WELFARE PROGRAMS AND REFORMS IN CANADA: REDUCING OR REPRODUCING HEALTH INEQUALITIES?

by

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Table of Contents

List of Tables

List of Figures

ABSTRACT

The effect of welfare policies is evident in the behaviours of welfare recipients and in their patterns of health. Yet there are very few studies with up to date analyses on the health consequences of the mid-1990s welfare reform in Canada. This study examines the effects of welfare income and welfare reforms on health outcomes of welfare recipients. I use National Population Health Survey (NPHS) in 1996 to present a baseline health differences by welfare status. I later utilize the mid-1900s welfare reform in a natural experiment setting to examine the health outcomes of welfare poor and working poor respondents. By using provincial welfare reform intensities, I detect exogenous variation that can indicate the effect of a greater reduction in welfare funding on health outcomes. Overall, my results show a strong correlation between welfare income and health outcomes, but policy makers must be cautious when interpreting causality.

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CHAPTER 1 INTRODUCTION

Welfare economics deals with redistribution of wealth and equalization of benefits within society. The objectives of the redistribution of income can vary; however, the most common argument is that money should be distributed to the individuals who are least well off in society, which makes it mandatory for the wealthy to assist the poor. The aims of financially egalitarian societies are known to be achieved through the system of taxation (Carens, 1986). This system encourages social equality through the use of social assistance programs.

Social assistance, also known as welfare, is a series of long-standing social programs that help with the provision of income assistance to individuals who have insufficient resources and have exhausted all other possible sources of revenue to meet their basic needs (Vozoris & Tarasuk, 2004). Generally, welfare programs are channels through which people with disabilities, people with barriers to employment, aged persons, and students get income assistance. There are two classifications of impoverishment in Canada that I will focus on: the working poor and the welfare poor. In my study, individuals classified as the working poor are employed but are surviving below a sustainable level of income, and individuals classified as the welfare poor are unemployed with or without disabilities and are on social assistance.

Social assistance is distributed to welfare poor through a resource channel which allows them to directly purchase goods and services, or through other support which provides a less stressed environment, such as employment counselling. From a theoretical

perspective, one of the assumptions under the consumer demand theory states that more is always preferred than less; however, it is questionable if this is true for low-income groups receiving welfare**.** Policies aimed at alleviating poverty advocate that income transfer should generally make recipients better off (Andrade, 2002). However, it is inadequate to assume that the redistribution of income alone will improve the well-being of the poor and that the quality of life will increase in proportion to each dollar distributed. I therefore intend to investigate the effect of welfare programs and welfare reforms on the health outcomes of welfare recipients. The first stage of my analysis explores the correlation between health status and welfare recipients and non-recipients, while the second uses welfare reform intensity to obtain exogenous variation that can indicate the effect of welfare income on health outcomes.

In this thesis, due to data limitation, I focus my research on the effect of income source on health for low-income individuals. More specifically, I focus my analysis on the health outcomes of welfare and working poor individuals by comparing the health states of all eligible non-disabled people from both groups. Individuals who receive welfare are typically unemployed due to restrictive disabilities or the inability to find employment. To infer an unbiased causal relationship of welfare programs and poor health it is important to remove individuals who received welfare because of pre-existing health conditions. My research empirically assesses whether individuals who receive social assistance have lower health states than similar individuals who do not receive social assistance.

Social assistance programs in Canada are established by provincial governments to help individuals living with low income, as well as the individuals who have the

inability to earn income to meet their basic needs. The aim of income support is to offset the negative circumstances that made welfare recipients eligible for assistance. Income assistance is not always beneficial for the overall well-being of welfare recipients (Andrade, 2002). The effectiveness of welfare programs is a subject of large and growing literature, which ascribes to the implementation of welfare reforms.

In Canada, welfare reforms are organized by province and territory because each provincial and territorial welfare system is distinct and largely self-contained (National Council of Welfare, 1992). The Canada Assistance Plan Act of 1996 gave each province and territory the freedom to alter its welfare system without the approval of the federal government. The main reasons for these reforms were as a result of limited employment opportunities and strict government budget. Their objectives were to tighten the eligibility for income supplement and unemployment insurance and to get more welfare recipients into job training programs. These efforts caused the initiation of the "welfare-to-work" program along with a series of initiatives that restrict eligibility for social assistance and reduce the benefit levels (Williamson & Salkie, 2005). Although there was a collaborative effort across province to have more welfare dependents transition into the labour force, significant discrepancies exist in the intensities of provincial reforms. Ontario, Alberta and British Colombia were the only provinces that attempted significant implementation of such changes. These reforms dramatically changed the economic incentive faced by low-income individuals, creating more dependency on social assistance.

Although there were strong efforts to push welfare recipients in to the labour force, the welfare programs are still known to support different forms of dependency and

stigma. These consequences of welfare programs cause the recipient to feel negatively about receiving welfare income as opposed to earning income from employment. A common argument is that welfare carries negative psychological consequences for recipients. Theses consequences arise because welfare need or means tested programs "stigmatize" the recipient (Nicholas-Casebolt, 1986). Individuals that deviate from societal norms and behaviours suffer from social exclusion. This method of evaluation brands the individuals as 'poor', social outcasts, who are distinct from social norms that link hard work to economic stability. It is argued that having to declare oneself poor in order to receive benefits is identical to declaring oneself as a social outcast (Nicholas-Casebolt, 1986). Researchers also argue that welfare participants have feelings of social exclusion, shame, and disgrace when receiving welfare (Nicholas-Casebolt, 1986).

In order to answer my research question, I cannot look at dependency and stigma directly and will have to use appropriate indicators. Food insecurity is known to make low-income households vulnerable to welfare programs. Davis and Tarasuk (1994) define food insecurity as the inability to acquire or consume an adequate diet quality or sufficient quantity of food in socially acceptable ways. As resources get scarcer, people with food insecurity become dependent on welfare programs to alleviate hunger. Sheldrick et. al (2006), through the use of panel data, found that the majority of the participants were in fact receiving welfare for extended periods. These findings are the basis of using food insecurity as an indicator of dependency. Stress is another common health concern for welfare recipients; for example stress that is accumulated over time threatens mental stability (Shields, 2004). Through similar mechanisms, emotions stimulated by stress can change immune responses and influence the initiation and

development of physical illnesses. Stress has many origins, but for the purpose of this research I will only focus on stress developed through stigma, which is defined as the negative feelings of shame and disrespect arising from being on welfare (Wang-Sheng & Umut, 2007). I use the distress scale produced by a structured diagnostic instrument to measure welfare stigma.

To my best knowledge, research in Canada is focused on the impact of income amount on health rather than that of income source on health. One of the few studies that examined the impact of social assistance on health in Canada found that among those with unrestricted activity, welfare recipients had greater odds of heart disease when compared to those not on welfare (Vozoris & Tarasuk, 2004). While there is extensive work done on the imapct of welfare reform, there are relatively few previous studies of the effect of welfare reform intensity on health. For example, Bilter, Gelbach, and Hoynes (2004) found that welfare reform is associated with reduction in health insurance coverage and specific measures of health care utilization, as well as an increase in the likelihood of needing care but finding it unaffordable. They found no significant results for the effects of welfare reforms on health status. I will perform a similar analysis using pooled cross-sectional data from National Population Health Survey (NPHS) over the period 1994-1999 for the second stage, and NPHS 1996 is used for the first stage as a baseline comparison for health difference between welfare poor and working poor respondents. As stated previously, this is a significant period as it accounts for the fundamental changes in social assistance policy and practice in Canada that took place in 1996 (Lightman, Mitchell, & Herd, 2010). The second stage of my analysis will therefore exploit a difference-in-difference (DID) framework. The repeated cross-

sectional data sets, NPHS 1994/1995, 1996/1997, and 1998/1999, will be used to construct DID estimators. For each respondent in the pooled sample all variables will be observed, where T is a time index. The groups in the 1996/1997 and 1998/1999 samples were exposed to welfare reforms (post-treatment) relative to the counterfactual 1994/1995 sample, no-reform (pre-treatment). Between the pre-treatment and post-treatment periods, some segment of the population is exposed to the high intensity welfare reforms that took place in 1996. I call those respondents living in high intensity reform provinces the treated groups. Similarly, those living in low intensity provinces are the controls or untreated groups. The degree of intensity in each province is based on the reduction in level of funding and the number of beneficiaries outlined in Chapter 2. This research design examines the effects of a change in welfare policies in Canadain provinces on health state of welfare poor and working poor individuals. The aim of the comparison study of high and low intensity welfare reform provinces is not only to show the difference between the two groups, but also to create some measure for the effect of welfare income on health.

Theory and research argue that there are strong correlations among health, income and their socioeconomic determinants (Wagstaff & Doorslaer, 2000); (Wilkinson & Pickett, 2006). Although the relationship between health outcomes and income is frequently researched, a better understanding of the relationship would result in better policy making. Overall this research should aid in the development and redesign of public policy by increasing the understanding of health and its determinants, with my target audience being health policy makers and public policy makers. Welfare policies have the capacity to significantly impact the health and well-being of participating families

(O'Campo & Rojas-Smith, 1998). Policies from both groups can conflict; therefore, outlining the relationship among social, economic, and health effects of welfare reforms and programs would assist in better policy-making. My research intends to provide new knowledge in an area that has not been adequately studied and provides avenues for the Canadian government to protect welfare participants from detrimental consequences of welfare programs.

CHAPTER 2 BACKGROUND INFORMATION

2.1 Social Assistance in Canada[1]

Social assistance is formally divided between the federal and provincial governments following guidelines from The Constitution Act, 1867 (Federal-Provincial-Territorial (FPT) Directors of Income Support, 2010). The constitution however has been interpreted that provinces have primary jurisdiction for social services, making welfare programs variable across provinces.

Typically, social assistance are distributed to individuals or head of family households, based on the requirements set out by the government, who are deemed unable to provide adequately for themselves and/or their dependents. As a condition of eligibility, employable candidates may be required to take part in one or more forms of employment to receive financial assistance. Many jurisdictions, therefore offer employment services and training opportunities together with monetary assistance. If recipients choose not to look for work they may be penalized through the reduction of benefits for a period of time until evitable termination. Most jurisdictions require all candidates to have the age of majority before applying, and reside in Canada at the time of application and while receiving benefits.

The categories of beneficiaries include employable persons, single-parents families, persons with disabilities, persons with multiple barriers to employment, aged persons and students. Each individual in these categories are evaluated for financial

[1] (Federal-Provincial-Territorial (FPT) Directors of Income Support, 2010)

eligibility. Their evaluations include a need or means test and a valuation of assets and income. The need or means test looks at the individual or family basic needs and the availability and capability of the financial resources to meet the needs. Once the needs and means tests are performed, the investigators will inquire about the type and value of assets owned by the individual or family to gauge the eligibility. Assets such as property and actual and potential liquid assets are included into the evaluation process for the purpose of calculating the social assistance entitlement. In addition to assets, an examination of income from all sources is done to validate qualification.

Once the candidates have been deemed in need of assistance, there are three categories in which they are able to receive benefits: basic assistance, special needs assistance, transitional assistance, and indexation. Basic assistance[2] helps with the provision of food, shelter, clothing, personal and household items and when necessary recurring special needs. Special needs assistance is a case-by-case provision basis in accordance with the appropriate policies and guidelines. This type of assistance provides items, services or allowances that are specific to age, disability, employment, education, training and other special circumstances. Social assistance recipients shifting to employment receive transition benefits to lessen the financial impact the transition. It's the aim of the government through this type of assistance, to reduce dependency on social assistance and increase labour market participation for employable recipients. Indexation is the adjustment of welfare benefits to the cost of living index, so that benefits rises or

[2] i. Pre-added budget method – It combines all non-shelter requirements into a single support allowance. A separate shelter component is then provided.
ii. Itemized budget method – It provides a standard allowance for each of the non-shelter and shelter requirements. The sum of the individual items to which the individual or family is entitled then forms the total benefit payable.
iii. Flat rate of assistance – It provides a lump sum amount for non-shelter and shelter items based on a household's structure and the program in which it is participating.

falls at a rate corresponding to the rate of inflation. Each province and territory has the authority to determine whether or not they should index its benefits.

