy is unknown. We have represented these factors as interacting multiplicatively since we feel that this is closer to reality than an additive model. For example, a highly efficacious program that is not adopted by many clinics or only reaches a very small proportion of eligible citizens will have little population-based impact. Future

research is needed to determine if other mathematical functions may better represent the interplay of these dimensions than does multiplication.

Within the multiplicative approach, data collected using the RE-AIM dimensions can serve at least three evaluative purposes:

1) Assessing the Public Health Impact (PHI) of an intervention within an adopting organization across time. Figure 1 shows hypothetical data for an ongoing intervention that is evaluated every two months. The pattern of scores on the dimensions reflects an organization that has been able to adopt a relatively efficacious intervention in most of its service settings, but has encountered difficulties in implementing and maintaining the intervention consistently with those who might benefit from exposure. Using a multiplicative approach to combining the dimensions, the PHI ranges from 0 to .09 across the various assessment points (if any one of the dimensions is 0, using the multiplicative approach, the product is also 0).

2) Comparing the PHI of an efficacious intervention across several organizational units. Figure 2 shows the hypothetical scores on each of the five dimensions for six locations that have committed to a high efficacy ($E=.9$) intervention. The lowest PHI is .04 for Location 6 which has reached only 14% of those who might benefit despite having successfully implemented the intervention in 74% of the 67% of the possible delivery settings adopting the intervention. Location 4, with a PHI of .76, has adopted, implemented, and maintained the intervention in virtually all of its settings ($A=.99$, $I=.93$, $M=.96$) and has reached some 95% of those targeted for the intervention.

3) Comparison of one or more interventions in a setting. Figure 3 compares two interventions in a single set of service settings. One of the interventions is highly efficacious ($E=.9$) but costly to adopt, implement, and maintain (reflected in scores of $A=.2$, $I=.45$, and $M=.3$). The other has lower efficacy ($E=.35$) but is lower in cost making it easier to adopt, implement, and maintain ($A=.6$, $I=.7$, $M=.5$). The lower cost intervention has a reach 3 times that of the higher cost intervention (.8 vs. .25) and a PHI 10 times as great (.06 vs. .006).

Limitations of the Current Model

The extent to which these dimensions are independent or orthogonal also is an open question. Future research should investigate these relationships, which should prove quite provocative in their policy implications. For example, if it is true that programs which have a larger reach tend to be less efficacious,⁹¹ what are the public health actions that should follow?. What if it turns out, as we expect, that programs which are most efficacious (under highly controlled, optimal conditions) tend to be those that have the worst Implementation results? Such an inverse relationship between program Efficacy and Implementation, especially if robust, could have significant implications for the types of interventions on which NIH and other funding organizations should be placing high priority. An inverse relationship would also suggest different criteria for selecting programs for efficacy testing if the goal is to produce practical programs that have population-based impact.

The RE-AIM model as presented here does not directly address issues of cost-effectiveness, an increasingly important outcome and major determinant of program adoption and

institutionalization (see Table 3).³³ A population-based or “bottom-line” cost-effectiveness index could, however, be calculated by dividing the resulting Public Health Impact of an experimental program or policy by the total societal costs ³³ of the program. In addition, dividing each component dimensional index of the RE-AIM model (e.g., Reach or Implementation) by the costs relevant to that dimension could help elucidate where these costs were coming from, and to identify areas of efficiency and waste.

Future Research and Application Issues

- 1) We recommend systematic reviews to determine the extent to which different research fields have emphasized—or neglected—each dimension of the RE-AIM framework. We expect that Adoption and Maintenance/Institutionalization, and secondarily, Reach, will be the most understudied dimensions, but this needs to be documented for different research topics.
- 2) The RE-AIM model should be especially applicable to innovative technologies; electronic, interactive and distance learning interventions; and other interventions such as Web-TV ¹³ capable of reaching millions of persons. Comparisons of these innovations to more traditional public health outreach and low tech programs on each of the RE-AIM dimensions would increase understanding of the advantages and limitations of both types of interventions.

Summary and Conclusions

We suggest that public health interventions and policies should be evaluated more broadly and comprehensively than has traditionally been the case.^{28,42,97} In particular, we argue that frequently omitted dimensions, such as Reach, Adoption and Implementation are crucial to the evaluation of programs intended for wide scale dissemination. We hope that the RE-AIM framework, or some similar model that focuses on the overall population-based impact of programs, can be used to more fully evaluate future public health innovations. Such a conceptual model and related evaluation framework is helpful to remind us of the differences between public health, organizational change, or community interventions ^{91,97,113,119} and the much more common randomized clinical/pharmacological trials that typically maximize efficacy results while failing to attend to the other RE-AIM dimensions. It is high time to RE-AIM, or refocus our evaluation efforts.

Table 1

Characteristics of RE-AIM Dimensions

Evaluation Dimension	Units and Level of Measurement	Prevalence of Research (Example References)
Reach	Percent and representativeness of members of an organization that participate (0 to 1.0)	Modest ^{38,43,64}
Efficacy	Magnitude or percent of improvement on outcome(s) of concern (0 to 1.0)	Substantial ^{55,79}
Adoption	Percent of organizations or settings that try an intervention (0 to 1.0)	Minimal ¹²⁰
Implementation	Consistency and quality of intervention delivery under real world conditions (0 to 1.0)	Moderate ^{32,79}
Maintenance	Extent to which individuals or implementation agents continue to deliver a program over time (0 to 1.0)	Little ^{2,84}
Public Health Impact	End result of interaction of factors above (0 to 1.0)	None to our knowledge ¹²

Table 2

Component Dimensions of the RE-AIM Evaluation Framework

	% REACH (what proportion of the panel of patients in each setting will receive or be willing and able to participate in this intervention?)
X	% EFFICACY (success rates if implemented as in guidelines: Defined as positive outcomes minus negative outcomes)
X	% ADOPTION (how many settings, practices and plans will adopt this intervention?)
X	% IMPLEMENTATION (how often is the intervention implemented as intended in the real world?)
X	% MAINTENANCE (extent to which program is sustained over time)
<hr/>	
=	PUBLIC HEALTH IMPACT (population-based effects) of an Intervention.
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Table 3

Extent of Influence of Various Factors on RE-AIM Dimensions

Influence Factors*	RE-AIM Dimensions				
	Reach	Efficacy	Adoption	Implement.	Maintenance
Cost: Money or Time (-)	High	High (direct)	High	High	High
Simplicity/Ease (-)	High	Medium	High	High	Medium
Lack of Knowledge or Skill (-)	Medium	High	Medium	High	Medium
Amount of Training or Change Required (-)	Low	High (direct)	High	Medium	Medium
Endorsement of Professional Orgs. (+)	Medium	Low	Medium	High	Medium
Financial Incentives to Use (+)	High	Low	High	High	High
Data on Effectiveness (+)	Medium	Low	Medium	High	Medium
Packaging/Promo/Marketing Claims (+)	High	Low	Med-High	High	High
Peer Examples and Models (+)	High	Medium	High	Medium	Low
Pt. Satisfaction and PR Concerns (+)	Med-High	High	Medium	Medium	High
Timely - Useful Feedback (+)	Low	High	Low	High	Med-High
Accountability (+)	Low	Medium	Low	High	High

Table 4

Relationship of RE-AIM Dimensions to Levels of Analysis

Research Evaluation Issue	Level of Analysis or Change Unit	
	Individual or Participant Level	Larger Unit or Setting Level
Representativeness of participants	Reach - Recruitment from defined population	Adoption - recruitment from list of all possible clinics, worksites, providers
Outcome under optimal conditions	Efficacy in RCT	Efficacy (same as individual level)
Outcome under real world conditions	Effectiveness in defined population-based, Phase 4 or Dissemination Trials	Implementation studies

Figure 1. Display of Scores on Different RE-AIM Dimensions over Time

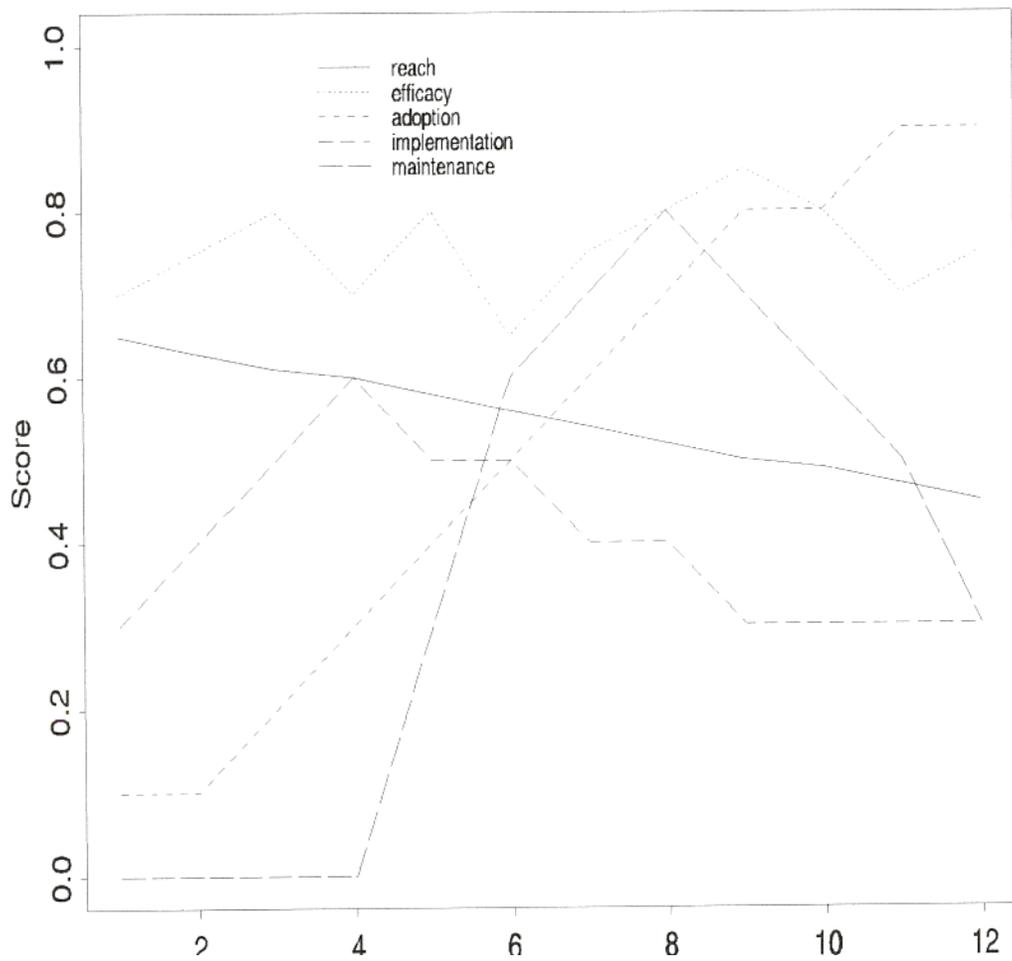


Figure 2. “Star Display” of Performance Across Different Performance Locations on Each RE-
AIM Dimension (R=Reach, E=Efficacy, A=Adoption, I=Implementation, M=Maintenance)

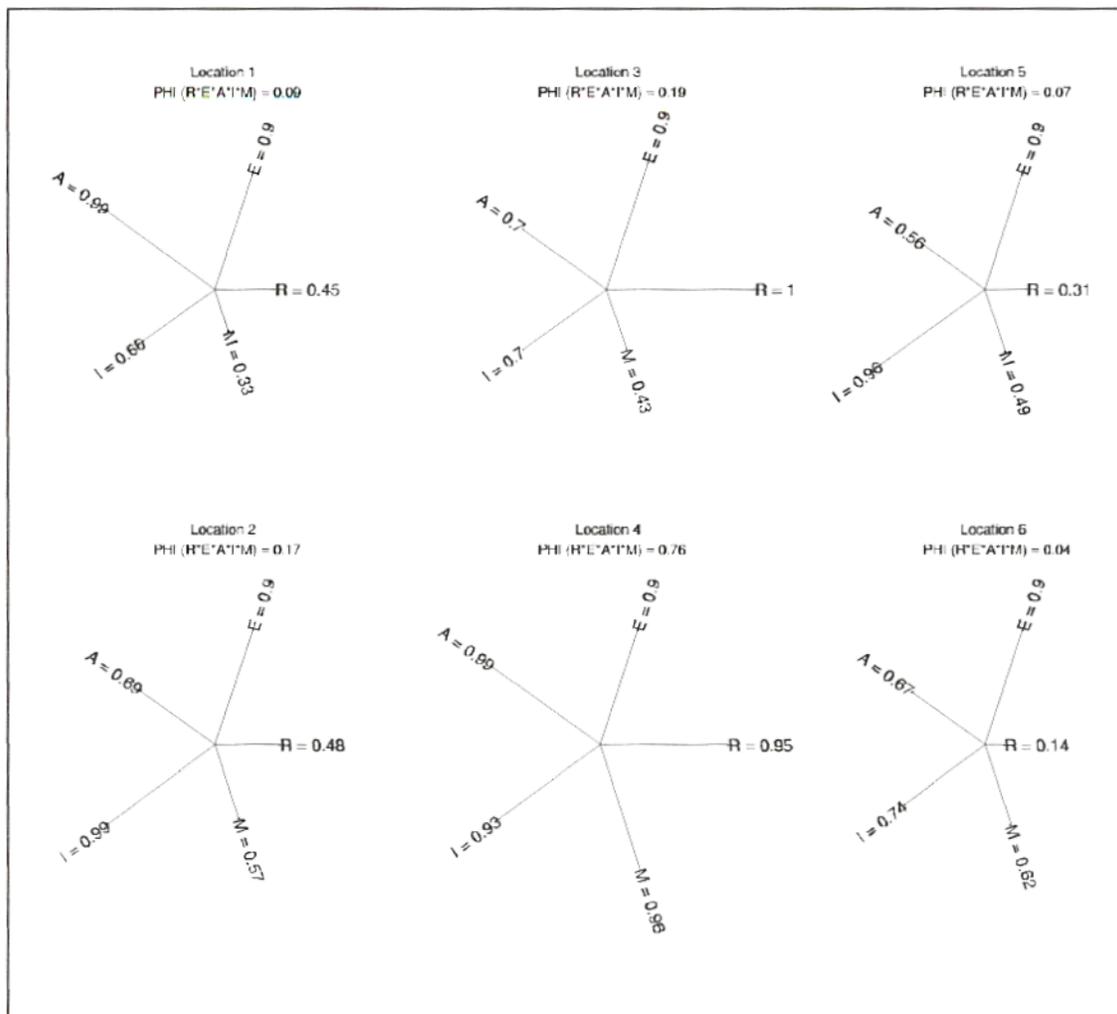
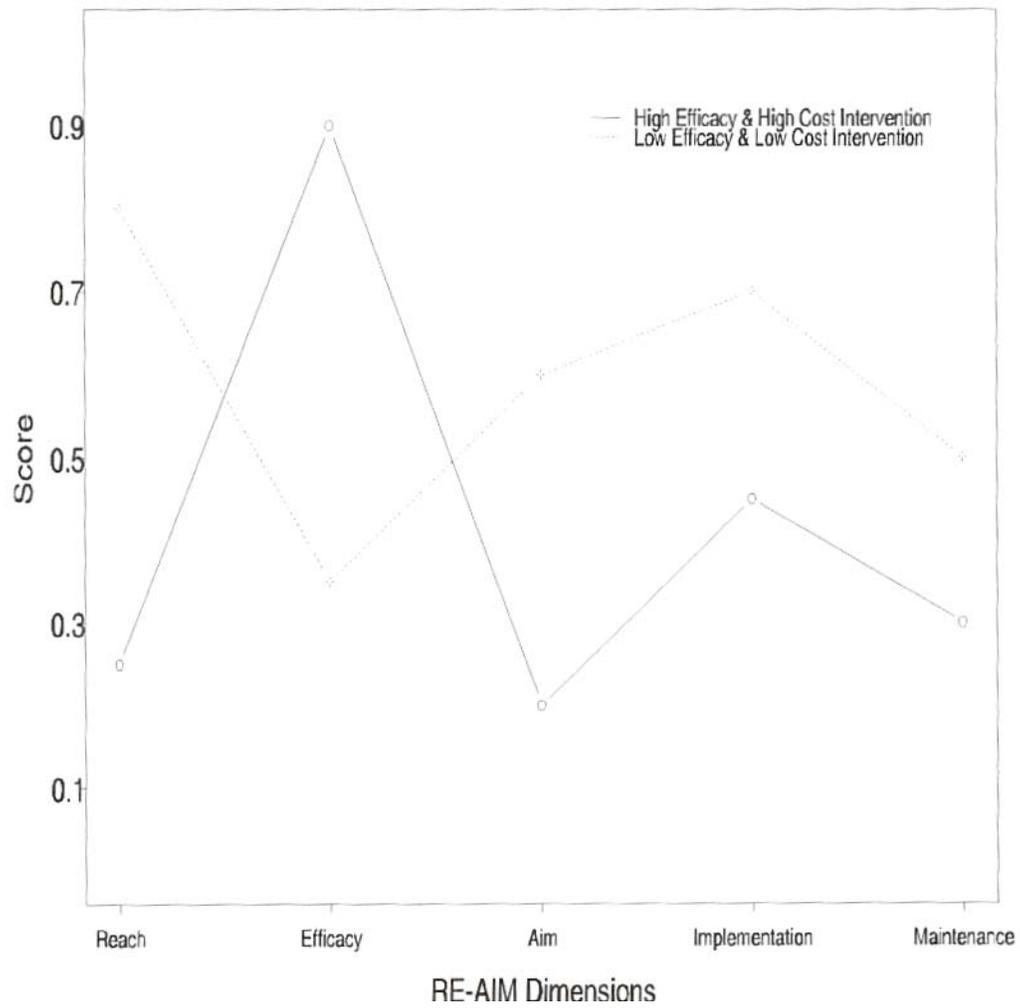


Figure 3. Display of Two Different Intervention Programs on Various RE-AIM Dimensions



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APPENDIX C: Take 5 Results Chain

Inputs	Activities	Outputs	Outcomes	Impacts
<ul style="list-style-type: none"> - CCO Staff - CHC & HU staff - Draft manual - CCO budget - Contracts with CHCs and HUs - CCO literature review - Provincial committee - CHC and HU staff - 2001 focus group results on veg. and fruit consumption - census data - evaluation tools - HU and CHC facilities 	<ul style="list-style-type: none"> # Centres participate - Recruitment at sites - Sessions taught at sites - Incentives provided - Cooking at sites - Daycare at sites - Administration support at CCO and at sites - Materials distributed - Q&A among sites and CCO - Read additional relevant literature 	<ul style="list-style-type: none"> # Graduates # Dropouts # Participating centres - Program manual - Recruitment materials # Sessions # Facilitators - Unanticipated outputs - Costs (\$) - Networking among centers - Literature review 	<ul style="list-style-type: none"> - Vegetable and Fruit consumption increase - Facilitators teach program - Increased awareness of Program - Awareness of self-efficacy factors, - Awareness of dietary options, - New recipes adopted - Recommended changes to Takes 5 Guide - New capacity at CHC's and HU's - Participants aware of cancer and veg and fruit consumption influence 	<ul style="list-style-type: none"> - Long term maintenance of Dietary Change - Support at CHC & HU level across Ontario for Take 5 - Revised program manual - Unanticipated impacts - Funding support for implementation across Ontario - Friends and family modify diet, - Requests for Take 5 provincial implementation - Request for mutual aid or self help groups continuing

Outputs: the completion of activities.

