Inequality is Bad for Our Hearts

Why Low Income and Social Exclusion are Major Causes of Heart Disease in Canada

North York Heart Health Network

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The rhyme Ring Around the Rosey is based upon children's experiences of the great plagues that devastated Europe during the era of infectious diseases. In this report Ring Around the Rosey represents the cardiovascular risks that low-income children accumulate through their experiencing of material and social deprivation. The chain link fence illustrates the process by which people on low incomes are systematically excluded from participation in Canadian life.

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Foreword

Over twenty-five years ago, the Canadian Government recognized that the health of its population was dependent on factors other than personal behaviors and the provision of health care. Spurred by the North York Heart Health Network, Dennis Raphael has taken another step in this process by presenting this exhaustive summary of what inequality in society does for heart disease. He cogently summarizes many studies that show that living in a society that tolerates a large gap between the rich and poor is bad for our health. Raphael, a versatile researcher who has carried out a number of studies of how government policies influence health, has also suggested approaches to addressing this critical problem of our age.

Why should inequality, perhaps the biggest factor affecting the health of populations, be so bad for us? In a big gap society, those lower down the ladder experience more chronic stress than those towards the top. We are beginning to understand how this stress produces ill health, in large part mediated through hormones released by the adrenal glands.

Inequality concepts relate to the quality of social and human relations produced by the structure of society which in our era are largely determined by measures of hierarchy. We tend to associate with people like ourselves, most of us do not have friends who are either much richer or much poorer than we are. As a young boy, growing up in the 1950s in East York, a part of Toronto, I lived in a working class neighbourhood and did not consider myself disadvantaged. My father repaired shoes, and my friends' parents were similar workers. When I went to the University of Toronto, I became aware of hierarchy in Canada, as my classmates came from more privileged backgrounds than mine. I began to feel poor. Today with lifestyles of the rich and famous always in the media we don't compare ourselves to just our friends anymore but to the many achievers and the wealthy who are constantly in our face. Finding ourselves down the ladder, our sense of self-worth, our ability to control our lives and our access to what is considered essential for health, suffers. Not only do we not do as well, but society's health suffers.

Modern societies, unless held in check, tend to share income and wealth unfairly.

Growing up, I was oblivious to the various ways in which the general concept of income used to be redistributed in Canada: family support payments, transfer payments across provinces, a somewhat progressive income tax system, social welfare, federally subsidized higher education, and later universal health care.

Today, as Raphael documents, the checks on maintaining socioeconomic justice have loosened, and hierarchy is increasing. As a result Canada's health, in comparison to other countries that have resisted such market reforms, has dropped from second place to seventh.

The kinds of positive societal changes that will produce health improvements will only come from popular pressure on the forces of wealth and power. Canadians must continue to maintain and strengthen their unique society, one that values cultural diversity and social justice. Many prescriptions for dealing with health problems are outlined herein, but none of them will be given to you by your doctor. We are all affected by this dis-ease, and must work together to take this remedy through the democratic process.

This monograph could be the trebuchet that breaks down the walls of hierarchy that are being built up in Canada.

Stephen Bezruchka

Stephen Bezruchka MD, MPH grew up in Toronto and graduated from the University of Toronto. He has worked as a doctor in Canada. Currently he teaches in the International Health Program in the School of Public Health and Community Medicine at the University of Washington and practices as an emergency physician.

Preface

The North York Heart Health Network commissioned Dennis Raphael to write this report after attending his presentation on the impact of the social determinants of health. It was evident to us that cardiovascular disease was the one disease most sensitive to the effects of low income and social exclusion among Canadians. This fact, in addition to our increasing realization that the sole promotion of lifestyle messages as a means of improving heart health was an incomplete approach, resulted in our refocusing upon the impact of low income as a major predictor of heart disease. This report demonstrates that low income is a significant cause of heart disease and identifies viable solutions that must be taken to ensure an acceptable quality of life for all Canadians.

The overwhelming majority of heart health initiatives focus on increasing physical activity, promoting healthy eating, and decreasing tobacco use. This traditional approach addresses health risk behaviours and is a mainstay of the total heart health picture, as well as being manageable and comfortable for health practioners. However, it does not expose the entire picture. Health professionals, policy and decision makers, and community networks must begin to acknowledge and address fundamental risk factors such as poverty, social exclusion and the growing economic gap, in order to decrease cardiovascular disease and improve the health of our communities.

It is our hope that this report will increase the awareness of the clear and dramatic links between low income and heart disease, and that this new awareness will inspire you to take action. Now is a particularly critical time for Canadians as more and more of us are living on low incomes and our health care system is becoming increasingly strained. While this report focuses on the relationship between cardiovascular disease and low income, the impact of low income on the health of Canadians is by no means limited to heart disease, nor are the health damaging effects limited to Canadians living on low incomes.

The word 'heart' conjures up many images: images of caring, love and courage. The solutions suggested in this report require all of these things. Seeking and implementing solutions to increasingly greater numbers of Canadians being forced to live on low income and the increasing economic gap between rich and poor are the right and just things to do.

To decrease cardiovascular disease substantially, means of reducing the incidence of low income must be addressed now. The social and economic costs of not doing so are becoming increasingly evident through increasing health-care costs and social service cutbacks. Nations that support healthy public policies have healthy economies. Corporations require a skilled and healthy workforce to compete at the international level. All of this makes this report's content too costly for society to ignore.

About the North York Heart Health Network

The North York Heart Health Network is a strong, committed coalition of over 45 diverse community partners that have been working together since 1995 to improve the heart health of people in the north region of Toronto. Our members include Toronto Public Health and Toronto Parks and Recreation, local hospitals and community health centres, the YMCA, school boards, the College of Naturopathic Medicine and York University, community organizations such as the Heart and Stroke Foundation and the Cancer Society, women's, seniors' and church groups, foodbanks, and individual volunteers. The Network has focused most of its efforts on programs that encourage physical activity and healthy eating, and decreasing tobacco use. It has done so by increasing awareness, building skills, creating a supportive environment, and advocating for healthy public policy.

About the Author

Dennis Raphael, Ph.D., is an associate professor at the School of Health Policy and Management of the Atkinson Faculty of Liberal and Professional Studies, York University, Toronto, Canada. Dr. Raphael has worked and written in the areas of education, human development, social work, measurement and evaluation, and community and public health. The most recent of his 85 scientific publications have been concerned with the health effects of income inequality, the quality of life of communities and individuals, and the impact of government decisions on Canadians' health and well-being. Dr. Raphael has served as Chair of the Toronto Mayor's Committee on Aging's Health and Well-Being Sub-Committee and as a member of the Board of Directors of the South Riverdale Community Health Centre in Toronto.

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Executive Summary

Poor conditions lead to poorer health. An unhealthy material environment and unhealthy behaviours have direct harmful effects, but the worries and insecurities of daily life and the lack of supportive environments also have an influence.

Heart disease and stroke are the leading killers of Canadians and the leading causes of hospitalization. The Heart and Stroke Foundation of Canada estimates the total cost to Canada of cardiovascular disease as close to $20 billion.

An extensive body of research now indicates that the economic and social conditions under which people live their lives, rather than medical treatments and lifestyle choices, (diets low in fat and cholesterol and rich in vegetables and fruits, regular physical activity, and smoke-free living), are the major factors determining whether they develop cardiovascular disease. One of the most important life conditions that determine whether individuals stay healthy or become ill is their income. In addition, the overall health of a society appears to be more determined by the distribution of income among its members rather than the overall wealth of the society.

Cardiovascular disease is the disease which is most associated with low income among Canadians. Yet to date, there has been virtually no public consideration in Canada of the role that societal factors such as income play in the incidence of cardiovascular disease and how recent changes in income distribution may be affecting cardiovascular health. This is surprising as many studies find that socioeconomic circumstances, rather than medical and lifestyle risk factors (diets high in fat and cholesterol, inactivity, and tobacco use), are the main causes of cardiovascular disease, and that conditions during early life are especially important.

Latest estimates are that 23% of premature years of life lost prior to age 75 in Canada can be attributed to income differences. That is, 23% of all of the premature years of life lost to Canadians is accounted for by the differences that exists among wealthy, middle-income, and low income Canadians. The disease most related to income differences is cardiovascular disease. Twenty-two percent of all years lost that can be attributed to income differences are caused by cardiovascular disease.

In addition, it is estimated that income differences account for a 24% excess in premature deaths prior to 75 years from cardiovascular disease among Canadians. Were all Canadians' rates of death from cardiovascular disease equal to those living in the wealthiest quintile of neighbourhoods, there would be 6,366 fewer deaths each year from cardiovascular disease. An estimate of the annual costs to Canada of these income-related cardiovascular disease effects is $4 billion.

This report outlines the role that income and its distribution play in the incidence of cardiovascular disease. There is particular focus on how living on low income -- combined with government policies that limit access to basic needs and resources required for health -- contributes to the process of social exclusion by which individuals are denied full participation in Canadian life. This exploration of the role of income on cardiovascular health is particularly timely as the distribution of income is becoming less equitable in Canada.

Societal changes that increase the numbers of Canadians living on low incomes and foster social exclusion are considered in relation to what is known about the societal determinants of cardiovascular disease. The hypothesis that increases in income inequality are associated with deteriorating health of those who are not living on low incomes is also examined. Finally, means are presented for addressing these issues in order to reduce the incidence of cardiovascular disease in Canada. These include recommendations for reducing the number of Canadians living on low incomes, reducing the social exclusion of citizens from participation in Canadian society, and ways by which the social safety nets that support population health can be restored.

Key Messages Contained in this Report

1. The current emphasis on medical and lifestyle risk factors (diets high in fat and cholesterol, inactivity, and tobacco use) as a means of preventing cardiovascular disease in Canada is not enough.

2. Low income is a major cause of cardiovascular disease in Canada.

3. Social exclusion -- involving material deprivation, lack of participation in common societal activities, and exclusion from decision-making and civic participation -- is the process that explains how low income causes cardiovascular disease.

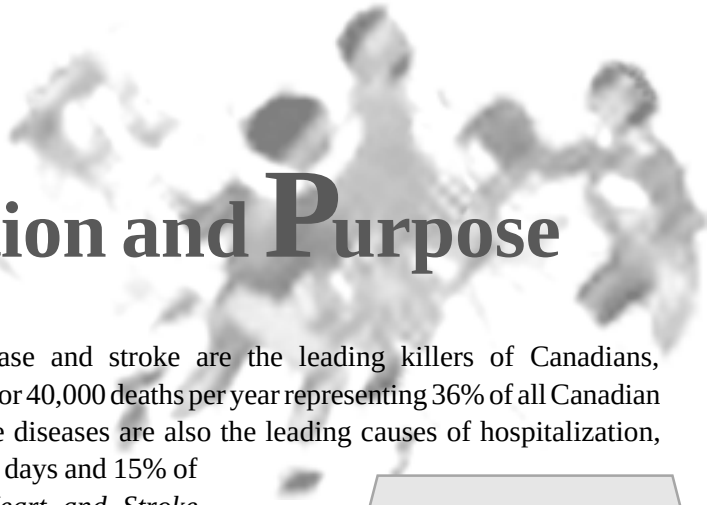
4. Canadians should be aware that directions in which Canadian society is heading are inconsistent with what is known about reducing the incidence of cardiovascular disease.

5. These directions — including greater inequality of distribution of income — undermine the cardiovascular health of Canadians at all income levels.

6. Solutions are available to reduce the number of Canadians living on low incomes and distribute income more fairly, thereby improving the cardiovascular health of all.

The full report is available at http://www.yorku.ca/wellness/heart.pdf

Introduction and Purpose



Heart disease and stroke are the leading killers of Canadians, responsible for 40,000 deaths per year representing 36% of all Canadian deaths.[3] These diseases are also the leading causes of hospitalization, accounting for 19% of patient days and 15% of hospital discharges.[4] The *Heart and Stroke Foundation of Canada* estimates the total annual cost to Canada of cardiovascular disease as close to $20 billion.

While medical treatments and lifestyle risk factors (diets high in fat and cholesterol, inactivity, and tobacco use), typically dominate discussions concerning the causes of cardiovascular disease, an extensive body of recent research indicates that the economic and social conditions under which people live their lives are the major factors determining whether they develop a variety of diseases including cardiovascular disease.[5,6] Healthy lifestyle awareness messages must be part of an integrated health promotion approach that requires more resources (human and fiscal) to address social determinants at the individual/ family level and the social/policy level. A key aspect of how people live their lives is whether society provides conditions that allow them to be included in the activities expected of most members of that society. Social exclusion occurs when people are not provided the opportunity to participate in activities as full members of society.[7]

One of the most important life conditions that both determines whether people are included or excluded from society and whether

Inequalities in health and well-being can be traced back to socioeconomic inequalities, that is to the harsh living conditions which marginalize so many of our fellow citizens, not only limiting their access to essential goods, but depriving them as well of any meaningful role in social life.[1, p.60]

Poor conditions lead to poorer health. An unhealthy material environment and unhealthy behaviour have direct harmful effects, but the worries and insecurities of daily life and the lack of supportive environments also have an influence.[2, p.7]

they stay healthy or become ill is their income.[8] This is especially the case for people living on very low income, that is, in poverty. In addition to an individual's income affecting whether he or she stays healthy or becomes ill, research is finding that the overall health of all members of a society is more determined by the distribution of income rather than by the overall wealth of the society.[9]

Cardiovascular diseases -- including heart disease and stroke -- are the set of diseases where low income among Canadians have the greatest impact on the incidence of illness and death.[10] The incidence of cardiovascular disease is especially related to the incidence of poverty -- a situation that applies to a number of diseases. Yet to date, there has been virtually no public consideration in Canada of the role that these societal factors play in the incidence of cardiovascular disease and how recent changes in income distribution -- and social exclusion -- may be affecting the cardiovascular health of Canadians. To illustrate this lack of attention, the *Heart and Stroke Foundation of Canada* document *The Changing Face of Heart Disease and Stroke in Canada 2000* states:

> *There is a growing body of evidence that the determinants of health go beyond individual genetic endowment, lifestyle behaviour, and the health care system to the more pervasive forces in the physical, social and economic environment... Health policy makers and analysts have emphasized that these underlying determinants need to be addressed in order to prevent heart disease and stroke. They urge us to direct attention towards modifying not only risk factors and risk behaviours but also such 'risk conditions' as poverty, powerlessness and lack of social support.*[3, p.23]

Yet like so many other public discussions of the causes of cardiovascular disease, the risk factors discussed in that document are limited to age, gender, family history, unhealthy behaviours such as tobacco use and physical inactivity, and biomedical indicators such as high blood pressure and blood cholesterol. This is surprising as numerous studies indicate that while these medical and lifestyle risk factors contribute to heart disease and stroke, they account for only a small proportion of the variation in their incidence.[11,12,13] This gap was recognized by the director of the *Cardiovascular Disease Prevention Unit, Health Promotion Directorate of Health Canada:*

> *It is clear that promoting heart health in the community requires consideration of a complex social, economic and cultural context which goes much beyond the immediate issues of risk reduction.*[14, p.2]

Canadian policy makers need to support public health, health care, and heart health workers in their efforts to further address the social, economic, and cultural contexts contributing to cardiovascular disease. More Canadian research studies examining the role of societal determinants of health such as income in the incidence of cardiovascular disease are needed. Also needed is more discussion of the cardiovascular health effects that may result from increases in the number of Canadians living on low incomes and being excluded from full participation in Canadian life.

