

**ADDRESSING INEQUITABLE UPTAKE IN THE
NEWFOUNDLAND AND LABRADOR COLORECTAL
CANCER SCREENING PROGRAM**

by

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ABSTRACT

Newfoundland and Labrador has the highest estimated 2010 mortality rates from colorectal cancer (CRC) in the country for both men and women. In March 2010, the Government of Newfoundland and Labrador announced it would introduce a population-based CRC screening program to address this serious health issue. Research has shown that uptake of cancer screening varies across social and economic factors. Unequal rates of uptake and subsequent unequal rates of mortality based on lower socioeconomic conditions are unjust and therefore inequitable. Addressing inequitable uptake of screening is not considered in the research supporting CRC population-based screening and is therefore a limitation of the new screening program in Newfoundland and Labrador. This paper shows that the new Newfoundland and Labrador CRC screening program should address the problem of inequitable uptake and recommends how research could help achieve this.

Keywords: colorectal cancer; screening uptake; health inequities; Newfoundland and Labrador.

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1: INTRODUCTION

1.1 Public Health Problem

In Canada colorectal cancer (CRC) has a significant impact on mortality rates from cancer, accounting for an estimated 11.9% of cancer deaths in 2010 for men and women combined. The province of Newfoundland and Labrador has the highest estimated age-standardized mortality rates from CRC in the country for 2010, with a mortality rate of 26 per 100,000 for women and 44 per 100,000 for men. These rates are higher than any other province and surpass the national average estimated at 16 per 100,000 for women and 25 per 100,000 for men. The mortality rates from CRC in Newfoundland and Labrador are estimated to be approximately twice that of the province with the lowest rates - British Columbia (Canadian Cancer Society, 2010a).

In March 2010, the Government of Newfoundland and Labrador announced it would introduce a population-based CRC screening program to address this serious health issue (Government of Newfoundland and Labrador, 2010). This program is based on research showing population-based screening with fecal occult blood test (FOBT) could significantly reduce mortality rates from CRC (Flanagan et al., 2003; Hardcastle et al., 1996; Jørgensen, Kronborg, & Fenger, 2002; Mandel et al., 1999).

Recently, research has shown that uptake of cancer screening varies across social and economic factors (Ramji et al. 2005; Sewitch, Fournier, Ciampi,

& Dyachenko, 2007; Singh et al., 2004; Wagner et al., 2009; Weller et al., 2007; Wilkins & Shields, 2009a; Wilkins & Shields, 2009b; Zarychanski, Chen, Bernstein, & Hébert, 2007). Evidence from Canada and the UK shows that unequal uptake of CRC screening within the population exists in both countries despite the acceptance of government-sponsored CRC screening programs (Ramji et al. 2005; Sewitch et al., 2007; Singh et al., 2004; Wagner et al., 2009; Weller et al., 2007; Wilkins & Shields, 2009a; Zarychanski et al., 2007). Furthermore, research on breast cancer screening in Canada shows that differences in uptake persist after screening programs have been implemented over a long period of time (Wilkins & Shields, 2009b).

Unequal uptake of CRC screening based on social and economic factors is a public health concern because it may lead to unequal rates of mortality from CRC. All individuals should have the right to achieve good health - it is unjust and therefore inequitable when persons of lower socioeconomic status are less likely to be screened and are at higher risk of mortality from CRC. Addressing inequitable uptake of screening is not considered in the research supporting CRC population-based screening and is therefore a limitation of the new screening program in Newfoundland and Labrador.

The new CRC screening program in Newfoundland and Labrador needs to overcome this limitation and include measures to address potential inequitable uptake of CRC screening. Screening uptake has been shown to differ between social and economic groups in other populations; therefore screening policies may need to be modified to prevent these inequities in the province. The first

step is developing a clear understanding of the barriers to screening for these sup-populations. Research using a health inequities framework could be used in collaboration with the implementation of the new screening program to gain a clear understanding of the causes of inequitable uptake and propose actions to address them.

1.2 Purpose

The purposes of this paper are to show that the new Newfoundland and Labrador CRC screening program should address the problem of inequitable uptake and to recommend how research could help achieve this. The first section of findings will show that the new CRC screening program and the supporting research does not address inequitable uptake of screening. The second section of findings will show that this is a limitation by presenting evidence that inequitable uptake of screening is prevalent in Canada and the UK despite government sponsored population-based programs. Based on these findings, recommendations will be made for how research using a health inequities framework could help the new CRC screening program in Newfoundland and Labrador overcome its limitations in failing to address inequitable uptake.

2: BACKGROUND

2.1 What is Colorectal Cancer?

CRC usually develops from polyps on the inner surface of the bowel or rectum. These polyps are slow growing and may take up to ten years to become cancerous. Not all polyps are cancerous. Pathological analysis is needed to determine the likelihood of a polyp developing into cancer. Almost all polyps identified as villous adenomas will develop into cancer while others identified as hyperplastic have no malignant potential. The disease is curable if the cancerous polyps are identified and removed before they metastasize or spread through the bowel wall (Gottfried, 2008).