Outcomes: Changes occurring in participants (institutional and individual) as a result of the activities.

Impacts: Changes occurring beyond the immediate participants in the long term.

APPENDIX D: Community Profile of Each Test Site

Site profiles are provided for each of the 12 test sites. Data from Statistics Canada's 2001 population census is featured. Where 2001 census data is unavailable, data from the 1996 population census is provided. The test site profiles feature Census Division or Census Sub-division data depending on the size of the catchment area of the Public Health Units/Community Health Centres. Each of the site profiles is organized in the following manner:

1. Introduction
2. Lead Agency and Catchment Area
3. Community Profile
 - 3.1 Gender Distribution
 - 3.2 Urban versus Rural Population
 - 3.3 Population of Women by Age Groups
 - 3.4 Visible Minorities
 - 3.5 Mother Tongue
 - 3.6 Aboriginal Groups
 - 3.7 Family Income
 - 3.8 Education
 - 3.9 Labour Force

Profile for City of Hamilton

1. Introduction

The City of Hamilton is located in South Western Ontario, approximately 80 kilometres southwest of Toronto. The City of Hamilton has a total population of 490,268 (Statistics Canada, 2001). The city includes rural, urban, and suburban areas with diverse economic and multicultural populations.

2. Lead agency

The lead agency for the project is Social and Public Health Services Department, Nutrition and Physical Activity Promotion Program - City of Hamilton.

The main contact for the program at this agency is:

Lisa Taraba
Manager
Healthy Lifestyles & Disease Prevention Branch, City of Hamilton
Social & Public Health Services Department (Upper Ottawa Office)
71 Main St. West
Hamilton, ON
L8P 4Y5

The catchment area for the Public Health Services Department is the entire City of Hamilton.

3. Community profile

The City of Hamilton has a total land area of 1,117 square kilometres, and a population density per square kilometre equal to 439. The total population between 1996 and 2001 has increased by 4.8% (Statistics Canada, 2001).

3.1 Gender distribution

Between 1996 and 2001, the gender distribution has remained almost the same. There were 51.3% females in 1996 and 51.1% in 2001 (Statistics Canada, 1996, 2001).

3.2 Urban versus rural population

The majority of the population, 428,202 people or 91.5% (Statistics Canada, 1996) lives in urban settings, while only 8.5% live in rural areas.

3.3 Population of women by age groups

According to 2001 census data, 38.2% of women are between the ages of 25 and 49. The age group of women between 35 and 39 years of age represents the largest group (21.7%), followed by the age group 30 to 34 years (21.5%). A more detailed breakdown is provided in Table 1.

Table 1. Distribution of female population (age 25 to 49) by age group for the City of Hamilton

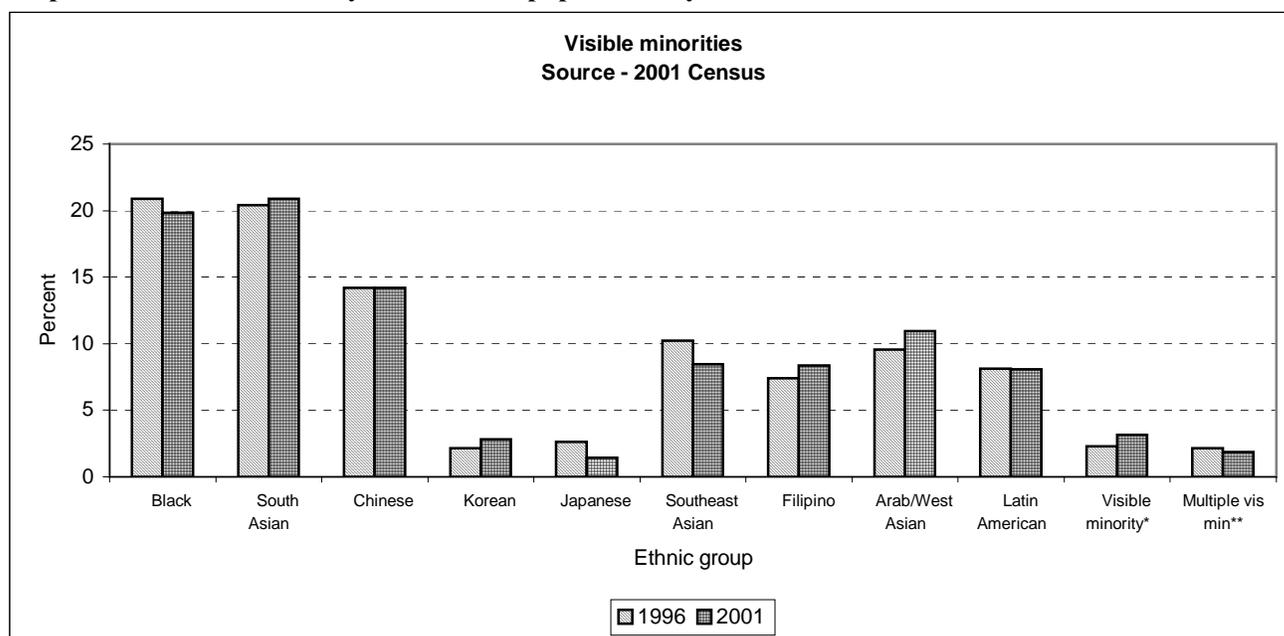
Age group	Population	Percent	Cumulative percent
25-29 years	16,960	18.53	18.53
30-34 years	19,725	21.55	40.08
35-39 years	19,835	21.67	61.76
40-44 years	18,380	20.08	81.84
45-49 years	16,620	18.16	100.00
Total	91,520	100	

Source: Statistics Canada, 2001.

3.4 Visible minority

Of the 11 minority groups reported by the Population Census, four groups experienced a decline between 1996 and 2001. These groups are: a) Blacks, b) Japanese, c) Southeast Asians, and d) Multiple visible minorities. The distribution of all the visible minorities is provided in Graph 1.

Graph 1. Distribution of City of Hamilton population by visible minorities



* Not included elsewhere – includes Pacific islanders and other visible minority groups.

** Multiple visible minority - includes respondents who reported more than one minority group.

3.5 Mother Tongue

The official languages (English and French) were reported as the mother tongue for 78% of the population (Statistics Canada, 1996). The remainder of the population (22%) was divided between 16 groups. Of those speaking an official language, 98.2% reported English as their mother tongue compared to 1.8% who reported French. Among the groups that reported other languages as their mother tongue (100,330 people), Italian was the single largest group (21.4%), followed by Polish (9.1%), Portuguese (7.3%), German (6.5%),

Croatian (5.6%), Chinese (4.8%), Spanish (4%), Dutch (3.9%), Serbian (3.6%), Hungarian (3.16%), Ukrainian (3.1%), Arabic (2.6%), Punjabi (2.5%), Greek (2.3%), and Vietnamese (2.2%). Close to 19% belong to the 'Other mother tongue' category.

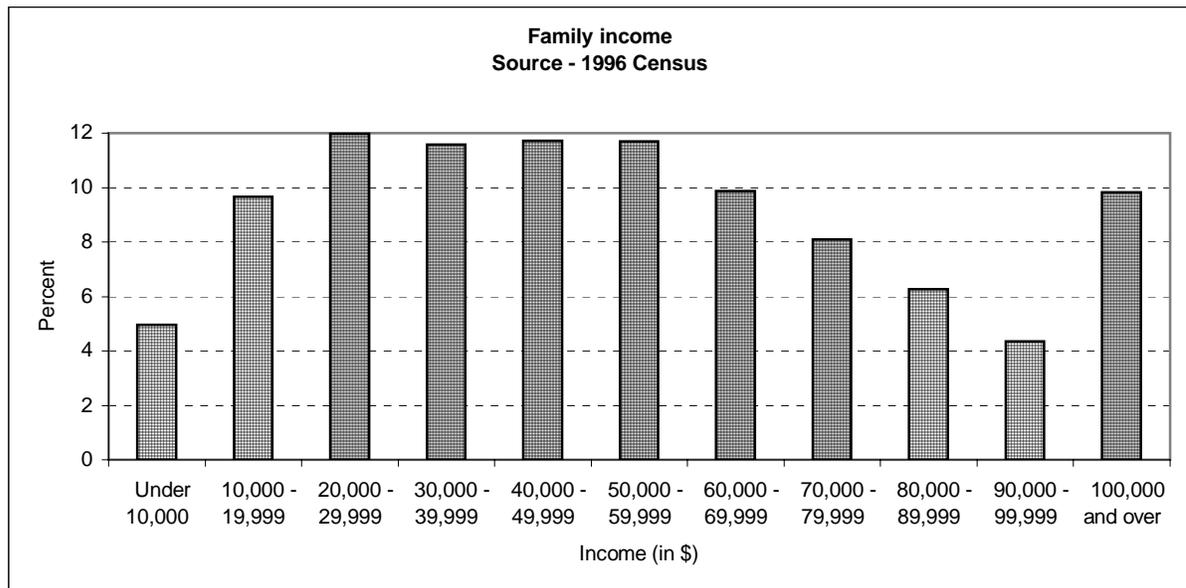
3.6 Aboriginal groups

The aboriginal population in Hamilton increased from 4,825 people in 1996 representing 1% of the population, to 6,270 in 2001 representing 1.3% of the population (Statistics Canada, 1996, 2001).

3.7 Family income

The average family income is \$56,223, and the median family income is \$50,038 (Statistics Canada, 1996). Families that have an income of \$10,000 or less represent 4.9% of the total families (6,330 families), while families, whose income is \$100,000 or more represent 9.8% (12,560 families). A more detailed breakdown of families by income is presented in Graph 2.

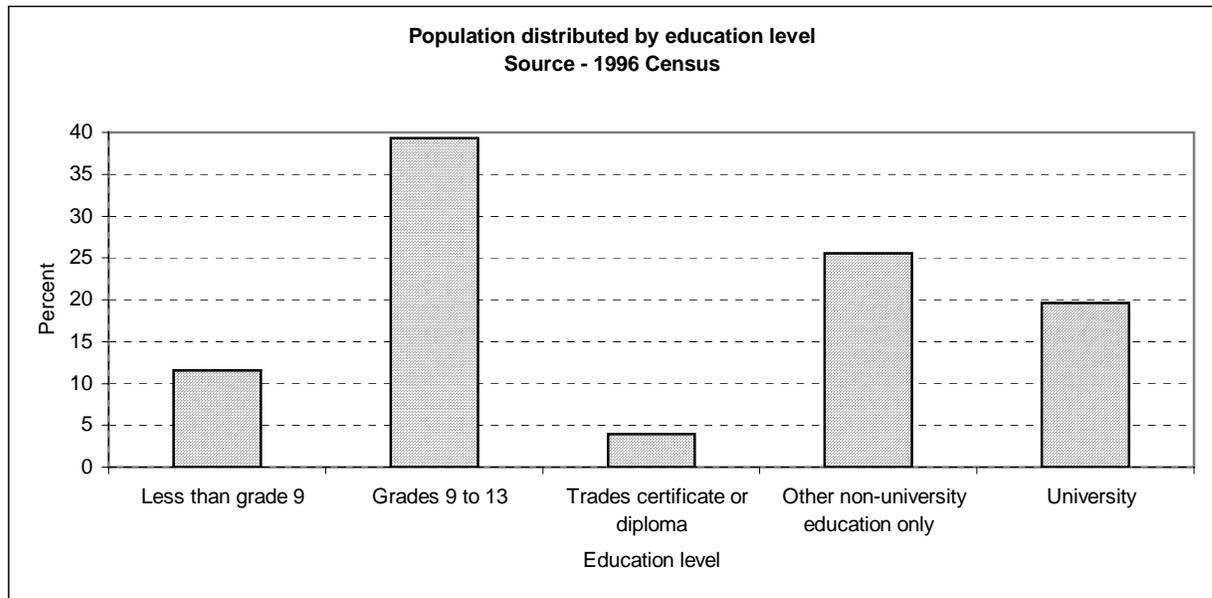
Graph 2. Distribution of City of Hamilton population by family income category



3.8 Education

From the population 15 years of age and older, only 11.5% do not have a grade 9 education (Statistics Canada, 1996). People reporting completion of grades 9 to 13, represent the largest group at 39.3%. The second largest group is the group that completed ‘other non-university’ education. A complete breakdown of the population by education level is provided in Graph 3.

Graph 3. Distribution of City of Hamilton population by education level



3.9 Labour force

The total number of women 25 years and over by labour force activity was 161,520 (Statistics Canada, 1996). Of this number, 55% (or 89,250) were in the labour force, and 45% (or 72,270) were not in the labour force. The unemployment rate was 7.5% (6,710).

Profile for the North Bay and District Health Unit (Nipissing District)

1. Introduction

The district is comprised of four distinct areas with numerous small communities within each: The City of North Bay, East Nipissing (the largest centre is Mattawa), West Nipissing (the largest centre is Sturgeon Falls) and the southern part – stretching to South River.

2. Lead agency

The lead agency for the project is North Bay and District Health Unit. The main contact for the program at this agency is

Carolyn Froats Emond
Public Health Dietitian
North Bay and District Health Unit
681 Commercial Street
North Bay, ON P1B 4E7

The catchment area for the North Bay and District Health Unit is located in Northeastern Ontario. The Health Unit boundaries encompass approximately a 40-mile radius from the City of North Bay, the largest centre in the district with approximately 55,000 people. The total population of North Bay and District is estimated at 93,000.

3. Community profile

The Nipissing District has a total land area of 17,064.65 square kilometres, and a population density per square kilometre equal to 4.9. The total population between 1996 and 2001 has decreased by 2.3% (Statistics Canada, 1996, 2001).

3.1 Gender distribution

Between 1996 and 2001, the gender distribution remained almost unchanged. There were 51.2% females in 1996 and 51.5% in 2001 (Statistics Canada, 1996, 2001).

3.2 Urban versus rural population

The majority of the population, 60,559 people or 71.4% lives in urban settings (Statistics Canada, 1996). The rest of the population, 24,273 people or 28.6% of the total population lives in rural areas.

3.3 Population of women by age groups

According to census data, 37% of women are between the ages of 25 and 49 (Statistics Canada, 1996). The age group of women between 35 and 39 years of age represent the largest group with 22.7%, followed by the age group 30 to 34 years with 22.5%. A more detailed breakdown is provided in Table 1.

Table 1. Distribution of female population (age 25 to 49) by age group for North Bay

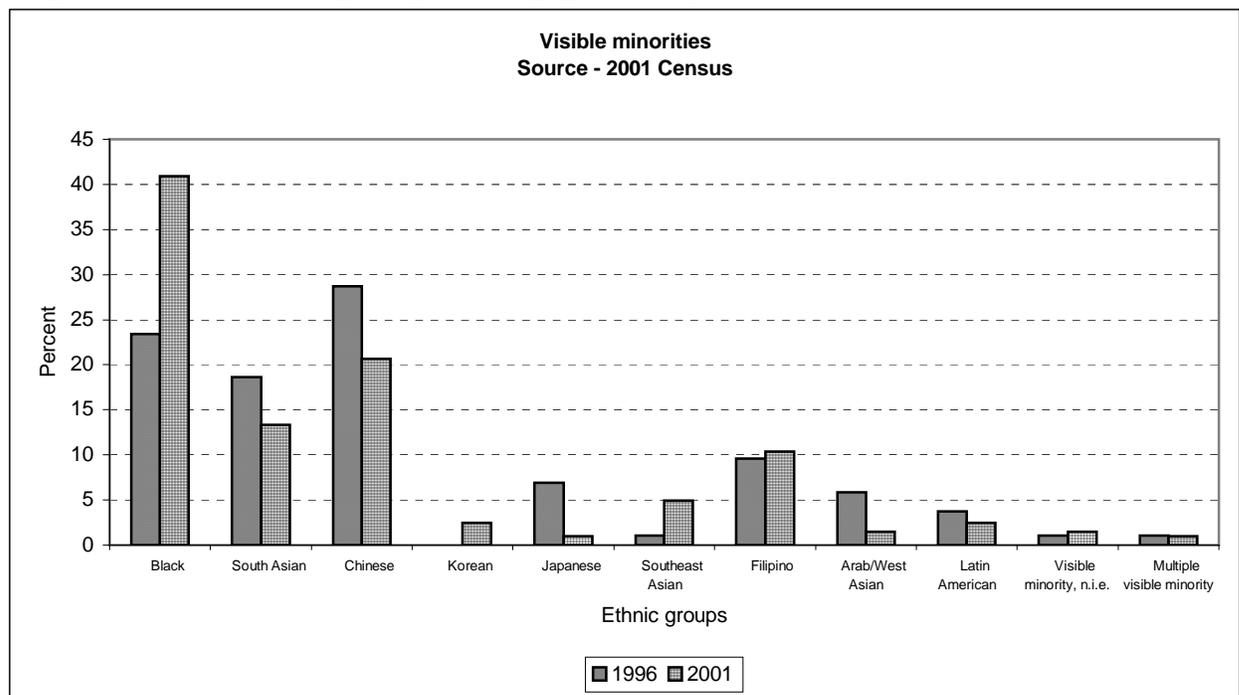
Age group	Population	Percent	Cumulative percent
25-29 years	2,570	15.96	15.96
30-34 years	3,615	22.45	38.40
35-39 years	3,655	22.69	61.10
40-44 years	3,225	20.02	81.12
45-49 years	3,040	18.88	100.00
Total	16,105	100.00	

Source: Statistics Canada, 2001.