2.2 1996 Welfare reform in Canada

There have been a significant amount of changes in welfare policy across Canada since 1992 (National Council of Welfare, 1997) . During this period, Canada's economy was in a stage of complex social and economic change; through which significant growth in the elderly population, changes in family structures, higher government debt, volatile labour markets, and economic conditions were evident (Tarasuk & Davis, 1996). Also during this period 10 percent of the population relied on social assistance. This is a 100 percent increase from 1980's.

The main reasons for these reforms were as a result of limited employment opportunities and strict government budget. The government's budget deficit and higher health and social program cost caused a reduction in the monies available for welfare. The Canadian government was compelled to find more effective methods or programs to assist impoverished families. They decided to reduce the welfare benefits and intensify the efforts of welfare recipients to find employment, which in the end should allow recipients to support themselves and their families. Their objectives were to tighten the eligibility for income supplement and unemployment insurance and to get more welfare recipients into job training programs. These efforts caused the initiation of the "welfare-to-work" program along with a series of initiatives that restrict eligibility for social assistance and reduce the benefit levels (Williamson & Salkie, 2005).

The initiative of welfare reforms focus on moving employable people off welfare. The effectiveness of this program, however, will always be constrained by the number of jobs available. In Canada, almost two-thirds of adults under 65 who were classified as the poor in 1993 reported working either full or part time (Tarasuk & Davis, 1996). This limitation has stimulated the conversion of large number of poor welfare recipients into working poor individuals. Even though welfare reforms and labour market conditions have collaborated to help alter the income source of impoverished families in Canada, the cuts in social assistance benefit levels and more stringent eligibility criteria have increased the extent and depth of poverty in Canada.

Although there was a collaborative effort across province to have more welfare dependents to transition into the labour force, significant discrepancies exist in the intensities of various provincial reforms. The Canada Assistance Plan Act of 1996 gave each province and territory the freedom to alter its welfare system without the approval of the federal government. The policies developed in Canada were motivated by the success of the reform implemented in the United States. Evidence suggests that the basis for successful welfare reform consist of six main policies: benefit lifetime limits[3], proactive diversion programs, work requirements and sanctions for non-compliance, employment focus, work incentives, and innovative approaches to program support and delivery (Gabel, Clemens, & LeRoy, 2004). Ontario, Alberta and British Colombia were the only provinces that attempted significant implementation of such changes. It is my aim to outline the distinct changes across Canadian provinces and focusing on the different

[3] A limitation placed on assistance for most families to a maximum of five years in order to receive full TANF grant. Many states have used the flexibility granted under PRWORA to legislate time limits shorter than 5 years.

impacts on welfare recipients. I will organize this discussion by starting with eastern provinces, the central provinces and ending with provinces on the west.

The success of Newfoundland's economy was heavily dependent on fisheries. However, the overfishing and poor management of international fishing quotas lead to the closure of the cod fishery in July 1992 left more than 30,000 people unemployed. As a result, the federal government developed a Northern Cod Adjustment and Recovery Plan to help the number of displaced fisherman and processing plant workers. In accordance with the nation-wide welfare reform this program and other assistances was put on hold. The budget issued in 1994 froze the grants that should have been issued to social agencies. The 1995 budget constrained the allowances granted to welfare recipients for furniture and electricity. This was a 50 percent reduction from the initial allowance. As shown in Figure A.1, Newfoundland had a 14 percent reduction in overall funding levels but only 3 percent of previous beneficiaries left the welfare system. This demonstrates that their effort to transit welfare recipients into the labour force was not as successful relative to the reduction funding levels. Figure A.1. shows a graphical represent of this gradual decline of welfare beneficiaries from 1993 to 1999 across the 10 provinces[4].

Prince Edward Island (PEI) was affected by the economic downturn and the closure of the Canadian Forces Base Summerside in 1992. Later that year PEI noticed increased dependency on unemployment insurance and welfare. In efforts to reduce the number of dependencies on welfare, the government froze welfare in 1993. From 1992 to 1995 they reduced the fund distributed to single employable person, disable person, single parent with one child and a couple with two children. In 1996 they had cut the

[4] Territories are excluded from this research

shelter allowances which added hardship on some welfare recipients (National Council of Welfare, 1997). Overall PEI had a 14 percent reduction in number of beneficiaries after the reform along with a 13 percent reduction in funding levels.

The welfare reform in New Brunswick was linked to changes in the employability program. However, the forecasted budget surpluses and declining unemployment gave New Brunswick the opportunity to soften its approach to welfare reform. They had an overall 14 percent reduction in their funding levels and 9 percent reduction in the number of beneficiaries.

In Quebec the welfare reform generally applied cuts to an employable person sharing a house or apartment with someone else. Estimating 107,000 of the 350 00 employable households on welfare in June 1997 had cheques cut because of the shared accommodation rule. Overall this resulted into a 13 percent reduction in Quebec's overall funding, but only a 4 percent reduction in number of beneficiaries.

Ontario has made substantial changes in their welfare programs. The government emphasised the importance of welfare recipients to engage in work activity. Evidence shows that, since 1995, 42 percent of social assistance expenditure was reduced and an estimated 620, 000 left the welfare system. Aside from the cuts in welfare rate, new administrative measures to tighten eligibility and reduce fraud went to into effect almost immediately in 1997. As a result, JobOntario training programs and special relief to municipalities with high caseloads were terminated. In Figure A.1. Ontario has the second largest reduction in the number of beneficiaries, at 17 percent.

Manitoba's welfare reform, in 1996, offered additional assistance to recipients in marginal jobs, but penalized benefits to people who did not satisfy adequate training or employment expectations. This program aimed at encouraging people to take the initiative to find employment. Under this reform family heads on welfare could lose up to $100 per month from their assistance cheques if they did not meet the requirement for work. Also social assistance rates from children aged 1 to 17 were reduced to the rates established provincially, except for the city Winnipeg that maintained higher rates for infants. In Figure A.1, it shows that Manitoba had a 13 percent reduction in funding levels and number of beneficiaries.

Most of the welfare reform initiatives in Saskatchewan, since 1994, were administrative changes which were geared to improve the management of welfare recipients. This explains the small 3 percent reduction in the number of beneficiaries. They also had a 13 percent reduction in funding but that was due to federal cuts to unemployment insurance and welfare for off-reserves Indians. By the end of the year in 1996 the government had not made any changes to its welfare system with very few cuts for non-aboriginal Canadians.

Alberta was the first province, among all Canadian provinces, to introduce significant welfare reform. In 1993, the provincial government started with the revamping of the welfare administration with its main purpose being to reduce the number of first time applicants entering the system. Applicants were required to deplete all their means of support prior to getting any assistance. The aim of this policy was to divert welfare candidates from the welfare system into employment. This diversion strategy only

reduced funding by 12 percent but was highly successful in reducing the number of welfare recipients by 42 percent.

In 2002, British Colombia was the first province to implement time limits on welfare benefits forcing welfare recipients to work for a total of 2 years for every 5 year period (Gabel, Clemens, & LeRoy, 2004). The province required employable welfare recipients to find employment or job training to remain eligible for assistance. If recipients were not able to adhere to these job requirements their benefits were either postponed or cancelled. The jobwaveBC, a re-employment program, was developed by the provincial government and operated by a private company. This program helped 25,000 British Colombians get off social assistance. Overall BC was able to reduce their funding levels by 9 percent and their number of beneficiaries by 10 percent.

Supplementary efforts by provincial governments played an important role in consolidating the benefits from welfare programs. This variation in social programming across Canada builds the investigation on the effect of the intensity of welfare reforms on health outcomes of welfare and working poor respondents.

2.3 Literature Review

Unequal societies become dominated by state competition and class differentiation, which increase health inequality (Wilkinson & Pickett, 2006). The evolution of social policy in Canada has facilitated the examination of policies geared towards improving the well-being of the social destitute. There has been ample research done on the effectiveness of social policy in equalizing benefits. Although the literature

presents social policies in many contexts, this review will primarily focus on welfare programs and welfare reforms. Most studies in Canada focus on the impact of welfare policies on employment, while little is said about the impacts on the overall state of health of the individual which in turn may prohibit employment. Here, I focus on the much smaller body of literature which compares the health outcomes of welfare and non-welfare recipients.

As noted above, the literature on the effects of welfare program on health is very small and is not extensively reviewed. Vozoris and Tarasuk (2004) explored the issue of the health of Canadians on welfare by comparing the health outcomes of welfare and non-welfare recipients. Their objective was to examine the likelihood that adults in households whose main source of income was welfare would report poor mental and social health, and selected chronic conditions. Through the use of logistic regression models, the authors found that welfare recipients are more likely to report poor functional health, depression, distress and poor social support in comparison to non-welfare recipients. They hypothesized a correlation between receipt of welfare and specific health outcomes. The main limitation of their paper is its inability to obtain a causal relationship between poor health and welfare recipience. My research differs from Vozoris and Tarasuk (2004) as I draw upon stress related stigma and dependency on welfare to explain the variability in health outcomes of welfare recipients. In addition, through the manipulation of a difference-in-difference model, my research aims at generating causal inferences.

One of the chief arguments against welfare programs is that the evaluation process is stigmatizing, causing negative psychological consequences for recipients

(Nicholas-Casebolt, 1986). Stigma, defined as the negative feelings of shame and disrespect, is a common form of stress for recipients (Wang-Sheng & Umut, 2007). When income assistance is given to individuals on the basis of societal interest rather than the needs of the individuals, recipients view themselves as outsiders, a classification based on community action (Simmel, 1971). The literature on health consequences of social assistance suggests that stress induced by welfare stigma has negative long-term effects on the recipients. Evidence from a longitudinal study of welfare and mental health of an African-American cohort suggests that welfare recipients are more likely to have poor health but continuous participation produces lower levels of health state (Ensminger, 1995). Other work done by Manchester and Mumford (2009) demonstrated that the psychological cost of being on welfare increases as recipients become more educated. Specifically, people who are more educated and receive welfare have a higher rate of depression and stress levels. Roger-Dillon (1995) reviewed ten divorced or separated women and concluded that stigma is relational and situational, and therefore cannot accurately be transformed into indices. Manchester and Mumford (2009) also criticized the existing literature that formulated various indices for welfare stigma, stating that stigma in itself is complex and contingent upon the recipient's social environment. It is, however, common for older approaches studying welfare to develop different indices for welfare stigma; the most common being psychological well-being indicators attributed by stress.

Nicholas-Casebolt (1986) took a different approach by looking at the effects of the evaluation of financial eligibility on health. She argued that the administration of means tests foster apathy and powerlessness in recipients. Through the use of a

longitudinal study, Nicholas-Casebolt (1986) compared the psychological effects of single-parent women who are recipients of Aid to Families with Dependent Children (AFDC) with those who are non-recipients. Her results were consistent with Roger-Dillon's results in that they both found evidence to suggest that AFDC recipients do have lower psychological well-being than non-recipients.

Welfare programs do not intend to create stigma, in fact they aim at compensating for the negative factors that make the recipients eligible. The Grossman Theory on demand for health care explicitly states that health is directly related to income by enabling a person to have time to earn more income and purchase other commodities (Grossman, 1992). Poor health therefore restricts a family's ability to generate income or to accumulate assets because of limited work and high medical expenses (Smith, 1999). Welfare programs can create environments to produce mental illnesses and poor health; and therefore increase the recipient's reliance on social assistance. The studies on stigma find that welfare programs cause recipients to feel incapable of providing for their needs. Nicholas-Casebolt (1986) noted that 'administrative practices of welfare programs emphasize continual scrutiny of eligibility, but the rules and regulations governing eligibility are so complex that recipients are uncertain about what to expect or demand' (p.288). These uncertainties make individuals feel powerless and futile in their ability to manage their lives. Therefore, they not only become more dependent, but often feel trapped in the system (Sheldrick, Dyck, Michell, & Myers, 2006); (Nicholas-Casebolt, 1986). Sheldrick, Mitchell, and Dyck et. al (2006) assessed the length of time individuals spent on welfare. Though their analysis might lack external validity, the results showed that welfare recipients do rely on income assistance for extended periods of time.