2.2 Colorectal Cancer Screening

The role of screening is to identify unrecognized disease in individuals who are otherwise healthy. The characteristics of CRC make screening a useful tool because the disease can be diagnosed in the pre-clinical stage. Treatment begun at this stage is more successful and therefore reduces mortality and morbidity caused by CRC (Canadian Partnership Against Cancer, 2009).

The most common types of screening used for CRC are FOBT, colonoscopy, sigmoidoscopy and double-contrast barium enema. The FOBT is used to detect blood in stool that may be from a cancerous polyp in the bowel. A sample is taken and treated chemically to detect blood that is not visible to the

naked eye. A colonoscopy uses a flexible scope to visualize the entire inside of the colon for abnormal growths. A sigmoidoscopy is similar to colonoscopy but visualizes only the lower colon and rectum. Finally, a barium enema is an x-ray of the large intestine after the ingestion of a barium solution and is also used to identify polyps (Canadian Cancer Society, 2010).

Each of the CRC screening tools has advantages and disadvantages. Colonoscopy and sigmoidoscopy are useful because polyps can be removed at the time of screening. However, they are invasive procedures that carry a risk of complications and are expensive to perform. A barium enema is also expensive to perform and polyps cannot be removed at the time of screening. The most widely accepted population-based screening tool is the FOBT because of the simple administration and low cost. The test is not highly specific because blood in the stool can have many causes. Due to the multiple causes of blood in the stool, it is recommended that positive FOBTs be followed up using one of the more invasive tests (Gottfried, 2008).

2.3 Colorectal Cancer in Newfoundland and Labrador

CRC in Newfoundland and Labrador is a serious public health issue. The province has the highest estimated 2010 mortality rate in the country for both men and women. These rates are approximately twice as high as those in British Columbia, which has the lowest mortality rates. The province also has the highest estimated 2010 incidence rate for men and second highest estimated 2010 incidence rate for women (Canadian Cancer Society, 2010).

The high burden of disease from CRC in the province has brought screening to the attention of the medical community and the government in Newfoundland and Labrador. Several appeals were made in the winter of 2009-2010 from members of the medical community for the implementation of a provincial CRC screening program (“Lack of N.L. cancer screening tragic”, 2009; “More N.L. colon cancer screening needed”, 2010) As a result, the government introduced a provincial CRC screening program in March 2010 (Government of Newfoundland and Labrador, 2010).

2.4 Colorectal Cancer and Health Inequities

Our ability to reduce the burden of disease increases with the introduction of health care initiatives such as population-based CRC screening procedures. Some members of our society may gain more from these innovations because of their social and economic advantages (Link, Northridge, Phelan, & Ganz, 1998). If individuals are less likely to be screened for CRC because of social and economic factors, they are more at risk of dying from CRC. This unequal uptake of screening meets the definition of a health inequity, which is a difference in health that is unnecessary and avoidable and therefore considered unjust and unfair (Whitehead, 1990).

3: METHODS

This paper is divided into three sections to show why and how the Newfoundland and Labrador CRC screening program should address potential inequitable uptake of screening. First, a review of the literature and the government press release will indicate that the success of the new screening program is dependent upon adequate uptake by the population and the program does not consider the potential problem of inequitable uptake. The following section will show that not addressing this potential problem is a limitation because research indicates inequitable uptake of cancer screening is prevalent despite government-sponsored programs. Based on the evidence presented, recommendations will be outlined for how research using a health inequities framework could help address inequitable uptake.

Limitations of the Provincial CRC Screening Program

To demonstrate that the new CRC screening program in Newfoundland and Labrador is limited, a review of the program and the literature upon which the program was based will be presented. To review the program, the March 2010 Government of Newfoundland and Labrador press release will be used. A review of the literature on which the program is based will also be conducted. It will be shown that while the evidence used to support a population-based CRC screening program makes the case that an adequate percentage of the population being screened is required for success, it does not consider

inequitable uptake of the program (Flanagan et al., 2003; Hardcastle et al., 1996; Jørgensen et al., 2002; Mandel et al., 2000).

Why Should Inequitable Uptake be Addressed?

This section will show that inequitable uptake of screening is a potential problem that should be addressed in the provincial program. The evidence will come primarily from the Statistics Canada report, *Colorectal Cancer Testing in Canada 2008* (Wilkins & Shields, 2009a). This source was chosen because it is the only report that uses nationwide data on CRC screening. These data on CRC screening were collected through the Canadian Community Health Survey (CCHS) for the first time in all provinces in 2008 (Wilkins & Shields, 2009a). Four other Canadian studies were also chosen from the literature as supporting evidence (Ramji et al. 2005; Sewitch et al., 2007; Singh et al., 2004; Zarychanski et al., 2007).