3.4 Visible minority

In 2001 there were 11 minority groups reported by the Census, up from 10 minority groups reported in 1996 (Statistics Canada, 1996, 2001). The additional minority group reported in 2001 was Korean. The minority group with the largest increase between 1996 and 2001 was Blacks (from 23.4% in 1996 to 40.9% in 2001). The distribution of all the visible minorities is provided in Graph 1.

Graph 1. Distribution of Nipissing District population by visible minorities



* Not included elsewhere – includes Pacific islanders and other visible minority groups.

** Multiple visible minority - includes respondents who reported more than one minority group.

3.5 Mother tongue

The official languages (English and French) were reported as the mother tongue for 96.3% of the population (Statistics Canada, 1996). Approximately 73% of this group reported their mother tongue as English while 27% reported their mother tongue as French. The remainder of the population (3.7%) was divided between 16 groups. Among the groups reporting non-official languages (a total of 3,050 individuals), Italian is the largest group (21.6%), followed by German (15.7%), Polish (8.5%), Dutch (7%), Ojibway (6.7%), Chinese (5.2%), Cree (4.4%), Ukrainian (3.38%), Portuguese (2.9%), Finnish (2.8%), Greek (2.6%), Spanish and Hungarian with 2% each, Creoles (1.6%), and Russian (1.5%). Approximately 12% of the population was reported in the 'other mother tongue' category.

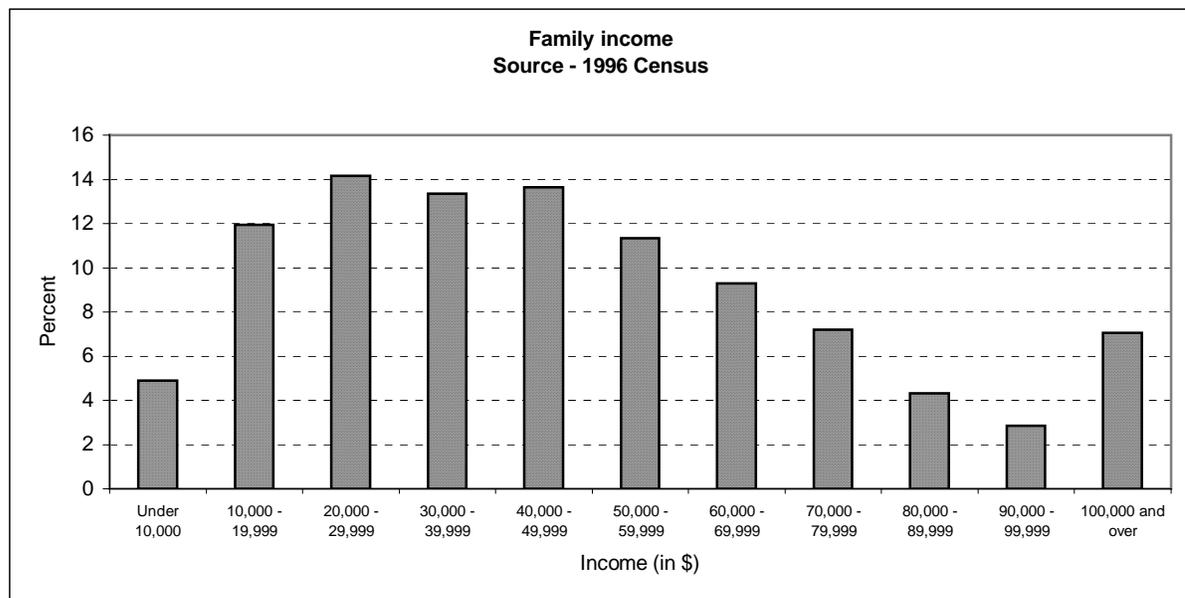
3.6 Aboriginal groups

The aboriginal population in the Nipissing District increased from 4,250 people in 1996, representing 5.1% of the population to 6,135 in 2001, representing 7.52% of the population (Statistics Canada, 1996, 2001).

3.7 Family income

The average family income is \$50,151, and the median family income is \$44,063 (Statistics Canada, 1996). Families that have an income of \$10,000 or less represent 4.9% of the total families (1,165 families), while families whose income is \$100,000 or more represent 7.1% (1,680 families). A more detailed breakdown of families by income is presented in Graph 2.

Graph 2. Distribution of Nipissing District population by family income category



3.8 Education

From the population 15 years and older only 11.8% had less than a grade 9 education (Statistics Canada, 1996). The people, who have completed grade 9 to 13, represent the largest group (38.4%). The second largest group is the one that has completed other non-university education (28.1%), followed by individuals with some university (17.1% or 11,315 individuals), and individuals with trade certificates or diploma with 4.6% (or 3,060 individuals).

3.9 Labour force

There was a total of 28,690 women 25 years and over by labour force activity (Statistics Canada, 1996). Of this total 54% (or 15,500 women) were in the labour force, and 46% (or 13,190 women) were not in the labour force. The unemployment rate was 8.7% (1,350 women were unemployed).

Profile for the NorWest Community Health Centre (Thunder Bay Site)

1. Introduction

The City of Thunder Bay is located in the northwest region of Ontario, and has a population of 109,016 (Statistics Canada, 2001).

2. Lead agency

The lead agency for the project is NorWest Community Health Centre. The main contact for the agency is

Anita Jean
Program Coordinator
NorWest Community Health Centre
525 Simpson Street
Thunder Bay ON
P7C 3J6

The catchment area for the Thunder Bay site runs north at McIntyre River, south at Arthur Street, west at Balmoral Street, and east by Kaministiqui River.

3. Community profile

The city of Thunder Bay has a total land area of 328.47 square kilometres, and a population density per square kilometre equal to 332. The total population between 1996 and 2001 decreased by 4.1% (Statistics Canada, 1996, 2001).

3.1 Gender distribution

Between 1996 and 2001, the gender distribution has remained almost the same. There were 51.1% females in 1996 and 51.3% in 2001 (Statistics Canada, 1996, 2001).

3.2 Urban versus rural population

The majority of the population, 108,132 people or 95% live in urban areas, while only 5% live in rural areas (Statistics Canada, 1996).

3.3 Population of women by age groups

According to census data, 37.9% of women were between the ages of 25 and 49 (Statistics Canada, 1996). The age group of women between 35 and 39 years of age represent the largest group (with 22.5%), followed by the age group 30 to 34 years with 20.8%. A more detailed breakdown is provided in Table 1.

Table 1. Distribution of female population (age 25 to 49) by age group for the city of Thunder Bay

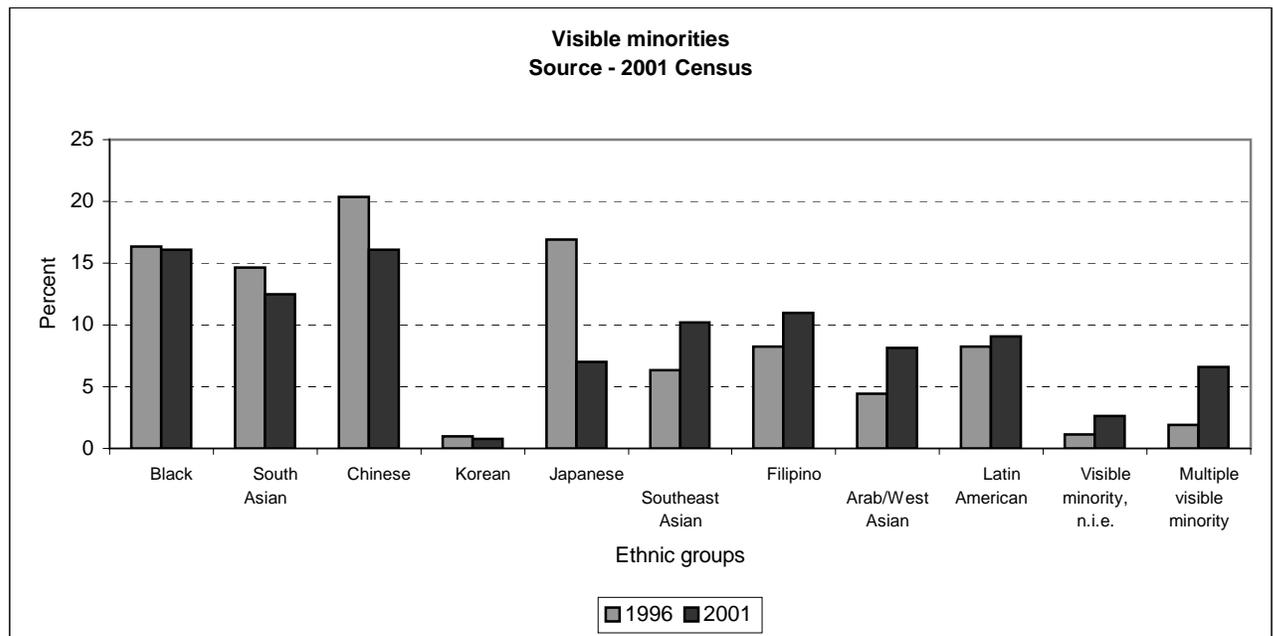
Age group	Population	Percent	Cumulative percent
25-29 years	4,015	18.24	18.24
30-34 years	4,590	20.85	39.09
35-39 years	4,960	22.53	61.62
40-44 years	4,445	20.19	81.81
45-49 years	4,005	18.19	100.00
Total	22,015	100.00	

Source: Statistics Canada, 2001.

3.4 Visible minority

From the 11 minority groups reported in the 2001 Census, four groups experienced an increase in population from 1996 to 2001. This includes South Asians, Filipino, Arab/West Asian, and Latin Americans. The distribution of all the visible minorities is provided in Graph 1.

Graph 1. Distribution of the city of Thunder Bay population by visible minorities



* Not included elsewhere – includes Pacific islanders and other visible minority groups.

** Multiple visible minority - includes respondents who reported more than one minority group.

3.5 Mother tongue

The official languages (English and French) were reported as the mother tongue for 84.3% of the population (Statistics Canada, 1996). Approximately 97% of this group reported their mother tongue as English while 3% reported their mother tongue as French. The remainder

of the population (15.7%) was divided between 16 groups. Among the groups reporting non-official languages (a total of 17,405 persons), Italian is the largest group (23.8%), followed by Finnish (18.8%), Ukrainian (11.4%), Polish (9.4%), German (6%), Ojibway (3.6%), Slovak (2.8%), Croatian (2.6%), Chinese (2%), Dutch (2%), Portuguese (1.7%), Spanish (1.7%), Greek (1.5%), Hungarian (1%), and Cree (1%). Approximately 11% of the population was reported in the ‘other mother tongue’ category.

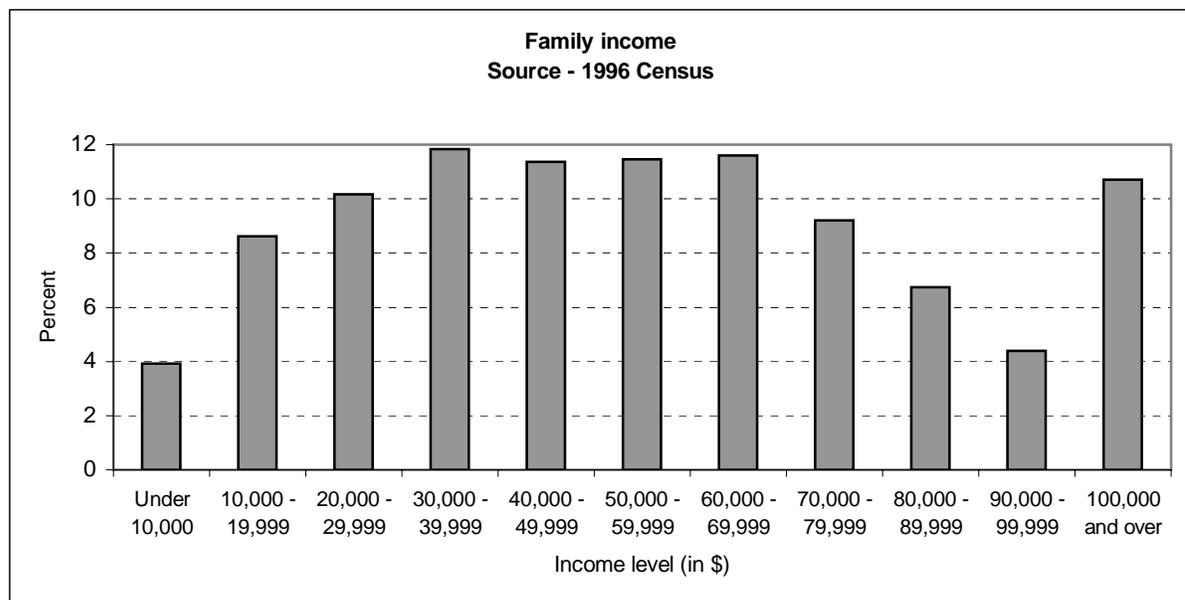
3.6 Aboriginal groups

The aboriginal population in Thunder Bay increased from 6,510 people in 1996 representing 5.8% of the population to 7,250 in 2001 representing 6.7% of the population (Statistics Canada, 1996, 2001).

3.7 Family income

The average family income is \$58,245, and the median family income is \$53,695 (Statistics Canada, 1996). Families that have an income of \$10,000 or less represent 3.9% of the total families (1,220 families), while families whose income is \$100,000 or more represent 10.7% (3,335 families). A more detailed breakdown of families by income is presented in Graph 2.

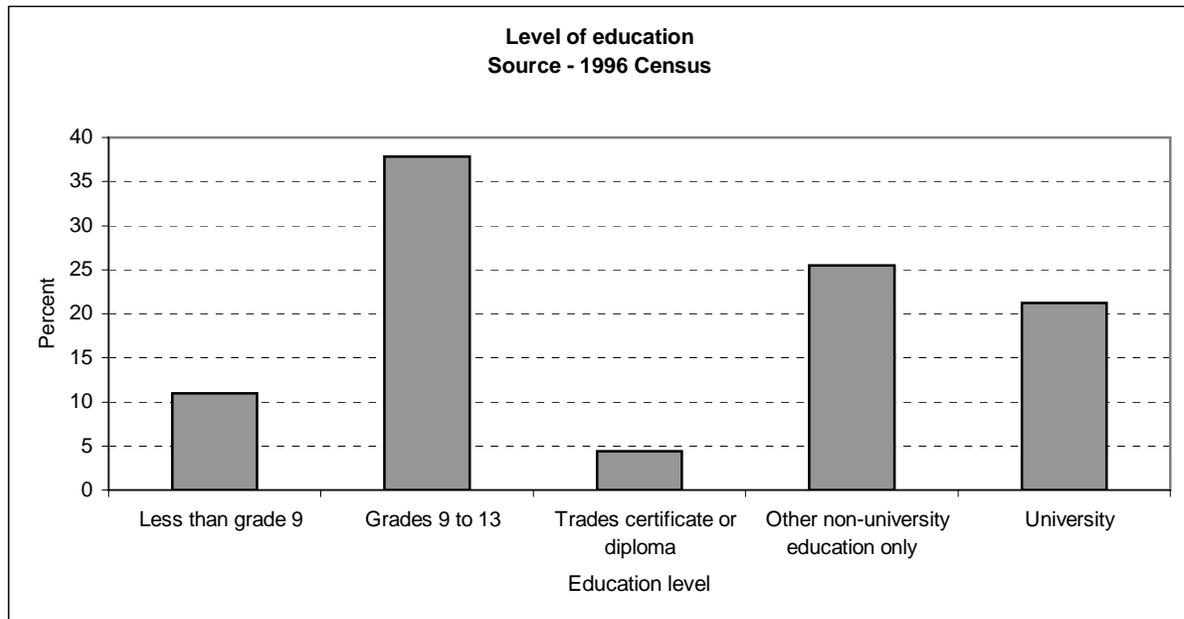
Graph 2. Distribution of the city of Thunder Bay population by family income



3.8 Education

From the population 15 years and older only 11% had less than a grade 9 education (Statistics Canada, 1996). The people, who have completed grade 9 to 13, represent the largest group (39%). The second largest group is the one that has completed other non-university education (25%). A complete breakdown of the population is provided in Graph 3.