Inequality is Bad for Our Hearts: Why Low Income and Social Exclusion are Major Causes of Heart Disease in Canada focuses on the roles that income and its distribution play in the incidence of heart disease and stroke. There is a particular emphasis on how living on low income -- when combined with government policies that limit access to basic needs and resources required for health -- contributes to the process of social exclusion by which individuals are denied full participation in Canadian life. The process of social exclusion is a key process by which people living on low income become susceptible to cardiovascular disease.[15] The analysis of the role of income on cardiovascular health is particularly timely since the distribution of income is becoming increasingly unequal in Canada.[16] This growing gap between the rich and poor in Canada has led to greater numbers of Canadians living on lower incomes while those who are already wealthy have become wealthier. In addition, evidence is emerging that the growing incidence of low income is becoming especially concentrated within populations of women, visible minority groups, and newcomers to Canada.

Associated with this trend towards greater inequality of income in Canada has been an increase in the incidence and depth of low income.[17] Poverty is the most extreme manifestation of living on a low income and is one of the strongest predictors of cardiovascular disease.[18] Also occurring in tandem with the trend towards greater inequality of income has been the weakening of social infrastructure and the social safety net -- factors that have been identified as helping to prevent disease across the lifespan.[19] Recent government policy decisions are considered in relation to what is known about how societal factors such as these affect cardiovascular health. The hypothesis that increases in income inequality are associated with deteriorating health of those not living on low incomes is also examined. Finally, the report outlines means of addressing the growing income inequality among Canadians with an eye towards reducing the incidence of cardiovascular disease.

Inequality is Bad for Our Hearts: Why Low Income and Social Exclusion are Major Causes of Heart Disease in Canada has as its paramount purpose to draw the attention of policymakers, health professionals, and the public to the increasing threats posed to Canadians' cardiovascular health by these shifting patterns of income distribution. Another purpose is to present the reasons why the focus on medical

treatments and lifestyle risk factors as a means of reducing the incidence of cardiovascular disease in Canada is an inadequate approach to the problem.

Through presentation of findings from numerous research studies, the report identifies the cardiovascular disease consequences for Canada of exposing increasing numbers of citizens to the difficult and stressful living conditions associated with low incomes. The content of *Inequality is Bad for Our Hearts: Why Low Income and Social Exclusion are Major Causes of Heart Disease in Canada* should serve as a call to action for Canadians who are concerned about the incidence and consequences of cardiovascular disease in Canada and committed to addressing its fundamental causes.

Identifying the Causes of Cardiovascular Disease

In this report the focus is on how low income and social exclusion cause cardiovascular disease. The concept of cause in science is a complicated one. To speak of a cause is to ask the questions *Why do things happen?* and *Why did something turn out one way and not another*"[20] Many philosophers and scientists use the idea of *efficient cause* based upon Aristotle's notion of what puts an event in motion. For a situation such as low income to be an efficient cause of an outcome such as cardiovascular disease it must: a) occur prior in time to the outcome; b) represent a process that produces the changes that lead to the outcome; and c) be part of a causal network that includes direct and indirect effects on the outcome of interest.

It should be noted that these causative effects are not absolute but rather probabilistic; that is, a cause does not *always* lead to an outcome but rather leads to an increase in the probability that an outcome will occur. Just about every risk factor identified by science has this kind of probabilistic relationship to disease. And this causative network must be validated empirically through scientific observation. This report is about the direct and indirect ways that low income and social exclusion leads to — or causes — cardiovascular disease.

> *At this point we are prepared to place our causal linkages into a causal network, that is, a set of influences, processes, and conditions that, put together, constitute the circumstances under which some event or action occurs.*[20, p.3]

Throughout *Inequality is Bad for Our Hearts: Why Low Income and Social Exclusion are Major Causes of Heart Disease in Canada*, the following terms are used:

Cardiovascular disease: This term is used to refer to all diseases involving the heart and circulatory system. It includes ischemic heart disease, cerebrovascular disease, and other diseases of the circulatory system. When a specific heart disease term such as coronary heart disease or hypertensive disease is used, this was the term used by the researchers whose work is being examined.

Low income: This term refers usually refers to the *Low Income Cut-offs* identified by Statistics Canada. These cut-offs define low income in relative terms, based on the percentage of income that individuals and families spend on the basic needs of food, clothing and shelter in comparison with other Canadians. The category identifies those who are substantially worse off than the average Canadian and are living in straitened circumstances. The Canadian rates used in this report refer to pre-tax incomes. An extensive discussion of the value of using this figure is available.[16] When other definitions of low income are used, they are described in the text.

Poverty: This refers to those who, in addition to living below the Statistics Canada *Low Income Cut-offs*, are exposed to absolute material deprivation involving the failure to meet basic life needs such as shelter, food, and clothing. The emphasis here is on issues of low-income but issues of poverty have attained significantly greater emphasis as illustrated by the increasing incidence of homelessness and use of food banks across Canada. In addition, many writers use the term poverty to refer to people living below the Statistics Canada *Low Income Cut-offs.*

Key Messages

1. The current emphasis on medical and lifestyle risk factors (diets high in fat and cholesterol, inactivity, and tobacco use) as a means of preventing cardiovascular disease in Canada is not enough.

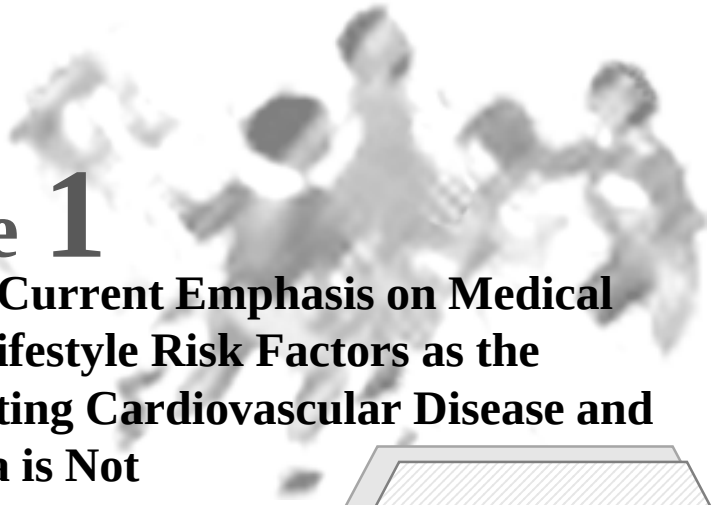
2. Low income is a major cause of cardiovascular disease in Canada.

3. Social exclusion -- involving processes of material deprivation, lack of participation in common societal activities, and exclusion from decision-making and civic participation -- is the means by which low income causes cardiovascular disease.

4. Canadians should be aware that the directions in which Canadian society is heading are inconsistent with what is known about reducing the incidence of cardiovascular disease.

5. These directions — including greater inequality of distribution of income — compromise the cardiovascular health of Canadians at all income levels.

6. Solutions are available to reduce the number of Canadians living on low incomes and to distribute income more fairly, thereby reducing social exclusion and helping to improve the cardiovascular health of Canadians.



Message 1

The Current Emphasis on Medical and Lifestyle Risk Factors as the Means of Preventing Cardiovascular Disease and Stroke in Canada is Not Enough

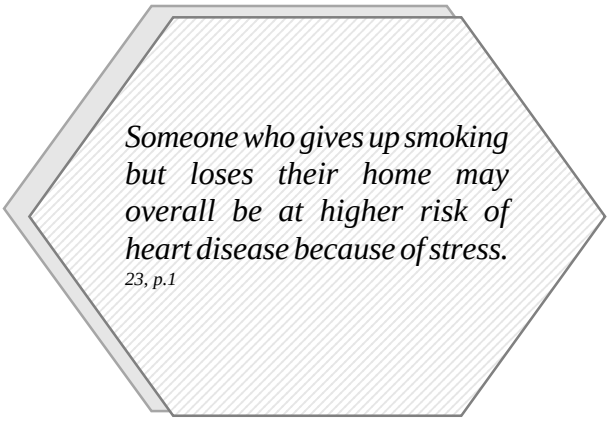
> *Medical care can prolong survival after some serious diseases, but the social and economic conditions that affect whether people become ill are more important for health gains in the population as a whole.* [2, p.7]

While there have been significant improvements in health status among the populations of Western industrialized nations, there continue to be wide disparities in health between nations as well as among citizens within them. [5,6,8] Access to medical care has been hypothesized as being responsible in part for such differences as have differences in lifestyle behaviours. [21] Differences in cardiovascular disease among people have been shown to be related to the risk factors familiar to Canadians such as elevated serum cholesterol that can result in part from diets rich in saturated fats, cigarette smoking, hypertension, and lack of physical activity. But studies carried out in the United Kingdom, the United States, Canada and elsewhere find that most of the differences in numbers of deaths from cardiovascular disease among income groups within jurisdictions cannot be accounted for by these factors.

To illustrate, a very large and carefully designed study revealed that lifestyle risk factors such as alcohol and tobacco use, body mass index, and activity accounted for a rather small proportion of variance in total death rates from cardiovascular disease as compared to income. These findings of a small effect for lifestyle behaviours were seen across sex, race, and age and led the researchers to state:

> *Our results suggest that despite the presence of significant socioeconomic differentials in health behaviours, these differences account for only a modest proportion of socioeconomic disparities in mortality. Thus, public health policies and interventions that exclusively focus on individual risk behaviours have limited potential for reducing socioeconomic disparities in mortality.* [12, p.1707]

The largest ever international study of cardiac disease carried out by the World Health Organization found that according to rates of cardiovascular disease among 21 nations there was no relationship between reductions in cardiovascular disease and national changes in obesity, smoking, blood pressure, or cholesterol levels.[22] Instead, the findings suggested that factors such as societal unrest, poverty, and social and economic change may be responsible for different levels of cardiovascular disease.



Concerning the role of underlying biological processes in cardiovascular disease, there is continuing uncertainty regarding the processes that contribute to disease. Marmot and Mustard argue that there are two: those that cause thickening of blood vessels and those that cause narro wing and blood clotting. The presence of environmental stressors may be related to the second process which is the main cause of coronary heart disease. And whether the second process occurs appears to be related to whether the person experiences stress. The implications of this for preventing disease are potentially profound:

> *For example, since the main cause of myocardial ischemia (heart attacks) is a thromboembolic event it is difficult to see how changes in cholesterol levels in adult males will dramatically change outcomes since there is no evidence that cholesterol has a major clinical effect on the thromboembolic process. This may be one of the reasons why risk modifications by trying to lower cholesterol levels has not had a dramatic effect on the incidence of heart attacks.* [24, p.213]

Despite research that demonstrates lowering cholesterol is effective, these and numerous other studies indicate that there are additional societal factors that provide much better explanations than the traditional risk factors related to lifestyle of why some people stay healthy and others become ill. These factors have been named *social determinants of health* and a solid body of evidence now exists concerning their importance in determining whether people become ill or stay healthy. What might some of these social determinants of health be?

The World Health Organization has outlined a number of these societal factors that determine health. These social determinants of health are income differences, stress, experiences during the early years of life, social exclusion, work conditions,

unemployment, social support, addiction, availability of food, and transportation.[2,5] In *Inequality is Bad for Our Hearts: Why Low Income and Social Exclusion are Major Causes of Heart Disease in Canada* the focus is on income as a determinant of health that influences the presence and quality of many of the other health determinants.

Low income influences the quality of early life, levels of stress, availability of food and transportation, incidence of addictions, and so on. Additionally, the focus on the social exclusion of low income people from Canadian society provides a means of understanding how low income contributes to the onset of cardiovascular disease. Social exclusion is not the only way in which low income leads to cardiovascular disease, but it does direct our attention to this important process.

Message 2

Low Income is a Major Cause of Cardiovascular Disease in Canada

The effect of low income on health have been known since the 19th century.[26] A series of studies in the United Kingdom document how those living on lower incomes are more likely to suffer from and die from cardiovascular disease — and a number of other diseases — at every age.[27] A recent study found significant differences in overall death rates between those in the lowest two income groups and those in the highest two income groups in England and Wales. Lower income men had a 68% greater chance and lower income women had a 55% greater chance of dying than those with higher incomes. For coronary heart disease however, lower income women had more than twice the chance of dying than higher income women. For men, the ratio was stable with lower income men having a 66% greater chance of dying of coronary heart disease than higher income men.[28]

Another extensive British study assessed men's income status at three times: early childhood, first employment, and time of study during adulthood.[29] The study found that lower income had a cumulative effect upon presence of higher blood pressure, current cigarette smoking, angina, and body mass index. Death from cardiovascular disease was most likely to occur among men who were from the lower income classes for at least two assessment times. Death rates were most likely associated with fathers having lower income.

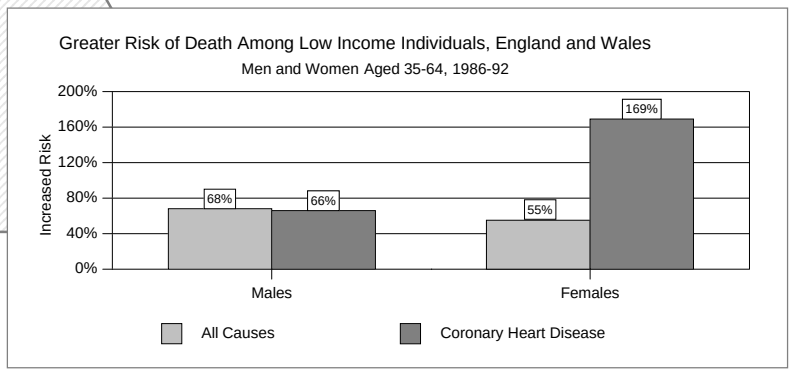
In the USA, lower-income Americans have a higher incidence of a range of illnesses including cardiovascular disease. The death rate for cardiovascular disease during the period

It is one of the greatest of contemporary social injustices that people who live in the most disadvantaged circumstances have more illnesses, more disability and shorter lives than those who are more affluent.[18, p.1]

Measures of social and economic status, including occupation, are extremely powerful predictors of premature heart disease.[25, p.32]

1979-1989 for those between the ages of 25-64 earning <$10,000 was 318/100,000; for those earning $10,000-14,999, 251/100,000; those earning $15,000-$24,900,142/100,000, and those earning $25,000 or more, 126/100,000. The ratio of cardiovascular disease death rates for the lowest income group to the highest income group was 2.52 indicating that the lowest income group more than twice the chance of death than those in the highest income group.[21]

Figure 1



In Canada, data on individuals' income and social status are not routinely collected at death, so national examination of the relationship between income and death from various diseases must use census tract of residence to estimate individuals' income. There is potential for error in these analyses which relate income to death based on residential area, since some low income people live in well-off neighbourhoods and vice versa. Essentially, these analyses are conservative estimates of the relationship between income level and death rates. In both 1986 and 1996, those Canadians living within the poorest 20% of urban neighbourhoods were much more likely to die from cardiovascular disease, cancer, diabetes, and respiratory diseases — among other diseases — than other Canadians.[10]