The findings from Canadian studies will be complemented by evidence from government screening programs that have similar characteristics to the CRC screening program being introduced in Newfoundland and Labrador. These include studies conducted in the UK, where the national FOBT CRC screening program has been fully implemented since 2006 (Wagner et al., 2009; Weller et al., 2007) Also, evidence showing inequitable uptake of breast cancer screening in Canada will be presented (Wilkins & Shields, 2009b).

Recommendations

A research project will be recommended with the goal of formulating measures to address potential inequitable uptake in the Newfoundland and Labrador CRC screening program. To achieve this, the *social determinants of health* framework should be applied using quantitative and qualitative methodologies. Statistical analysis should be used to identify where gaps in uptake exist in the population based on social and demographic factors. Interviews and focus groups should be used to identify the barriers to uptake for the identified sub-populations and to propose solutions. This section discusses why the *social determinants of health* framework would be useful and outlines how the research could be carried out in collaboration with the implementation of the screening program.

4: FINDINGS

4.1 Limitations of the Newfoundland and Labrador Colorectal Cancer Screening Program

This section will describe the new CRC screening program in Newfoundland and Labrador and review the literature upon which it was based. The goal of the screening program is to reduce mortality rates from CRC, and it is based upon research showing that mortality rates could be reduced if a sufficient percentage of the population is screened. The underlying research does not address inequitable uptake of screening and therefore this potential problem is not addressed in the provincial program.

4.1.1 The CRC Screening Program

In March 2010, The Government of Newfoundland and Labrador announced it would introduce a provincial population-based CRC screening program. The development of the program resulted from collaboration between the National Colorectal Cancer Screening Network and a provincial working group composed of gastrointestinal specialists, general practice physicians, general surgeons, nurse practitioners, members of the provincial breast cancer screening program, the Canadian Cancer Society and the provincial Cancer Care Program (Government of Newfoundland and Labrador, 2010).

The screening program will be introduced using a phased implementation approach over several years starting with the Eastern Regional Health Authority.

During the first year 2000 FOBT screening kits will be distributed through the mail to men and women between 50 and 74 years of age. During the second year a minimum of 10,000 kits will be distributed, followed by incremental expansion to include the whole province. Follow-up colonoscopies will be offered for all positive tests. The phased approach will allow for evaluations of cost and effectiveness of the program. The program is expected to cost \$4.3 million over the first three years (Government of Newfoundland and Labrador, 2010).

The program is based on the guidelines established by the National Colorectal Cancer Screening Network (Network), an initiative formed by the Canadian Partnership Against Cancer (Government of Newfoundland and Labrador, 2010). This is an independent organization supported by the federal government with membership from most provinces and territories. The Network based its recommendations on epidemiological evidence showing that population-based screening using FOBT could reduce CRC mortality rates (Canadian Partnership Against Cancer, 2009; Flanagan et al., 2003; Hardcastle et al., 1996; Jørgensen, Kronborg, & Fenger, 2002; Mandel et al., 1999).

Since the acceptance of the CRC screening guidelines, most provinces and territories have committed to implement organized CRC screening programs. Several provinces have already introduced their programs (Canadian Partnership Against Cancer 2009). In 2007, Ontario initiated a provincial CRC screening program; Manitoba launched the pilot phase in the Winnipeg and Assiniboine Regional Health Authorities; and Alberta issued new CRC screening clinical practice guidelines together with a public and professional educational campaign.

In all three provinces, biennial FOBTs are recommended for the general public over 50 years of age (Wilkins & Shields, 2009a).

4.1.2 Evidence Supporting the Screening Program

The epidemiological evidence showing that population-based CRC screening can reduce mortality rates includes several international and Canadian studies (Flanagan et al., 2003; Hardcastle et al., 1996; Jørgensen et al., 2002; Mandel et al., 2000). Several large randomized controlled trials have been conducted internationally assessing the efficacy of screening with FOBT in reducing mortality rates from CRC (Hardcastle et al., 1996; Jørgensen, et al. 2002; Mandel et al., 1999).

Researchers used the data from international studies and applied them to Canadian demographics to estimate the impact of FOBT in Canada (Flanagan et al., 2002). From these studies it is estimated that mortality rates could be reduced by 15% to 17% if approximately 70% of Canadians between the age of 50 and 74 had biennial FOBT followed by colonoscopy for positive tests (Wilkins & Shields 2009a).

4.1.3 Limitations

The potential problem of inequitable uptake is overlooked due to two main limitations of the studies supporting the CRC screening. First, the original international studies showing the efficacy of population-based FOBTs used randomized controlled trials that did not reflect real-life conditions outside the research setting. Secondly, when applying these results to the Canadian

population, the estimates did not consider how social and economic factors may contribute to the potential problem of inequitable uptake.

First, the main international studies on the effectiveness of population-based FOBT were conducted in Denmark, the UK and the U.S. and all used randomized controlled trials. In these trials people were assigned to take part in screening and special measures were taken to ensure adequate compliance.