Graph 3. Distribution of the city of Thunder Bay population by education level



3.9 Labour force

There was a total of 38,960 women 25 years and over by labour force activity (Statistics Canada, 1996). Of this total 56% (or 21,885 women) were in the labour force, and 44% (or 17,080 women) were not in the labour force. The unemployment rate was 8% (1,745 women were unemployed).

Profile for the Profile for the NorWest Community Health Centre (Longlac Site)

1. Introduction

The town of Longlac and the Ginoogaming Reserve is located in the northwest region of Ontario, and has a population of 2,641 (Statistics Canada, 2001).

2. Lead agency

The lead agency for the project is NorWest Community Health Centre. The main contact for the agency is:

Anita Jean
Program Co-ordinator
NorWest Community Health Centre
525 Simpson Street
Thunder Bay ON
P7C 3J6

The catchment area for the Longlac site consists of the town of Longlac, Long Lake #58 Reserve and Ginoogaming Reserve

3. Community profile

The main characteristics of the Longlac site are as follows:

3.1 Gender distribution

Females represent 48% of the total population and males represent 52% of the population (Statistics Canada, 2001).

3.2 Urban versus rural population

The majority of the population, 2,074 people or 78.5% lives in urban settings, while 21.57% or 567 people live in rural areas (Statistics Canada, 1996).

3.3 Population of women by age groups

According to census data, 38.8% of women were between the ages of 25 and 49 (Statistics Canada, 1996). The age group of women between 30 and 34 years of age represents the largest group with 22.2% followed by the age groups of 25 to 29 years of age and 40 to 44 years with 21.2% each. A more detailed breakdown is provided in Table 1.

Table 1. Distribution of female population (age 25 to 49) by age group for Longlac, Long Lake #58 Reserve, and Ginoogaming Reserve

Age group	Population	Percent	Cumulative percent
25-29 years	105	21.21	21.21
30-34 years	110	22.22	43.43
35-39 years	100	20.20	63.64
40-44 years	105	21.21	84.85
45-49 years	75	15.15	100.00
Total	495	100.00	

Source: Statistics Canada, 2001.

3.4 Mother tongue

The official languages (English and French) were reported as the mother tongue for 94% of the population (Statistics Canada, 1996). Approximately 61.6% of this group reported their mother tongue as English while 38.4% reported their mother tongue as French. Among the groups reporting non-official languages (a total of 150 people), the Ojibway language was used by 30% of the people, Serbo-Croatian by 23.3%, Portuguese by 20%, Finnish by 10%, and Italian and German by 6.7% each.

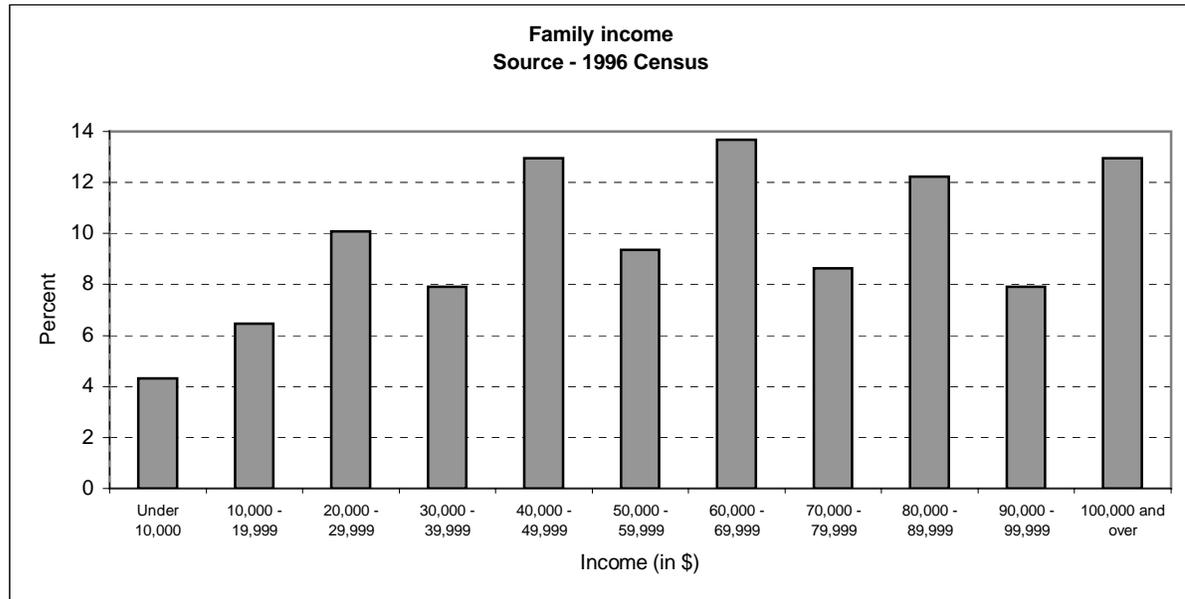
3.5 Aboriginal groups

The aboriginal population of the Longlac site represents 27 % of the total population.

3.6 Family income

The average family income is \$32,982, and the median family income is \$31,175 (Statistics Canada, 1996). Families that have an income of \$10,000 or less represent 4.3% of the total families (30 families), while families, whose income is \$100,000 or more represent 13% (90 families). A more detailed breakdown of families by income is presented in Graph 1.

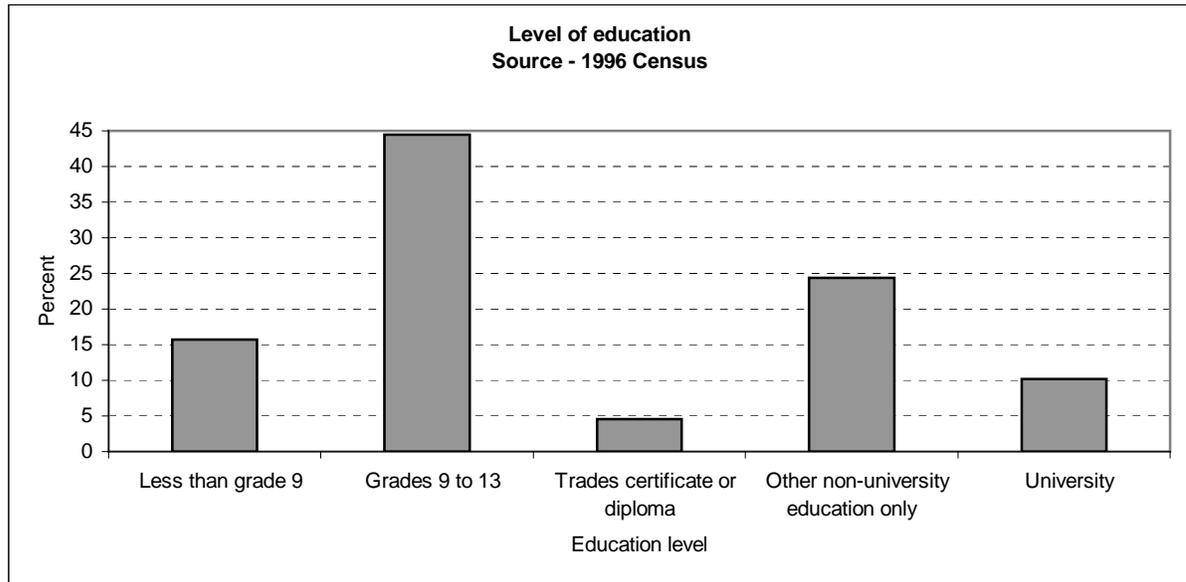
Graph 1. Distribution of Longlac, Long Lake #58 Reserve, and Ginoogaming Reserve population by family income



3.7 Education

From the population 15 years and older, 15.7% had less than a grade 9 education (Statistics Canada, 1996). Persons that have completed grade 9 to 13, represent the largest group (44.4%). The second largest group is the group that completed other non-university education (24.4%). A complete breakdown of the population is provided in Graph 2.

Graph 2. Distribution of Longlac, Long Lake #58 Reserve, and Ginoogaming Reserve population by level of education



3.8 Labour force

There was a total of 690 women 25 years and over by labour force activity (Statistics Canada, 1996). Of this total 64% (or 445 women) were in the labour force, and 35% (or 240 women) were not in the labour force. The unemployment rate was 10 (45 women were unemployed).

Profile for the Porcupine Health Unit (Township of Black River Matheson)

1. Introduction

The Porcupine Health Unit is one seven public health units involved in the Northern Healthy Eating Project (NHEP). NHEP is an innovative partnership whose mandate is to increase vegetable and fruit consumption of Northern Ontarians.

2. Lead agency

The lead agency for the project is Porcupine Health Unit. The main contact for this program is:

Patricia Desroches
Public Health Dietitian
Porcupine Health Unit
PO Box 2012
Timmins ON P4N 8B7

3. Community profile

The population for the Township of Black Rivers Matheson was 3,220 in 2001 (Statistics Canada, 2001).

3.1 Gender distribution

Females represent 49% of the total population, and males represent 51% of the population (Statistics Canada, 2001).

3.2 Urban versus rural population

The population of the Township of Black River Matheson lives in an urban setting.

3.3 Population of women by age groups

According to 1996 census data 38.7% of women were between the ages of 25 and 49. The age group of women between 35 and 39 years of age represent the largest group with 25.4%, followed by the age group 30 to 34 years with 19.7%. A more detailed breakdown is provided in Table 1.

Table 1. Distribution of female population (age 25 to 49) by age group for Porcupine (Township of Black River Matheson)

Age group	Population	Percent	Cumulative percent
25-29 years	105	17.21	17.21
30-34 years	120	19.67	36.89
35-39 years	155	25.41	62.30
40-44 years	110	18.03	80.33
45-49 years	120	19.67	100.00
Total	610	100.00	

Source: Statistics Canada, 2001.

3.4 Visible minority

There were only 35 individuals of visible minority in 2001 (Statistics Canada, 2001). Of this number, 15 individuals (or 42.8%) were Chinese. The rest were Blacks and Southeast Asians with 28.6% each.

3.5 Mother tongue

The official languages (English and French) were reported as the mother tongue for 98% of the population (Statistics Canada, 1996). Approximately 62% of this group reported their mother tongue as English while 38% reported their mother tongue as French. Among the groups reporting non-official languages (a total of 55 people), Chinese was reported as the largest group at 27% of the group. Other groups include German, Dutch, and Serbian with 18% each.

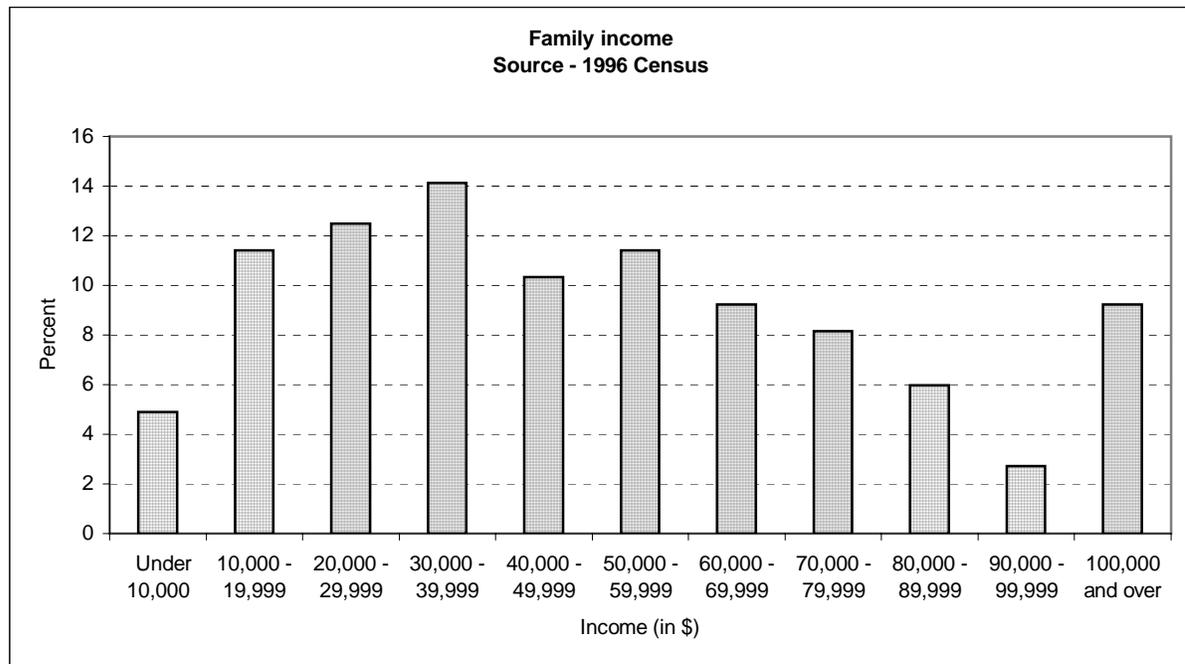
3.6 Aboriginal groups

The aboriginal population of the Township of Black River Matheson represents approximately 1% of the total population.

3.7 Family income

The average family income is \$51,096, and the median family income is \$46,331 (Statistics Canada, 1996). Families that have an income of \$10,000 or less represent 4.9% of the total families (45 families), while families, whose income is \$100,000 or more represent 9.2% (85 families). A more detailed breakdown of families by income is presented in Graph 1.

Graph 1. Distribution of Township of Black River Matheson population by family income



3.8 Education

From the population 15 years and older, 19.7% have less than a grade 9 education (Statistics Canada, 1996). Persons that have completed grade 9 to 13, represent the largest group at 44%. The third largest group is the group that completed other non-university education at 19.5%. The other groups include individuals with university (10%), and individuals with trade certificates or a diploma (7%).

3.9 Labour force

There was a total of 1,020 women 25 years and over by labour force activity (Statistics Canada, 1996). Of this total 50% were in the labour force and 50 were not in the labour force. The unemployment rate was 4% (20 women were unemployed).

Profile for Somerset West Community Health Centre (Ottawa)

1. Introduction

The City of Ottawa is located in Eastern Ontario, and has a total land area of 2,788.64 square kilometers.

2. Lead agency

The lead agency for the project is Somerset West Community Health Centre (SWCHC). SWCHC is located in an area of Ottawa that is slightly west of the main downtown core. The catchment area covers an area of approximately 18 sq km and includes “Chinatown” and “Little Italy”. The catchment area has a population of about 30,000 people. The main contact for the program at this agency is

Bonnie Baxter
Community Dietitian,
Somerset West Community Health Centre
55 Eccles Street
Ottawa, ON K1R 6S3

3. Community profile

The community profile was developed using census data for the City of Ottawa as census data was not available for the specific catchment area. The main characteristics of the city are as follows:

3.1 Gender distribution

Females represent 52% of the total population with 168,540 individuals while males represent 48% of the population with 154,800 individuals (Statistics Canada, 2001).

3.2 Urban versus rural population

The population lives in an urban setting.

3.3 Population of women by age groups

According to 2001 census data, 40% of women are between the ages of 25 and 49 (Statistics Canada, 2001). The age group of women between 25 and 29 years of age represents the largest group with 22.4%, followed by the age group 30 to 34 years with 21.6%. A more detailed breakdown is provided in Table 1.

Table 1. Distribution of female population (age 25 to 49) by age group for the city of Ottawa

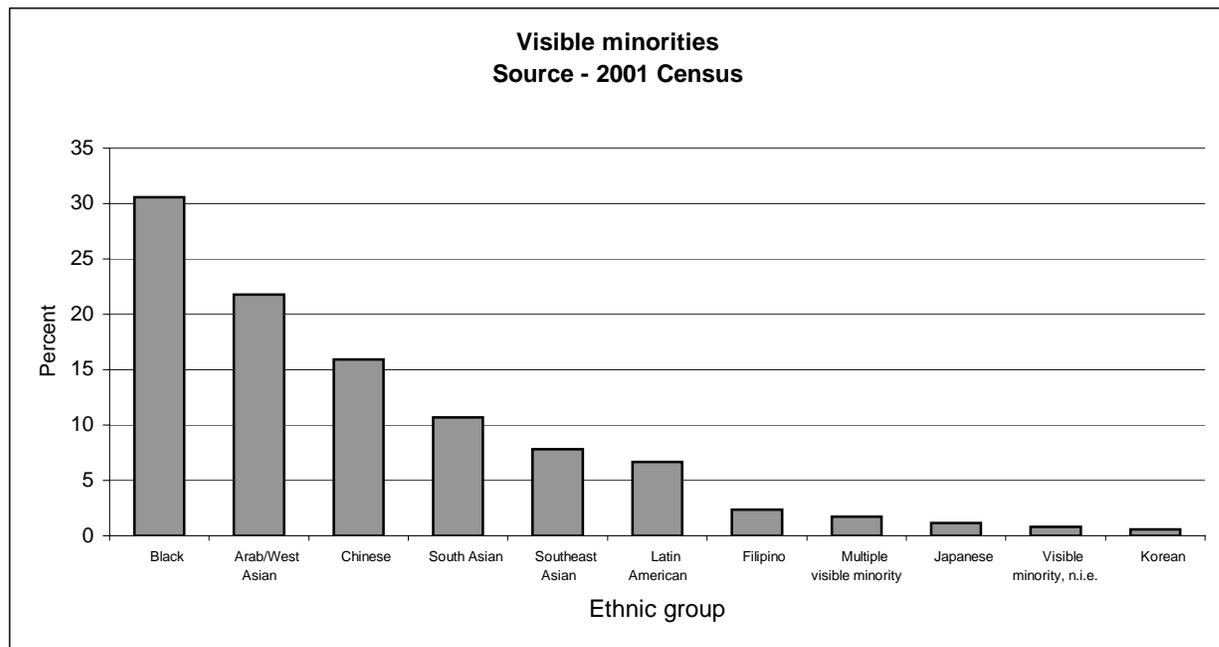
Age group	Population	Percent	Cumulative percent
25-29 years	15,185	22.43	22.43
30-34 years	14,630	21.61	44.04
35-39 years	13,675	20.20	64.24
40-44 years	12,460	18.41	82.65
45-49 years	11,745	17.35	100
Total	67,695	100.00	

Source: Statistics Canada, 2001.