Figure 2

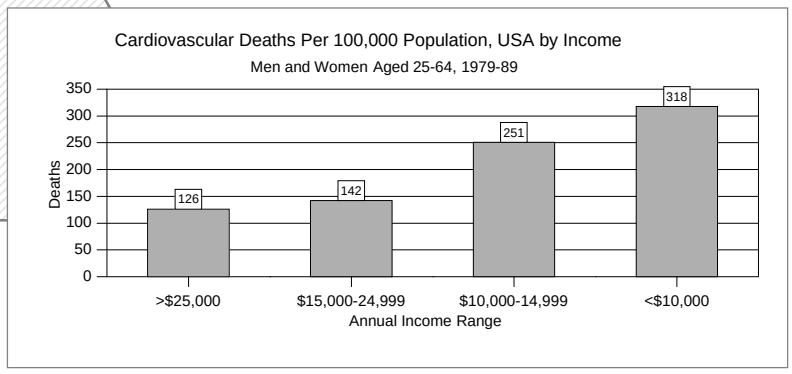
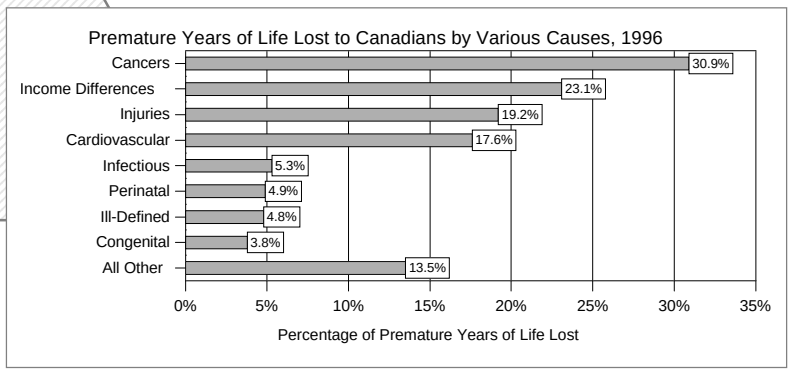
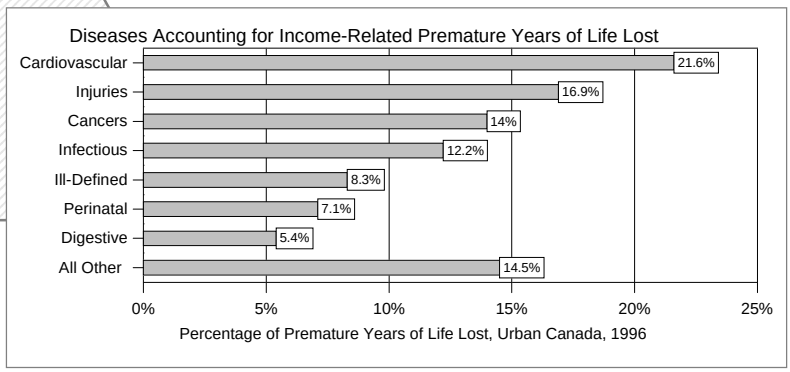


Figure 3



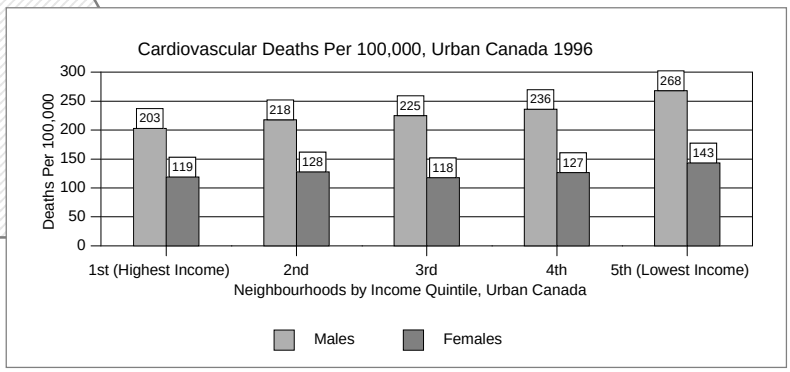
In 1986, it was estimated that 21% of premature years of life lost for all causes prior to age 75 in Canada could be attributed to income differences and this estimate increased to 23% by 1996.[30] This figure is calculated by using the mortality rates in the wealthiest quintile of neighbourhoods as a baseline and considering all deaths above that rate to be excess related to income differences. That is, 23% of all of the premature years of life lost to Canadians can be accounted for by the differences that exists among wealthy, middle-income and low income Canadians. At both times, the diseases most responsible for income-related differences in death rates were cardiovascular diseases. In 1996, 22% of all the years lost that were attributed to income differences were caused by cardiovascular disease. These estimates are very similar to those obtained in Australia and Holland.[31,32]

Figure 4



There were significant declines in deaths caused by cardiovascular disease in Canada from 1986 to 1996. Death rates declined the most for males living in the lowest income neighbourhoods. Nevertheless, people at each step up the income scale are healthier than those on the step below.

Figure 5



For females, differences between income quintiles were smaller than for males but still large, with especially higher rates in the lowest income quintile. Figure 5 shows the death rates from cardiovascular disease for urban men and women in Canada as a function of income quintile of neighbourhood.

For almost every cause of death examined, the rate of mortality was higher in individuals of lower social and socioeconomic classes than individuals of the upper social and economic classes. This trend was most noticeable in deaths due to hypertensive heart disease, tuberculosis, asthma, and pneumonia and bronchitis.[33, p.1755]

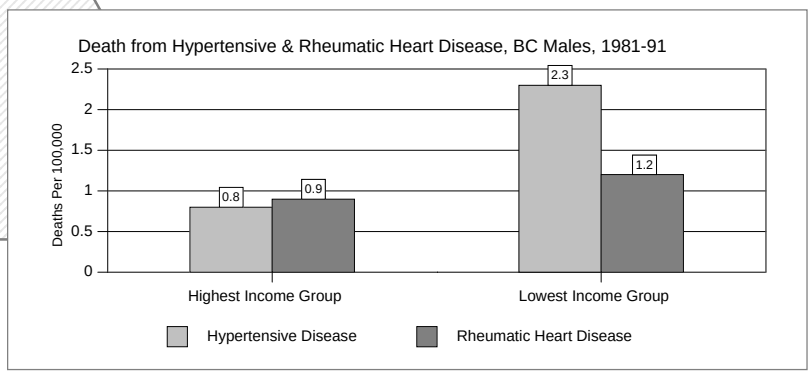
It should be noted that the ratio of death rates from cardiovascular disease between the lowest income quintile and the highest income quintile declined for men from 1.35 in 1991 to 1.32 in 1996. But the same ratio increased for women from 1.12 in 1991 to 1.20 in 1996.

Overall, it is estimated that income differences account for a 23.7% excess in premature deaths (death prior to 75 years) from cardiovascular disease among Canadians.[30] Were all Canadians' rates of death from cardiovascular disease equal to those living in the wealthiest quintile of neighbourhoods, there would be 6,366 fewer deaths each year from cardiovascular disease.

In addition, the 1996 analysis also revealed that for each income quintile of neighbourhoods, the percentage of low income people increased from 1991 to 1996 with the greatest increases occurring in lower income neighbourhoods. The implications of greater numbers of Canadians living on low incomes for cardiovascular health are discussed in later sections.

Another Canadian study of the relationship between income and deaths due to hypertensive and rheumatic heart disease was able to obtain individuals' income level. This study found that income group was a reliable predictor of death from heart disease among men living in British Columbia.[33] Men identified as being in the lowest income group had a death rate from hypertensive disease of 2.3/100,000 as compared to .8/100,000 for the highest income group: a ratio of almost 3:1. This means that lower income men had three times greater chance of dying from hypertensive disease than the highest income group. For rheumatic heart disease the comparative figures were 1.2/100,000 and .9/100,000 a ratio of 1.3:1, indicating a 30% greater risk of death for low income men.

Figure 6



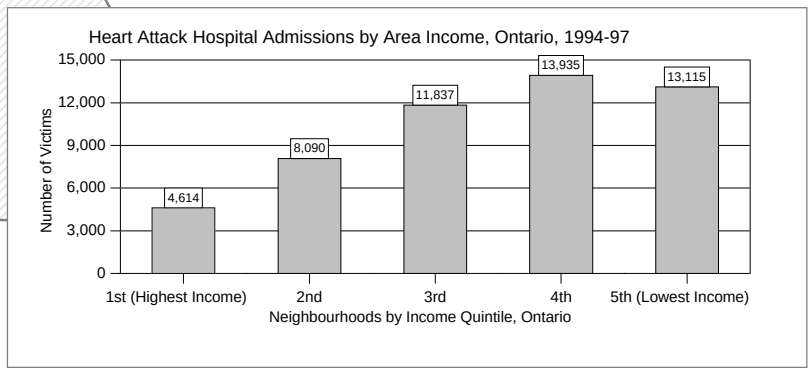
Concerning the prevention of these conditions, the researchers concluded that in addition to careful monitoring of the health status of the population, *Social conditions giving rise to disease also deserve greater attention.*[33,p.1757]

A study in Manitoba found that death rates from ischemic heart disease was 43% higher in the lowest income population quintile as compared with the highest.[34] And one very detailed study looked at the relationship of median income of neighbourhood and the incidence of, and survival from acute myocardial infarction (heart attack) among 51,000 Ontario patients admitted to hospital.[35] Ontario neighbourhoods were categorized into five quintiles as a function of median income. Anyone who had suffered a heart attack within the previous year was excluded as were those less than 20 or more than 105 years of age.

A disproportionate number of patients with acute myocardial infarction were in the lower income quintiles, illustrating the greater burden of illness among those with lower socioeconomic status.[35, p.1362]

Figure 7 shows the number of heart attack victims from each of the income quintiles of neighbourhoods and Figure 8 shows the one year mortality rate as a function of neighbourhood quintile. The greatest number of victims came from lower income neighbourhoods and the survival rates were higher for those in the wealthier neighbourhoods.

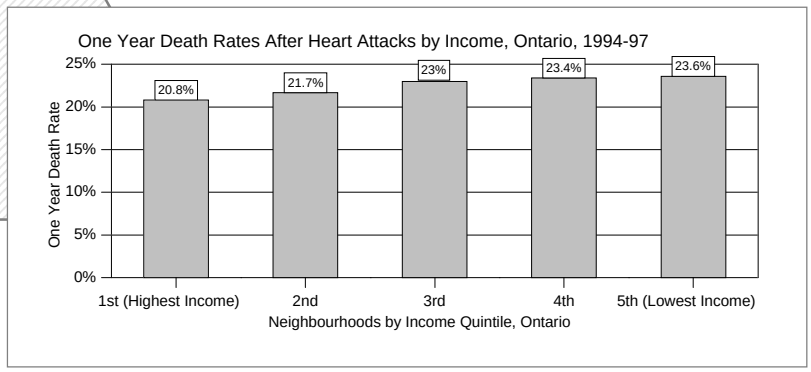
Figure 7



This same study also identified pronounced differences in access to specialized cardiac services as a function of income status of patients. Those patients who were from more well-off neighbourhoods had greater rates of coronary angiography and shorter waiting times for catheterization. These findings were not a function of severity of illness, the speciality of the attending physician or the characteristics of the hospital, but rather the income level of the patient. The issue of differential treatment of people as a function of their income level is an area worthy of much greater attention by the heart health community.

Another very careful study found that lifestyle and medical risk factors accounted for very little variation in whether people developed coronary heart disease.[36] Thirteen thousand US residents with no history of coronary heart disease were followed over a period of 9 years. Over this period 615 individuals experienced events such as heart attacks associated

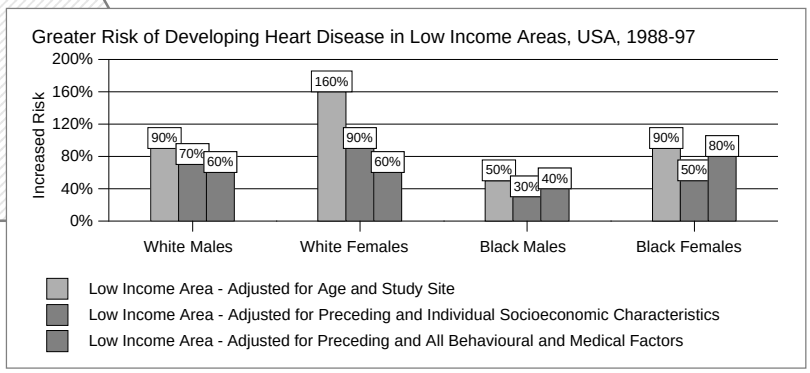
Figure 8



with coronary heart disease. It was found that those living in lower income neighbourhoods were much more likely to develop coronary heart disease than those in well-off neighbourhoods. These effects remained strong even after controlling for tobacco use, level of physical activity, presence of hypertension or diabetes, level of cholesterol, and body mass index. In fact, neighbourhood characteristics such as median income, level of education, and occupational level were the strongest predictors of the incidence of coronary heart disease.

Figure 9 shows the increased risk for those in the lower 1/3 of socioeconomically defined neighbourhoods as compared to those in the most advantaged neighbourhoods. It should be noted that most of the risk associated with living in a low socioeconomic neighbourhood remains after all of the biomedical and behavioural risk factors are accounted for.

Figure 9



As noted, numerous longitudinal studies — usually European — document how low income precedes the incidence of, and death from, cardiovascular disease. In Canada, there is very limited data that considers in detail how low income leads to the incidence of cardiovascular disease. Data from the *National Population Health Survey* provide important evidence of the human and social costs of cardiovascular disease.[37] In 1996/1997 three percent of the aged 35-64 Canadian population reported having a diagnosis of heart disease. As compared to Canadians without such a diagnosis, those with heart disease had six times the likelihood of having two other health conditions, three times the likelihood of chronic pain, and six and a half times greater likelihood of an activity restriction.

The failure of risk factors to explain differences in the risk of cardiovascular disease among socioeconomic groups is a common finding even in studies focussing on traditional measures of personal income, education, and occupation. [36, p.103-104]

More generally, our findings point to the role of the broader social and economic forces that generate differences among neighbourhoods in shaping the distribution of health outcomes. [36, p.105]

The 1996/1997 survey found that those with heart disease had almost a two times greater chance of living on low income than those Canadians without heart disease but these individuals were also more likely to not be working, making a causative inference of low income leading to incidence of heart disease difficult. But data from the 1998/1999 *National Population Health Study* provides evidence in support of this hypothesis.[38] Middle-aged Canadians were identified who reported a decline in their health status from 1994/1995 to 1998/1999. Being in the lowest and the lower middle income groups was associated with a 80% greater chance of reporting a decline in health over that period. In addition, being in the upper-middle and highest income group was associated with twice the chance of reporting an improvement in health status. While heart disease can lead to lower income, carefully designed studies such as those described above, clearly indicate that low income serves as a predictor of cardiovascular disease.

Message 3

Social Exclusion -- Including Processes of Material Deprivation, Lack of Participation in Common Societal Activities, and Exclusion from Decision-making and Civic Participation -- Is the Means by Which Low Income Causes Cardiovascular Disease

The fact that low income is associated with cardiovascular disease is not in dispute.[40] While the exact mechanisms by which cardiovascular disease results from low income remain a focus of research, current evidence is converging around three main ways in which low income causes disease. Low income is associated with material deprivation during early life and adulthood, excessive psychosocial stress, and the adoption of health threatening behaviours — all of which cause cardiovascular disease.[18] All of these precursors of cardiovascular disease come about since low income is part of the process of social exclusion.