Specifically, 61% of single mothers had been welfare dependent for 6 years and 29% for 11 years. The chief focus of their analysis showed that single mothers and disabled individuals suffer from a more pervasive level of vulnerability and tend to be on social assistance for longer periods of time. These effects are not uniform for all demographics. Therefore extending the study to other vulnerable groups provides more evidence for the hypothesis that there are psychological effects due to welfare participation.

As resources get scarcer, people with food insecurity become more dependent on welfare programs to alleviate hunger. Food insecurity, a stimulator of dependency, is "the inability to acquire or consume an adequate diet quality or sufficient quantity of food in socially acceptable ways" (Davis & Tarasuk, 1994, p. 1) Dependency on income assistance can also reduce the incentive to take the initiative on maintaining good health. Studies show that recipients may be less inclined to eat nutritious meals, quit smoking or drink less (Smith, 1999). The availability of sugary drinks and, convenient processed and fast foods, on average has reduced an individual's physical activity (Smith, 1999). Today's modern environments promote overeating and sedentary behaviour which is conducive to chronic diseases (Ries & Von Tigerstrom, 2010). Olson's (1999) research showed that inadequate intake of several important nutrients increase the risk of conditions such as type 2 diabetes, heart disease, high blood pressure, high cholesterol and obesity.

Food insecurity has become recognized as a public health issue. Vozoris and Tarasuk (2003) contributed to an understanding of the scope and nature of food insecurity in Canada through the analysis of data from the 1996-1997 NPHS. Their results show that the odds of food insufficiency increase with income inadequacy across Canada. In

particular, single parent families had greater odds of reporting food insecurity when they reported their major source of income as welfare or unemployment compensation; did not own dwellings; and lived in the Western Canada. In addition food-insufficient households are likely to report heart disease, diabetes, high blood pressure and food allergies (Vozoris & Tarasuk, 2003). This result is also consistent with other Canadian studies by McIntyre, Connor, and Warren (2000), and Che and Chen (2001), which examined the interrelationship between low-income poverty and indicators of food insecurity. These studies confirm the significant correlation between welfare and household food insecurity. I found no existing literature that specifically addressed the extent to which welfare programs have sustained vulnerability and/or dependency.

Research on social assistance programs has increasingly focused on labour outcomes. This focus is not surprising because welfare programmes are designed and restructured to improve the attitudes and motivation of the unemployed (Lightman & Mitchell & Heard, 2010). In many countries, notably the US, Germany, and France, there is extensive evaluation of welfare programs by looking at the impact of general government transfer. Hildebrandt (2002) explored the dynamics of 'work- for- welfare' programs as a substitute for general government transfers. The authors examined the effectiveness of work- for-welfare and found that recipients had better health outcomes relative to basic welfare recipients. They utilized a qualitative community study of 34 women who lived in a predominately African-American community and enrolled in a work-based welfare program. The main purpose of the study was to search for positive and negative effects of work-based welfare through three themes: health, well-being, and empowerment. Although they did not perform any econometric analysis, their summary

statistics showed that 82.4% of the women negative health status increased fourfold. Their results also showed that anxiety had the strongest influence on their health, reporting life-threatening effect of stress on the women and their children. Other studies, including Huber, Lechner, and Wuncsh (2009) provided greater insight into the effect of welfare programs by tracking individuals after leaving welfare. Through the application of a semi-parametric propensity score matching estimator they found that employment substantially increases mental health. Specifically they found that self-reported health improved for males over time after employment using a unique data set which combines various survey data sources.

The federal, provincial and territorial governments have tried to deal with the shortcomings of welfare programs through the manipulation of welfare reforms. These policies and programs are redesigned to ensure that the distributed welfare incomes maximize the well-being of Canadians who rely on these programs. Welfare reforms in Australia, the United Kingdom and the United States implemented in the 1990's had encouraged Canadian policy makers to increase their motives to push welfare recipients into the workforce (Williamson & Salkie, 2005). Historically provincial and territorial welfare programs were known to offer services and support which help ease the transition from social assistance to the labour market. However, since 1996, social assistance benefits have been reduced or withheld across provinces and territories if recipients do not actively seek employment or participation in welfare to work programs (Williamson & Salkie, 2005). These reforms have the potential to significantly damage or eliminate the safety net of vulnerable groups, such as single parent and low income households. The social safety net is depicted as a system that entraps people into poverty and creates

long-term dependency. Majority of literature written on welfare reforms argues that welfare is the problem rather than the solution for low-income families (Greenwood, 2005). This negative image portrayed by welfare has stimulated the rewriting of welfare policies with programs that promote self-reliance versus dependence.

While there is extensive evidence linking welfare participation to poor health state, the literature examining the effects of welfare reform on health is limited in Canada (for example Salkie and Williamson (2005)). Many papers focus on the assessment of work-to-welfare reform in terms of the intrinsic value of participating in paid employment and of the intangible benefits work provides. Another domain of literature in this area focuses on the support of labour market participation. It is believed that income generated through employment gives hope of economic independence in the way that dependence on social assistance support can never achieve (Greenwood, 2005).

The literature that captures the causal relationship of welfare on health takes advantage of natural and quasi-experiments in welfare reforms. These studies examined health outcome measures post-government intervention, for welfare recipients and welfare non-recipients. Bilter, Gelbech, and Hoynes (2004) investigated the relationship between welfare reform and health insurance, health care utilization, and self-reported measures of health status for women aged 20-45 in the US. They exploited difference-in-difference and difference-in-difference-in-difference models to find that welfare reform is associated with a reduction in health insurance coverage, specific measures of health care utilization and an increase in the likelihood of needing care. Their overall effects were larger for Hispanics compared to Blacks and low-educated women. I would expect the results to be different if this study was conducted in Canada where the universal system

of health allows individuals to have full insurance coverage irrespective of welfare policies or reforms. Similarly, Kaestner amd Kaushal (2003) and Darnell and Rosenbaum (1997) examined the impact of welfare reforms on health insurance, but their studies are not applicable to countries such as Canada and the UK, where there is an universal health system. In the US, leaving welfare may lead to loss of health insurance and the ability to pay for critical health care needs (O'Campo & Rojas-Smith, Welfare Reform and Women's Health: Review of the Literature and Implications for State, 1998). This explains why American studies would look at welfare reforms in relation to health insurance.

Cook, Frank, and Berkowitz et al. (2002) examined, using logistic regression models, the impact of loss or reduction of food insecurity on health outcomes of young children. In the US, it is one of the few studies which look at the impact of welfare reform in respect to food insecurity. This study used a sample of 2718 children aged 36 months or younger whose households received welfare or had lost welfare due to a reform. These changes in benefits were as a result of reduction in income or expenses. They found, after controlling for potential confounding factors, that children in families who suffered from a welfare reform; relative to those who were not impacted had a greater odds of being exposed to food insecurity, having been hospitalized since birth, and being admitted to the emergency room.

Salkie and Williamson (2005) did a similar analysis on the well-being of children under welfare reform in Canada. They explored the implications of welfare reforms during the mid-1990s on the well-being of pre-school children living in poverty. The authors argued that there is inadequate information about the effect that income source

and welfare-to-work initiatives have on children. Their goal was to determine whether policies that force parents to be active in employment or employment-related activities improve the well-being of Canadian children in poverty. They used bivariate analyses[5] of data from the National Longitudinal Children Survey from two cohorts, before and after the reform. They compared the school readiness and family environment characteristics of the sub-group of children living in working poor families with the sub-group of children living in families receiving social assistance. One of the key findings from their study shows that both before and after implementation of the welfare reform, pre-school Canadian children in working poor families had higher school readiness scores than the comparison families receiving social assistance.

While the literature explored is diverse with different analytical techniques, the results generally suggest that welfare negatively affects the well-being of low income individuals and households. What determines whether welfare reforms have been successful is not only based upon the welfare recipients' transition into the labour force, but also upon the improvement of their overall well-being. In order to better understand the success of welfare reforms, I determine whether variation in welfare reform intensities causes changes in the health state of low-income individuals. First, I examine the baseline health difference, using NHPS 1996, immediately following the reform. I use a research design that addresses, in a more complete way than previous studies, the possibility that welfare dependency and welfare stigma may account for the variability in health status of welfare recipients. Second, I explicitly link welfare reform to health

[5] They constructed bivariate analyses of data from the 1994/1995 and 1998/1999 cohorts to compare the school readiness and family environment characteristics of the sub-group of children lining in working poor families with the sub-groups of children living in families receiving social assistance.

outcomes by examining the relationship between changes in funding reduction and timing of welfare reform policies to changes in health outcomes of welfare poor and working poor respondents. .My methodology will draw upon linear, logistic and difference-in-difference models used in past research with intention of finding similar results in Canada.

CHAPTER 3 DATA

3.1 Sample Selection

I analyse the impact of social assistance and the mid-1990s welfare reforms in Canada on the health of low-income respondents, using data from Statistic Canada's National Population Health Survey (NPHS). The NPHS conducted household-level survey related to the health of the Canadian population. The household component of the survey includes household residents in all provinces excluding the Indian reserves households, Canadian Forces Bases and few remote areas in Quebec and Ontario. The survey time period is known as a 'cycle' and a total of three cycles will be used. The first cycle of data collection began in 1994 and biennial thereafter, giving users the advantage of using pooled cross-sectional and panel data sets. This survey was created by first selecting households and then within each household choosing one member of the household to be in the longitudinal study. The second cycle was conducted in 1996, which recontacted the longitudinal respondents chosen in the first cycle, who had completed the general component of the questionnaire in 1994-1995. The "National Population Health Survey, 1996-1997: Health File", National Population Health Survey, 1994-1995: Health File, and National Population Health Survey, 1998-1999: Health File are the surveys that will be used in this study[6]. The longitudinal data are not released to the public, but biennial cross-sectional samples are. The cross-sectional data is representative of the population at a single period in time. The goal is to measure the aggregate effects by demographic group.

[6]The first stage of analysis was restricted to the use of NPHS 1996 data due to inconsistences in variables reported in subsequent years.

The survey questionnaires included questions on household characteristics, food security, stress, welfare participation, and health state. The population was stratified by two income groups. The first being low income, which consists of respondents living in families with incomes at or below the low income cut-off. The second is middle-income, which consists respondents living in families with incomes between the low-income cut-offs and double the low-income cut-offs[7].

Those households who reported their main source of income as welfare and employment compensation were classified as welfare poor households (though unlikely, this could include households on welfare with middle income adequacy). The reminder of the sample was classified as the working poor households who reported their main source of income as employment income. It is possible that households who report middle income adequacy could also report welfare or employment compensation as their main source of income. The classification of the welfare candidates is based of self-reported main source of household income and eligibility criteria set out by Service Canada. Similar to Vozoris and Tarasuk (2004) all households who reported welfare/unemployment insurance/workers' compensation as their main source of income and reported household income in the lowest or low middle category of income adequacy were classed as on welfare. While those in the middle income category of income

[7] LICO is an income threshold below which a family will likely devote a larger share of its income on the necessities of food, shelter and clothing than the average family. The approach is essentially to estimate an income threshold at which families are expected to spend 20 percentage points more than the average family on food, shelter and clothing. (Statistics Canada, 2009)

adequacy and those who reported employment, senior's benefit or other source as their main source of household income will be classed as working poor[8].

The NPHS included three questions to explore issues of household food insecurity. Household respondents were asked if, over the past 12 months, their household had ever run out of money to buy food. If their response was yes, they were then asked if anyone in their household receive food from a food bank, soup kitchen or other charitable agency. They were then asked to describe their food situation by choosing one of the following responses: a) always enough food to eat, b) sometimes not enough food to eat, or c) often not enough food to eat. The distress scale in NPHS was derived based on the work of Kessler and Mroczek (from Michigan University). The index is based on a subset of items from the Composite International Diagnostic Interview (CIDI). The CIDI is a structure diagnostic instrument that was designed to produce diagnoses according to specific definitions and criteria. Higher scores represent more distress.