3.4 Visible minority

Visible minorities represented 18.9% of the total population in 2001 (Statistics Canada, 2001). The distribution of all the visible minorities is provided in Graph 1.

Graph 1. Distribution of City of Ottawa population by visible minorities



* Not included elsewhere – includes Pacific islanders and other visible minority groups.

** Multiple visible minority - includes respondents who reported more than one minority group.

3.5 Mother tongue

The official languages (English and French) were reported as the mother tongue for 78% of the population (Statistics Canada, 1996). Approximately 81% of this group reported their mother tongue as English while 19% reported their mother tongue as French. Among the groups reporting non-official languages (a total of 67,670 people), Arabic was the largest single group at 14.6% followed by Chinese at 12%, Italian at 8.4%, Spanish at 7%, Polish at 4.7%, Vietnamese at 4.3%, German at 4.2%, Portuguese at 2.7%, Persian (Farsi) at 2.5%, Greek at 2%, Russian at 1.9%, Hungarian at 1.7%, Dutch at 1.5%, Ukrainian at 1.4%, and

Creoles at 1.2%. Approximately 29.6% (or 20,000 individuals) reported having ‘other mother tongue’.

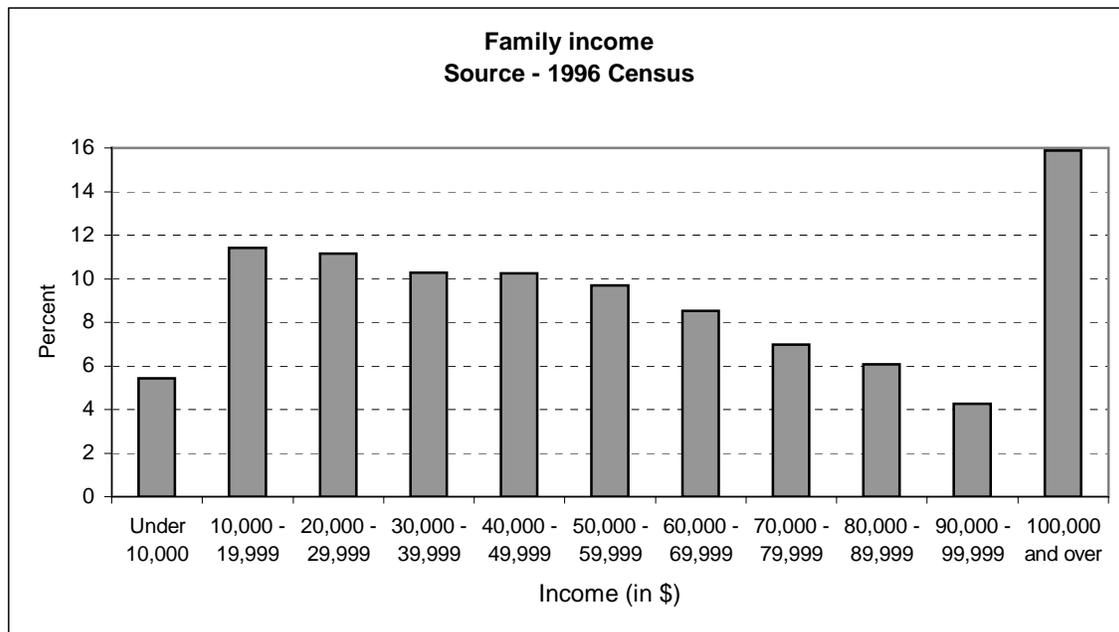
3.6 Aboriginal groups

The aboriginal population represents 1% of the total population with 3,465 individuals (Statistics Canada, 1996).

3.7 Family income

The average family income is \$61,452, and the median family income is \$51,553 (Statistics Canada, 1996). Families that have an income of \$10,000 or less represent 5.4% of the total families (4,300 families) while families whose income is \$100,000 or more represent 15.9% (12,560 families). A more detailed breakdown of families by income is presented in Graph 2.

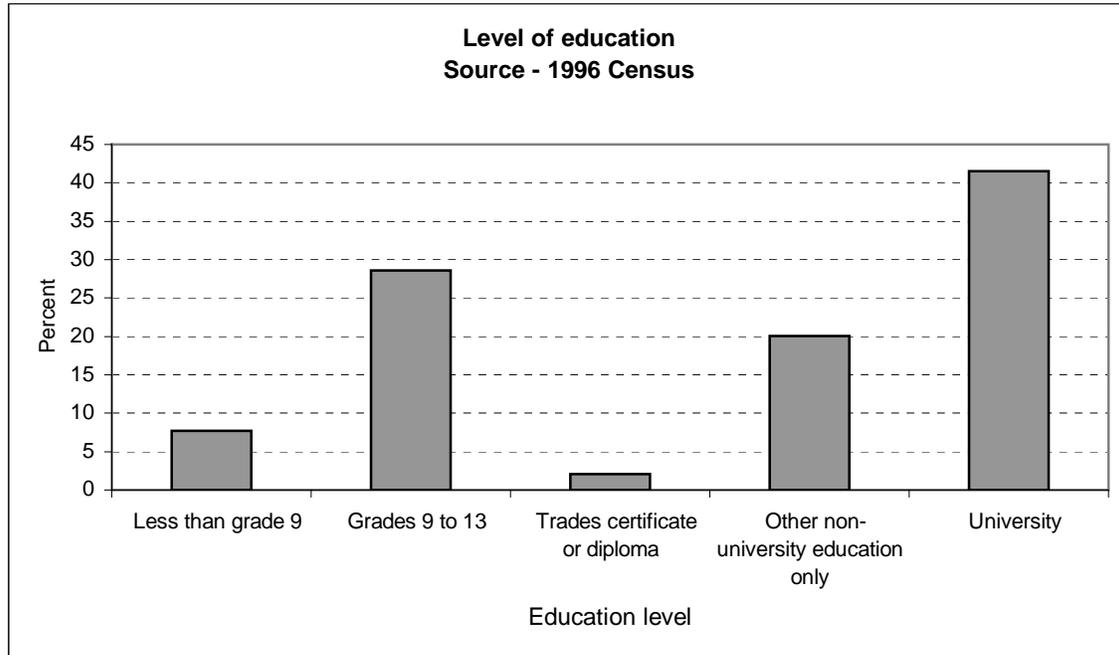
Graph 2. Distribution of City of Ottawa population by family income



3.8 Education

From the population 15 years and older, 7.7% have less than a grade 9 education (Statistics Canada, 1996). Persons that have completed university represent the largest group at 42%. The second largest group is the group that completed grades 9 to 13 with 28%. A complete breakdown of the population is provided in Graph 3.

Graph 3. Distribution of City of Ottawa population by education level



3.9 Labour force

There was a total of 118,745 women 25 years and over by labour force activity in 1996 (Statistics Canada, 1996). Of this total 55.9% were in the labour force. The unemployment rate was 8.6% (5,780 women were unemployed).

Profile for the Sudbury and District Health Unit (City of Greater Sudbury, Sudbury District, and Manitoulin District)

1. Introduction

The City of Sudbury is located in northwestern Ontario. It has a total population of 155,219 people (Statistics Canada, 2001).

2. Lead agency

The lead agency for the project is Sudbury and District Health Unit. The catchment area for the Sudbury and District Health Unit is located in Northeastern Ontario. The Health Unit boundaries encompass approximately a 60-mile radius from the City of Sudbury. The largest centre in the district is the City of Sudbury. The main contact for the for the program at this agency is:

Kim Curtis
Public Health Dietitian
Sudbury & District Health Unit
1300 Paris Street
Sudbury, Ontario P3A 3E3

3. Community profile

The main characteristics of the area are as follows:

3.1 Gender distribution

In 2001 females represented 51.2% of the total population, slightly higher from 50.7% in 1996 while males represented 48.8% down from 49.3% in 1996 (Statistics Canada, 1996, 2001).

3.2 Urban versus rural population

Approximately 78% of the population lives in urban settings, with the balance (22%) living in rural areas (Statistics Canada, 1996).

3.3 Population of women by age groups

According to census data, 38.21% of women were between the ages of 25 and 49 (Statistics Canada, 2001). The age group of women between 35 and 39 years of age represents the largest group with 22%, followed by the age group 30 to 34 years with 21.6%. A more detailed breakdown is provided in Table 1.

Table 1. Distribution of female population (age 25 to 49) by age group for the city of Greater Sudbury, Sudbury District and Manitoulin District

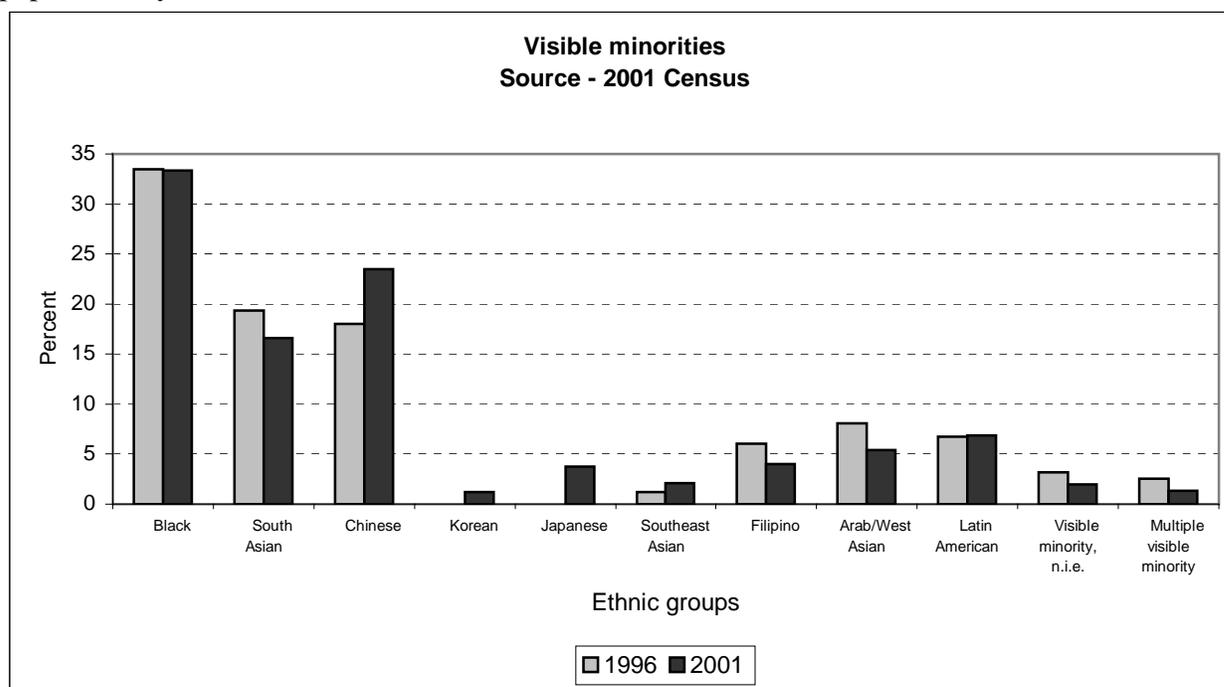
Age group	Population	Percent	Cumulative percent
25-29 years	6,615	17.00	17.00
30-34 years	8,410	21.61	38.60
35-39 years	8,550	21.97	60.57
40-44 years	8,065	20.72	81.29
45-49 years	7,280	18.71	100.00
Total	38,920	100.00	

Source: Statistics Canada, 2001.

3.4 Visible minority

Visible minorities represented 1.7% of the total population in 2001 (Statistics Canada, 2001). The three largest minority groups are Blacks (33.3%), Chinese (23.5%), and South Asians (16.6%). The distribution of all visible minorities is provided in Graph 1.

Graph 1. Distribution of Greater Sudbury, Sudbury District and Manitoulin District population by visible minorities



* Not included elsewhere – includes Pacific islanders and other visible minority groups.

** Multiple visible minority - includes respondents who reported more than one minority group.

3.5 Mother tongue

The official languages (English and French) were reported as the mother tongue for 81% of the population (Statistics Canada, 1996). Approximately 72% of this group reported their mother tongue as English while 28% reported their mother tongue as French. Among the groups reporting non-official languages (a total of 12,160 people), Italian was the largest single group at 24.9%, followed by Finnish (14.9%), Ojibway (10.2%), German (10%), Ukrainian (7.6%), Polish (5.7%), Croatian (3%), Chinese (2.8%), Dutch (2.1%), Spanish (2%), Serbian (1.6%), Portuguese (1.4%), Czech (1%), Greek (1%), and Arabic, Hungarian and Slovak with 1% each. Approximately 9% (or 1,415 individuals) reported having ‘other mother tongue’.

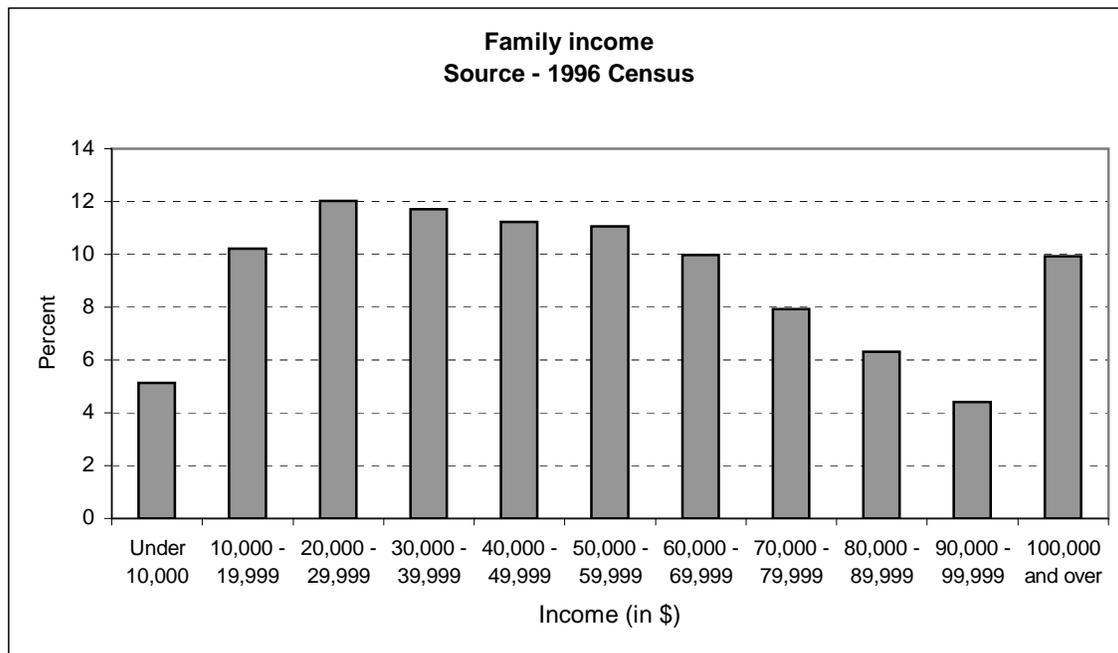
3.6 Aboriginal groups

The aboriginal population represents 7.4% of the total population with 14,160 individuals (Statistics Canada, 1996).

3.7 Family income

The average family income is \$49,577, and the median family income is \$43,832 (Statistics Canada, 1996). Families that have an income of \$10,000 or less represent 5% of the total families (2,910 families), while families, whose income is \$100,000 or more represent 9.9% (5,620 families). A more detailed breakdown of families by income is presented in Graph 2.

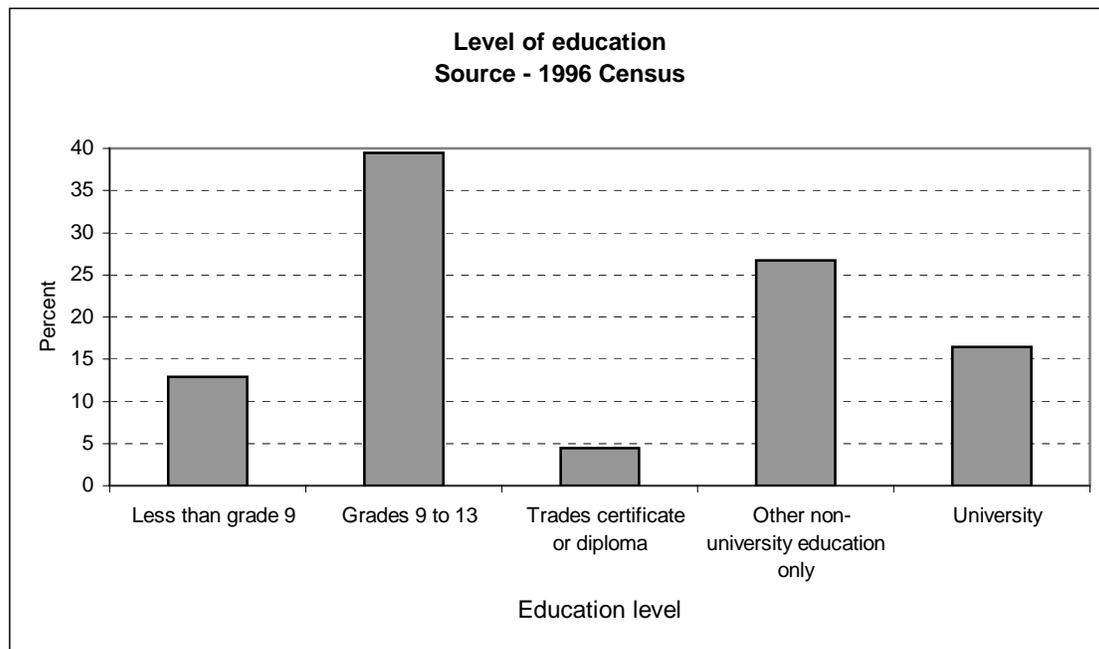
Graph 2. Distribution of Greater Sudbury, Sudbury District and Manitoulin District population by family income



3.8 Education

From the population 15 years and older, 13% have less than a grade 9 education (Statistics Canada, 1996). Persons that have completed grade 9 to 13 represent the largest group at 39.5%. The second largest group is the group that completed other non-university education with 26.7%. A complete breakdown of the population is provided in Graph 3.