> *Health inequalities are produced by the clustering of disadvantage – in opportunity, material circumstances, and behaviours related to health – across people's lives.*[39, p.65]

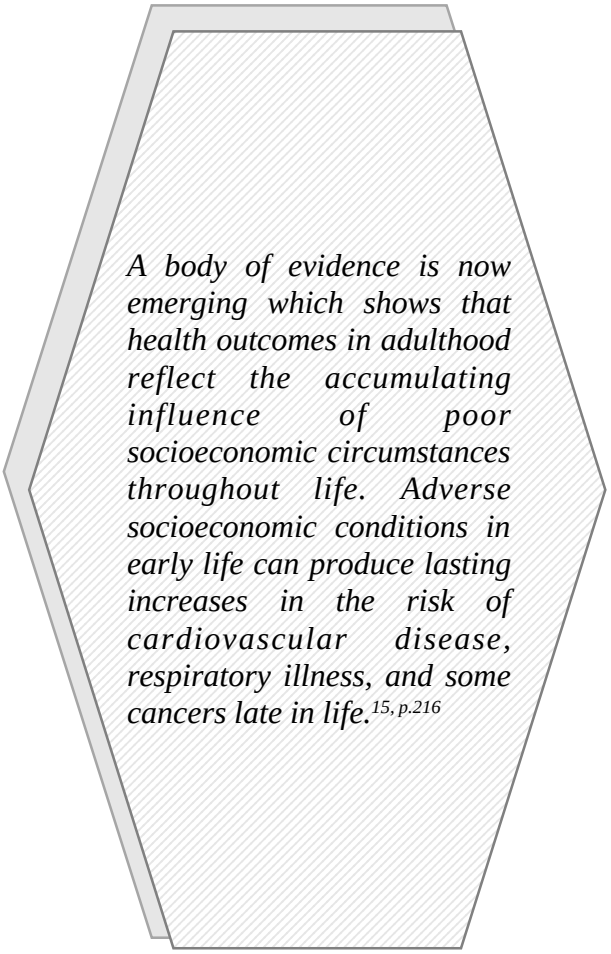
Material Deprivation Causes Cardiovascular Disease

Material deprivation refers to the differences that individuals experience in their exposures to both beneficial and damaging aspects of the physical world.[41] These exposures accumulate over the course of the lifespan and are very much influenced by the amount of income people have available to them. Individuals who suffer from material deprivation have greater exposures to negative events such as hunger and lack of quality food, poor quality of housing, inadequate clothing, and poor environmental conditions at home and work. In addition, individuals suffering from material deprivation also have less exposures to positive resources such as education, books, newspapers, and other stimulating resources, attendance at cultural events, opportunities for recreation and other

leisure activities, and involvement in other stimulating activities that contribute to human development over the life span.

Material deprivation is not an all-or-nothing phenomenon. People who are going hungry, lack housing or shelter, or cannot buy warm clothing are suffering clear material deprivation. Increasingly however, material deprivation is being seen as a graded phenomena by which members of a society lack in varying degrees the life circumstances and resources that support health and development. Townsend has defined poverty in terms of relative material deprivation – a definition that just as easily describes living on low income – as follows:

People are relatively deprived if they cannot obtain, at all or sufficiently, the conditions of life – that is the diets, amenities, standards and services – which allow them to play the roles, participate in the relationships and follow the customary behaviour which is expected of them by virtue of their membership in society. If they lack or are denied the incomes, or more exactly the resources, including income and assets or services in kind, to obtain access to these conditions of life they can be defined as living in poverty.[42 ,p.36]



There is increasing evidence about the cardiovascular-related health effects of material deprivation. The profound increases in food bank use and homelessness in Toronto the past decade are illustrations of the increasing incidence of material deprivation that contributes directly to poor health.[43, 44] For those so exposed to these conditions of absolute material deprivation, their health is severely at risk. And whatever indicator of health is used – cardiovascular disease, emergency room use, chronic illness, poor school performance, suicide rate, and a range of other diseases – rates for those living under these conditions are strikingly higher than for the population as a whole.[45] But material deprivation is also

a relative phenomenon by which those with lower incomes have less access to health enhancing resources and greater exposure to negative influences upon health than the income group right above it and experience disease in corresponding degrees.

Furthermore, it should be noted that while each level of the income scale shows different levels of health – including the likelihood of developing cardiovascular disease – the greatest burden is concentrated on the lower end of the income range.[8, 10] That is, the gap in life expectancy and incidence of disease is usually greater between those in the lowest income group and the next higher group than between each of the increasingly higher income groups.

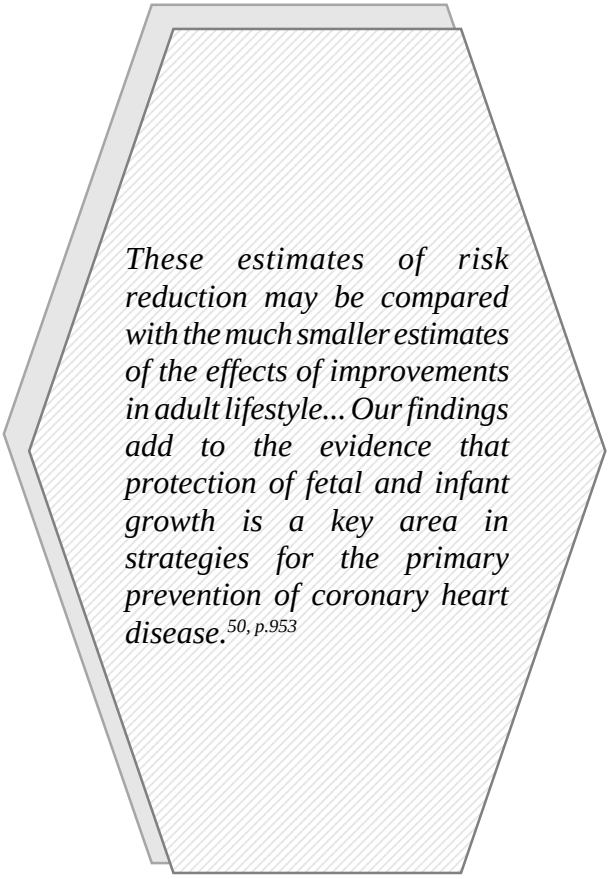
There is increasing evidence that the differences in level of access to resources that result from income differences — especially among those

More accurately, the social structure is characterized by a finely graded scale of advantage and disadvantage, with individuals differing in terms of the length and level of their exposure to a particular factor and in terms of the number of factors to which they are exposed. [51, p.1640]

Figure 10

Critical Periods of the Life Course Span During Which Individuals are Especially Vulnerable to the Effects of Material and Social Deprivation

Fetal Development
Birth
Nutrition, Growth and Health in Childhood
Educational Career
Leaving Parental Home
Entering Labour Market
Establishing Social and Sexual Relationships
Job Loss or Insecurity
Parenthood
Episodes of Illness
Labour Market Exit
Chronic Sickness



with lower income — play their greatest role during important life transitions. Thirteen critical periods of the life course have been identified during which people are especially vulnerable to social disadvantage.[39] These are the times during which adequate support must be provided to maintain health and prevent illness.

Health burdens resulting from low income and the absence of societal supports during these key periods accumulate over the lifespan. That is, low income during early childhood and during adulthood make independent contributions to the likelihood of developing cardiovascular disease. Even if low income children transcend their low income status in later life, they still carry a cardiovascular health burden into adulthood.

To illustrate, research now documents how material deprivation during very early life has implications for the development of cardiovascular disease. Numerous studies show that low birth weight – itself strongly associated with low income – is associated with greater likelihood of death from cardiovascular disease in later life.[47, 48, 49] The most recently published study found that low birth weight and low weight and height at ages 1 and 3 were reliable predictors of the incidence of coronary heart disease among Finnish men aged 45-54 years of age.[50] Additionally, it was also found that rapid weight gain among boys from ages 1-5 who were of low birth weight also added to the risk of coronary heart disease.

Since material conditions in childhood and adulthood make independent contributions to the likelihood of death by illness over the lifespan, low income during childhood can contribute to the incidence of cardiovascular disease over the entire course of the lifespan even if an individual's income situation improves subsequent to childhood. The cardiovascular health consequences of increasing numbers of Canadian families living on low incomes may be manifest for the entire next generation. And considering the magnitude of the increases in the incidence of low income among children and families, such consequences pose direct threats to the sustainability of the health care system.

Excessive Psychosocial Stress Causes Cardiovascular Disease

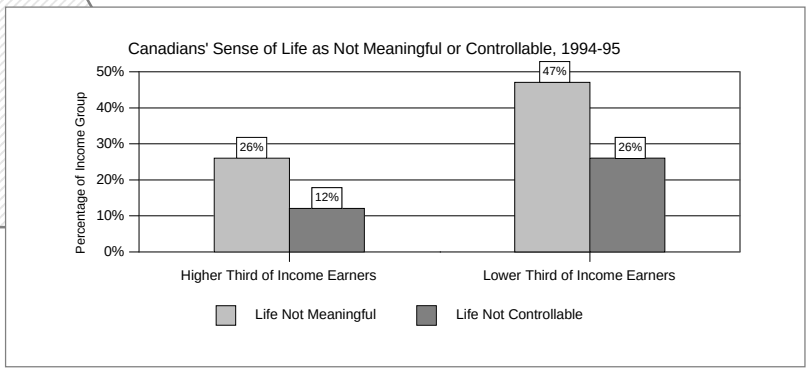
Living on low income creates uncertainty, insecurity, and feelings of lack of control over one's life — these are all conditions that have powerful effects on health. The National Population Health Survey found that among Canadians in the lower third of the income distribution, 47% reported seeing the world as not being meaningful, events as being incomprehensible, and life's challenges as being unmanageable.[52] The comparable figure for the highest third income group was 26%. Similarly, people in the lower income group were 2.6 times more likely to have a low sense of control over their lives than the higher income third of Canadians (31% vs. 12%).

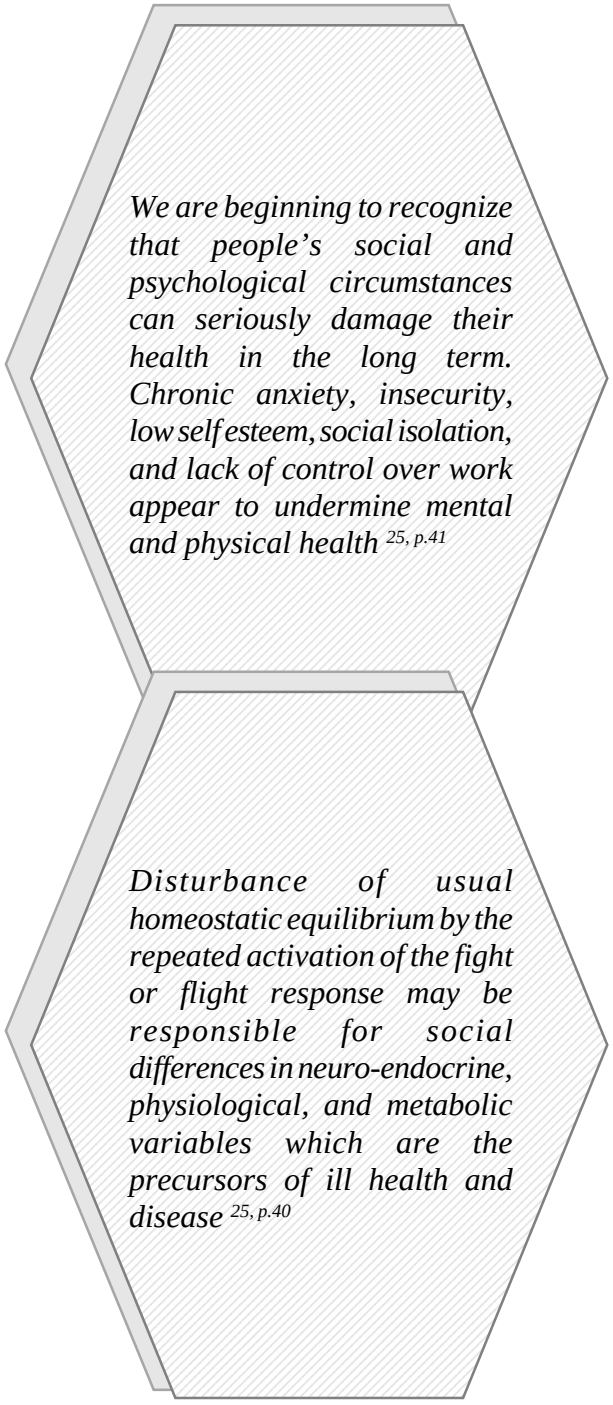
Chronic stress is expected to increase the rate of premature death directly through the immune and neuroendocrine systems and indirectly through adverse behavioural responses such as smoking, excessive drinking, and violence.[51, p.1640]

A recent examination of the role that stress plays in disease identified the psychological and biological pathways by which exposure to adverse psychosocial circumstances — of which low income is one of the most potent — leads to the onset of cardiovascular disease. The social environment can create adverse conditions that produce the "fight or flight" reaction. This works through the sympathetic nervous system and the hypothalamic pituitary-adrenal axis to produce lipid abnormalities, high blood pressure, and clotting disturbances.

Plausible models of how stress leads to disease have been developed and validated.[53] A series of studies by animal researchers have identified the biological and psychological mechanisms by which chronic stress and hierarchy creates illness and eventually death.[54, 55] These stress

Figure 11





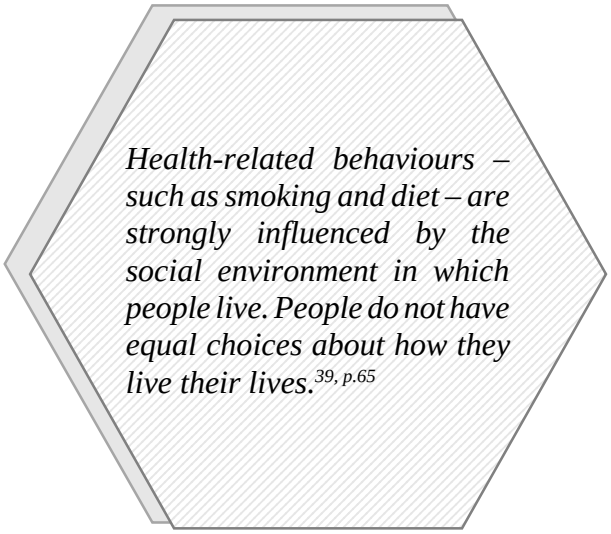
models are consistent with many studies that describe the experience of living on low incomes and provide plausible models that explain the low income and cardiovascular disease relationship.

To identify excessive psychosocial stress as a cause of cardiovascular disease requires a solution of dealing with problems at the root and taking a comprehensive health promotion approach that takes into account a broad range of social determinants. It is not to suggest a solution of providing low income people with advice on coping skills. First, such an approach on its own is not likely to be effective as the issues many low income people must deal with are not easily amenable to coping strategies. Providing hungry and poorly housed families with advice on how to cope with these situations is not likely to solve their core problems. Second, considering the increasing numbers of Canadians being subjected to difficult living situations, there would never be enough resources available to provide such supports to those who would benefit from them. Third, advocating such a solution would signal a recognition that subjecting significant numbers of Canadians to difficult living situations is an acceptable state of affairs.