The health variables in the survey are based self-reported assessment of the respondent's general health status and prevalence of health condition such as heart disease, diabetes, hypertension, obesity, depression and distress. Initially general health status was recorded by the assessment of the individual's overall health on a scale 1 being excellent and 5 poor. However, in order to utilize a linear probability model I dichotomized the variable into 1 for poor and fair health, and 0 for good and excellent.

[8] Income adequacy variable is a constructed within five discrete categories. This variable is based on household income and the size of the household.. The lowest income, lower middle income, and middle income quintiles are 1, 2, and 3 respectively.

The remaining health variables were originally in the binary form, 1 if the condition is reported and 0 otherwise.

Several identification strategies were used to mitigate selection bias and to control for confounding factors. To infer an unbiased correlation of welfare programs and poor health, it is important to remove individuals who received welfare because of pre-existing health condition. Individuals who receive welfare are typically unemployed due to restrictive disabilities or the inability to find employment. The survey does not directly identify whether individuals are receiving welfare as a result of disabilities. However it is imperative in my research to isolate individuals who receive assistance because of ill health. I control for welfare and pre-existing health conditions that are potential correlated with self-selection processes and that may influence their reported health statuses. Vozoris and Tarasuk (2004) use a restricted activity index developed through the survey that indicates whether the respondents have a long-term disability. As outlined in the survey, restricted activity is defined as having long-term disabilities or handicaps and/or any long-term physical or mental condition or health problem that limits the amount of activity that one can do at home/school/work/other activities (Vozoris & Tarasuk, 2004). I will therefore use this index to exclude all low-income respondents who report restricted activity.

The original sample size for cycle 2 was 81,804, after accounting for the age, income, missing values and health criteria the sample size was reduced (n= 45260). For the policy component of my research the cycle 1, 2, and 3 were appended, formulating a pooled cross sectional data set with (n= 62354).

3.2 Descriptive Statistics

The descriptive statistics shown in Table A.1 presents statistics for NPHS 1996-1997 (cycle 2), immediately following the reform. The demographic statistics suggests that 43 percent of the welfare poor individuals have been widowed. Single adults have a higher chance of being affected by economically by poor health than adults in a dual-earner household (Morris, et al., 2005). The loss of one of the household providers can be financial and emotional challenging, causing widowed individuals to seek alternative support. Social assistance is a method used to help relieve some of the financial burden. This partially explains why single persons and widows make up 62 percent of the welfare poor sample.

The effect of income source may have a greater impact on health for respondents who are more educated. Table A.1 also shows that working poor respondents are more educated than welfare poor. 53 percent of the welfare poor respondents lack basic education, while the remainder has secondary or tertiary education. Welfare programs across Canada provide short-term education and training. These programs support recipients to find entry-level jobs. Critiques argue that these programs are not effective as they do not provide a pathway out of poverty. They also argue that longer-term skill based training for jobs that will provide greater economic security (Butterwick, 2010). In contrast, 74 percent of the working poor respondents have some level of education. The summary statistics enables one to assume that the working poor respondents are destitute as a result of poor job choice that is low paid. Authors argue that welfare recipients who are educated usually have lower psychological well-being relative to the uneducated recipients (Nicholas-Casebolt, 1986); (Moffit, 1983). It is commonly argued that

educated working poor respondents may qualify for welfare but choose not to apply because of the shaming effect of welfare stigma (Nicholas-Casebolt, 1986).

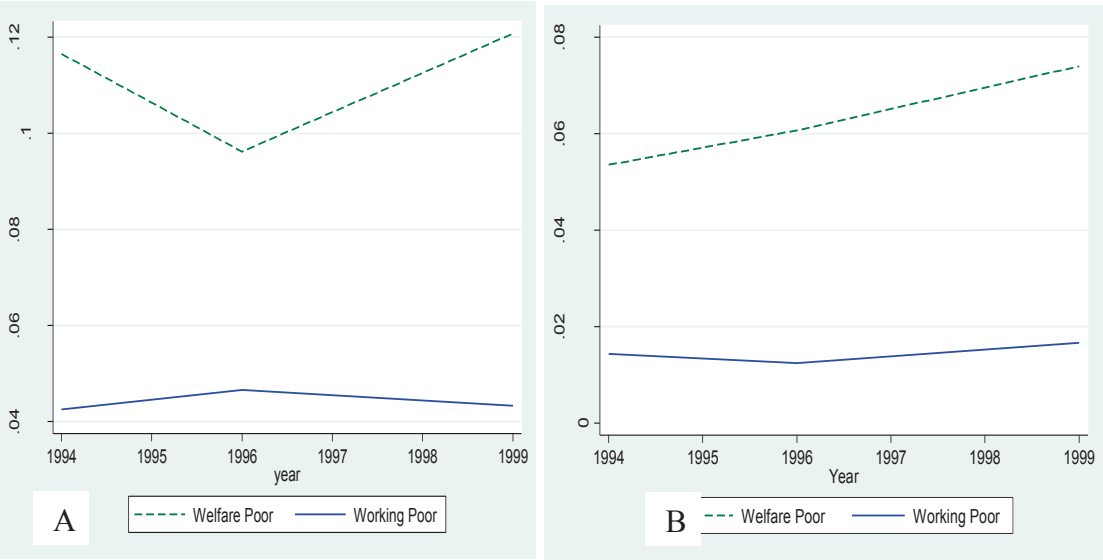

Figure 1: Mean of respondents reporting poor health (a) and diabetes (b), separated by welfare poor and working poor. Sample weights for each respondent are applied to both graphs. NPHS 1994-1999, pooled cross-sectional data, used to calculate means.

Figures 3.1, 3.2, and 3.3 show the general movement in health outcomes of welfare poor and working poor respondents over the years 1994 to 1999. Figure 3.1 (a) shows that after 1996, the percent of welfare poor respondents reporting poor health increased while working poor respondents showed no significant change. Diabetes and obesity for welfare poor have steady inclines, with more welfare poor respondents reporting these conditions than working poor. This is demonstrated in in Figure 3.1(b) and Figure 3.3 (a) respectively. A similar trend is found in Figure 3.2 (b) for heart disease. However, hypertension in Figure 3.2 (a) had a parallel progression prior to 1996, but remained constant thereafter.

Migraine had the most interesting trend. Figure 3.2 (b) demonstrates that more working poor respondents report migraine than welfare poor. The summary statistics showed that there are more educated working poor respondents. One plausible explanation is that low-income educated respondents may be pressured to attain higher wages and accumulated anxiety over time can result in chronic migraine conditions.

Figure 2: Mean of respondents reporting hypertension (a) and heart disease (b), separated by welfare poor and working poor. Sample weights for each respondent are applied to both graphs. NPHS 1994-1999, pooled cross-sectional data, used to calculate means.

Figure 3: Mean of respondents reporting obesity (a) and migraine (b), separated by welfare poor and working poor. Sample weights for each respondent are applied to both graphs. NPHS 1994-1999, pooled cross-sectional data, used to calculate means.

CHAPTER 4 EMPIRICAL METHODOLOGY

To achieve the first objective I will begin by conducting a series of six ordinary least squared and logistic regressions, sorted by sex from the NPHS cycle 2 (1996/1997) data. I use cycle 2 data to present the baseline for health differences by welfare status[9]. The model aims to estimate the odds of respondent reporting welfare as their main source of household income would also report poor health outcomes. Consider the model:

$$y_i = \beta_1 W_i + \beta_2 L_i + \beta_3 R_i + \beta_4 S_i + \beta_5 P_i + \beta_6 X_i + u_i \quad (1)$$

y_i is the health state of respondent *i,* where y= 1 represents a respondent reporting a poor health condition, otherwise y=0 . W is a dummy variable for being in the welfare poor category where W=1, otherwise W= 0 for working poor. The β_1 parameter is the effect of being supported by welfare on health outcomes. Formally, this can be expressed as the odds Y=1|W=1. L*, R* and *S* represent income adequacy, food insecurity and stress respectively which are all binary variables except income adequacy. In Canada, welfare reforms are organized by province and territory because each provincial and territorial welfare system is distinct and largely self-contained. Canadian provinces and territories also have unique characteristics such as economic opportunities that can affect labour market outcomes, and lifestyle qualities that may affect health outcomes. Social assistance programs are delivered by the province/territories. P, therefore controls the variable financial levels and policies of welfare assistance by province (Federal-

[9] The first stage of analysis was restricted to the use of NPHS 1996 data due to inconsistences in variables reported in subsequent years.

Provincial-Territorial (FPT) Directors of Income Support, 2010). X is a set of covariates controlling for differences across age, education, occupation and marital status and ownership of property. Literature indicates that welfare is associated with low income, and education is tightly linked to income (Vozoris & Tarasuk, 2004). The socio-demographic variables associated with welfare are single parenthood and specific occupations and levels of education. Additional, age is an individual level characteristic that is directly linked to health states. These control variables must be included in the regression model as they may affect the relationship between health outcomes and welfare.

For the second research objective DID model will be implemented by estimating the following equation:

$$y_{ipt} = \beta_0 + (\text{funding})\,\delta_p + (\text{post reform})\upsilon_t + (\text{funding}_p * \text{post reform}_t)\,\lambda_{pt} + X_{it}\,\mu + + \varepsilon_{it}\,, \quad (2)$$

y_{ipt} is the health state for respondent i in period t, t = 0 or 1 and i= 1,2, ….N. The population is observed in a pre-treatment period (1994/1995) t= 0, and in a post-treatment periods (1996/1997, 1998/1999) t=1. One potential concern that results from this welfare reform is that it caused a shift in the distribution of those welfare poor respondents who were eligible for social assistance. This shift would imply that after the reform some welfare poor respondents would enter the workforce and altered their main source of income to employment. To try to address this concern, I follow the conventional strategy of introducing comparison groups based on provinces that had more intensive policies and therefore should have more of an impact. As shown earlier, different provinces in

Canada had distinct intensity of welfare reforms (Figure A.1). Areas with larger percentage decrease in funding will have greater impact on health outcomes, whereas provinces with small percentage decreases in funding will not. This heterogeneity allows for a treatment/control strategy (Hoyt, 2007). p therefore indexes the respondent's residing province.

The advantage of this approach is that it provides a second source of variation in this natural experiment. Thus if the comparison groups are valid, then they net out any welfare poor and working poor respondents trends in health outcomes common to the high intensity and low intensity reform provinces in Canada.

4.1 Identification Strategy

The first factor for identifying the effect of welfare reform is that different provinces had distinct level of funding reduction. Provinces with a large percentage of the population relying on welfare had more intensive programs which shifted more welfare dependents off social assistance. This means that residents in high intensive provinces were more exposed to welfare reforms than those from low intensive provinces. Populations in areas with high percentage of population on welfare recipients were in a position to be more effected from the welfare reform compared to provinces with low intensity. I use data on social assistance funding by province from 1994-1999 from National Council of Welfare (1997).

Secondly, I assume that out of province migration as result of a welfare reform is unchanged during the study period. My approach implicitly assumes that repsondents are unaware of the provincial government budget contraints or the provincial government

decision-making. Studies on interprovincial migration have tried to identify effects of fiscal variables, such as the level of intergovernmental transfer payments and provincial government natural resources revenues, on interprovincial migration, and found inconclusive results (Day, 1992). Respondents within this sample are of low income groups . Therefore, it is abritarily assumed that they would not be able to afford moving cost in the amount of time requried to do so. Moreover, this approach assumes that migration is not sensitive to the levels of social assistance funding.