Graph 3. Distribution of Greater Sudbury, Sudbury District and Manitoulin District population by education level



3.9 Labour force

There was a total of 66,605 women 25 years and over by labour force activity in 1996 (Statistics Canada, 1996). Of this total 54.6% were in the labour force. The unemployment rate was 10% (3,675 women were unemployed).

Profile for the East End Community Health Centre (Toronto)

1. Introduction

The East End Community Health Centre is located in the former city of Toronto, in the East End of the present city limits. In 2001 the total population for the East York census area amounted to 115,185 (Statistics Canada, 2001).

2. Lead agency

The lead agency for the project is East End Community Health Centre. The main contact for the program at the agency is:

Pallavi Kashyap
Health Promoter
East End Community Health Centre
343 Coxwell Avenue
Toronto, Ontario M4L 3B5

The catchment area for the Health Centre is bounded by Greenwood Avenue north of Dundas Street and Coxwell Avenue south of Dundas Street, and to the east by Victoria Park Avenue to the south by Lake Ontario and the north by Danforth Avenue.

3. Community profile

The area serviced by the East End Community Health Centre has the following characteristics:

3.1 Gender distribution

According to 2001 census data for East York, 52.5% of the population (60,495 individuals) were females, and 47.5% (54,695 individuals) were males.

3.2 Urban versus rural population

The total population of the census area lives in an urban setting.

3.3 Population of women by age groups

According to census data, 42.3% of women were between the ages of 25 and 49. The age group of women between 30 and 34 years of age represents the largest group with 23.8% followed by the age group 35 to 39 years with 22.7%. A detailed breakdown is provided in Table 1.

Table 1. Distribution of female population (age 25 to 49) by age group for Toronto (former city of Toronto)

Age group	Population	Percent	Cumulative percent
25-29 years	4,515	18.57	18.57
30-34 years	5,805	23.87	42.44
35-39 years	5,520	22.70	65.14
40-44 years	4,655	19.14	84.29
45-49 years	3,820	15.71	100.00
Total	24,315	100.00	

Source: Statistics Canada, 1996.

3.4 Visible minority

The 1996 census reports that the census area had 33,235 individuals from visible minorities. These individuals were from the following minorities: South Asian (33%), Chinese (20.5%), Black (17.9%), Filipino (12.2%), Arab/West Asian (5.6%), Visible minorities not included elsewhere (2.8%), Latin American (2.2%), Japanese (1.7%), Multiple visible minority (1.7%), Korean (1.3%), and Southeast Asian (1%).

3.5 Mother tongue

The official languages (English and French) were reported as the mother tongue for 64.4% of the population (Statistics Canada, 1996). Approximately 98% of this group reported their mother tongue as English while 2% reported their mother tongue as French.

Among the groups reporting non-official languages (a total of 37,040 people), Greek was the largest single category at 16.8%, followed by Chinese at 15.5%, Tagalog (Filipino) at 6.7%, Italian at 6.2%, Gujarati at 4.6%, Serbian at 3.1%, Urdu and Macedonian with 2.9% each, German at 2.8%, Persian at 2.4%, Polish at 2.4%, Bengali at 1.9%, Spanish at 1.9%, and Arabic and Romanian with 1.8% each.

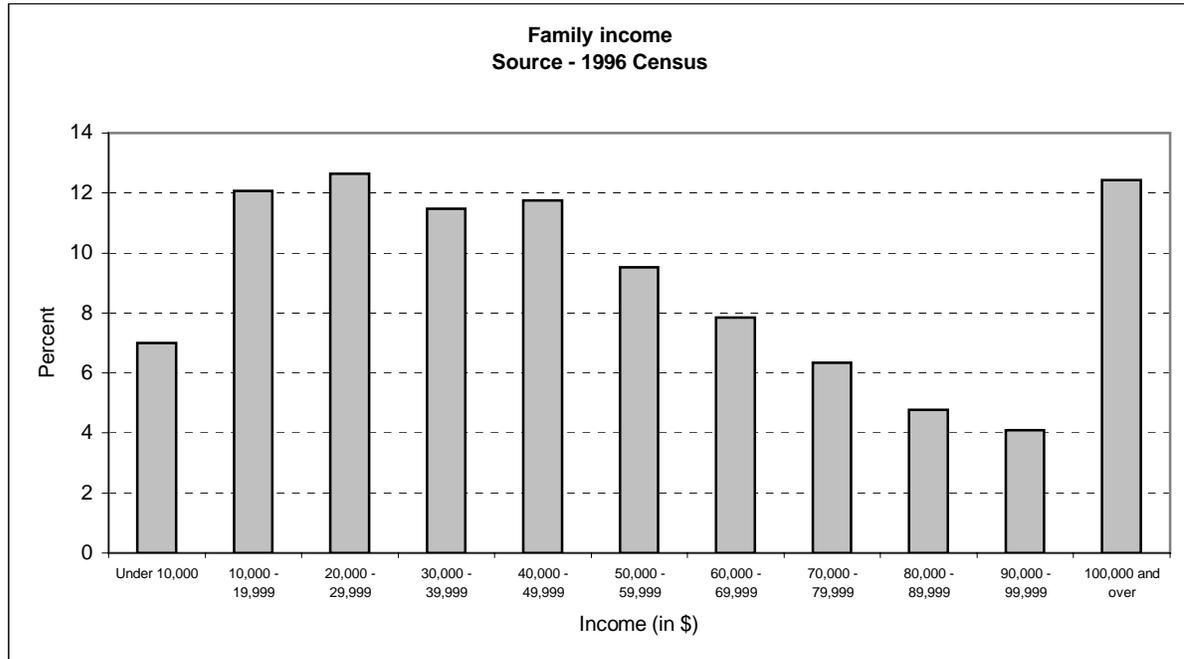
3.6 Aboriginal groups

According to the 1996 census the aboriginal population in East York represents 0.4% of the total population (395 individuals).

3.7 Family income

The average family income is \$56,391, and the median family income is \$45,563 (Statistics Canada, 1996). Families that have an income of \$10,000 or less represent 7% of the total families (1,970 families), while families, whose income is \$100,000 or more represent 12.4% (3,500 families). A more detailed breakdown of families by income is presented in Graph 1.

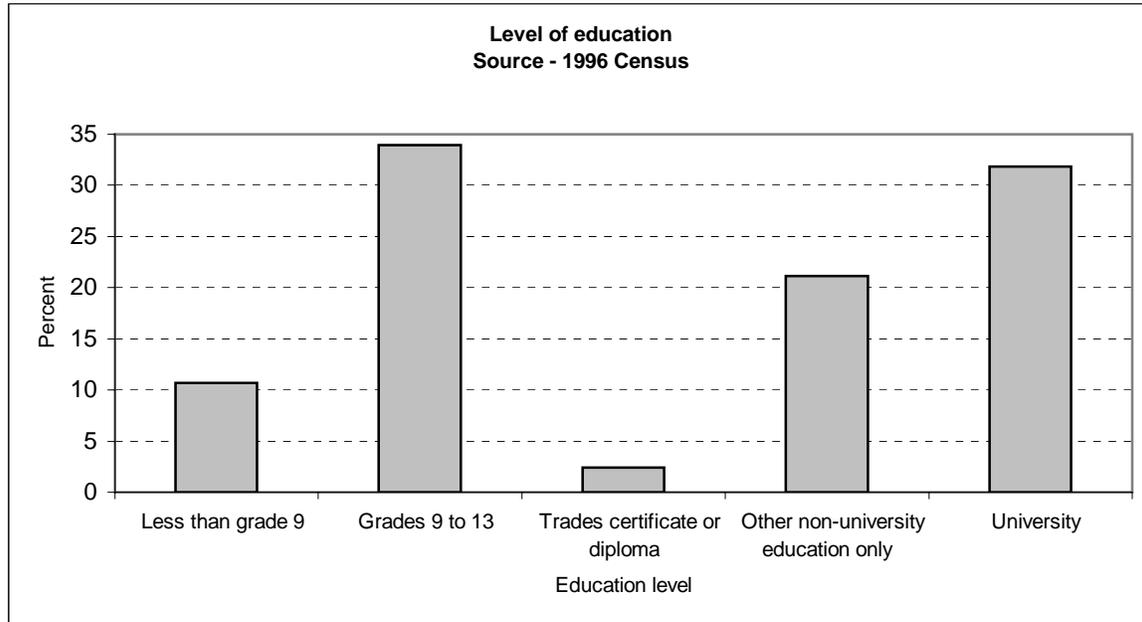
Graph 1. Distribution of East York population by family income



3.8 Education

From the population 15 years and older, 10.7% have less than a grade 9 education (Statistics Canada, 1996). Persons that have completed grade 9 to 13 represent the largest group at 34%. The second largest group is the group that completed university at 31%. A complete breakdown of the population is provided in Graph 3.

Graph 2. Distribution of East York population by education level



3.9 Labour force

There was a total of 42,060 women 25 years and over by labour force activity in 1996 (Statistics Canada, 1996). Of this total 58% were in the labour force. The unemployment rate was 8.4% (2,030 women were unemployed).

Profile for Toronto Public Health Unit (Municipality of Toronto)

1. Introduction

The City of Toronto is located in southern Ontario on the northwest shore of Lake Ontario. With the amalgamation of the City of Toronto on January 1st 1998, six former health departments were brought together to create the new Toronto Public Health Unit, the largest health unit in Canada. The Toronto Public Health Unit services an area with a population of approximately 2.5 million (Statistics Canada, 2001).

2. Lead agency

The lead agency for the project is Toronto Public Health. The program contact for the agency is:

Lisa Swimmer
Public Health Nutritionist
Toronto Public Health
North Region
5100 Yonge Street, 2nd Floor
Toronto, ON M2N 5V7

The Health Unit worked in collaboration with the Four Villages Community Health Centre with Krystyna Lewicki as a co-facilitator. The catchment area was the area serviced by the Four Villages CHC.

3. Community profile

The main characteristics of the area are as follows:

3.1 Gender distribution

According to 2001 census data for the Municipality of Toronto, 52% of the population were females (1,237,730) and 48% were males (1,147,695).

3.2 Urban versus rural population

The total population of the census area lives in an urban setting.

3.3 Population of women by age groups

According to census data, 41.50% of women were between the ages of 25 and 49 (Statistics Canada, 2001). The age group of women between 30 and 34 years of age represent the largest group with 22.9%, followed by the age group 25 to 29 years with 21.3%. A more detailed breakdown is provided in Table 1.

Table 1. Distribution of female population (age 25 to 49) by age group for Toronto Metropolitan Municipality

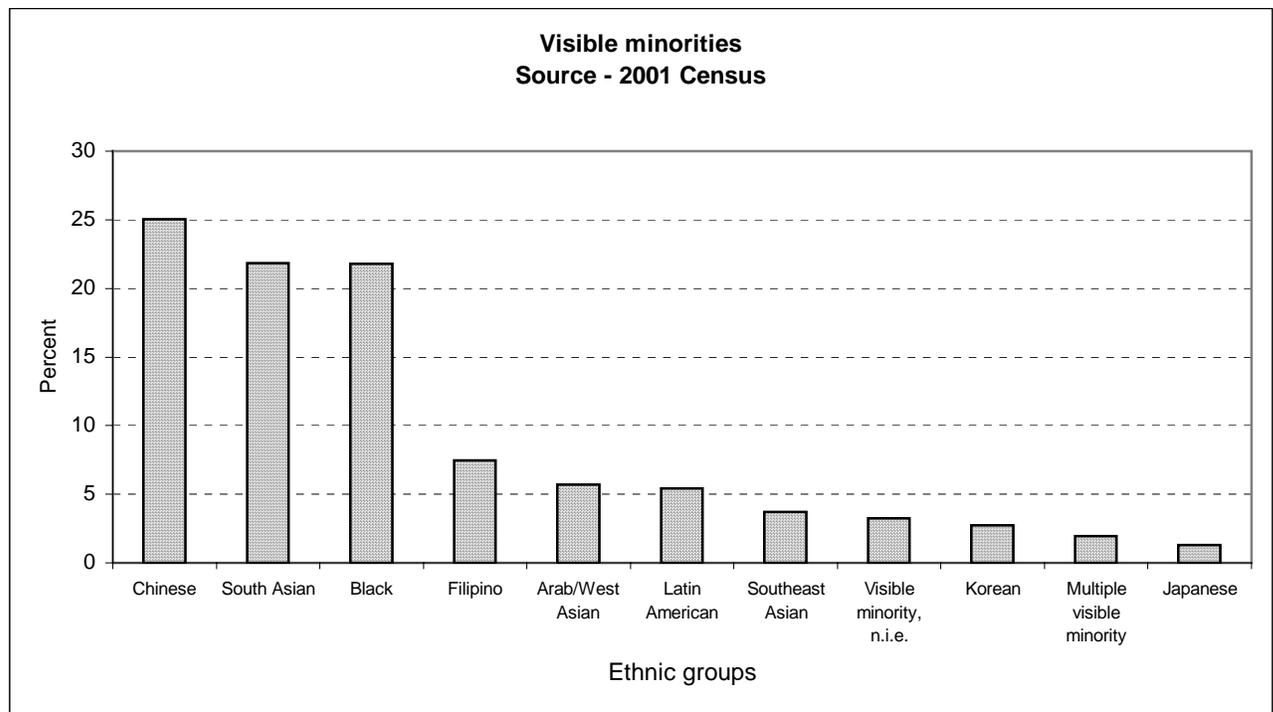
Age group	Population	Percent	Cumulative percent
25-29 years	109,575	21.33	21.33
30-34 years	117,640	22.90	44.24
35-39 years	106,425	20.72	64.96
40-44 years	93,890	18.28	83.24
45-49 years	86,095	16.76	100.00
Total	513,625	100.00	

Source: Statistics Canada, 2001.

3.4 Visible minority

Visible minorities represented 37.3% of the total population or 882,330 individuals (Statistics Canada, 2001). The three largest groups are Chinese (25%), South Asians (22%) and Blacks (22%). The distribution of all the visible minorities is provided in Graph 1.

Graph 1. Distribution of Municipality of Toronto population by visible minorities



* Not included elsewhere – includes Pacific islanders and other visible minority groups.

** Multiple visible minority - includes respondents who reported more than one minority group.

3.5 Mother tongue

The official languages (English and French) were reported as the mother tongue for 56.9% of the population (Statistics Canada, 1996). Approximately 98% of this group reported their mother tongue as English while 2% reported their mother tongue as French.

Among the groups reporting non-official languages (a total of 993,880 people), Chinese represents the single largest category at 19%, followed by Italian at 11.5%, Portuguese at 7.1%, Spanish at 5.5%, Polish at 4.8%, Tamil at 4.7%, Tagalog (Filipino) at 4%, Greek at 3.8%, German at 2.6%, Vietnamese at 2.4%, Punjabi at 2.3%, Persian (Farsi) at 2.3%, Arabic at 2.2%, Korean at 1.9%, and Ukrainian at 1.8%). Approximately 23.6% of individuals reported having some other mother tongue.

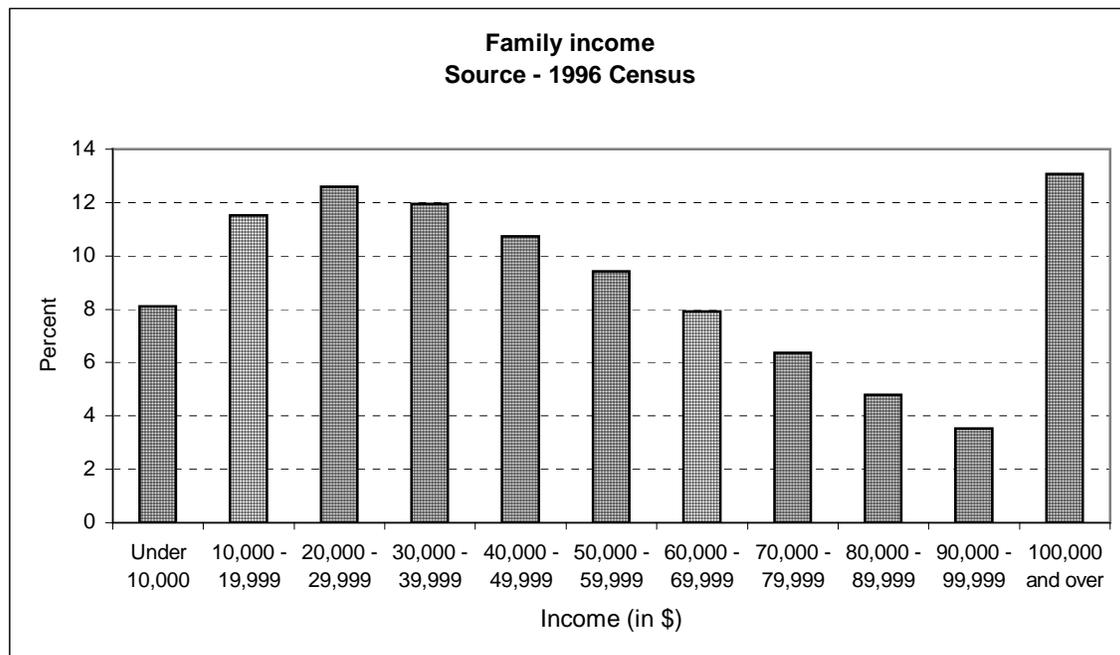
3.6 Aboriginal groups

The aboriginal population represents approximately 0.5% (9,985 individuals) of the total population.