Adoption of Health Threatening Behaviours Causes Cardiovascular Disease

The behavioural risk factors for cardiovascular disease are well known: tobacco smoking, an unhealthy diet, and inactivity. All of these behaviours are associated with lower income and social status. However, much of the cardiovascular health literature assumes that these behavioural patterns are adopted through

voluntary lifestyle choices. It is becoming increasingly clear that patterns of health behaviours are strongly shaped by the social and economic environments in which people live. High levels of stress produce behaviours aimed at ameliorating tension such as high fat diets and poor nutrition, and tobacco use.



It should not be surprising then that individuals faced with low income or other issues such as unemployment or underemployment, racism, insecure or unaffordable housing would engage in these behaviours to cope with needs that are not being fulfilled by society. The following conclusion concerns the use of tobacco — a contributor to cardiovascular disease — but also applies to issues of unhealthy eating and inactivity:

> *The factors that predict smoking involve material circumstances, cultural deprivation, and indicators of stressful marital, personal, and household circumstances. This illustrates what might be proposed as a general law of Western industrialized society; namely that any marker or disadvantage that can be envisaged and measured, whether personal, material or cultural is likely to have an independent association with cigarette smoking.*[56, p.242]

The emphasis on explaining unhealthy behaviours as a matter of individual choice and exhorting individuals – especially those on low income – to give up their unhealthy behaviours is an ineffective approach to modifying these risk behaviours. First, these lifestyle factors only account for a small proportion of the likelihood of developing cardiovascular disease as compared to income. Second, it tends towards a "blaming the victim" approach whereby those with disadvantage are blamed for adopting means – admittedly unhealthy in the long term – for coping with their difficult life situations. Third, an emphasis on individual choice fails to address

Given the disturbing increases in income inequality in the United States, Great Britain, and other industrial countries, it is vital to consider the impact of placing ever larger numbers of families with children into lower SES groups. In addition to placing children into conditions which are detrimental to their immediate health status, there may well be a negative behavioural and psychosocial health dividend to be reaped in the future.[57,p.817]

underlying issues of why disadvantaged people adopt these behaviours. Fourth, it is an ineffective approach.

An analysis of the determinants of adults' health-related behaviours such as tobacco use, physical activity, and healthy diets, found these behaviours were predicted by poor childhood conditions, low levels of education, and low status employment. The study also found that poor socioeconomic conditions during early life predicted adult rates of feelings of hopelessness, cynical hostility, and low sense of coherence — all factors that contribute to illness.[57]

Identifying the pathways to cardiovascular disease such as material deprivation, excessive psychosocial stress, and adoption of health threatening behaviours helps explain how low income causes cardiovascular disease. But full understanding of these issues requires a framework that explains how these conditions come about and the role government policymaking plays in either generating these conditions or helping to remove them. The concept of social exclusion allows for consideration — in addition to individuals' life situations — the societal context under which increasing numbers of Canadians are subjected to cardiovascular health-threatening living conditions.[58]

Placing These Findings within a Societal Context: The Process of Social Exclusion

What is the process by which these three components of cardiovascular disease risk come to cluster together among individuals? The concept of social exclusion provides a useful means of understanding how these three aspects of low income people's lives: material disadvantage, excessive psychosocial stress, and unhealthy behaviours, are interrelated. The concept of social exclusion also describes an overall process by which the incidence of low income — and the related precursors of cardiovascular disease —

among Canadians are associated with government social and economic policies and other societal processes. To be useful, social exclusion must meaningfully relate to the presence of material deprivation, excessive psychosocial stress and feelings of lack of control and powerlessness, and the adoption of health compromising behaviours. It should also be capable of considering how discrimination and systematic barriers to jobs, education, and social participation can contribute to these conditions. Contemporary definitions of social exclusion meet this requirement.

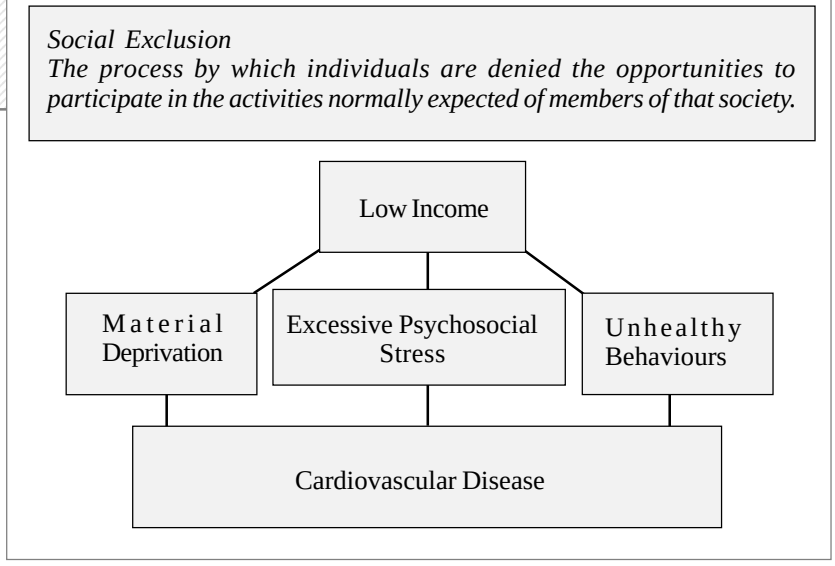
Social exclusion creates misery and costs lives [2, p.14]

Inequality may make people miserable long before it kills them. [59, p.988]

> *Social exclusion is defined as a multi-dimensional process, in which various forms of exclusion are combined: participation in decision-making and political processes, access to employment and material resources, and integration into common cultural processes. When combined they create acute forms of exclusion that find a spatial representation in particular neighbourhoods.* [60, p.22]

Figure 12

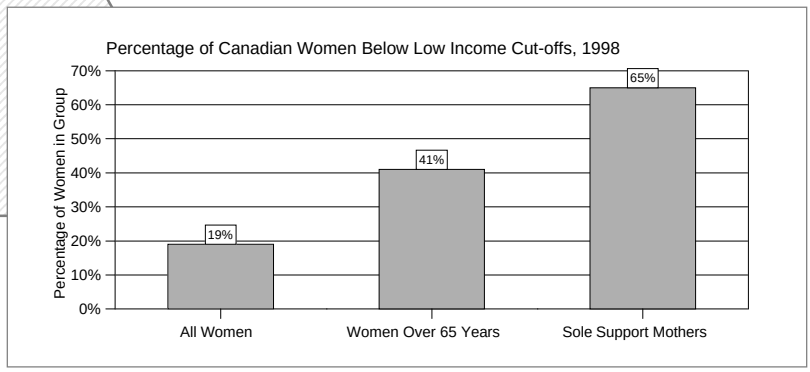
How the Process of Social Exclusion Contributes to the Mechanisms by Which Low Income Causes Cardiovascular Disease



> *Exclusion processes are dynamic and multidimensional in nature. They are linked not only to unemployment and/or to low income, but also to housing conditions, levels of education and opportunities, health, discrimination, citizenship and exclusion in the local community.*[61, p.156]

Social exclusion is a process by which people are denied the opportunity to participate in civil society; denied an acceptable supply of goods or services; are unable to contribute to society, and are unable to acquire the normal commodities expected of citizens. All of these elements occur in tandem with the material deprivation, excessive psychosocial stress, and adoption of health threatening behaviours shown to be related to the onset of, and death from, cardiovascular disease.

Figure 13



The value of the concept is that it recognizes that exclusion from society is something that happens to people as a result of societal change and government policy rather than a direction freely chosen by individuals.[62] The processes that lead to social exclusion include economic change such as increased unemployment or widespread job insecurity, demographic changes such as an aging population or single parent families, changes to welfare programs such as cuts and withdrawals, discrimination and systematic exclusion from societal participation, and specific processes of geographical segregation and isolation of certain groups such as those with low income.

Government policies are especially important in either increasing or decreasing the extent of social exclusion within a society. In Ontario, for example, there has been a systematic weakening of the supports that are available to low income people. There have been dramatic decreases in social assistant rates that have led to those who were already living on very low incomes being subjected to increasingly difficult living conditions. The doubling of food bank use in Toronto over the past ten years — with children representing

39% of users in the Toronto area — reflects the consequences of such government actions.[63]

Additionally, the cancelling of 18,000 new social housing units, combined with the end of rent controls, has led to an explosion of homelessness, especially among young families with children. The waiting list for government supported housing in Toronto for a family is now 18 years.[64] There is no known literature that suggests that increasing the incidence of hunger, homelessness, and hopelessness will serve to improve cardiovascular health. Indeed, the available research suggests that cardiovascular health will suffer as a result of such actions.

Finally, the reduction in income tax rates in Ontario has served to herald a massive transfer of funds from the least well-off to the wealthiest citizens. This has occurred at a time when adequate funding is no longer available for provision of long-term care services for seniors and when the public school system is laying off health professionals, librarians, and social workers that provide supports to the least well-off in society. All of these actions serve to exclude even further those already unable to participate fully in society.

Identifying Particular Groups at Risk for Low Income and Social Exclusion

The emphasis here has been on Canadians living on low incomes being subjected to experiencing social exclusion. According to recent formulations concerning social exclusion, in each society particular groups are at higher risk for experiencing social exclusion as well as low income. In Canada, three groups have been identified as being of special risk: women, recent arrivals to Canada, and persons of colour.

Women at risk. Women, and more specifically older women and women heading families, are especially at risk for low income.[65] Currently, almost 19% of adult women are living below the low income cutoffs – the highest rate in the past twenty years. About 2.2 million adult women are now living below these cutoffs, that is, in straitened circumstances.[66] The most recent numbers indicate that 41% of women over 65 are in this situation. For women heading sole-support families, the figure is 56%.

New Canadians at risk. New Canadians are also much more likely to be living with low incomes than other Canadians.[67] This is the case in all major Canadian cities. The gap between immigrants and non-immigrants is especially great for West Asian, East Asian, and Southeast Asian, Polish, Arab, Jewish, Chinese and Ukrainian residents. Such a gap is present for all groups except Spanish and Black/Caribbean where the rates of low income are very high for both immigrant and non-immigrant populations. In addition, there has been increasing spatial concentration of poverty low income whereby the gap

between wealthy and non-wealthy neighbourhoods have grown as have the concentration of ethnic groupings in neighbourhoods. In the US, such concentrations of low income ethnic groups have been associated with increasing mistrust, social breakdown and increases in crime and other health threatening indicators.

Visible minorities at risk. A recent report documents how Canadians of colour experience a persistent income gap, above average levels of living on low income, higher levels of unemployment and underemployment, and under-representation in higher paid jobs.[68] In addition, people of colour are disproportionately concentrated in part-time, temporary, and home-based work. This is especially the case for women. There is also – consistent with other research documenting the spatial concentration of low income – a much greater likelihood of people of colour living in substandard housing, and other instances of material deprivation, as well as higher risks of mental and physical health problems. In later sections that consider broader social effects of increasing numbers of low income people and the weakening of the social safety net, the interaction of these events as a further contributor to social exclusion is examined.

A Final Study That Illustrates the Role of Lower Income and Stress Upon Cardiovascular Health

A recent British study looked at an indicator of incipient coronary heart disease — coronary artery calcification — among relatively young men and women aged 30-40 years using electron beam computed tomography.[69] Being in the manual (lower income) social class was associated with more than twice the chance of calcification. Even after adjusting for age, sex, systolic blood pressure, high density lipoprotein cholesterol, low density lipoprotein cholesterol, triglycerides, alcohol consumption and body mass index, those in the lower income class were still twice as likely to have calcification of arteries. Additionally, the research supported the argument that income differences contribute to cardiovascular disease independent of risk behaviours. Their findings of physiological effects associated with status even among relatively young people led them to state:

> *Social class differences in coronary risk factors were generally small or non-existent in this cohort and explained little of the social class differences in coronary artery calcification... Interventions aimed at reducing inequalities in heart disease must include young adults and possibly children.*[69, p.1263]

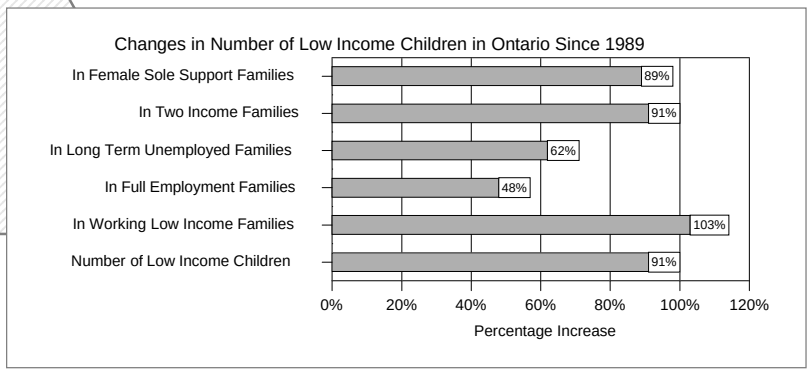
Message 4

Canadians Should Be Aware That the Directions in Which Canadian Society is Heading are Inconsistent with What Is Known about Reducing the Incidence of Cardiovascular Disease

By 1996, the incidence of low income among Canadians had risen to 18% from 16.6% in 1986 and the rate for children reached a 17-year peak of 21%.[71] Children living on low income has become a policy focus in Canada and by 1996, 1.5 million Canadian children lived on low incomes, up from 934,000 in 1989.[72, 73, 74] The 1996 Census data indicate that provincial rates of children on low incomes ranged from a low of 18.5% in Prince Edward Island to a high of 26.2% in Manitoba. Ontario, the wealthiest Canadian province in terms of Gross Personal Product, experienced an increase in low income from 11% in 1989 to 20.3% in 1996. In Toronto it is estimated that 38% of children are now living on low incomes. Figure 15 summarizes changes in the number of low-income children in Ontario since 1989. It should be noted that during this period, the average depth of poverty — the gap between the low income cut-offs and the levels of income received by low income people — increased 11%, social assistance benefits for parents with children declined 19%, and the number of rental housing starts has been reduced by 92%.[75] Similar data is available for Canada as a whole.[76]

It has become obvious that people on the low end of the income scale are cut off from the ongoing economic growth that most Canadians are enjoying. It is also obvious that in these times of economic prosperity and government surpluses that most governments are not yet prepared to address these problems seriously, nor are they prepared to ensure a reasonable level of support for low-income people either inside or outside of the paid labour force.[70, p.145]

Figure 14



In most cities the inequality indexes rose more or less continually between 1980 and 1995 with the exception of Ottawa-Hull and Vancouver. Quebec City also displayed relatively little increase in equality. The cities with the largest proportional increases included Edmonton, Calgary, Winnipeg, and Toronto, where the Theil index increased by between 50% and 60% during the 1980-1996 period and the Gini index by between 24% and 31%.[80, p.9]

The Growing Gap report details how by 1996, the 1973 21:1 ratio of pre-tax income between the richest 10% and the poorest 10% of families in Canada had increased to 314:1.[16] In Canada the potential health-related effects of economic inequality had been kept in check by the presence of strong social programs and the tax structure. Since 1993, social programs have been weakened and the after taxes gap has begun to grow; Statistics Canada reports that during the 1980's the real income of most Canadians had decreased and child poverty increased, yet the well-off in Canada became wealthier.[77]

Additionally, increasing incidence of low income has occurred in conjunction with and is exacerbated by the reduction of social safety nets.[8] In Canada, government policies of reducing eligibility for employment insurance and other benefits, weakening services and supports, and reducing the absolute level of these benefits have served to both increase the incidence of Canadians living on low income and remove the means by which those living on low incomes can sustain themselves. Documentation detailing how these changes have increased the number of low income families is available.[78]

This shift has occurred in part as a result of the reorganization of the income tax system by which the well-off have had their tax rates decreased, providing less resources for governments to provide social assistance benefits and social services to those in need.[10] Ontario has seen the greatest shift of income with drastic reductions in social assistance payments being combined with income tax cuts that primarily accrue benefit to the already wealthy.[16]

As noted earlier, a 1996 analysis revealed increases in the number of people living on low incomes in urban Canada with the greatest concentration of increases in the poorer neighbourhoods. This analysis was confirmed by a recent Statistics Canada study of neighbourhood income inequality from 1980 to 1995 in major Canadian cities.