(Hardcastle et al., 1996; Jørgensen et al., 2002; Mandel et al., 1999):

- The study conducted in the UK (n=152,850) recruited participants from general physician registries and sent FOBT kits with a letter from the participant's own physician (Hardcastle et al., 1996). Those with access to a regular general physician do not represent the general population and may be more inclined to participate in screening upon their physician's request.
- The study conducted in the U.S. (n=46,551) recruited partly from volunteers of the American Cancer Society (Mandel et al. 1999). These individuals are most likely more supportive of cancer screening than the general population.
- In relation to all three studies, individuals may be more willing to take part in a research project than a government program.

The conditions of the randomized controlled trials do not reflect how the Newfoundland and Labrador program will be conducted. Factors associated with uptake were not investigated in the studies because the research design did not reflect how the target population would normally have access to screening. As a result, inequitable uptake was not recognized as a potential problem.

Second, inequitable uptake was not considered when the results of the international studies were applied to the Canadian population. A study by

Flanagan et al. (2003), published by Public Health Agency of Canada, used a simulation program, the Population Health Model (POHEM), to evaluate the potential impact of population-based screening with FOBT outside a research setting. Their simulation estimated that there would be a rate of participation of 67% with media promotion, letters of invitation and physician visits. They acknowledged that uptake could be a potential problem, but failed to acknowledge how it could lead to health inequities (Flanagan et al., 2003).

The problem of inequitable uptake was not investigated by the randomized controlled trials supporting population-based screening with FOBT or in the research study applying these findings to Canada (Flanagan et al., 2003; Hardcastle et al., 1996; Jørgensen et al., 2002; Mandel et al., 2000). These studies were successful in showing that mortality rates could be decreased with adequate uptake, but they did not consider that socioeconomic factors may influence the degree of uptake within the population. As a result, potential inequitable uptake of screening is not addressed in the new screening program in Newfoundland and Labrador.

4.2 Why Should Inequitable Uptake of Colorectal Cancer Screening be Addressed?

Accepting that the new provincial screening program in Newfoundland and Labrador does not consider inequitable uptake, this section will show why this potential problem should be addressed. Evidence that inequitable uptake of CRC is prevalent in the Canada and the UK will be presented along with evidence that inequities in breast cancer screening uptake remain even after programs have

been in place for over 10 years (Ramji et al., 2005; Sewitch et al., 2007; Singh et al., 2004; Wagner et al., 2009; Weller et al., 2007; Wilkins & Shields, 2009a; Wilkins & Shields, 2009b; Zarychanski et al., 2007). These examples serve as a benchmark to show that inequitable uptake should be considered a potential problem for the new screening program in Newfoundland and Labrador and must be addressed.

4.2.1 Inequitable Uptake of CRC Screening in Canada

Several studies in Canada have investigated factors associated with uptake of CRC screening (Ramji et al., 2005; Sewitch et al., 2007; Singh et al., 2004; Wilkins & Shields, 2009a; Zarychanski et al., 2007). In 2009, Statistics Canada was the first to use national data collected by the CCHS to study social and demographic factors related to uptake of CRC screening (Wilkins & Shields, 2009a). Statistics Canada references several similar studies conducted with provincial CCHS data on CRC screening and other smaller surveys (Ramji et al., 2005; Sewitch et al., 2007; Singh et al., 2004; Zarychanski et al., 2007). All of these studies indicate inequitable uptake of CRC screening exists in Canada.

The Statistics Canada report, *Colorectal Cancer Testing in Canada 2008*, completed the most recent and comprehensive study investigating factors associated with CRC screening. The purpose of the study was to use new national data on CRC screening from the CCHS to get a more complete picture of uptake in Canada. Using the CCHS, Statistics Canada measured uptake by province and by selected social and demographic characteristics. These characteristics included gender, age, marital status, rural and urban residence,

place of birth, number of years since immigration, household income quintile, having a regular general physician, self-perceived general health, smoking status, leisure-time physical activity level, and body mass index category (Wilkins & Shields, 2009a).

The study found that those living in a household with an income in the lowest two quintiles were less often screened than those in higher quintiles. Also, Immigrants living in Canada for less than 20 years were less often screened than individuals born in Canada. Overall, screening was associated with being 65 or older, higher income, having a regular doctor, being a non-smoker, and being physically active (Wilkins & Shields, 2009a).

The Statistics Canada report was similar to previous studies conducted in Canada on CRC screening uptake (Ramji et al., 2005; Sewitch et al., 2007; Singh et al., 2004; Zarychanski et al., 2007):

- Sewitch et al. (2007) found in a sample of 17,498, associations between uptake of some types of CRC screening and having a regular physician, getting a flu shot, having a chronic condition, greater physical activity, higher consumption of fruits and vegetables, smoking cessation and self-perceived stress.
- Ramji et al. (2005) found in a sample of 1944, that family history of CRC, increased age, higher household income, and use of hormone replacement therapy (among women) were all significantly associated with having had CRC screening.
- Zarychanski et al. (2007) studied 12,776 people from British Columbia, Saskatchewan, Ontario, and Newfoundland and Labrador using data from the 2003 CCHS and found that those who had regular contact

with a physician were more likely than those without contact to report uptake of screening.