3.7 Family income

The average family income is \$58,939, and the median family income is \$45,251 (Statistics Canada, 1996). Families that have an income of \$10,000 or less represent 8.1% of the total families (50,230 families), while families, whose income is \$100,000 or more represent 13% (80,960 families). A more detailed breakdown of families by income is presented in Graph 2.

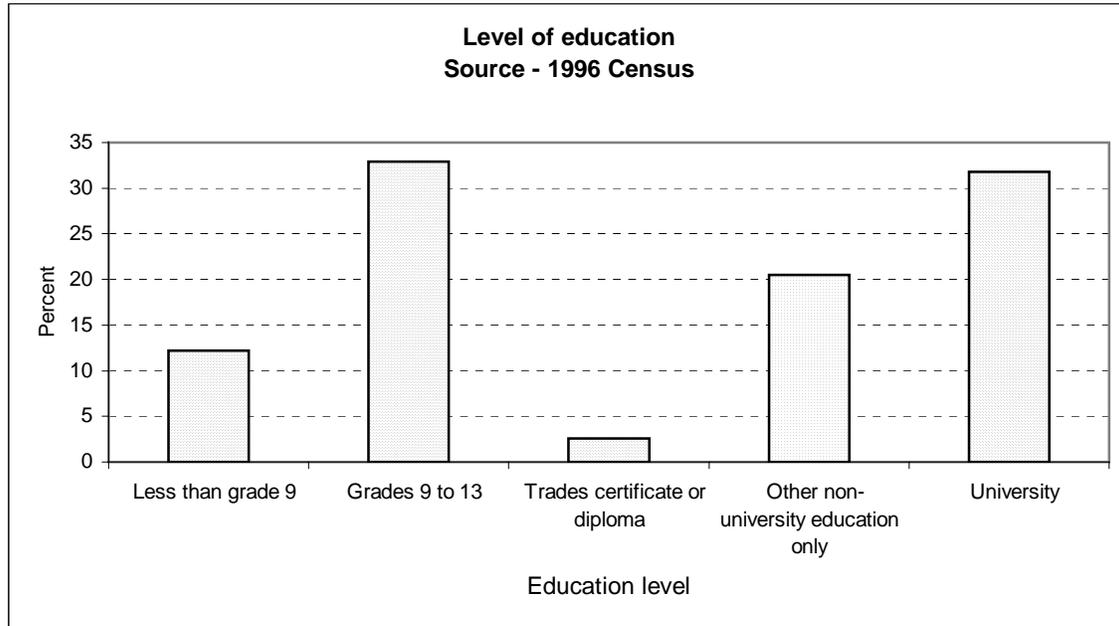
Graph 2. Distribution of Municipality of Toronto population by family income



3.8 Education

From the population 15 years and older, 12.2% have less than a grade 9 education (Statistics Canada, 1996). Persons that have completed grade 9 to 13 represent the largest group at 33%. The second largest group is the group that completed university at 32%. A complete breakdown of the population is provided in Graph 3.

Graph 3. Distribution of Municipality of Toronto population by education level



3.9 Labour force

There was a total of 868,210 women 25 years and over by labour force activity in 1996 (Statistics Canada, 1996). Of this total 58% were in the labour force. The unemployment rate was 9.8% (49,615 women were unemployed).

Profile for the Region of Waterloo Public Health (Region of Waterloo)

1. Introduction

The Region of Waterloo is located in central-west region of Ontario, approximately 80 km from the city of Toronto. The Waterloo Regional Municipality has a total population of 438,515 (Statistics Canada, 2001).

2. Lead agency

The lead agency for the project is Waterloo Region Community Health Department. The main contact for the program at this agency is

Mary Ellen Prange
Public Health Nutritionist
Heart Health & Cancer Prevention Program
Waterloo Region Community Health Department
99 Regina Street South, 3rd Floor,
Waterloo, ON N2J 4V3

3. Community profile

The Waterloo Regional Municipality has a total land area of 1,368.55 square kilometres, and a population density per square kilometre equal to 320.4. The total population between 1996 and 2001 has increased by 8.2% (Statistics Canada, 1996, 2001).

3.1 Gender distribution

Between 1996 and 2001, the gender distribution has remained almost the same with females representing 50.8% of the total population (Statistics Canada, 1996, 2001)

3.2 Urban versus rural population

The large majority of the population, 405,435 people or 93% (Statistics Canada, 1996) live in urban settings, while 7% live in rural areas.

3.3 Population of women by age groups

According to census data 39.7% of women were between the ages of 25 and 49 (Statistics Canada, 1996). The age group of women between 30 and 34 years of age represent the largest group with 22.4%, followed by the age group 35 to 39 years with 21.6%. A more detailed breakdown is provided in Table 1.

Table 1. Distribution of female population (age 25 to 49) by age group for Waterloo Regional Municipality

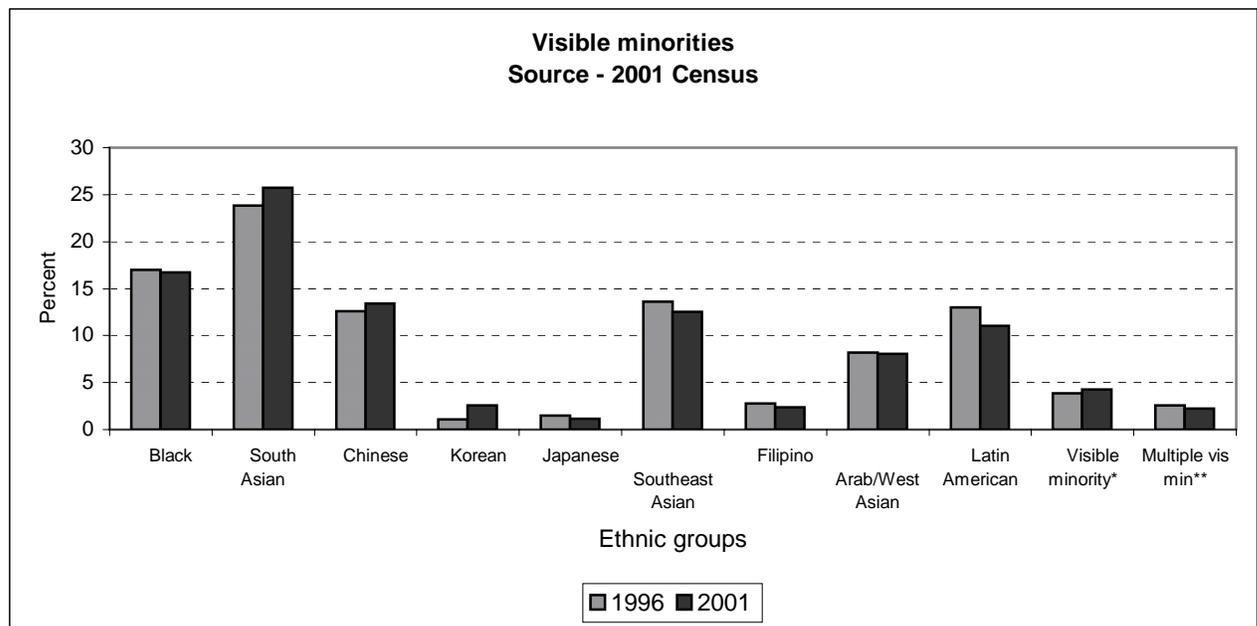
Age group	Population	Percent	Cumulative percent
25-29 years	15,620	19.09	19.09
30-34 years	18,310	22.38	41.46
35-39 years	17,710	21.64	63.11
40-44 years	15,885	19.41	82.52
45-49 years	14,305	17.48	100.00
Total	81,830	100.00	

Source: Statistics Canada, 1996.

3.4 Visible minority

Of the 11 minority groups reported in the 1996 and 2001 census, three groups experienced an increase. These groups are South Asians, Chinese and Koreans. The distribution of all the visible minorities is provided in Graph 1.

Graph 1. Distribution of Waterloo Regional Municipality population by visible minorities



* Not included elsewhere – includes Pacific islanders and other visible minority groups.

** Multiple visible minority - includes respondents who reported more than one minority group.

3.5 Mother tongue

The official languages (English and French) were reported as the mother tongue for 80.1% of the population (Statistics Canada, 1996). Approximately 98% of this group reported their mother tongue as English while 2% reported their mother tongue as French.

Among the population reporting non-official languages (a total of 100,330 people), German represents the single largest category at 25.6%, followed by Portuguese at 14.8%, Polish at 7%, Spanish at 5.7%, Romanian at 3.9%, Chinese at 3.7%, Dutch at 3.1%, Vietnamese at 3.1%, Italian at 2.9%, Croatian at 2.3%, Hungarian at 2.1%, Greek at 2.1%, Punjabi at 2.1%, Serbian at 1.6%, and Arabic at 1.6%). Approximately 18.2% of individuals reported having some other mother tongue.

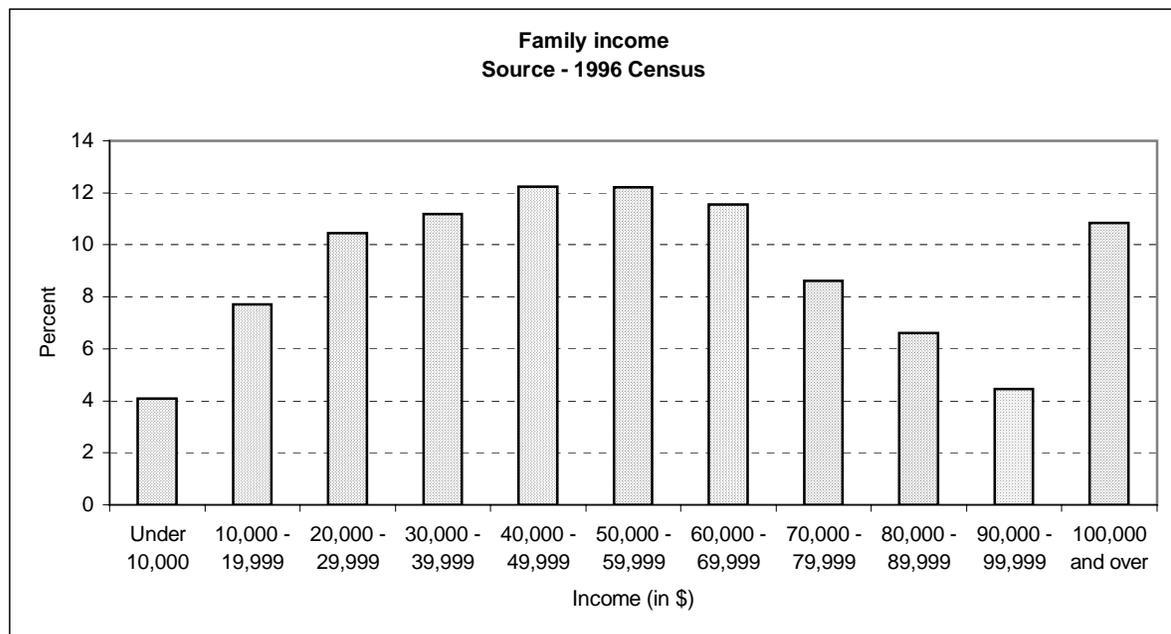
3.6 Aboriginal groups

The aboriginal population in Waterloo Region increased from 2,350 people in 1996 representing 0.5% of the population to 3,340 in 2001 representing 0.7% of the population (Statistics Canada, 1996, 2001).

3.7 Family income

The average family income is \$59,916, and the median family income is \$53,568 (Statistics Canada, 1996). Families that have an income of \$10,000 or less represent 4.1% of the total families (4,540 families), while families, whose income is \$100,000 or more represent 10.8% (12,035 families). A more detailed breakdown of families by income is presented in Graph 2.

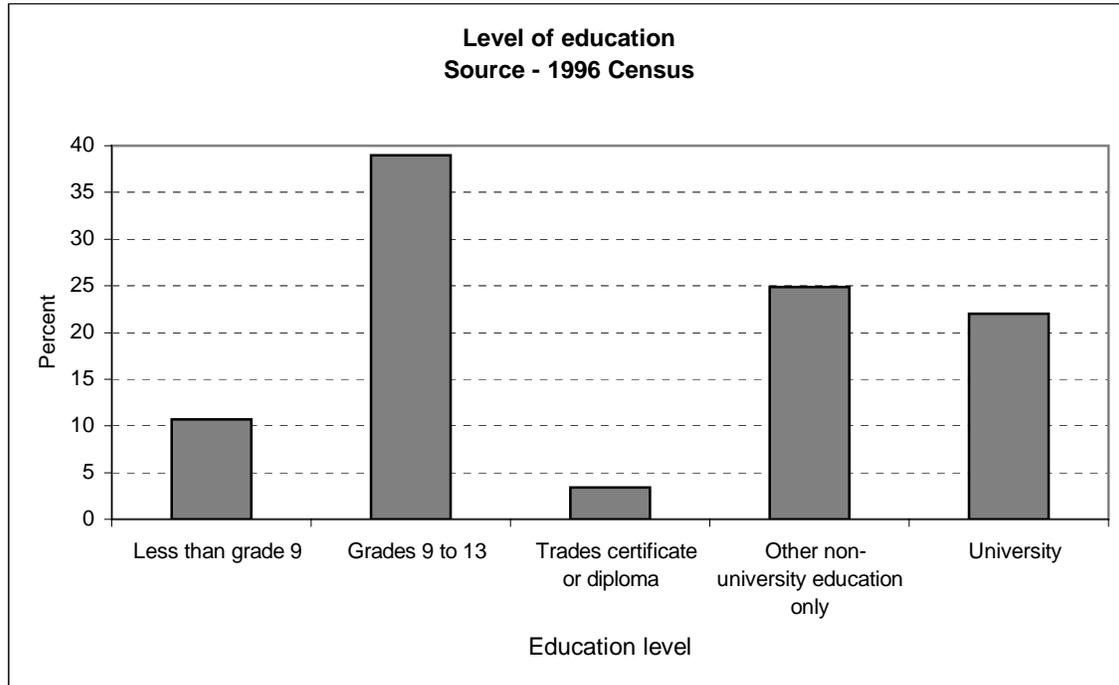
Graph 2. Distribution of Waterloo Regional Municipality population by family income



3.8 Education

From the population 15 years and older, 10.7% have less than a grade 9 education (Statistics Canada, 1996). Persons that have completed grade 9 to 13 represent the largest group at 39%. The second largest group is the group that completed other non-university education at 25%. A complete breakdown of the population is provided in Graph 3.

Graph 3. Distribution of Waterloo Regional Municipality population by education level



3.9 Labour force

There was a total of 132,350 women 25 years and over by labour force activity in 1996 (Statistics Canada, 1996). Of this total 63% were in the labour force. The unemployment rate was 7.2% (6,060 women were unemployed).

Profile for West Elgin Community Health Centre (West Elgin and Dutton-Dunwich)

1. Introduction

The West Elgin Community Health Centre is situated in the village of West Lorne, located 20 minutes west of London, just off the 401 and serves the municipalities of West Elgin and Dutton-Dunwich. The Municipality of West Elgin covers 32,354 hectares of land. The Thames River to the north and Lake Erie to the south form the natural boundaries. Highways 15 and 5 are the boundaries to the west and east. The Municipality of Dutton-Dunwich covers approximately 29,446 of land. As with the Municipality of West Elgin, the Thames River and Lake Erie form the northern and southern boundaries. Highways 5 and 14 mark the western and eastern boundaries. The cited geographic boundaries are viewed as porous. The WECHC draws clients from outside the boundaries and works in collaboration with other agencies to ensure seamless service delivery. The total population of West Elgin in 2001 was 5,464 (Statistics Canada, 2001).

2. Lead agency

The lead agency for the project is West Elgin Community Health Centre. The main contact for the program at this agency is

Shari Mizzen
Registered Dietitian
West Elgin Community Health Centre
168 Main St. Box 761
West Lorne, ON N0L 2P0

3. Community profile

The main characteristics of West Elgin and Dutton-Dunwich are as follows:

3.1 Gender distribution

According to 2001 census data for West Elgin, 50.5% of the population were females (2,760) and 49.5% were males (2,704).

3.2 Urban versus rural population

More than half of the total population lives in rural areas (56.3%) and the remainder to the population lives in urban areas (Statistics Canada, 1996).

3.3 Population of women by age groups

According to census data, 35.4% of women were between the ages of 25 and 49 (Statistics Canada, 1996). The age group of women between 30 and 34 years of age represent the largest group with 23.7%, followed by the age groups of 35 to 39 and 40 to 44 years of age with 21% each. A more detailed breakdown is provided in Table 1.

Table 1. Distribution of female population (age 25 to 49) by age group for West Elgin

Age group	Population	Percent	Cumulative percent
25-29 years	245	14.71	14.71
30-34 years	395	23.72	38.44
35-39 years	350	21.02	59.46
40-44 years	350	21.02	80.48
45-49 years	325	19.52	100.00
Total	1,665	100.00	

Source: Statistics Canada, 1996.

3.4 Visible minority

According to 1996 census data there were only three visible minority groups in the area representing a total of 95 individuals. These groups are South Asian which represents 68.4% of visible minorities, Chinese (15.8%) and Japanese (10.5%).