The Theil and Gini indices are standard measures of income inequality with the Theil being more sensitive to changes at the bottom of the distribution. These changes reflect the finding that average family pre-tax income in all cities, except Ottawa-Hall, in the poorest neighbourhoods fell by 8-18% while in the highest income neighbourhoods, income rose by 2-10%. Calculations using after-tax income also show that income inequality increased in Toronto, Montreal and Vancouver by 8-10% using the Gini index and from 9-21% using the Theil index.

In Britain, such increases in income concentration have been associated with increases in rates of death among lower income people and widening gaps between citizens for a range of diseases.[39] Data from the 2001 census will examine the hypothesis that increasing numbers of low income people in Canada will lead to either a greater incidence of deaths from diseases including cardiovascular diseases or a weakening of the trend towards lower rates that have occurred over the past few decades.

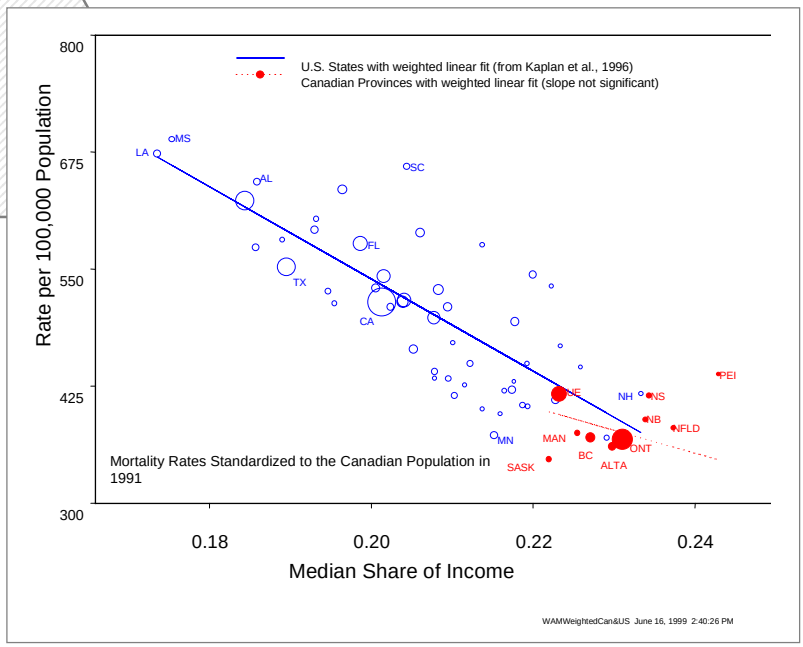
Implications for Cardiovascular Health of the Increases in Low Income and Income Inequality

As of 1991 Canadians enjoyed remarkably lower mortality rates and less economic inequality than our neighbours to the south.[81] As well, Canada has traditionally been in the mid-levels of nations in the percentage of tax revenues allocated to spending on the social safety net, an important determinant of health for all individuals, but especially those living on low incomes.[19,82] Since 1991, income inequality has increased in Canada and a move towards reduced spending on services and supports has occurred simultaneously with an increase in numbers of Canadians living on low incomes.[16]

A recent national analysis of low birth weights — a predictor of adult cardiovascular disease — in urban Canada found increasing income-related disparities in low birth weights.[83]

Figure 15

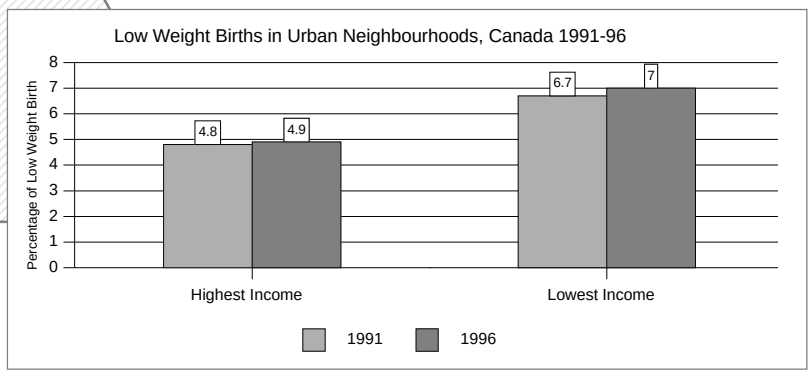
Differences Between Canada and the USA in Mortality and Income Inequality, 1991.



Relations between mortality rates and income distribution for working-age men (25-64 years of age) for US states and Canadian provinces (indicated by 2-letter postal symbols, with Canadian provinces in boldface). The size of each circle indicates relative population size. Mortality rates were standardized to the Canadian population in 1991. [Adapted, with permission of the *BMJ* Publishing Group, from Ross and Associates, *BMJ 2000*(7239):898-902.]

In 1991, the rates per income quintile ranged from 4.8% in the richest urban neighbourhoods to 6.7% in the poorest urban neighbourhoods. By 1996, the rate in the richest urban neighbourhoods had increased slightly to 4.9%, but the rates had increased to 7.0% in the poorest neighbourhoods.

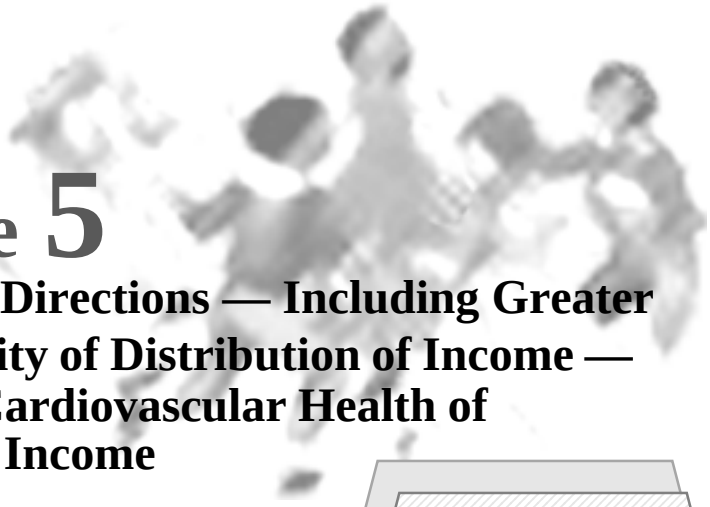
Figure 16



The rates also increased in every other quintile during that period. The rate difference between the lowest and highest income quintile neighbourhoods increased as did the rate ratio. The average birth weight of babies born in Canada's lowest income neighbourhoods is currently about 120 grams (one-quarter-pound) less than that of babies in the highest income neighbourhoods. Evidence now indicates that such effects are predictive of the development of cardiovascular disease in later life regardless of the adult status of the individual.[15]

Despite attempts at one level of government to raise the income of those living in these very difficult situations, policies at another level of government may take any potential benefit away.[16] The *National Council of Welfare* documents how much if not all of the Federal government's *National Tax Benefit* – specifically designed to assist children and families living on low incomes – has been clawed back by many provinces. In Ontario for instance, families on social assistance now receive less money than they did previously, prior to the *Benefit,* but the Federal government now pays a greater portion of it. Such policies then, end up doing little to raise the incomes of those living on low or very low incomes.

A recent report from Statistics Canada documents how wealth has become increasingly concentrated among fewer and fewer Canadians.[17] The highest 20% of family units increased in wealth by 39% in constant dollars from 1984-1999. But the lower 20% of Canadian family units showed no increase. Overall, the top 50% of families now own 94% of wealth while the bottom 50% owns only 6%. And the top 10% of family units are now worth $703,000 and own 53% of wealth while the bottom 10% owes $2,100 in debts and has no net positive wealth. Further analyses of the role government policies play in increasing low income and income inequality in Canada and how these threaten health are available.[18,19]



Message 5

These Directions — Including Greater Inequality of Distribution of Income — Undermine the Cardiovascular Health of Canadians at All Income Levels

It is not surprising then that societies with greater numbers of people with low incomes show poorer population health. Additionally, there is increasing evidence that societies with greater numbers of low income people begin to show a spillover effect by which the health of those not living on low incomes begins to deteriorate as well. Wilkinson brought together much of the research showing that societies with greater income inequality have higher mortality rates across the entire population.[9] For example, after decades of rapidly increasing economic inequality, the most well-off in Britain now have higher infant and adult male death rates than the less well-off in Sweden.[91] There are also findings that the well-off in economically unequal American communities have greater rates of health problems — including deaths from cardiovascular disease — than the well-off in relatively equal communities.[92]

Concerning these spillover effects, those living within the most unequal US states have 25% greater chance of reporting poor or fair health even after controls for household income, sex, race, education level, body mass, and smoking status. One extensive study found that the effects of unequal income distribution on

What matters in determining mortality and health in a society is less the overall wealth of that society and more how evenly wealth is distributed. The more equally wealth is distributed the better the health of that society.[89, p.985]

Canada's taxation and transfer policies result in considerably lower levels of income inequality and less variation which translates into considerably lower Canadian mortality rates.[90, p.9]

self-rated health was not limited to the lowest income groups; those in the middle income groups in states with the greatest inequalities in income rated themselves as having poorer health than those in middle income groups in states with the smallest inequalities.[93]

Another study found that the well-off in economically unequal American communities were showing health problems at greater rates than the well-off in relatively equal communities.[94] And state levels of inequality — controlling for absolute level of income — have been shown to predict body mass index, hypertension, and sedentarism, especially among the least well-off.[95] It has been estimated that the differences in death rates due to income differences among US cities is equal to the total number of deaths due to cardiovascular disease. Why would this be so?

The implications of persistent income and employment inequality, economic and social segregation, and political marginalization, are a looming crisis of social instability and political legitimacy for Canadian society. That is because social inequality exacerbates social instability and economic decline, and it may even lead to violence, as key institutions in society lose legitimacy among the affected communities. [67, p.4]

It has been argued that societies with greater income inequality begin to "disintegrate" -- that is, they show evidence of decreased social cohesion and increased individual hopelessness and apathy.[7] These are all precursors of increased illness and death. The case has also been made that income inequality contributes to the deterioration of what has been termed social capital, or the degree of social cohesion or citizen commitment to society.[96]

Greater incidence of lower income results from a process of increasing income inequality. This process leads directly to greater health problems among the population as greater numbers of people living on lower incomes face related health risks. In addition, the decreasing social capital and social cohesion associated with the growing gap in income among citizens itself becomes an additional threat to health and well-being. The distancing of citizens from each other leads to a weakening of social cohesion and a lack of common commitment to societal and governmental institutions. Such an argument was recently made in relation to the growing evidence of the social exclusion of visible minorities in Canada.

In Canada, one such institution that comes under threat is the health care system. Its sustainability is threatened due to the greater incidence of disease and ill health that results from more people on lower incomes becoming ill. Additionally, other institutions such as the education system and the social service system become strained as a result of increasing numbers of people whose lives are becoming more difficult as a result of harsher living conditions. And these threats apply to everyone in the society, not just those living on low incomes.

Another potential source of uncertainty that can affect the health of all citizens concerns reduced spending on social infrastructure including health and social services as well as education. Societies with high levels of low income and greater inequality are also the ones that spend less on social support for citizens through such services.[8] This lack of support for services increases insecurity among the entire population, thereby threatening the health of all citizens.

The Toronto Case: An Example of Societal Disintegration

It is beyond the scope of this report to consider the societal situation across Canada. But the case of Toronto illustrates how profound shifts in governmental approach to income distribution and the provision of services can influence population health.[97] Are there any signs of societal disintegration in Toronto, Canada's largest city? The Federation of Canadian Municipalities Quality of Life Reporting System was designed for use by large urban centres to monitor the state of social infrastructure.[98] The most recent report issued in March 2001 found that the following indicators for Toronto had declined in quality during the 1990's: community affordability (declined), cost of living (increased), spending more than 30% of income on shelter costs (increased from 32% of the population to 45%), and percentage of low income families (increased from 12% to 19%).

While there has been a recent decrease in low birth weight babies and infant mortality, the City of Toronto showed an increase, counter to overall Canadian trends, in premature mortality rate – death before the age of 75 years – during the period 1991 to 1997. There was also an increase from 1996 to 1998 in work hours lost to illness or disability among Toronto workers. These health declines were balanced however, by declines in hospital discharges during this period.

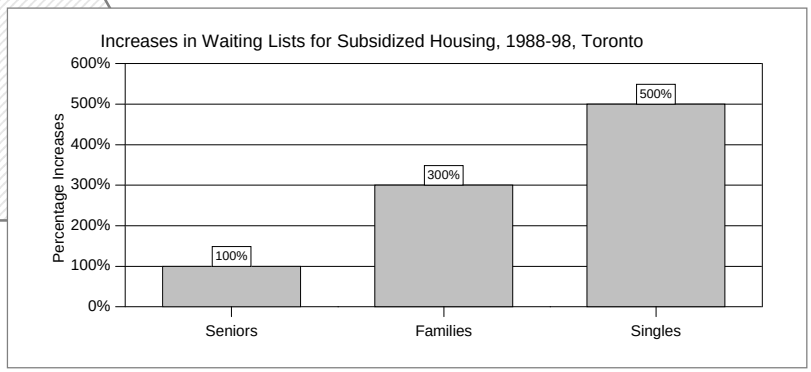
Results for indicators of community functioning in Toronto should also be of concern. Until 2000, Toronto had experienced a decade of decline in crime rates. In 2000 though, non-sexual assaults increased by 12%, homicides increased by 25% and sexual assaults increased by 3.3%.[99] This trend is similar to those seen in other nations that experience an increase in low income and greater income inequality. Federal election turnout declined from 67% in 1993 to 57% in 2000. Family incomes increased slightly during the period 1996

to1998 in Toronto but have yet to make up for the strong declines in income for those in the lower 30% of Toronto income earners from 1992-1996.

The *Vital Signs* report presented the following areas of concern related to well-being in Toronto during the 1990's: increasing income polarization (Toronto has shown the greatest recent increases in number of low income people and in the gap between rich and poor): increased waiting list for long-term care facilities, increased number of children living on low incomes and in poverty, and sharp rises in the number of children living in homeless shelters.[100]

Concerning the waiting lists for subsidized housing, there were increases in the waiting list for subsidized housing for families, seniors, and single people. Toronto had a net lost of 1,000 rental units in 2000 and a decline in vacancy rate to .6% from .9% the previous year.[101] Finally, there have been sharp rises in the number of evictions, corresponding to the profound reduction of levels of social assistance benefits, and the ending of construction of new social housing units and rental control in Ontario.