- Singh et al. (2004) found a positive association between higher income and uptake of CRC screening in a study cohort of 1,664,188 people living in Ontario.

The Statistics Canada report and related studies all found that a variety of factors were associated with uptake of CRC screening. The most common factors associated with screening were income and access to a regular physician. None of the studies assessed uptake by Aboriginal status. This is a limitation considering the most significant health inequities in Canada are between Aboriginal and non-Aboriginal peoples (Adelson, 2005).

Another limitation of the studies was the lack of conclusive answers to what were the mechanisms causing these associations and recommendations that could alleviate the inequities:

- The Statistics Canada report concluded that there were significant differences in CRC screening between provinces, physician contact, and certain behavioural and socioeconomic characteristics. They did not explain why these differences were present and recommended continued monitoring of screening adherence in the future (Wilkins & Shields, 2009a).
- Sewitch et al. (2007) acknowledged that disparities exist in CRC screening in Canada and that uptake was associated with health care seeking and healthy lifestyle behaviour. They concluded that screening invitations should be separate from physician consultation and come directly from government organizations.

- Alternatively, Zarychanski et al. (2007) concluded that contact with family physicians was positively associated with uptake of CRC screening.
- Ramji et al. (2005) and Singh et al. (2004) acknowledged that socioeconomic status affected uptake of CRC screening but failed to explain why this association was present. Ramji et al. (2005) recommended targeted initiatives for low-income people to improve screening rates. Singh et al. (2004) recommended further investigation to determine the reasons for low rates of CRC screening among individuals of lower socioeconomic status.

What was conclusive after reviewing these studies is that social and economic factors are related to uptake of CRC screening. Why these associations are present are not as clearly understood and require more in-depth investigation. What is clear is that there is a relationship between low uptake and low socioeconomic status, creating a health inequity, which is avoidable and unjust and needs to be addressed.

As population-based screening programs sponsored by provincial governments have only recently been introduced (or not at all in some provinces) it could be argued that inequities in uptake could decrease over time as provincial programs expand and become established. The following section will show that this is an unrealistic claim by showing inequities in uptake have continued in other countries for some time after the introduction of government-sponsored population based screening programs.

4.2.2 Inequitable Uptake of CRC Screening in the UK

As in Canada, CRC is a major health issue in the UK – and the second leading cause of all cancer deaths. In response to this public health problem the UK government began pilot testing a population-based screening program with biennial FOBTs to reduce mortality rates. The program was introduced nationally in 2006 and it is estimated there will be 20,000 fewer deaths over the next 20 years with a 60% rate of uptake (Cancer Research UK, 2010).

Researchers in the UK were concerned about inequitable uptake of CRC screening and its effect on resulting inequitable mortality rates. This section will review two studies that investigated the relationship between social and economic factors and uptake of screening during the pilot phase and the first three years after the program was implemented (Wagner et al., 2009; Weller et al., 2007). Their findings are useful because the screening program in the UK is similar to the one proposed in Newfoundland and Labrador and the UK has similar political, social and demographic characteristics as Canada.

Weller et al. (2007) evaluated feasibility and uptake of FOBTs during the pilot phase of the population based screening program in the UK using a sample of 127,746 individuals. One section of the study linked data from the Index of Multiple Deprivation (IMD) to screening uptake. The IMD is a research tool developed by the UK government combining economic, social, and housing issues into a single score for small geographic areas in the UK. The study found that as levels of deprivation increased, uptake of screening fell significantly from 61.2% to 37.2% across IMD quintiles 1 through 5 (Weller et al., 2007).

Wagner et al. (2009) investigated the relationship between socioeconomic status and CRC screening uptake in the London area for the first 30 months after the national population-based program was implemented. The Townsend Material Deprivation Index was used to measure inequitable uptake. The index is based on four census indicators: levels of unemployment among those who are economically active; percentage of homes owned by the occupier; percentage who own a car; and, home overcrowding. A gradient across quintiles of deprivation was observed with those living in areas of greatest deprivation having lower rates of uptake (Wagner et al., 2009).

The evidence from the UK studies indicates that inequities in CRC screening uptake persist even after a government-sponsored program has been introduced. This evidence is relevant to the situation in Newfoundland and Labrador because of the similarities between the screening programs. Both programs are based on biennial mail-out of FOBTs and the respective governments fund both.

Furthermore, Canada and the UK share similarities between their population and health care systems. A comparison of indicators from the World Bank shows that the UK and Canada are similar in their level of economic development, employment rates, and both countries have the majority of their health care systems publicly funded (World Bank, 2010). The UK evidence is therefore an indicator of what the CRC screening program could look like in the province and supports the need to address inequitable uptake.

The main limitation of the evidence from the UK is the short amount of time the national program has been in place. It could still be argued that over a longer period of time inequities in uptake would eventually decrease. The following section will show that inequities in breast cancer screening uptake persist even after government-sponsored population-based programs have been in place for over ten years.