3.5 Mother tongue

The official languages (English and French) were reported as the mother tongue for 86.8% of the population (Statistics Canada, 1996). Approximately 99% of this group reported their mother tongue as English while 1% reported their mother tongue as French.

Among the population reporting non-official languages (a total of 1,195), Portuguese represents the single largest category at 24.3%, followed by Dutch at 18.4%, German at 15.9%, Hungarian at 8.4%, Romanian at 7.1%, Urdu and Lithuanian at 4.6% each, Slovak and Serbian at 2.5% each, Chinese, Ukrainian, and Russian at 1.2% each, and Greek, Danish, and Flemish with 0.8% each. Approximately 5.4% of the people reported having some other mother tongue.

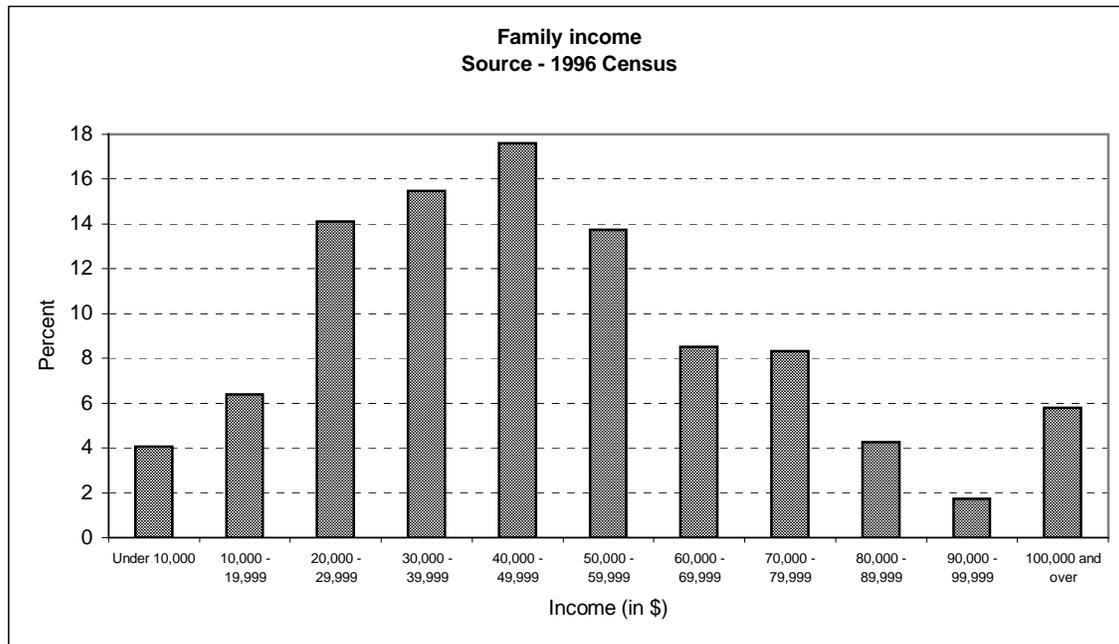
3.6 Aboriginal groups

The aboriginal population represents approximately 1.5% (140 individuals) of the total population.

3.7 Family income

The average family income is \$51,039, and the median family income is \$46,880 (Statistics Canada, 1996). Families that have an income of \$10,000 or less represent 4% of the total families (105 families) while families, whose income is \$100,000 or more represent 5.8% (150 families). A more detailed breakdown of families by income is presented in Graph 1.

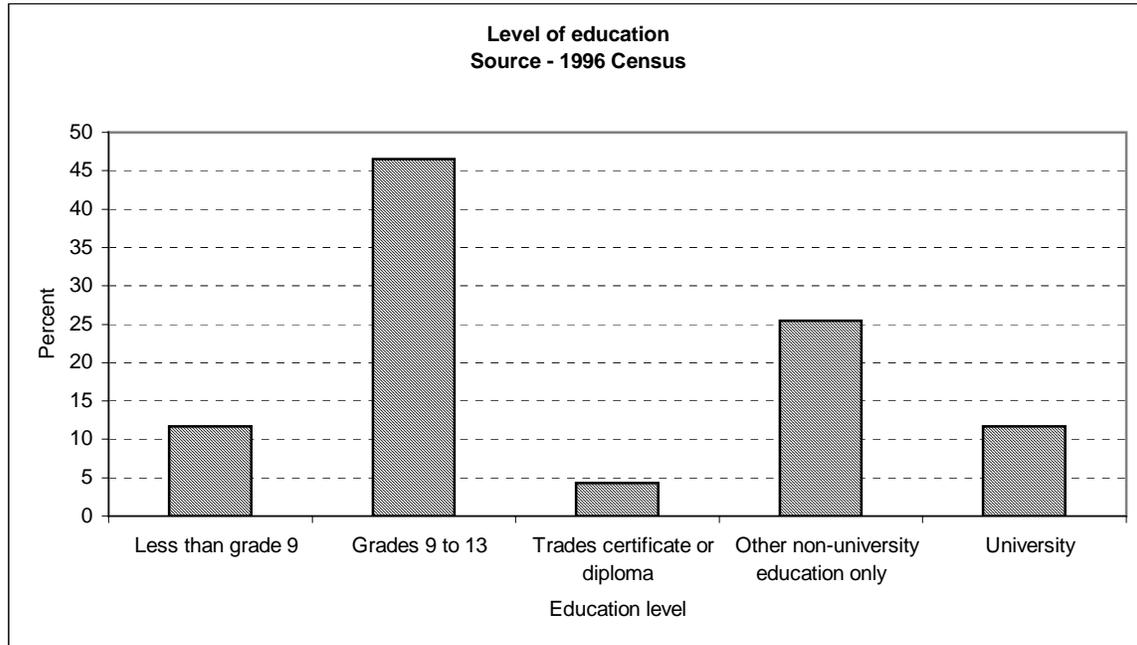
Graph 1. Distribution of West Elgin and Dutton-Dunwich population by family income



3.8 Education

From the population 15 years and older, 11.7% have less than a grade 9 education (Statistics Canada, 1996). Persons that have completed grade 9 to 13 represent the largest group at 46.5%. The second largest group is the group that completed other non-university education at 25%. A complete breakdown of the population is provided in Graph 2.

Graph 2. Distribution of West Elgin and Dutton-Dunwich population by education level



3.9 Labour force

There was a total of 3,080 women 25 years and over by labour force activity in 1996 (Statistics Canada, 1996). Of this total 60% were in the labour force. The unemployment rate was 9.6%.

Profile for Kingston, Frontenac, Lennox, and Addington

1. Introduction

The City of Kingston is located in central Ontario, approximately 250 km north east of Toronto.

2. Lead agency

The lead agency for the project is Kingston, Frontenac & Lennox & Addington (KFL&A). The KFL&A Health Unit catchment area is comprised of the City of Kingston and surrounding area, the town of Greater Napanee and a largely rural area which consists of 7 townships (previously the counties of Frontenac, and Lennox & Addington) The catchment area has a total population of 178,067 (Statistics Canada, 2001).

The main contact for the agency is:

Valerie Stenzl,
Director, Chronic Disease and Injury Prevention
Kingston, Frontenac and Lennox and Addington Health Unit
221 Portsmouth Ave.
Kingston, ON K7M 1V5

3. Community profile

The main characteristics of the area are as follows:

3.1 Gender distribution

In 2001, 51% of the total population were females (90,585) and 49% were males (87,485). (Statistics Canada, 2001)

3.2 Urban versus rural population

Approximately two-thirds of the population (65.06%) lives in urban settings while the balance of the population lives in rural areas (Statistics Canada, 1996).

3.3 Population of women by age groups

According to census data, 38.2% of women were between the ages of 25 and 49 (Statistics Canada, 1996). The age group of women between 35 and 39 years of age represents the largest group at 21.8% followed by the age group of 30 to 34 years at 21.3%. A more detailed breakdown is provided in Table 1.

Table 1. Distribution of female population (age 25 to 49) by age group for Kingston, Frontenac, Lennox, and Addington

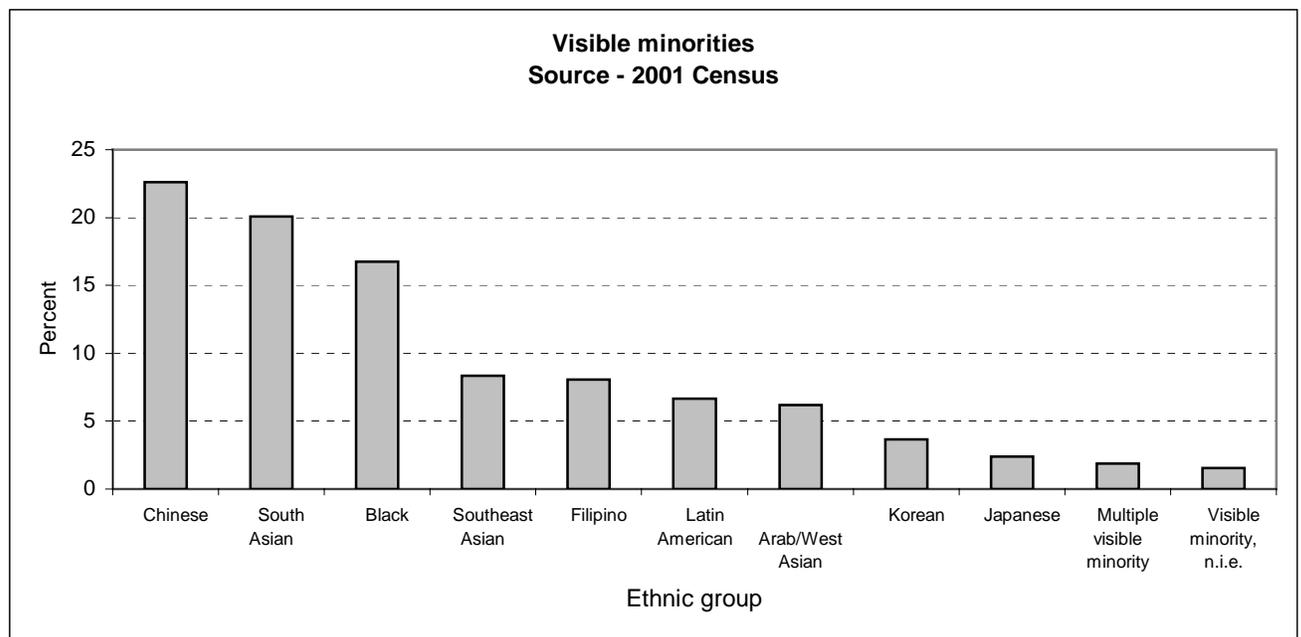
Age group	Population	Percent	Cumulative percent
25-29 years	6,170	18.13	18.13
30-34 years	7,255	21.32	39.46
35-39 years	7,425	21.82	61.28
40-44 years	6,840	20.10	81.38
45-49 years	6,335	18.62	100.00
Total	34,025	100.00	

Source: Statistics Canada, 1996.

3.4 Visible minority

Visible minorities represented 3.8% of the total population (6,455 individuals). The distribution of all the visible minorities is provided in Graph 1.

Graph 1. Distribution of Kingston, Frontenac, Lennox, and Addington population by visible minorities



* Not included elsewhere – includes Pacific islanders and other visible minority groups.

** Multiple visible minority - includes respondents who reported more than one minority group.

3.5 Mother tongue

The official languages (English and French) were reported as the mother tongue for 92.8% of the population (Statistics Canada, 1996). Approximately 97% of this group reported their mother tongue as English while 3% reported their mother tongue as French.

Among the population reporting non-official languages (a total of 12,160 people), Portuguese represents the single largest category at 16.5%, followed by German at 13.5%, Dutch at

9.9%, Chinese at 8.8%, Italian at 5.6%, Polish at 5%, Spanish at 4.3%, Greek at 3.6%, Vietnamese at 2.5%, Arabic at 2%, Tagalog (Filipino) at 2%, Hungarian at 1.8%, Korean at 1.6%, and Persian (Farsi) and Ukrainian at 1.5% each. Approximately 18% of the people reported having some other mother tongue.

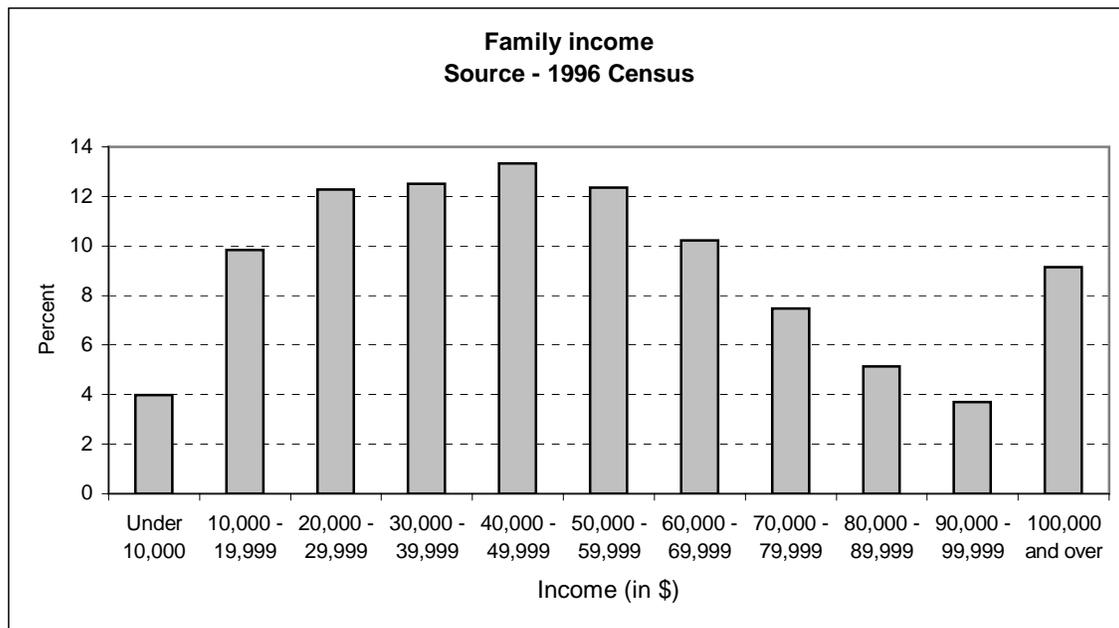
3.6 Aboriginal groups

The aboriginal population represents approximately 1% (2,045 individuals) of the total population (Statistics Canada, 1996).

3.7 Family income

The average family income is \$52,717, and the median family income is \$47,322 (Statistics Canada, 1996). Families that have an income of \$10,000 or less represent 4% of the total families (1,910 families) while families, whose income is \$100,000 or more represent 9% (4,375 families) of the total families. A more detailed breakdown of families by income is presented in Graph 2.

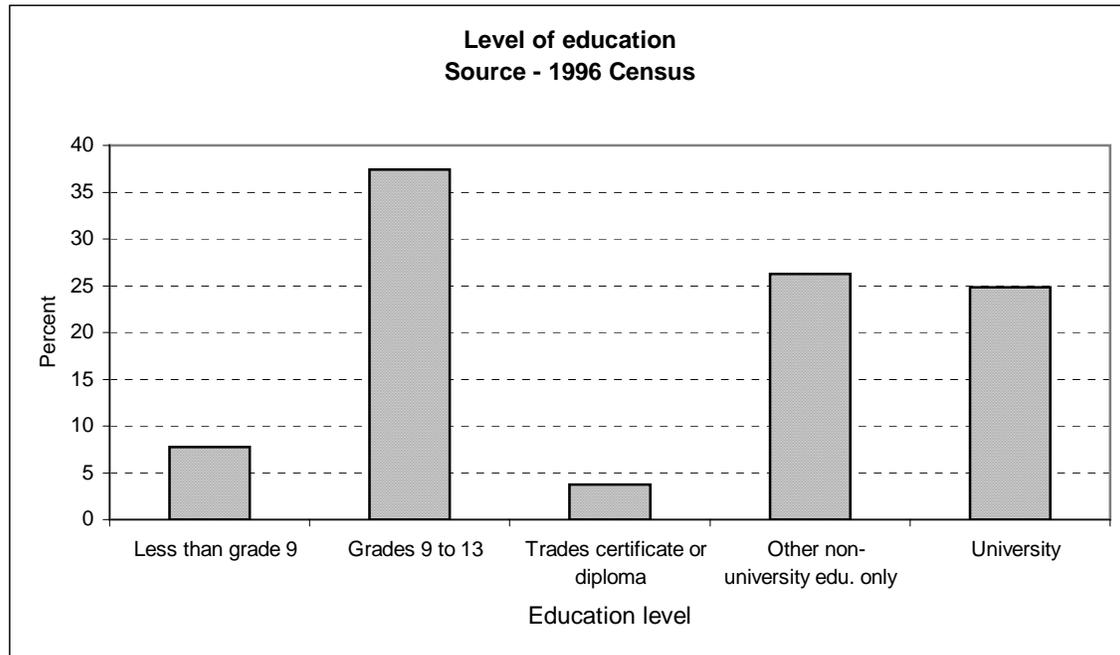
Graph 2. Distribution of Kingston, Frontenac, Lennox, and Addington population by family income



3.8 Education

From the population 15 years and older, 7.7% have less than a grade 9 education (Statistics Canada, 1996). Persons that have completed grade 9 to 13 represent the largest group at 37.4%. The second largest group is the group that completed other non-university education at 26%. A complete breakdown of the population is provided in Graph 3.

Graph 3. Distribution of Kingston, Frontenac, Lennox, and Addington population by education level



3.9 Labour force

There was a total of 59,380 women 25 years and over by labour force activity in 1996 (Statistics Canada, 1996). Of this total 64.5% were in the labour force. The unemployment rate was 7.5%.