. This model would also require the assumption that variation in funding cuts across province does not systematically vary with health outcomes. These assumptions combine to form the central variable in my study:

$$(\text{Funding Reduction Rate})_p * (\text{Indicator for Post reform})_t.$$

The change in helalth outcomes in high intensity provinces is the expected value that a respondent living in high intensity provinces has poor health post reform less the expected value that a respondent living in a high intensity province has poor health pre reform. Formally, this can be expressed as, $E[Y=1|T=1, P=1] – E[Y=1|T=0, P=1]$, where P=1 represents a high reform intensity province and P=0 is a low intensity province. More compactly, λ_{pt} represent the average effect of high intensity welfare reforms on health outcome of welfare poor and working poor respondents. Formally this can be expressed as:

$$\lambda_{pt} = \{E[Y=1|T=1|P=1] – E[Y=1|T=0|P=1]\} – \{E[Y=1|T=1|P=0] – E[Y=1|T=0|P=0]\} \quad (3)$$

This DID coefficient is design to caputure how the relationship between low- income and health outcomes differs across welfare reform intensity. The DID model assumes that,

conditional on covariates, the average outcome for treatment and control groups would have followed parallel paths in absense of the treatment. Therefore, my estimates also assume that health inequality of welfare poor and working poor individuals in both high intensity and low intensity provinces would be systematically the same over time in the absence of reform. As a result, this research does not consider temporal differences that produce non-parallel outcome levels for the treated and control groups. I compare the changes in health outcomes across provinces with distinct welfare reform intensity, in order to assess the contribution of the welfare programs to the observed changes in health. Therefore I expect to see results that show areas where the welfare reforms were more intensive saw greater drop in the probability of reporing poor health than low intensity areas. X_{it} is a vector of demographic characteristic, including controls for age education, occupation, marital status and own dwelling. This provides a way to adjust for observables differences between the observation and different groups. ε_{ist} is an individual-transitory shcok that has a mean zero at each period, T=0,1.

The two analytical objectives were estimated with the respondent's sample weight. The study will continue using STATA to perform all the regressions. The results of the estimation are presented and discussed in Chapter 5.

CHAPTER 5 RESULTS

5.1 First Stage

In order to investigate whether welfare income is associated with poor health outcomes, I begin with an OLS and logistic analysis. Using the NPHS 1996, the first set of analysis provides a benchmark for health differences between welfare poor and working poor respondents. The linear regression and logistic regression are used to estimate the factors which influence the health outcome of welfare respondents. This analysis, based these two specifications, allows for the use of food insecurity and stigma as explanatory variables for the variation in health outcomes of welfare recipients. The results appear in Tables 3-9 and Tables 10-16, for linear and logistic regressions respectively. Each table models equation (1), which is estimated with and without covariates and report clustered standard errors. The entire sample was considered by sex of the respondent. The analysis is shown in seven groups: poor health, hypertension, migraine, diabetes, heart disease, chronic condition, and obesity.

5.1.1 OLS- Linear regression

In the linear regression analysis, I test whether health outcomes are linearly related, and calculate the strength of the linear relationship. The estimates are based on equation (1) with two different model specifications. I will strategically use the statistical significant estimates and likelihood ratio test as the basis for reporting the key findings.

In Table 3, the probability of females reporting poor health is small and insignificant for welfare poor respondents than the working poor counterparts, when all variables are set at their means. Contrarily, also in Table 3, the probability of males

reporting poor health is 2.87 percent higher for welfare poor respondents than working poor respondents ($p<0.05$). The results in Table 4, find that hypertension is among the main health effect associated with being on welfare, with female welfare poor respondents reporting on average 19.8 percent more hypertension conditions than their working poor counterparts ($p<0.001$). Similarly, welfare poor male respondents have 13.7 percent chance of also reporting hypertension ($p<0.001$).

In Table 5, the probability of reporting migraine was negative indicating that welfare poor respondents had a lower probability of reporting this condition when compared to their working poor counterparts. This direction and magnitude of effect is similar to the Figure 3.3 (b) which shows that more working poor respondents report migraine than welfare poor when looking at the entire sample. The results are more considerable for females as it estimates $p< 0.01$.

In Table 7, male respondents reporting welfare/employment compensation as their main source of income had 5.87 percent higher probability of reporting diabetes ($p <0.001$). Also in Table 7, female respondents indicated as welfare poor had a 4.35 higher probability of reporting diabetes ($p<0.001$). The probability of reporting heart disease is statistically significant and higher by 5.3 percent for male welfare poor respondents and 4.7 percent for female welfare poor respondents when compared to working poor respondents (Table 8). Chronic Condition (males) and obesity also show positive statistically significant estimates indicating that welfare poor respondents have a greater chance of reporting these conditions. Specifically, the obesity coefficient estimates that welfare poor respondents have at least a 20 percent chance of reporting the condition ($p <0.001$).

Surprising estimate shows that welfare and working poor respondents who report food insecurity are not associated with reporting migraine, obesity(male), hypertension(male), diabetes(male), general health, and chronic condition(female). These results give reason to argue that being on welfare with food insecurity does not increase the risk of having health problems in this sample. These results do not confirm findings in Vozoris and Tarasuk (2003), which states that individuals who suffers from food insecurity had higher odds of reporting poor/fair health, multiple chronic conditions, depression, and distress. Also, these results from this sample do not give support to the authors' conclusive argument which states that food insecurity is one measurement of vulnerability among households suffering from economic instability.

Overall, the results for the OLS model indicate that the variation in the health outcomes of low-income individuals may be associated with their main source of income. The prevalence of positive coefficients implies that welfare respondents are at risk for poor health. More conclusive arguments will be made with the support of the logistic regressions.

5.1.2 Logistic Regression

In this section, I conduct logistic analysis to account for the non-linearity in the relationship between health outcomes and welfare status (Table 10-16). The log-likelihood function is used to indicate how likely it is to obtain the observed health outcome, given the values of the independent variables and parameters. Unlike the linear probability model, which is able to solve directly for the parameters, the solution for the

logistic regression model is found by beginning with a tentative solution, revising it slightly to see if it can be improved, and repeating the process until the change in the likelihood function from one to step of the process to another is negligible (Menard, 2001). I perform different specifications of equation (1), as to which one is more suitable is dependent on the likelihood ratio test. Although there are intermediate specifications, I selected two extreme cases; and compared their suitability. I will therefore focus on model specifications from columns 1/2 and 3/4; and I will only highlight the key findings from the model with the best fit.

The Tables 10-16 report the logarithm of the odds ratio as it gives an intuitive interpretation in terms of odd ratios. That is, I use the reported estimates to measure the marginal effects of change in the explanatory variables on the odds ratio. Logit regression analysis shows that some of the coefficients are not consistent with hypothesized relationships. Table 10, in column 4, shows that each one-unit increase in stress levels is associated with a decrease of 0.000178 in logit (poor health). Being female and exposed to high distress levels reduces the logit of poor health (odds ratio=0.99). Given that the stigma argument often emphasizes the feeling of shame and degradation by welfare recipients, one would expect the implied negative psychological well-being to be positively related to poor health outcomes.

In Table 12, column 4, the negative sign for the log-odds coefficients for food insecurity indicates that recipients who do not have enough money to buy food are not associated with reporting migraine ($p>0.001$). This result is inconsistent with finding to those from a recent Canadian study by Vozoris and Tarasuk (2003), which determined

that individuals living within lower middle and middle income adequacy groups who report food insecurity are more likely to poor health.

Region dummies attempt to capture differential effect of welfare programs for low-income groups. From the discussion in Chapter 2, health responses to welfare programs are expected to differ based on the respondents province of residence. Overall from NPHS 1996, the results show that respondents living in eastern Canadian provinces seem to have higher odds of reporting poor health outcomes when compared to respondents who live in the western and central provinces.

Within the male sample, welfare recipients were more likely to report heart disease in comparison to working poor respondents (Table 14, column 3). This suggests that the odds of reporting heart disease increases when the respondent is on welfare. For example, when a respondent reports heart disease the odds of being on welfare increase by 33.91 percent. The positive sign and significance of the welfare variable implies that social assistance is an important factor that will attribute to low-income respondents reporting heart disease in this sample. This study therefore revealed that a source of variation in health outcome for low-income respondents may be subjected to their main source of income. The results further confirm that the recipience of welfare might increase the chances for low-income respondents to report ill health.

The logistic regressions approximate how likely it is for the various health outcome to be present among those supported by welfare than among those supported by employment income. Overall, the analysis of the first stage does not give confirmation of the causal relationship between health outcomes and welfare recipience. I therefore focus

my analysis on the second stage results, using the DID estimators to make more conclusive arguments.

5.2 Second stage

The general approach taken in the policy stage to identify the effect of welfare reform exposure on health outcome is to compare the health state of respondents after 1996, which faced a disruption in the welfare programs and payments, to the respondents before the reform 1994. I therefore investigate how health outcomes vary with the intensity of the mid-1900s welfare reform. As a measure of intensity I use the funding reduction rate for each province (Figure A. 1.0). Tables 17-18 present the linear probability results of the impact of welfare reform on general health, heart disease, diabetes, obesity and hypertension of welfare poor and working poor respondents. Each table follows a basic structure. All rows in each table and panel provide DID estimates for funding*post reform. This is the quantity of interest tells the impact that welfare reform, based on the variation in funding levels, has on health. I will discuss the results by first presenting the overall results, then results separated by welfare, and lastly results by separated sex. Panel B of Tables 17-18 provide the estimates for each of the 5 health variables, the first being for welfare poor respondent and the second for working poor respondents. Panel B of Tables17-18 also provide the estimates for a different health outcome, the first being for males and the second for females. The model also includes controls for age and its square, marital status, ownership of dwelling, and education. To adjust for the clustering of observations over time, I estimate and report robust standard errors. For all models I present the coefficients and standard errors.

5.2.1 Overall results

In the study period, the mean of funding reduction in the sample is .13 and the standard deviation is .013. Moreover, the mean of reduction in beneficiaries is also .13 but standard deviation is 0.11. It is evident that there was greater variability across provinces in the number of beneficiaries who lost coverage after the reform in1996. The intensity of each reform can be seen through the funding reduction and by comparing the number of beneficiaries before and after the reform (Figure A.1).

Panel A of Tables 17-18 present the main results. Estimates of the quantity of interest (funding*post reform) are displayed for poor health, hypertension, diabetes, heart disease, and obesity. These estimates presented in Tables 17-18 are statistically insignificant. I therefore cannot imply a plausible direct for the effect of reduction in funding on the health outcomes. It is argued that welfare programming, though aim at improving the well-being of recipients, has negative consequences directly linked to dependency and stigma. It is therefore anticipated that a greater reduction in funding levels and the number of beneficiaries would have a positive impact on the overall health state of welfare candidates. However, the statistically insignificant coefficient estimates does not allow me to draw such conclusions. I will therefore extend my analysis to implement measures to further differentiate the effects based on welfare status and sex.

5.2.2 Results sorted by welfare status

The next set of results estimating the impact of welfare reform intensity is sorted by welfare status, the caveats mentioned in Chapter 3. Each table for this set of results divides the estimates, starting with the impact on working poor (welfare =0) and then the impact on welfare poor (welfare=1). The estimates for funding*post reform are

statistically insignificant for welfare poor respondents. This set of DID results tell a similar story when compared to the overall results. I will conclude, from this sample, that the mid-1990s welfare reform had no effects on the health outcomes of welfare poor respondents.

Next I examine how working poor health outcomes respond to the welfare reform intensity. This serves as a falsification exercise because working poor respondents should not be directly affected by the reform. When comparing results of the welfare poor with that of the working poor, I find similar estimates. These results also provide no evidence for the effect of welfare reform intensities on working poor respondents. Based on the statistically insignificant coefficient estimates, it is evident that the welfare reform had no impact on the working poor respondents. I therefore argue that this sample gives no conclusive causal inferences about the impact of welfare exposure on health outcomes.

5.2.3 Results sorted by sex

In conjunction with the results from the linear regression model in the first stage, the DID model, sorted by sex, aims to support the hypothesis that welfare programs do have an impact of the health state of recipients. This analysis therefore represents a different approach by looking at gender related health difference instead of looking at the behaviour of welfare status. Several differences emerge between males and females. In this subsection, I conduct regression analyses of changes in heart disease, chronic condition, obesity, hypertension, diabetes, and poor health between the 1994 and 1996-1999 by estimating equation (2) above. I assess the contribution of the welfare reform to the observed changes in health outcomes. Using the two-period comparison across province with distinct funding reduction rates, I find no changes in the overall health state

for male nor female respondents living in provinces with greater welfare reform exposure.