4.2.3 Inequitable Uptake of Breast Cancer Screening

In Canada, women have a 1 in 9 chance of developing breast cancer in their lifetime. Studies have shown that organized screening can help reduce the mortality rate from breast cancer and Health Canada recommends all women between the age of 50 and 69 receive a mammogram every two years. Every province in Canada has had a population-based screening program implemented since 1998. Between 1990 and 2009 the age standardized mortality rate from breast cancer decreased by 30% (Wilkins & Shields, 2009b).

In 2009, Statistics Canada conducted a national study, investigating uptake of mammography in Canada. It was interested in the differences between uptake of screening among social and demographic groups in the population. This study followed up on previous studies in the mid 1990's which found associations between screening and education level, being an immigrant, living in a rural area and having a regular physician (Wilkins & Shields, 2009b).

The study found that several factors were associated with low uptake of breast cancer screening in Canada. They concluded that low socioeconomic

status, being an immigrant, not having a regular physician, not having contacted a general practitioner or family doctor in the past year, and being a smoker were all linked to low uptake. The study pointed out that low socioeconomic status (measured by household income quintile and education status) was associated with low screening uptake and that in 2008 there was a decline in mammography use among women of low socioeconomic status. Furthermore, since 1990 women in the lowest income quintile have consistently had lower rates of screening (Wilkins & Shields, 2009b).

The evidence on breast cancer screening shows that despite the implementation of government-sponsored screening programs for more than ten years, socioeconomic inequities in uptake still exist. This evidence can be related to the CRC screening program in Newfoundland and Labrador because both programs involve population-based cancer screening outside the primary care system. Breast cancer screening in the province is not administered through referral from a physician - similar to the mail-out approach of the CRC screening program.

It is important to note the limitations of applying this evidence. Breast cancer screening involves only women and therefore may have unique gender issues related to uptake. Also, the CRC screening program plans to use the postal service and therefore presents a different set of barriers compared to mammography screening designated locations.

4.2.4 Summary

The evidence from the studies outlined above indicates that inequities in uptake of cancer screening exist and that this is a potentially serious problem for the new CRC screening program that should be addressed.

First, I showed that inequities in CRC screening uptake exist in Canada. These studies were limited because they covered the period before population-based CRC screening programs sponsored by provincial governments were established and consequently did not consider that the inequities in uptake could be reduced as population-based programs are expanded. To overcome this limitation, evidence was provided from the UK that socioeconomic inequities persist in uptake of CRC screening with FOBT even after a government-sponsored program has been introduced. Finally, evidence from breast cancer screening in Canada showed that social and economic inequities in uptake continue to be a problem after a screening program has been in place for many years.

Together, all of these findings indicate that inequities in CRC screening uptake are a serious potential problem for Newfoundland and Labrador and that we need to take action to understand how to address them before social inequities in mortality are exacerbated.

5: RECOMMENDATIONS

It is apparent from the discussion above that social and economic inequities in CRC screening are a potential problem for the Newfoundland and Labrador CRC screening program. We must now determine what actions are needed to prevent this potentially serious public health problem. National studies on uptake have been inconclusive about how to address inequities in screening uptake and no research has focused on inequitable uptake within Newfoundland and Labrador. New research is needed to overcome this gap and develop policies that can improve the provincial program. This research should identify inequitable uptake and also provide policy recommendations based on the needs of Newfoundland and Labradorians. The research also needs to collaborate with the phased implementation approach of the program set to begin by the end of 2010.

A mixed-methods approach using a health inequities framework is recommended for the proposed research project. Quantitative methods, like those used by Statistics Canada in their report on CRC screening and the studies in the UK evaluating uptake, would provide statistical measures of inequitable screening uptake as the program is introduced. Qualitative methods including interviews and focus groups can be used to gain a clearer understanding of why particular sub-populations experience low uptake and help develop policies based on their lived experience to overcome this inequity. The *social*

determinants of health theoretical framework would be used to analyze the findings and focus the research on eliminating health inequities.

5.1 *The Social Determinants of Health Theoretical Framework*

The *social determinants of health* theoretical framework is used to study health inequities and it is recommended to guide the research on CRC screening uptake in Newfoundland and Labrador. The framework allows for clear links to be made between health outcomes and measurable indicators of inequities (CSDH, 2008). The framework can also be applied to both quantitative and qualitative methodologies, as described in the sections below.

Social determinants include but are not limited to employment and working conditions, income and its distribution, food security, health care services, housing, education, physical environment, early childhood development, social support, social exclusion, unemployment and employment security, Aboriginal status, gender, race, ethnicity and immigration status (Raphael, 2009). The *social determinants of a health* theoretical framework is used to study how societal factors mentioned above lead to inequalities in health outcomes and understand the social, political and economic forces that determine the quality of these societal factors (Raphael, 2009). Empirical evidence to support this theoretical framework generally comes from measuring the relationship between social determinants and health outcomes (Raphael, 2009). This approach was seen in the studies referred to earlier on uptake of CRC screening and mammography, where societal factors such as income, education and access to health services were statistically linked to the rate of screening uptake.