Figure 17



Food bank use in the Greater Toronto area is on the rise reaching 140,000 recipients by Spring, 2001. Of these people, 5% are 60-64 years of age and another 5% are over 65 years of age. Fifty eight percent are women, and 37% of users were heads of families with children. In all 50,400 of food bank recipients were children.[102] The weakening of government supports to citizens also applies to seniors. A recent analysis examined how government policies are threatening the health and well-being of Toronto seniors by reducing opportunities for recreation and education, and limiting access to affordable housing and accessible health care.[103, 104]

All of these indicators provide increasing evidence of the existence of social exclusion as more people are denied access to the resources and services expected to be available to Canadians. The tremendous increase in waiting lists for housing and long-term care are especially disturbing and illustrate how government policies serve to threaten health by reallocating resources away from low income people and making access to services more difficult for these and other citizens. Other Canadian cities and areas can carry out similar monitoring of overall societal indicators.

As of 1991, reliable overall health effects were not seen between Canadian provinces and cities as a function of degree of income inequality.[81] But since 1991 inequality in Canadian provinces and cities has increased, and social safety nets have been weakened. Whether increasing income inequality and the associated weakening of the social safety net adversely affects the cardiovascular health of the entire population should begin to become apparent in the near future.

Message 6

Solutions Are Available to Reduce the Number of Canadians Living on Low Incomes and Distribute Income More Fairly, Thereby Reducing Social Exclusion, and Helping to Improve the Cardiovascular Health of Canadians

The argument presented in *Inequality is Bad for Our Hearts: Why Low Income and Social Exclusion are Major Causes of Heart Disease in Canada* has been that low income is a major cause of incidence of, and death from, cardiovascular disease among Canadians. The process by which low income leads to cardiovascular disease is through the social exclusion of many Canadians from full participation in Canadian life. This process is associated with growing numbers of citizens experiencing material deprivation and excessive levels of stress and insecurity, and adopting unhealthy behaviours.

In Toronto today, social and economic inequities must be reduced by supporting those most in need while protecting the health of the population as a whole. We can only make a difference in the overall health of all our citizens if we also make gains in those communities where health outcomes are likely to be much worse.[105, p.1]

The policy recommendations presented here are of three kinds. The first and most important set of recommendations is concerned with reducing the incidence of low income among Canadians. The second set of recommendations is concerned with reducing the incidence of social exclusion. The third set involves restoring the supports by which Canadians have traditionally been assisted in their navigation of the life course. These latter recommendations are about restoring the services and resources that provide all Canadians with the security that they had come to expect and which have demonstrated their worth in supporting the health of Canadian citizens.

The growing gap between rich and poor has not been ordained by extraterrestrial beings. It has been created by the policies of governments: taxation, training, investment in children and their education, modernization of businesses, transfer payments, minimum wages and health benefits, capital availability, support for green industries, encouragement of labour unions, attention to infrastructure and technical assistance to entrepreneurs, among others.[106, p.2]

Policies to Reduce the Incidence of Low Income Among Canadians

Numerous suggestions for improving health by reducing the income gap have recently appeared in publications from Canada, the United States, and the United Kingdom. The most important action is to increase the incomes of those living on low incomes.[39] Increasing the incomes of those most in need would both reduce differences in income among citizens and reduce the incidence of illness and death. One likely outcome would also be a reduction in the incidence of and death from cardiovascular disease.

Over the last 25 years, Canada has been more equal in its distribution of income than the USA — though much less equal than some European nations whose citizens live longer and healthier lives than do Canadians. A recent publication by the US-based National Policy Association praised the Canadian social policy tradition of transfer payments, strong services, and other policies that promote equalization of income as a model for improving the health of citizens. Yet the Canadian policies praised by *Improving Health: It Doesn't Take a Revolution* are exactly the ones under threat in the current policy environment. Their key recommendation, though directed to US policymakers, bears repeating for their counterparts in Canada:

> *Create a more equal economic environment through tax, transfer, and employment policies. Examples include increases in the minimum wage, unemployment compensation, and welfare payments where they are low.*[90, p.vi.]

In Canada, these same — and some additional recommendations specific to the Canadian scene — appeared in the report *The Growing Gap: A Report on Growing Inequality Between the Rich and Poor in Canada*. Based on these and other publications that have considered the health implications of increasing numbers of Canadians living on low income, *Inequality is Bad for Our Hearts: Why Low Income and Social Exclusion are Major Causes of Heart Disease in Canada* recommends the following actions be undertaken by Canadian policymakers:

1. Raise the minimum wage to a living wage. Canadians working full time at current Canadian minimum wage levels do not even come close to the current Statistics Canada low income cut-off levels. Additionally, in many provinces, minimum wages have not been adjusted for increased living costs or the impact of inflation for some time.

2. Improving pay equity. Low income is increasingly becoming concentrated among Canadian women. Women who are sole parents are especially disadvantaged with associated health consequences for both them and their children. Traditional women's occupations continue to pay only a fraction of those of men. Reducing the salary differentials between these occupations would go a long way to assuring the greater health of many Canadian families who are currently at risk.

Society as a whole must unite to improve the conditions into which children born and into which they spend their formative years. Families must have at their disposal enough income to meet their basic needs... For those who, despite very effort, will remain outside the job market, we must make sure that our social systems of income support are adequate, especially so that children will have the minimally decent conditions required for their development.[109, p.64]

3. Restoring and improving income supports for those unable to gain employment. Social assistance rates do not come close to allowing many recipients to meet basic needs and participate in Canadian society. In Ontario the profound reductions in social assistance benefits has led to an alarming increase in homelessness and use of food banks. And most users of food banks are families whose children are especially at risk for poor health outcomes. Other provinces have not reduced benefits to such a drastic extent as

> *A society which nurtures people's skills and abilities throughout the population, which provides economic opportunities for all, and fosters a cohesive and integrated social environment would do more for health than curative medical services are able to.*[109, p.12]

in Ontario, yet few have raised them to levels that come close to lifting people out of very difficult life circumstances.

4. Providing a guaranteed minimum income. Since the health effects of low income are well documented, it may be more cost-effective to provide Canadians with a basic minimum income in order to reduce the overall incidence of disease as well as various other social ills such as crime and poor school performance. A variety of possible schemes exist and recent analyses of the benefits of such programs are available.[107, 108]

Such actions would go a long way in providing lower income Canadians with the means to meet their basic needs and participate in Canadian society in more meaningful ways. But while providing increased income to those with lower incomes is an important means of improving health, it will not necessarily lead to greater social inclusion unless other steps are instituted by Canadian policy makers.

Policies to Reduce Social Exclusion

Numerous analyses have considered how social exclusion comes about and the role it plays in producing disease. Recommendations such as the one presented for reducing low income are essential in decreasing social exclusion. *Inequality is Bad for Our Hearts: Why Low Income and Social Exclusion are Major Causes of Heart Disease in Canada* has drawn upon a number of analyses to recommend the following — in addition to reducing low income — steps to reduce social exclusion in Canada.[62]

1. Enforcing legislation that protects the rights of minority groups, particularly concerning employment rights and anti-discrimination. New Canadians and visible minorities are especially at risk for low income and social exclusion.

2. Creating policies that will allow families to have sufficient income to provide their children with the means of attaining healthy development. The provision of these resources will reduce the proportion of children born into and living on poverty which will have short-term as well as long-term effects on health.

3. Reducing inequalities in income and wealth within population, through progressive taxation of income and inherited wealth. Canada is one of the few industrialized nations with no inheritance tax. In addition, the income tax rates for the very wealthy are lower than many other industrialized nations.

4. Assuring access to educational, training, and employment opportunities, especially for those such as the long-term unemployed.

5. Removing barriers to health and social services which will involve understanding where and why such barriers exist.

6. Providing adequate follow up support for those leaving institutional care.

7. Creating housing policies that provide enough affordable housing of reasonable standard.

8. Instituting employment policies that preserve and create jobs.

9. Directing attention to the health needs of immigrants and paying attention to the unfavourable socioeconomic position of many groups and the particular difficulties many New Canadians face in accessing health and other care services.

Policies to Restore and Enhance Canada's Social Infrastructure

Federal program spending as a percentage of Gross Domestic product has been decreasing since 1987 such that current federal spending is at 1950 levels. These decreases have occurred in tandem with decreases in tax revenues resulting from modifications to the tax structure that have favored the well-off. Much of this process involves municipal governments having to cope with the effects of reduced federal and provincial allocations to local infrastructure. Indeed, many cities are looking into attaining Charter status in order to have their voices heard by the other levels of government. Analyses of the effects of reducing public expenditure upon community infrastructures are only beginning, but it has been has argued that one way that reduced spending affects health is through reduction of services. In two community studies recently carried out in Toronto, the profound importance of community agencies and resources, and the effects of cutbacks were apparent.[110, 111] In *Dismantling the State: Downsizing to Disaster*, Stewart considers the potential impact of reduced government spending on social infrastructure upon Canadian well-being.[112] The concept of universality is an important cornerstone of policies designed to promote social inclusion. Programs that apply to all are more likely to engender political support from the public. It is recommended that the federal and provincial governments:

1. Restore health and service program spending to the average level of OECD nations. Federal spending on programs as a percentage of Gross Domestic Product is among the lowest of Organization for Economic Cooperation and Development nations. *The Growing Gap* report details that such spending is now at 1950s levels.

2. Develop a national housing strategy and allocate an additional 1% of federal spending for affordable housing.

3. Provide a national day care program. Such a program – long promised by the Federal government – would help many women to enter the work force and reduce the stress associated with carrying out homemaking and working roles.

4. Provide a national pharmacare program. Such a program would assure that those on low incomes and on social assistance would have access to needed medication. In addition, such a program would actually reduce health care and drug costs as it improved the health of Canadians.[113]

5. Restore corporate tax levels to the North American average in order to provide funds to provide health-enhancing supports to Canadians.

6. Restore eligibility and level of employment benefits to previous levels.

7. Require that provincial social assistance programs are accessible and funded at levels to assure health.

8. Assure that supports are available to support Canadians through the critical life transitions identified earlier.

A Call To Action

Action to improve cardiovascular heath is required in four areas. First, there is a need to communicate what is known about the links of low income with cardiovascular disease. Second, research into the causes of cardiovascular disease must consider the role of low income. Third, those concerned with improving cardiovascular health must call upon policymakers at all levels of government to implement polices that will reduce the incidence of low income and social exclusion. Fourth, policymakers must invest in the social infrastructure that helps support Canadians through crucial life transitions.

Communicating the Links Between Low Income, Income Inequality and Cardiovascular Disease

The findings of the strong relationship between societal factors such as low income and social exclusion and cardiovascular disease need to be better communicated to the various sectors concerned with cardiovascular health. These sectors include public health, health care, and foundations and research funding agencies focused on cardiovascular health. Most importantly, they need to be communicated to policymakers who create the policies that directly lead to how income is distributed and whether social infrastructure is supported or weakened. The social development and social welfare sectors — representing those who have traditionally been most concerned about increases in low income and the distribution of wealth — would benefit from being able to illustrate how poorly thought out social policies directly impact Canadians' cardiovascular health.

Canadians need to be made aware of the threats to their cardiovascular health by policies that increase the number of Canadians living on low incomes and that increase the gap between rich and poor. There has been little public discussion about low income and its effects on cardiovascular health. This needs to change. The media has been particularly slow in reporting how low income and income inequality affects cardiovascular health. It is not particularly clear why this has been the case. One reason may be the reluctance of health care and public health care workers to highlight these issues because they feel they lack the skills and knowledge to carry out poverty-related community development and policy analysis. Additionally, it was suggested at the 91st Canadian Public Health Association Conference that "some practitioners and policy-

makers fear that they will experience negative repercussions in their places of employment if they engage in political strategies addressing poverty."[114, p.183]

Also of significance is the media's continuing tendency to limit health issues to biomedical causes and treatments.[115] Clearly, there is a need to educate media medical and health reporters of recent findings concerning the determinants of health and how low income and income inequality contribute to disease.

Members of all of the sectors concerned with economic inequality and poverty effects upon health must petition their local public health departments to address these issues. Most departments and units in Canada are led by citizen boards. The information increasingly becoming available must be presented to them in a manner that will lead to increased understanding of these issues and increased willingness to move on such issues.

Increase Research into the Social Determinants of Cardiovascular Disease

There has been relatively little Canadian research attention directed to the roles that social determinants of health such as income play in cardiovascular disease. This is in stark contrast to the situation in the United Kingdom where extensive data gathering, concerning income, social class and disease, routinely occurs and allows for informed policy debate concerning these issues. Funds need to be directed towards research that would carefully document the effects of changing income and other social policies upon the cardiovascular health of Canadians.

In addition, ongoing policy research that assesses the effects of economic and social policy changes on health needs to be carried out. Such research must provide public impact statements as changes in policy are considered. The recommendations of the *Acheson Report on Health Inequalities* must be instituted by policymakers in Canada:

> *We recommend that as part of health impact assessment, all policies likely to have a direct or indirect impact on health should be evaluated in terms of their impact on health inequalities, and should be formulated in such a way that by favouring the less well off they will, wherever possible, reduce such inequalities.*[28, p.120]

Call Upon Policymakers at All Levels of Government to Implement Polices That Will Reduce the Incidence of Low Income and Social Exclusion

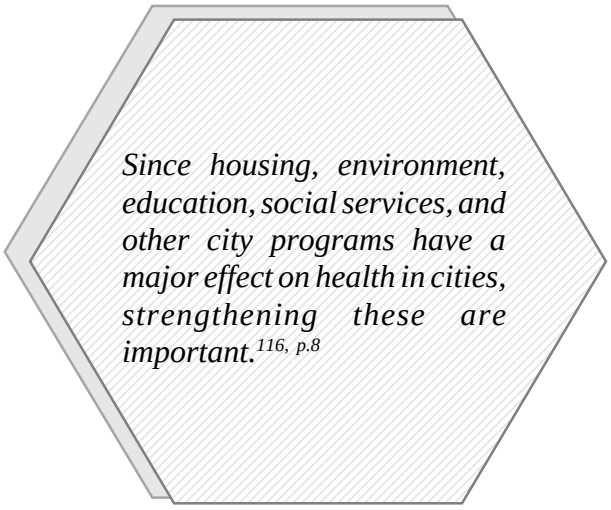
Polls have consistently indicated that most Canadians would prefer that governments address issues of low income and poverty rather than provide further tax cuts.

Additionally, Canadians are increasingly concerned with the deterioration of social infrastructure and social services. Efforts to have governments respond to these wishes will be further enhanced by pointing out the health-related implications for all Canadians of failing to do so.

Focus on restoring social assistance benefits to levels that will provide the conditions necessary for healthy development and raising the minimum wage to a living wage would be important first steps. The consequences for Canadian society of failing to take such action should be emphasized to elected representatives and policymakers at all levels of government.