The statistically insignificant coefficient estimates from this sample are surprising. One explanation is that the extent of previous poor health condition may impede a welfare respondent's ability to benefit from welfare reforms. But previous research does not consider this explanation satisfactory (Nicholas-Casebolt, 1986). Another explanation relates to the "relief" phenomenon used in welfare literature. Many of 1994 welfare recipients were moved into the employment and improved their economic stability; employment benefits may initially provide relief from the stress welfare caused. Nicholas-Casebolt argues that after the financial crisis is alleviated, the pre-existing poor health conditions of welfare begin to be felt. However this may also partially justify the statistically insignificant coefficient estimates.

Another possible explanation suggests that the extended periods of welfare dependency may have caused severe damage on health. Therefore anticipated improvements after welfare reforms could have lagged effects. The absence of a sufficient lag measurement may be mitigating positive coefficients. Thus, whereas in the initial year after the reform an individual's health state may not be affected, the longer one remains out of welfare (or with reduced funding) the better one's health state becomes. These arguments also explain the lack of significance of all the estimates. Overall, the second stage analysis yields no evidence supporting the effect of welfare reform on the health state of welfare recipients.

CHAPTER 6 CONCLUDING REMARKS

6.1 Future Research

Inferences about cause-effect relationships of welfare programs on health outcomes are known to be externally valid if the study can be generalized from differences in institutional environments, laws, and physical environments. For future research I would like to extend the study to other countries that have a similar health care system. Countries like the UK and France operate under a universal health care system. Therefore it would be interesting to see the response that welfare recipients have toward welfare reforms. Being able to generalize the study across different settings will continue the literature.

This study is limited by the NPHS cross-sectional data. In the repeated cross-sectional analysis the standard errors are large because of the variation between respondents. The power of detecting statistically significant differences in the estimates could have been undermined. Longitudinal analysis identifies observations that are measured on the same individuals. It is therefore possible to focus more keenly on changes occurring within subjects and develop population inferences that are not as sensitive between population subjects. The benefits of a longitudinal study over a repeated cross-sectional study include increased statistical power and the capability to estimate a greater range of conditional probabilities.

6.2 Summary and Conclusion

This research investigates two important questions about the well-being of welfare recipients in Canada. First, it investigates the correlation between welfare recipience and health outcomes. Second, it investigates effect of welfare reform exposure

on health outcomes of welfare poor and working poor respondents through the use of a natural experiment created by government intervention.

The first stage analysis suggests that welfare recipience is highly correlated with poor health outcomes. However, my intent is to also show that variability in poor health among welfare recipients is due to the pervasive vulnerability of recipients living in food insufficient households and welfare stigma. The results show that food insecurity was not statistically associated with poor health state. Therefore, these results make it plausible to conclude that the effects of food insecurity on health are not associated with a specific condition. Similarly, the results from the analysis are inconsistent with the argument that stigma is the psychological cost of being on welfare.

The cross-sectional nature of the first stage makes it impossible to infer causal relationships. I therefore extend my analysis using a natural experiment to examine the issue further. The DID estimator is one of the most popular methods in applied research in economics to analyse the effects of public intervention on outcome variables (Abadie, 2003). I observe the immediate effects of welfare reforms on health related outcomes. The advantage of evaluating this reform is through the provincial differences in welfare intensity that permit a treatment/control design.

In existing literature, the effects of welfare reforms on health received mixed support. However, in my analysis there are no statistically significant estimates for the effect of variation in welfare exposure on health outcomes of low-income respondents.

While this decomposition of the impact of reform exposure by welfare status is interesting, one might argue that the focus should be on gender differences. The quantity

of interest, funding*post reform based on gender, are also statistically insignificant. My research therefore welcomes further analysis that should capture lagged effects and account for the "relief" phenomenon. No conclusive arguments are made regarding the effect of welfare exposure on the health outcomes of low-income respondents.

The lack of longitudinal data precludes drawing inferences about statistically significant casual relationships. Thus, this study supports the explanation that poverty still persists as the most influential factor on health rather than the income source. It remains an open question whether the gains from greater welfare reform exposure can be realized for welfare poor respondents. Nevertheless, I provide evidence that there is some reasonable variability in health outcomes within the low-income groups, not solely captured by income amount. A cautious interpretation of these results suggests that low-income respondents, supported by welfare or employment compensation, are associated with harmful health outcomes. This variability by health outcome within low-income groups welcomes further research.

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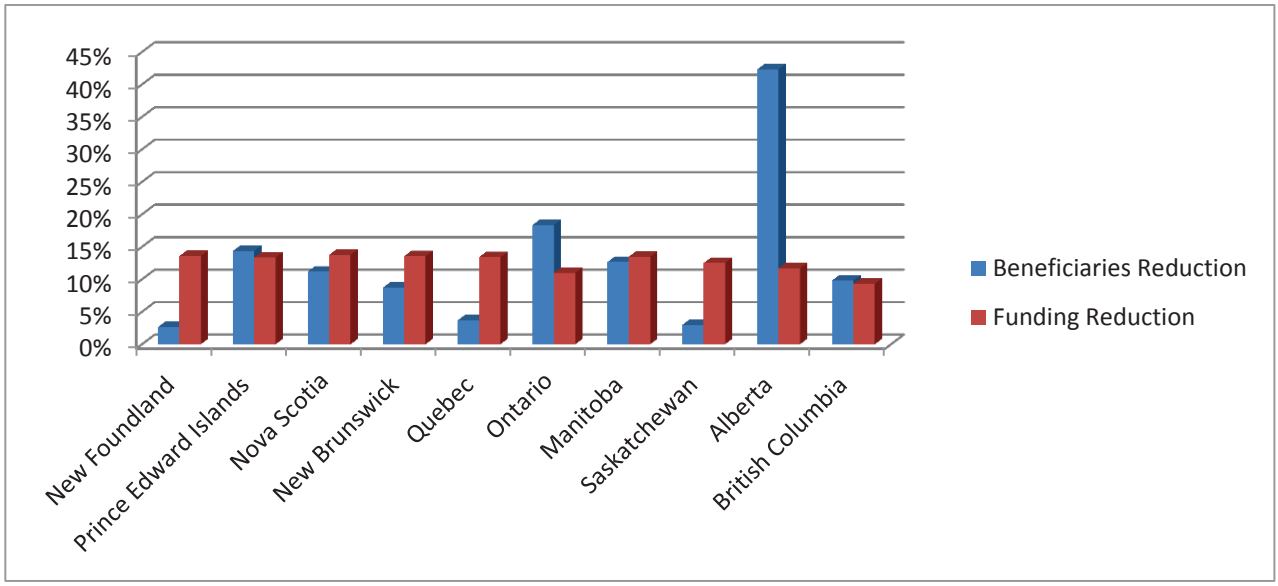
APPENDIX A FIGURES

Figure A.1: The Reduction in Funding Level and Number of Beneficiaries



Notes: The reduction in funding levels mean is 0.13 and standard deviation is 0.013. The reduction in the number of beneficiaries mean is0.13 and standard deviation is .11

Table B.1
Socio-demographic Profile of Analytic Sample of Welfare poor and Working Poor

Summary Statistics	Total n = 19,637 for First Stage NPHS 1996/1997	
	Welfare poor n= 6,876	Working Poor =12,761
Age		
15 to 19	3%	9%
20 to 24	4%	14%
25 to 29	4%	13%
30 to 34	4%	16%
35 to 39	4%	15%
40 to 44	3%	10%
45 to 49	2%	7%
50 to 54	2%	5%
55 to 59	5%	4%
60 to 64	9%	3%
65 to 69	18%	1%
70 to 74	18%	1%
75 to 79	13.2%	1%
80 >	11.8%	1%
Education		
No school	53%	26%
Secondary	15%	20%
Other post secondary	12%	17%
Diploma	11%	19%
Some university	3%	8%
Bachelor	4%	8%
Master	1%	1%
Sex		
Male	34%	46%
Female	66%	54%
Marital Status		
Married	38%	52%
Single	19%	34%
Widowed	43%	14%
Province		
Newfoundland	3%	2%
Prince Edward Island	2%	2%
Nova Scotia	2%	1%
New Brunswick	2%	2%
Quebec	5%	5%
Ontario	49%	46%
Manitoba	22%	19%
Saskatchewan	1%	2%
Alberta	12%	20%
British Colombia	2%	2%
Owned Dwelling		
Yes	61%	60%
No	38%	40%

Table C.3

Ordinary least squares regressions of Adults Respondents Supported by Welfare Reporting Poor Health

	(1)	(2)	**(3)**	**(4)**
	Male	Female	Male	Female
Welfare	0.0287*	0.00999	0.0235	0.0492
	(0.0243)	(0.0648)	(0.0274)	(0.0617)
Income adequacy	-0.00292	0.00273	-0.00338	0.00326
	(0.00897)	(0.00398)	(0.00984)	(0.00508)
Food Insecurity	-0.00207	-0.0213	-0.00233	-0.0203
	(0.0109)	(0.0241)	(0.0104)	(0.0220)
Stigma	0.000204	-0.000131***	0.0000908	-0.000178***
	(0.000250)	(0.0000333)	(0.000244)	(0.0000447)
Age			0.0143	-0.00547
			(0.0140)	(0.00711)
Age^2			-0.000468	0.000279
			(0.000560)	(0.000286)
Martial status			0.0214	0.00389
			(0.0171)	(0.00333)
West Canada			-0.00657	0.0184**
			(0.0160)	(0.00699)
Central Canada			0.0126	0.0199***
			(0.0153)	(0.00415)
Own dwelling			0.00235	0.00693
			(0.0120)	(0.00583)
Education			0.00155	-0.000344**
			(0.00135)	(0.000126)
Constant	0.0303	0.0473	-0.108	0.0361
	(0.0275)	(0.0442)	(0.0987)	(0.0681)
Obeservations	2468	3418	2468	3418
R-sq	0.008	0.008	0.025	0.014
LR^2_R			7.18	19.53

Notes: Robust standard errors are in parentheses. The likelihood ratio test performed between restricted and unrestrcited regressions dictates which model specification I report. 1,2,3 and 4 represent the column numbers. Sample weights included in all regressions.

* $p<0.05$ ** $p<0.01$ *** $p<0.001$

Table C.4

Ordinary least squares regressions of Adults Respondents Supported by Welfare Reporting Hypertension

	(1)	(2)	**(3)**	**(4)**
	Male	Female	Male	Female
Welfare	0.137***	0.198***	0.0438	0.0493
	(0.0168)	(0.0168)	(0.0420)	(0.0495)
Income adequacy	0.0249***	0.0302**	0.00518	0.00452
	(0.00740)	(0.00975)	(0.00710)	(0.00919)
Food Insecurity	-0.0116	0.0565***	-0.0249*	-0.00769
	(0.0121)	(0.0146)	(0.0123)	(0.0108)
Stigma	-0.000139	0.000214	-0.000206	-0.0000987
	(0.000198)	(0.000512)	(0.000198)	(0.000233)
Age			-0.00805	-0.0100
			(0.00988)	(0.0126)
Age^2			0.00127**	0.00184**
			(0.000464)	(0.000587)
Martial status			-0.00452	0.00637
			(0.00870)	(0.00891)
West Canada			-0.00169	-0.0539**
			(0.0157)	(0.0186)
Central Canada			0.00630	-0.0337*
			(0.0135)	(0.0168)
Own dwelling			0.00241	-0.0203*
			(0.00711)	(0.00866)
Education			-0.000446	0.00132
			(0.000668)	(0.00131)
Constant	-0.00630	-0.132***	0.0255	0.0222
	(0.0305)	(0.0330)	(0.0660)	(0.0791)
Obeservations	8198	11430	8198	11430
R-sq	0.054	0.080	0.115	0.181
LR^2_R			394.13	1012.71

Notes: Robust standard errors are in parentheses. The likelihood ratio test performed between restricted and unrestrcited regressions dictates which model specification I report. 1,2,3 and 4 represent the column numbers. Sample weights included in all regressions.