There are several limitations to this research approach when using the *social determinants of health framework*. First, it uses a finite number of determinants to describe the conditions of daily life and does not give sufficient attention to the relationship between these determinants. This conceptualization can result in the generalization of the lived experience of individuals from single social groups (eg. low-income, women, etc.) because the interaction between societal factors is not explored (Hankivsky & Christoffersen, 2008).

The approach also gives little focus to the economic, political and social context causing social inequities. The focus is the link between social determinants and health outcomes with little analysis of the policies that lead to social inequities in the first place. By studying only the measurable determinants of health the structures of power are overlooked and interventions from the research may not target the true cause of the health inequity (Hankivsky & Christoffersen, 2008).

Despite the limitations of this research approach using the *social determinants of health framework*, it has several strengths for research on inequitable uptake of CRC screening in Newfoundland and Labrador. The main strength is that it has been used successfully before in studies on CRC screening uptake by Statistics Canada and related research in the UK (Ramji et al., 2005; Sewitch et al., 2007; Singh et al., 2004; Wilkins & Shields, 2009a; Wagner et al., 2009; Weller et al., 2007; Zarychanski et al., 2007). This prior work will make the research more acceptable to policy makers - especially in Newfoundland and

Labrador where no research on inequities in cancer screening has been conducted.

Secondly, the provincial screening program is expected to begin this year leaving little time for an in-depth analysis of the cause of inequities. The recommendations for research on inequitable uptake are aimed at improving the current program and less on the upstream factors that cause health inequities. The goal of this research is to identify inequitable uptake and propose downstream interventions to alleviate these injustices as soon as possible. Future research should focus on structural factors and their relation to inequitable uptake.

5.2 Quantitative Methodologies

The research project would use quantitative methodologies to measure inequitable uptake of CRC screening as the provincial program is introduced. Statistics are needed to document the extent of inequitable uptake of screening and to identify subpopulations most at risk. The research could be accomplished in at least two ways: 1) through a survey administered with the FOBT kits in the mail or 2) using an index of deprivation based on indicators from the CCHS.

The first proposed method would involve the development of a survey that would measure social, economic and demographic factors of those invited to participate in the screening program. The survey would accompany the FOBT kits in the mail and the participants would be asked to return the survey along with the kits. Those who did not participate in screening would be followed up by

phone or mail. The main limitation of this method is that the same barriers to screening could affect participation in the survey.

The second proposed method would be to use the approach taken by studies in the UK on screening uptake – linking an index of deprivation to rates of uptake. Both studies used indices of deprivation based on selected indicators from the most recent census. The Index of Multiple Deprivation (IMD) and the Townsend Material Deprivation Index scored small geographic areas in England based on their level of deprivation. The studies then linked the postal addresses of those invited to participate in the screening program to the level of deprivation of their geographic area of residence (Wagner et al., 2009; Weller et al., 2007).

The approach of using an index of deprivation could also be used for research in Newfoundland and Labrador. Indicators could be used from the CCHS - a large cross-sectional survey designed to assess health determinants, health status and health system utilization in a nationwide sample of approximately 130,000 persons and is weighted to represent approximately 98% of the Canadian population aged 12 or older (Statistics Canada, 2010).

The main limitation of using area level of deprivation is that personal levels of deprivation may vary within a geographic area making it hard to conclude a direct link between deprivation and low uptake (Wagner et al., 2009). In addition, persons living on Indian Reserves or Crown lands, residents of institutions and full-time members of the Canadian Armed Forces are excluded from the survey (Statistics Canada, 2010). Inequities in health outcomes between Aboriginal and non-Aboriginal peoples is a significant problem in Canada and this gap in the

CCHS could limit the ability to assess inequities in uptake of CRC screening in Aboriginal populations.

Even with these limitations, quantitative methodologies are useful in providing generalizable information about a population that can be used by policymakers. The larger problem is that quantitative findings are not always representative of an individual's experience. They show what sub-populations are not getting screened but not always explain why. The following section will explain how qualitative methodologies can help form a clearer understanding of the causal relationship between social determinants and screening uptake.

5.3 Qualitative Methodologies

Qualitative methodologies will be used to gain a better understanding of why inequities in uptake exist and how they can be eliminated. Possible approaches include in-depth interviews, focus groups and community meetings. These methods will help overcome the limitations of quantitative analysis by using the knowledge from the lived experiences of the people of the province.

Several studies have used qualitative methods to investigate uptake of CRC cancer screening. The most useful example was a study conducted in the UK investigating why people decided to take part or not to take part in the national FOBT CRC screening program. The investigators used in-depth semi-structured interviews with individuals who had been invited to take part in the pilot or actual CRC screening program to understand why rates of uptake were

low in the country. Forty-four interviews ranging from 30 minutes to 2 hours were conducted over one year (Chapple, Ziebland, Hewitson, & McPherson, 2008).