Lobby Governments To Maintain the Community and Service Structures that Help to Maintain Canadians' Health and Well-Being

The work being carried out by the Federation of Canadian Municipalities on quality of life indicators should be linked to the increasing evidence concerning the role of social infrastructure in supporting health. Advocacy and lobbying activities can be carried out to highlight the importance of infrastructure and to detail how policies that increase economic inequality both weaken these infrastructures and help to produce poverty and poor health.



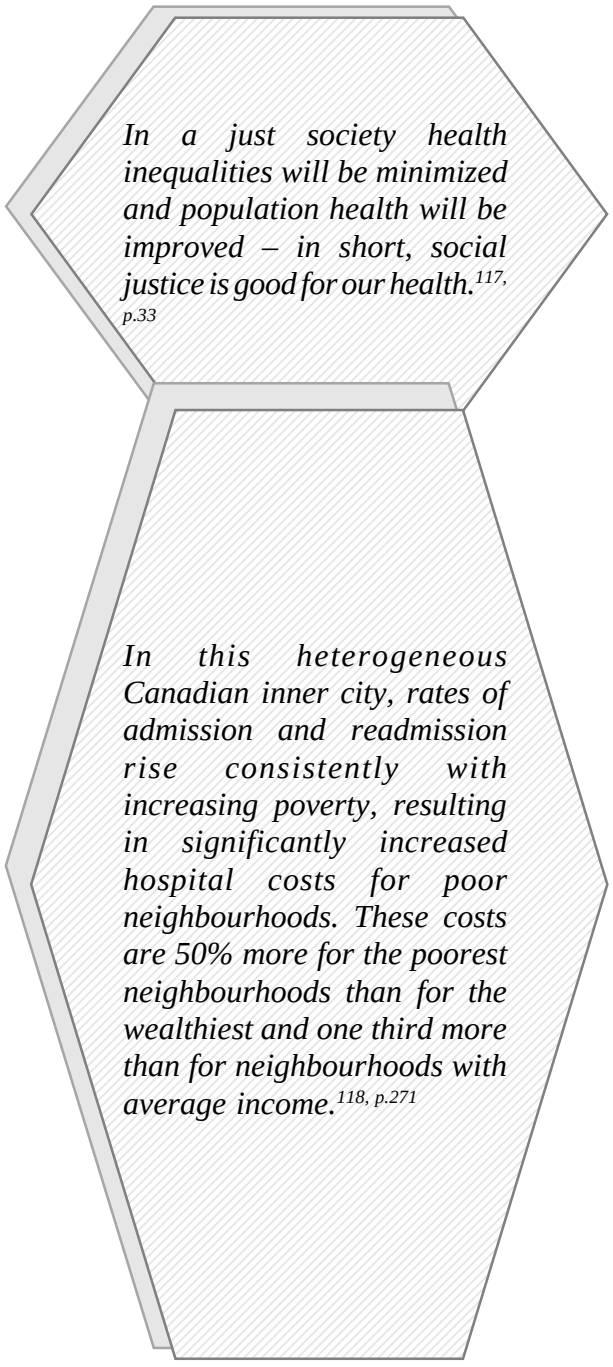
Conclusion
Adding up the Costs

The main purpose of this report has been to identify the links between low income and social exclusion and the development of cardiovascular disease. This has been done by demonstrating how low income, when combined with government policies that limit access to basic needs and resources required for health, contribute to the cardiovascular health threatening process of social exclusion.

To speak of low income and social exclusion as causes of cardiovascular disease, certain criteria have had to be met. It has been demonstrated that low income and social exclusion occur prior to the development of cardiovascular disease. The processes that lead to the development of cardiovascular disease have been outlined. And these processes have been placed within a causal network that includes direct and indirect effects of low income and social exclusion on the development of cardiovascular disease.

As noted earlier, the most recent detailed analysis of the role that low income plays in death from cardiovascular and other diseases is now available for the year 1996. Overall, 23% of premature years of life lost prior to age 75 to Canadians was related to income differences. This is a very high percentage comparable to total years lost due to cardiovascular disease, injuries and cancers. If the differences in all

Rather than relying on providing more special needs classes in schools, more prisons and police, more social workers and health services, more counsellors, and therapists, we have to tackle at root, some of the main causes of the problems in which they [citizens] attempt to cope. Even if we could afford vast armies of counsellors and community development workers with a small team for every street, there is no reason to think that it is possible to separate the structural causes from their social symptoms.[9, p.230.]



illness related to income did not exist the burden of illness would be reduced by a proportion greater than ALL years lost to cardiovascular disease.

Of these years lost related to income differences, 22% of these are caused by cardiovascular disease, the highest figure of any cause of death. Overall 6,366 lives per year were prematurely lost to cardiovascular disease related to income differences in Canada in 1996. And since 1996 the number of Canadians living on low incomes has increased.

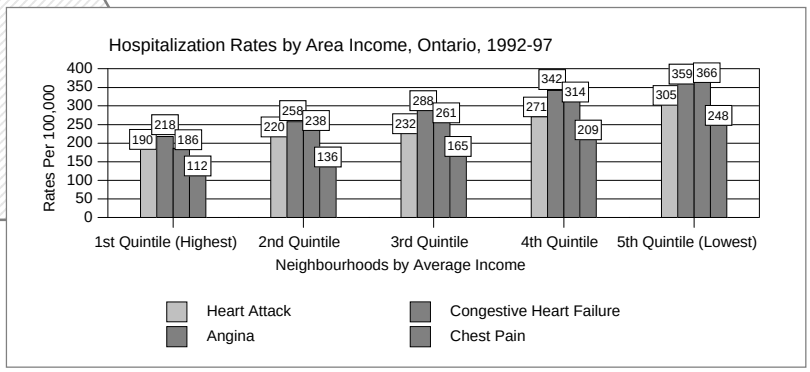
Very little work has been done to calculate the exact costs to the health care system of income-related differences in cardiovascular disease. One of the very few analyses of the effects of low income and social exclusion upon health care costs was carried out in Southeast Toronto.[118] A comparison was made between hospital admissions and use and associated costs for neighbourhoods that differed in income level. Individuals admitted from the highest income quintile of neighbourhoods averaged 60 per 1,000 population. However, the admission rate was 85 per 1,000 or almost 50% higher for those residing in the lowest income quintile of neighbourhoods.

Cardiovascular diseases are the ones most associated with income differences. It can be hypothesized that excess costs associated with hospital use for cardiovascular disease of low income people are probably similar to those for hospital use in general — that is, about 50%.

Actually, the data that are available suggests that the annual cardiovascular health costs associated with the lowest income quintile of citizens compared to the highest income

quintile may actually be higher than the 50% figure found by the Toronto researchers. The *ICES Atlas for Cardiovascular Health and Services* tracked hospitalization rates for heart attack, congestive heart failure, angina, and chest pains in Ontario from 1992/93 until 1996/1997.[119] The place of residence for each patient was used to identify them as being from neighbourhoods that were ranked from highest to lowest in income (Figure 18). The hospitalization rates for the lowest income quintile of neighbourhoods were 69% higher for heart attacks, 65% higher for congestive heart failure, 97% higher for angina, and 121% higher for chest pain than those in the highest income quintile of neighbourhoods.

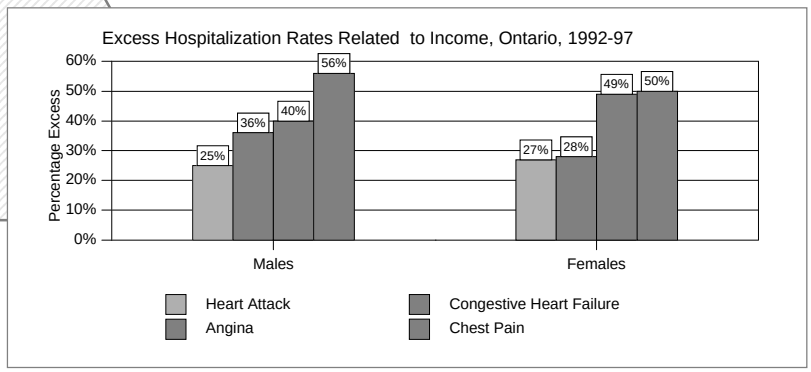
Figure 18



A review of the literature was unable to find any published analysis that calculated the overall excess costs for cardiovascular disease associated with income differences. Rough figures can, however, be calculated for excess hospitalization rates associated with income differences for Ontario residents for these ailments. If the highest income quintile of neighbourhoods is used as the baseline group — the levels of health to which we can reasonably aspire — then an estimate of excess cardiovascular disease associated with income differences can be calculated.

To illustrate, the overall age/sex specific hospitalization rates in Ontario for men and women for heart attacks from 1992-1997 was 240/100,000. The specific rate for those residents in the highest income quintile of neighbourhoods was 190/100,000. The difference of 50/100,000 between the possible rate and the observed overall rate represents a 26% excess over the baseline rate for the highest income residents of Ontario. Using this process, observed hospitalization rates for the Ontario population related to income differences represent a 26% excess for heart attacks, 24% for congestive heart failure, 44% for angina, and 53% for chest pain. Figure 19 shows the percentage excess for these four ailments for Ontario men and women related to income differences calculated in this manner.

Figure 19



A simple approximation of the dollar cost to Canadians of income differences related to cardiovascular disease can therefore be calculated. Since it is estimated that 23.7% of premature deaths from cardiovascular disease can be attributed to income differences, this figure can be used as a conservative — as demonstrated by the *ICES* data on income-related differences in hospitalization — estimate of excess burden in cardiovascular disease costs related to income differences. Lowering even this estimate to a 20% excess burden, it can be estimated that the cost to Canada of cardiovascular illness related to income differences is at least 20% of the total cost of $20 billion per year or $4 billion a year.

Since some people suffering heart attacks die before reaching hospital, this figure may overestimate the medical cost burden to Canada of cardiovascular disease among people with low income. But the figure may be an underestimate as the social costs to Canada of low income people dying at earlier ages is high. Also, the 20% extra burden figure may also be an underestimate of true costs because of the rapidly increasing expenses of new technologies for treating heart disease. Clearly, there is a need for careful study of the costs of income-related differences in the incidence of cardiovascular disease.

The prevention of heart disease is a matter of clinical, social, and economic policy. Treatment, preventive care, community health promotion and healthy social policy are interlocking parts of a single strategy for better health.[120, p.82]

These excess costs associated with low income and income inequality are just for cardiovascular disease. It should be recalled that income differences are also related to the incidence of premature deaths and premature

years of life lost due to injuries, cancers, and a variety of other diseases such as diabetes. The true dollar cost of income differences in health between the wealthy, middle class, and poor in Canada is tremendous.

These costs related to income differences affect our economic productivity, the sustainability of our health and social service systems, and the quality of life of our cities and communities. In addition, increasing the incidence of low income and social exclusion creates the conditions required for cardiovascular disease to develop. Increasing the number of low income people in Canada and providing the conditions that lead to social exclusion will increase the incidence of cardiovascular and other diseases, increase health care costs, and threaten the civil society that Canadians have come to expect.

Canada is at a choice point. One alternative is to continue on the path of increasing the income gap among Canadians and failing to address the issues that increase social exclusion and cause disease. The effects of this approach are well described by one US observer:

> *In the U.S., government policies of the past 20 years have promoted, encouraged and celebrated inequality. These are choices that we, as a society, have made. Now one half of our society is afraid of the other half, and the gap between us is expanding. Our health is not the only thing in danger.*[106, p.2]

The alternative vision is that of an inclusive and caring Canada. The kind of vision outlined by Canadian-born physician Stephen Bezruchka:

> *The policies that Canada has developed to improve population health reflects its more egalitarian structure. Examples include various tax and economic transfer policies that help to limit income differences across the country, as well as provision of important social services... If a healthy population is the goal, we must enter the political arena and fight to maintain the social contract that has sustained Canada as one of the world leaders in health.*[121, p.1702-1703]

Appendix

A Brief Summary of Canadian Federal and Selected Provincial Government Statements on The Role of Income in Health and Disease

Federal Government

In 1974, the Health Canada document *A New Perspective on the Health of Canadians* identified the environment as an important health determinant.[121] The report recognized that: *... on the subject of environment, the number of economically deprived Canadians is still high, resulting in lack of adequate housing and insufficient or inadequate housing.* [p.18]

In 1986 the Health Canada document *Achieving Health for All: A Framework for Health Promotion* stated: *The first challenge we face is to find ways of reducing inequities in the health of low- versus high-income groups in Canada.* It was recognized that health problems are more common among low income groups and that: *Poverty affects over half of single-parent families... more than one million children in Canada are poor.* The importance of the social determinants of health was stressed:

> *All policies which have a direct bearing on health need to be coordinated. The list is long and includes, among others, income security, employment, education, housing, business, agriculture, transportation, justice and technology.*[123, p.10]

In 1999 the Health Canada document: *Taking Action on Population Health: A Position Paper For Health Promotion and Programs Branch Staff* stressed the importance of income and social status as determinants of health:

> *There is strong evidence indicating that factors outside the health care system significantly affect health. These "determinants of health" include income and social status, social support networks, education, employment and working conditions, physical environments, social environments, biology and genetic endowment, personal health practices and coping skills, healthy child development, health services, gender and culture.*[124, p.1]

The Statistical Report on the Health of Canadians was released in September, 1999. It was commissioned by the *Federal, Provincial and Territorial Advisory Committee on Population Health* to provide a comprehensive and detailed statistical overview of the health status of Canadians and the major determinants of that status. The section of the report devoted to *The Social and Economic Environment* begins with the statement:

> *In the case of poverty, unemployment, stress, and violence, the influence on health is direct, negative and often shocking for a country as wealthy and as highly regarded as Canada.*[125. p.13]

Provincial Governments

Most provinces also recognize the key role of income on health. Five illustrations are presented. Saskatchewan's document *A Population Health Framework for Saskatchewan Health Districts* contains the statement:

> *While the list of these determinants of health is long and potentially overwhelming, consensus is growing that one general factor may be particularly important, and that is economic inequality. What this means is that the healthiest societies are those in which there is a relatively small gap between the best-off and the worst-off members.*[126, p.5]

The Prince Edward Island *Health Promotion Framework* asks the question *What makes and keeps us healthy?* Its first determinant of health is income and social status:

> *People are healthiest when they live in a society that can afford to meet everybody's basic needs. Once basic needs are met, people's health is also affected by how big a difference there is between the richest and poorest members of the society. When there are big differences in income in a society, there are also big differences in social status. This affects health because people with lower status have less control over their lives and fewer choices for themselves.*[127, p2]

The Ontario report entitled *Wealth and Health, Health and Wealth* states:

> *We conclude that efforts to create health in Ontario will not come from a narrow focus; both social and behavioural determinants must be addressed. Two sets of responses are required: policies that reduce poverty and policies that reduce the effects of poverty.*[128, p.1]

The Provincial Health Officer of British Columbia wrote:

> *There is a close relationship between income and health. An adequate income is associated with poor health status. Certainly, not all people with low incomes have poor health, just as not all people in well-off families have excellent health. But studies in Canada and elsewhere consistently show that, on average, people at each step on the income scale are healthier than those on the step below.*[129, p.26]

The government of Manitoba in a sustainability document indicates that:

> *The determinants of health are the key factors influencing health. They include healthy child development, personal health practices and coping skills, physical environment, employment/working conditions, education, income/socio-economic status, biology and genetic endowment, and access to quality health care services.* [130, p.1]

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