* p<0.05 ** p<0.01 *** p<0.001

Table C.5

Ordinary least squares regressions of Adults Respondents Supported by Welfare Reporting Migraine

	(1)	(2)	**(3)**	**(4)**
	Male	Female	Male	Female
Welfare	-0.0120	-0.0299**	0.0344	-0.0142
	(0.0116)	(0.0108)	(0.0354)	(0.0690)
Income adequacy	0.00200	0.00391	0.00256	0.0124
	(0.00762)	(0.00747)	(0.00736)	(0.00750)
Food Insecurity	-0.0130	-0.0691***	-0.00771	-0.0572**
	(0.00882)	(0.0176)	(0.0136)	(0.0219)
Stigma	0.000509	-0.000399*	0.00104	-0.000243
	(0.000740)	(0.000187)	(0.00111)	(0.000313)
Age			0.0329**	0.0334**
			(0.0101)	(0.0105)
Age^2			-0.00147***	-0.00164***
			(0.000427)	(0.000418)
Martial status			0.00197	0.00453
			(0.00714)	(0.00665)
West Canada			0.0244	-0.0203
			(0.0207)	(0.0166)
Central Canada			-0.000625	0.00780
			(0.0126)	(0.0148)
Own dwelling			-0.00782	0.0106
			(0.00761)	(0.00893)
Education			0.000391	0.000562
			(0.000572)	(0.000540)
Constant	0.0686**	0.224***	-0.114	-0.00269
	(0.0253)	(0.0394)	(0.0689)	(0.0712)
Obeservations	8203	11432	8203	11432
R-sq	0.003	0.009	0.015	0.019
LR^2_R			22.66	145.6

Notes: Robust standard errors are in parentheses. The likelihood ratio test performed between restricted and unrestrcited regressions dictates which model specification I report. 1,2,3 and 4 represent the column numbers. Sample weights included in all regressions.

* p<0.05 ** p<0.01 *** p<0.001

Table C.6

Ordinary least squares regressions of Adults Respondents Supported by Welfare Reporting Diabetes

	(1)	(2)	(3)	(4)
	Male	Female	Male	Female
Welfare	0.0587***	0.0435***	0.0133	-0.00359
	(0.00993)	(0.00792)	(0.0210)	(0.0232)
Income adequacy	0.0112**	0.000794	0.00408	-0.00333
	(0.00390)	(0.00539)	(0.00414)	(0.00502)
Food Insecurity	-0.00148	0.0160*	-0.00393	0.000163
	(0.00582)	(0.00643)	(0.00476)	(0.00498)
Stigma	-0.0000587	-0.0000980	-0.000182***	0.0000434
	(0.000117)	(0.000123)	(0.0000393)	(0.000120)
Age			-0.0198**	-0.00000365
			(0.00723)	(0.00591)
Age^2			0.00126***	0.000270
			(0.000356)	(0.000276)
Martial status			0.00887	0.00180
			(0.00676)	(0.00467)
West Canada			-0.0152	-0.0200
			(0.0102)	(0.0116)
Central Canada			-0.00789	-0.0143
			(0.00933)	(0.0111)
Own dwelling			0.00298	-0.000387
			(0.00420)	(0.00355)
Education			-0.000449**	0.0000376
			(0.000169)	(0.000465)
Constant	-0.0165	-0.0178	0.0652	0.00782
	(0.0143)	(0.0149)	(0.0455)	(0.0344)
Obeservations	8201	11429	8201	11429
R-sq	0.027	0.015	0.065	0.030
LR^2_R			160.29	131.61

Notes: Robust standard errors are in parentheses. The likelihood ratio test performed between restricted and unrestrcited regressions dictates which model specification I report. 1,2,3 and 4 represent the column numbers. Sample weights included in all regressions.

* p<0.05 ** p<0.01 *** p<0.001

Table C. 7

Ordinary least squares regressions of Adults Respondents Supported by Welfare Reporting Heart Disease

	(1)	(2)	(3)	(4)
	Male	Female	Male	Female
Welfare	0.0531***	0.0470***	0.0487	0.0486
	(0.00808)	(0.00672)	(0.0305)	(0.0523)
Income adequacy	-0.00721	0.00707	-0.00344	0.00257
	(0.00643)	(0.0119)	(0.00309)	(0.00391)
Food Insecurity	0.000102	0.000277	0.0000185	-0.0000972
	(0.000117)	(0.000461)	(0.0000741)	(0.0000834)
Stigma	0.00931**	-0.00424	0.00314	-0.00742
	(0.00336)	(0.00520)	(0.00337)	(0.00504)
Age			-0.0168**	-0.0200***
			(0.00597)	(0.00579)
Age^2			0.000977***	0.00113***
			(0.000277)	(0.000273)
Martial status			-0.00473	0.00563
			(0.00457)	(0.00387)
West Canada			-0.000882	-0.00222
			(0.00705)	(0.00813)
Central Canada			0.00750	0.00242
			(0.00582)	(0.00692)
Own dwelling			-0.00175	0.00468
			(0.00383)	(0.00368)
Education			-0.000286	-0.000243
			(0.000190)	(0.000178)
Constant	-0.00500	0.00771	0.0750*	0.0891**
	(0.0125)	(0.0293)	(0.0361)	(0.0300)
Obeservations	8203	11432	8203	11432
R-sq	0.029	0.022	0.050	0.046
LR^2_R			253.83	357.84

Notes: Robust standard errors are in parentheses. The likelihood ratio test performed between restricted and unrestrcited regressions dictates which model specification I report. 1,2,3 and 4 represent the column numbers. Sample weights included in all regressions.

* $p<0.05$ ** $p<0.01$ *** $p<0.001$

Table C. 8

Ordinary least squares regressions of Adults Respondents Supported by Welfare Reporting Chronic Condition

	(1)	(2)	(3)	(4)
	Male	Female	Male	Female
Welfare	0.0239*	0.0145	-0.000512	-0.0461
	(0.0112)	(0.00745)	(0.0351)	(0.0312)
Income adequacy	-0.0107	-0.00681	-0.0179	-0.0197
	(0.00803)	(0.00869)	(0.0132)	(0.0117)
Food Insecurity	0.000491	-0.000233**	0.000669	-0.000215
	(0.000487)	(0.0000888)	(0.000735)	(0.000121)
Stigma	0.00896	-0.00460	0.00886	-0.00284
	(0.00523)	(0.00520)	(0.00588)	(0.00528)
Age			0.0207*	0.0149*
			(0.00876)	(0.00724)
Age^2			-0.000795*	-0.000451
			(0.000398)	(0.000309)
Martial status			0.00353	0.0122*
			(0.00597)	(0.00551)
West Canada			0.00111	0.0111
			(0.0136)	(0.0108)
Central Canada			-0.00952	0.00355
			(0.0100)	(0.00871)
Own dwelling			0.00906	0.0123
			(0.00640)	(0.00874)
Education			-0.000186	-0.000255
			(0.000307)	(0.000234)
Constant	0.0210	0.0617**	-0.0968	-0.0583
	(0.0223)	(0.0192)	(0.0685)	(0.0558)
Obeservations	8204	11431	8204	11431
R-sq	0.007	0.002	0.014	0.012
LR^2_R			35.73	51.12

Notes: Robust standard errors are in parentheses. The likelihood ratio test performed between restricted and unrestrcited regressions dictates which model specification I report. 1,2,3 and 4 represent the column numbers. Sample weights included in all regressions.

* $p<0.05$ ** $p<0.01$ *** $p<0.001$

Table C.9

Ordinary least squares regressions of Adults Respondents Supported by Welfare Reporting Obesity

	(1)	(2)	(3)	(4)
	Male	Female	Male	Female
Welfare	0.209***	0.307***	0.0371	0.0516
	(0.0230)	(0.0191)	(0.0912)	(0.103)
Income adequacy	0.0868***	0.0763***	0.0554**	0.0315*
	(0.0194)	(0.0150)	(0.0188)	(0.0139)
Food Insecurity	-0.0320	0.0601*	-0.0530	-0.0447
	(0.0459)	(0.0301)	(0.0347)	(0.0308)
Stigma	0.00134**	-0.000544	0.00146*	-0.000316
	(0.000418)	(0.000785)	(0.000605)	(0.000644)
Age			-0.227***	-0.293***
			(0.0183)	(0.0163)
Age^2			0.0105***	0.0136***
			(0.000758)	(0.000665)
Martial status			-0.0349*	-0.0202
			(0.0152)	(0.0109)
West Canada			-0.0483	-0.0981***
			(0.0325)	(0.0290)
Central Canada			-0.0398	-0.106***
			(0.0271)	(0.0239)
Own dwelling			-0.0761***	-0.0478***
			(0.0171)	(0.0128)
Education			-0.00180	-0.00219
			(0.00113)	(0.00146)
Constant	0.429***	0.138*	1.888***	2.122***
	(0.0913)	(0.0603)	(0.142)	(0.118)
Obeservations	8204	11433	8204	11433
R-sq	0.048	0.082	0.137	0.226
LR^2_R			553.65	1686.35

Notes: Robust standard errors are in parentheses. The likelihood ratio test performed between restricted and unrestrcited regressions dictates which model specification I report. 1,2,3 and 4 represent the column numbers. Sample weights included in all regressions.

* p<0.05 ** p<0.01 *** p<0.001

Table C.10

Logistic Regression Analysis Results for the Prevalence of Poor Health

	(1) Male	(2) Female	**(3)** Male	**(4)** Female
Welfare	0.0362	0.0446	0.0235	0.0492
	(0.0243)	(0.0648)	(0.0274)	(0.0617)
Income adequacy	-0.00292	0.00273	-0.00338	0.00326
	(0.00897)	(0.00398)	(0.00984)	(0.00508)
Food Insecurity	-0.00207	-0.0213	-0.00233	-0.0203
	(0.0109)	(0.0241)	(0.0104)	(0.0220)
Stigma	0.000204	-0.000131***	0.0000908	-0.000178***
	(0.000250)	(0.0000333)	(0.000244)	(0.0000447)
Age			0.0143	-0.00547
			(0.0140)	(0.00711)
Age^2			-0.000468	0.000279
			(0.000560)	(0.000286)
Martial status			0.0214	0.00389
			(0.0171)	(0.00333)
West Canada			-0.00657	0.0184**
			(0.0160)	(0.00699)
Central Canada			0.0126	0.0199***
			(0.0153)	(0.00415)
Own dwelling			0.00235	0.00693
			(0.0120)	(0.00583)
Education			0.00155	-0.000344**
			(0.00135)	(0.000126)
Constant	0.0303	0.0473	-0.108	0.0361
	(0.0275)	(0.0442)	(0.0987)	(0.0681)
Obeservations	2468	3418	2468	3418
Pseudo R-sq	0.027	0.041	0.079	0.097
LR^2_R			7.98	35.15

Notes: Robust standard errors are in parentheses. The likelihood ratio test performed between restricted and unrestrcited regressions dictates which model specification I report. 1,2,3 and 4 represent the column numbers. Sample weights included in all regressions.

* p<0.05 ** p<0.01 *** p<0.001

Table C.11

Logistic Regression Analysis Results for the Prevalence of Hypertension

	(1) Male	(2) Female	(3) Male	(4) Female
Welfare	0.137***	0.198***	0.0438	0.0493
	(0.0168)	(0.0168)	(0.0420)	(0.0495)
Income adequacy	0.0249***	0.0302**	0.00518	0.00452
	(0.00740)	(0.00975)	(0.00710)	(0.00919)
Food Insecurity	-0.0116	0.0565***	-0.0249*	-0.00769
	(0.0121)	(0.0146)	(0.0123)	(0.0108)
Stigma	-0.000139	0.000214	-0.000206	-0.0000987
	(0.000198)	(0.000512)	(0.000198)	(0.000233)
Age			-0.00805	-0.0100
			(0.00988)	(0.0126)
Age^2			0.00127**	0.00184**
			(0.000464)	(0.000587)
Martial status			-0.00452	0.00637
			(0.00870)	(0.00891)
West Canada			-0.00169	-0.0539**
			(0.0157)	(0.0186)
Central Canada			0.00630	-0.0337*
			(0.0135)	(0.0168)
Own dwelling			0.00241	-0.0203*
			(0.00711)	(0.00866)
Education			-0.000446	0.00132
			(0.000668)	(0.00131)
Constant	-0.00630	-0.132***	0.0255	0.0222
	(0.0305)	(0.0330)	(0.0660)	(0.0791)
Observations	8198	11430	8198	11430
Pseudo R-sq	0.092	0.102	0.216	0.256
LR^2_R			458.31	1047.91

Notes: Robust standard errors are in parentheses. The likelihood ratio test performed between restricted and unrestrcited regressions dictates which model specification I report. 1,2,3 and 4 represent the column numbers. Sample weights included in all regressions.