Another approach would be to use focus groups, as seen in a qualitative study conducted in the UK investigating the acceptability of the FOBT screening program during the pilot phase. The study conducted four focus groups with a total of 36 people. Focus groups can provide different data based on the discussion among the group members that may not be produced in an individual interview (O'Sullivan & Orbell, 2004).

The research project on the Newfoundland and Labrador CRC screening program could use in-depth semi-structured interviews and focus groups; as seen in the methodologies of the UK studies. Individuals who participated in screening and those who had not would be invited to be interviewed or be part of a focus group after the initial quantitative analysis has been completed. The qualitative analysis would be used to understand why uptake was inequitable between the groups identified through the statistical analysis of the quantitative section. From this analysis, recommendations for how the program can be improved would be made based on people's lived experiences.

The use of qualitative research has some limitations. The main limitation is that the sample of participants in the study may not be representative of all experiences of inequitable uptake of screening (Chapple et al., 2008; O'Sullivan & Orbell, 2004). Not everyone can be interviewed and the recommendations made have to be based on the experience of a selected group. But even if the analysis of the qualitative data is not completely representative of all experiences

of inequitable uptake in the province, it still provides a better understanding than quantitative data alone.

5.4 Logistics

The recommended research project needs to provide meaningful information about inequitable uptake in the province but also has to consider that the provincial CRC screening program is beginning its implementation by the end of 2010. The research design has to be practical and easily carried out in collaboration with the screening program. A partnership with the provincial government and the regional health authorities is necessary to achieve this.

The Newfoundland and Labrador Centre for Health Information (NLCHI) has the capacity, resources and partnership with the provincial government needed to carry out the recommended mixed methods research project. NLCHI is a crown corporation of the provincial government of Newfoundland and Labrador. It is responsible for the implementation and maintenance of the provincial electronic health records but also has a department for health research and development. The Centre has access to the CCHS, which could be needed for the quantitative analysis of CRC screening uptake. The Centre also has researchers specializing in qualitative research that could carry out the qualitative section of the study (NLCHI, n.d.).

6: CONCLUSION

CRC is a serious health issue for the people of Newfoundland and Labrador. Mortality rates from the disease are higher than anywhere else in Canada (Canadian Cancer Society, 2010). Thankfully research has shown that a population-based screening program with FOBT can reduce mortality rates. The new CRC screening program introduced by the Government of Newfoundland and Labrador follows the recommendations supported by this research. This program is an important intervention to reduce the mortality rate from CRC in the province but there are limitations to the program that could lead to socioeconomic inequities in uptake and therefore mortality rates.

The goal of this paper is to show that inequitable uptake of CRC screening is a potential problem that should be addressed in Newfoundland and Labrador's new CRC screening program. Evidence was presented showing that research supporting population-based screening with FOBT is limited because the problem of inequitable uptake was not considered. This limitation was shown to be a potential problem for the provincial program based on research showing that inequities in screening uptake exist in Canada and the UK despite government-sponsored programs that are widespread and well established.

It is recommended that research utilizing a health inequities framework be conducted to address potential inequitable uptake in the new CRC screening program. A mixed-methods approach using the *social determinants of health*

framework would be the most practical research design to achieve this. This research is necessary because if inequitable uptake of screening is not addressed we run the risk of increasing socioeconomic and other social inequities in mortality rates from CRC. All Newfoundland and Labradorians have the right to good health – inequitable uptake of CRC screening must be prevented.

7: CRITICAL REFLECTION

I chose the topic of social inequities and CRC screening in Newfoundland and Labrador because I felt it brought together the concepts I have learned during the MPH program. It included the critical analysis of a public health program, addressed health inequities, and related to my practicum experience in public health research. It was also a relevant public health issue because of the recent announcement of the program and because Newfoundland and Labrador is my home province and I will be returning there to work in the future.

What I learned about disease prevention and epidemiologic research was essential to understanding the population based CRC screening program. I applied my knowledge about epidemiologic research to understand how it was used to determine CRC screening guidelines and study factors associated with uptake. I used what I learned about disease prevention to understand how this evidence was used to develop public health policy.

Another important part of what I learned in the program was the effect of social inequities on health. I now understand that the social conditions in which people live have a large impact on their health. These conditions are often unjust and are controlled by structural forces beyond the control of individuals. The study of health inequities is a dominant theme in the MPH program and I felt it important to focus on this area.

Finally this topic relates to my practicum experience at the Newfoundland and Labrador Centre for Health Information (NLCHI). For my practicum I used statistical analysis to profile social and demographic factors related to cancer screening in Newfoundland and Labrador.

Over the past two years I have learned the importance of population based screening programs. I believe the new screening program in Newfoundland and Labrador is a necessary step in reducing the mortality rate from CRC in the province. I have also learned about the effect of social inequities on health and recognize that this program does not address these issues. I believe that to understand and reduce inequities in uptake of CRC screening we need to use a research framework based on the lived experience of individuals.

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