* p<0.05 ** p<0.01 *** p<0.001

Table C.12

Logistic Regression Analysis Resutls for the Prevalence of Migraine

	(1) Male	(2) Female	**(3)** Male	**(4)** Female
Welfare	-0.288	-0.382**	0.949	-0.105
	(0.279)	(0.144)	(0.873)	(0.587)
Income adequacy	0.0537	0.0475	0.0749	0.159
	(0.175)	(0.0944)	(0.170)	(0.0963)
Food Insecurity	-0.346	-0.725***	-0.190	-0.544**
	(0.239)	(0.154)	(0.288)	(0.186)
Stigma	0.00825	-0.00647	0.0131	-0.00302
	(0.00872)	(0.00382)	(0.00884)	(0.00446)
Age			0.916***	0.582***
			(0.272)	(0.158)
Age^2			-0.0417***	-0.0291***
			(0.0121)	(0.00681)
Martial status			0.0617	0.0574
			(0.149)	(0.0820)
West Canada			0.498	-0.278
			(0.394)	(0.224)
Central Canada			-0.0159	0.0936
			(0.308)	(0.177)
Own dwelling			-0.203	0.104
			(0.216)	(0.0866)
Education			0.00775	0.00590
			(0.00787)	(0.00512)
Constant	-2.451***	-0.926*	-7.531***	-4.559***
	(0.586)	(0.370)	(1.741)	(0.908)
Observations	8203	11432	8203	11432
Pseudo R-sq	0.007	0.014	0.039	0.036
LR^2_R			25.71	191.6

Notes: Robust standard errors are in parentheses. The likelihood ratio test performed between restricted and unrestrcited regressions dictates which model specification I report. 1,2,3 and 4 represent the column numbers. Sample weights included in all regressions.

* p<0.05 ** p<0.01 *** p<0.001

Table C.13

Logistic Regression Analysis Results for the Prevalence of Diabetes

	(1) Male	(2) Female	**(3)** Male	**(4)** Female
Welfare	2.029***	1.437***	0.917	0.308
	(0.246)	(0.234)	(1.613)	(1.138)
Income adequacy	0.507**	0.0212	0.231	-0.138
	(0.196)	(0.167)	(0.222)	(0.162)
Food Insecurity	-0.0779	0.535**	-0.403	0.0444
	(0.198)	(0.200)	(0.514)	(0.398)
Stigma	-0.00250	-0.00394	-0.0327**	0.00205
	(0.00486)	(0.00509)	(0.0107)	(0.00578)
Age			0.591*	0.817**
			(0.239)	(0.274)
Age^2			-0.00716	-0.0221*
			(0.00925)	(0.0100)
Martial status			0.247	0.0378
			(0.154)	(0.128)
West Canada			-0.673	-0.709
			(0.420)	(0.366)
Central Canada			-0.304	-0.471
			(0.341)	(0.304)
Own dwelling			0.0667	0.00953
			(0.197)	(0.115)
Education			-0.0214	0.00173
			(0.0175)	(0.0106)
Constant	-5.810***	-5.295***	-10.03***	-9.647***
	(0.637)	(0.520)	(1.899)	(1.941)
Observations	8201	11429	8201	11429
Pseudo R-sq	0.101	0.055	0.208	0.110
LR^2_R			172.15	164.86

Notes: Robust standard errors are in parentheses. The likelihood ratio test performed between restricted and unrestrcited regressions dictates which model specification I report. 1,2,3 and 4 represent the column numbers. Sample weights included in all regressions.

* p<0.05 ** p<0.01 *** p<0.001

Table C.14

Logistic Regression Analysis Results for the Prevalence of Heart Disease

	(1) Male	(2) Female	**(3)** Male	**(4)** Female
Welfare	2.371***	1.733***	3.524*	2.152
	(0.320)	(0.242)	(1.627)	(1.307)
Income adequacy	-0.443	0.233	-0.312	0.219
	(0.425)	(0.384)	(0.583)	(0.389)
Food Insecurity	0.00348	0.00656	0.00438	-0.00617
	(0.00387)	(0.00856)	(0.00604)	(0.00949)
Stigma	0.542*	-0.133	0.207	-0.256
	(0.235)	(0.147)	(0.239)	(0.170)
Age			0.330	-0.0854
			(0.344)	(0.217)
Age^2			-0.000367	0.0122
			(0.0125)	(0.00813)
Martial status			-0.153	0.169
			(0.185)	(0.126)
West Canada			-0.0312	-0.171
			(0.487)	(0.379)
Central Canada			0.450	0.103
			(0.364)	(0.298)
Own dwelling			-0.312	0.124
			(0.383)	(0.0897)
Education			-0.0179	-0.0118
			(0.0190)	(0.00934)
Constant	-5.732***	-4.668***	-8.236**	-5.295***
	(0.766)	(0.900)	(2.597)	(1.301)
Obeservations	8203	11432	8203	11432
Pseudo R-sq	0.128	0.080	0.203	0.141
LR^2_R			170.55	266.25

Notes: Robust standard errors are in parentheses. The likelihood ratio test performed between restricted and unrestrcited regressions dictates which model specification I report. 1,2,3 and 4 represent the column numbers. Sample weights included in all regressions.

* $p<0.05$ ** $p<0.01$ *** $p<0.001$

Table C.15

Logistic Regression Analysis Results for the Prevalence of Chronic Condition

	(1) Male	(2) Female	**(3)** Male	**(4)** Female
Welfare	0.696*	0.350*	-0.266	-1.115
	(0.284)	(0.176)	(0.932)	(0.730)
Income adequacy	-0.421	-0.159	-0.682	-0.538*
	(0.313)	(0.200)	(0.379)	(0.256)
Food Insecurity	0.00994	-0.00763*	0.0139	-0.00725
	(0.00689)	(0.00383)	(0.00908)	(0.00547)
Stigma	0.332	-0.106	0.303	-0.0812
	(0.196)	(0.119)	(0.212)	(0.120)
Age			0.839**	0.463*
			(0.261)	(0.185)
Age^2			-0.0320**	-0.0148*
			(0.0114)	(0.00746)
Martial status			0.0774	0.243*
			(0.143)	(0.103)
West Canada			0.0111	0.309
			(0.393)	(0.298)
Central Canada			-0.344	0.119
			(0.303)	(0.262)
Own dwelling			0.236*	0.214*
			(0.116)	(0.107)
Education			-0.00701	-0.00705
			(0.0110)	(0.00876)
Constant	-3.780***	-2.697***	-8.457***	-5.981***
	(0.812)	(0.423)	(2.035)	(1.335)
Obeservations	8204	11431	8204	11431
Pseudo R-sq	0.022	0.007	0.048	0.034
LR^2_R			38.59	48.82

Notes: Robust standard errors are in parentheses. The likelihood ratio test performed between restricted and unrestrcited regressions dictates which model specification I report. 1,2,3 and 4 represent the column numbers. Sample weights included in all regressions.

* p<0.05 ** p<0.01 *** p<0.001

Table C.16

Logistic Regresion Analysis Results for the Prevalence of Obesity

	(1) Male	(2) Female	**(3)** Male	**(4)** Female
Welfare	1.042***	1.347***	0.0271	0.478
	(0.130)	(0.0944)	(0.451)	(0.530)
Income adequacy	0.395***	0.346***	0.260**	0.127
	(0.0862)	(0.0683)	(0.0938)	(0.0742)
Food Insecurity	-0.144	0.268*	-0.252	-0.250
	(0.212)	(0.135)	(0.156)	(0.142)
Stigma	0.00737**	-0.00241	0.00670*	-0.00228
	(0.00256)	(0.00350)	(0.00332)	(0.00287)
Age			-1.840***	-2.224***
			(0.131)	(0.110)
Age^2			0.0895***	0.107***
			(0.00622)	(0.00512)
Martial status			-0.249**	-0.157*
			(0.0925)	(0.0661)
West Canada			-0.298	-0.534***
			(0.173)	(0.156)
Central Canada			-0.260	-0.602***
			(0.146)	(0.130)
Own dwelling			-0.344***	-0.190*
			(0.0918)	(0.0784)
Education			-0.00876	-0.0107
			(0.00643)	(0.00978)
Constant	-0.372	-1.615***	10.21***	11.85***
	(0.421)	(0.275)	(0.850)	(0.710)
Obeservations	8204	11433	8204	11433
Pseudo R-sq	0.039	0.062	0.146	0.225
LR^2_R			893.26	2404.99

Notes: Robust standard errors are in parentheses. The likelihood ratio test performed between restricted and unrestrcited regressions dictates which model specification I report. critical values 1,2,3 and 4 represent the column numbers. Sample weights included in all regressions.

* p<0.05 ** p<0.01 *** p<0.001

Table C.17
Health State Based on Intensity of Exposure to the Welfare Reform

Controls for Socio-demographic characteristics	(1)	(2)	(3)	(4)
	No	Yes	No	Yes
Dependent Variables	Poor Health		Hypertension	
	Panel A: Main Results			
Independent Variables				
Funding * Post welfare reform	-0.38	-0.326	-0.479	-0.395
	(0.358)	(0.354)	(0.419)	(0.389)
	Panel B: Estimates Funding * Exposure for Demographic Subgroups			
Subsamples				
Males	-0.551	-0.515	-0.146	-0.118
	(0.446)	(0.44)	(0.536)	(0.508)
Females	-0.232	-0.168	-0.737	-0.591
	(0.536)	(0.531)	(0.619)	(0.564)
Welfare Poor	-0.384	-0.431	-0.391	-0.0948
	(0.721)	(0.698)	(0.917)	(0.874)
Working Poor	-0.32	-0.287	-0.604	-0.554
	(0.403)	(0.401)	(0.417)	(0.395)

Each panel/column reports a separate regression for the indicated samples and dependent variables. The demographic controls consists of indicator variables age, age^2, martial status, education, and own dwelling. Robust standard errors in parentheses. Single asterick denotes statistical significance at the 95% level of confidence, double at 90% and triple at 99%. Reporting of additional coefficient estimates is supressed.

Table C.18
Health State Based on Intensity of Exposure to the Welfare Reform

Controls for Socio-demographic characteristics	(1)	(2)	(3)	(4)	(5)	(6)
	No	Yes	No	Yes	No	Yes
Dependent Variables	Diabetes		Heart Disease		Obesity	
	Panel A: Main Results					
Independent Variables						
Funding * Post welfare reform	-0.297	-0.269	0.0566	0.0806	-0.613	-0.515
	(-0.237)	(0.233)	(0.211)	(0.208)	(0.768)	(0.733)
	Panel B: Estimates Funding * Exposure for Demographic Subgroups					
Subsamples						
Males	-0.496	-0.477	0.385	0.405	0.0451	-0.7
	(0.389)	(0.382)	(0.347)	(0.342)	(-0.642)	((1.125)
Females	-0.142	-0.0996	-0.203	-0.193	-0.485	-0.44
	(0.291)	(0.287)	(0.256)	(0.252)	(1.010)	(0.952)
Welfare Poor	-0.415	-0.369	-0.391	-0.0948	0.0252	0.786
	(0.546)	(0.525)	(-0.917)	(-0.874)	(1.052)	(0.913)
Working Poor	-0.257	-0.247	-0.604	-0.554	-0.781	-0.825
	(0.244)	(0.242)	(0.417)	(-0.395)	(0.974)	(0.974)

Each panel/column reports a separate regression for the indicated samples and dependent variables. The demographic controls consists of indicator variables age, age^2, martial status, education, and own dwelling. Robust standard errors in parentheses. Single asterick denotes statistical significance at the 95% level of confidence, double at 90% and triple at 99%. Reporting of additional coefficient estimates is supressed.