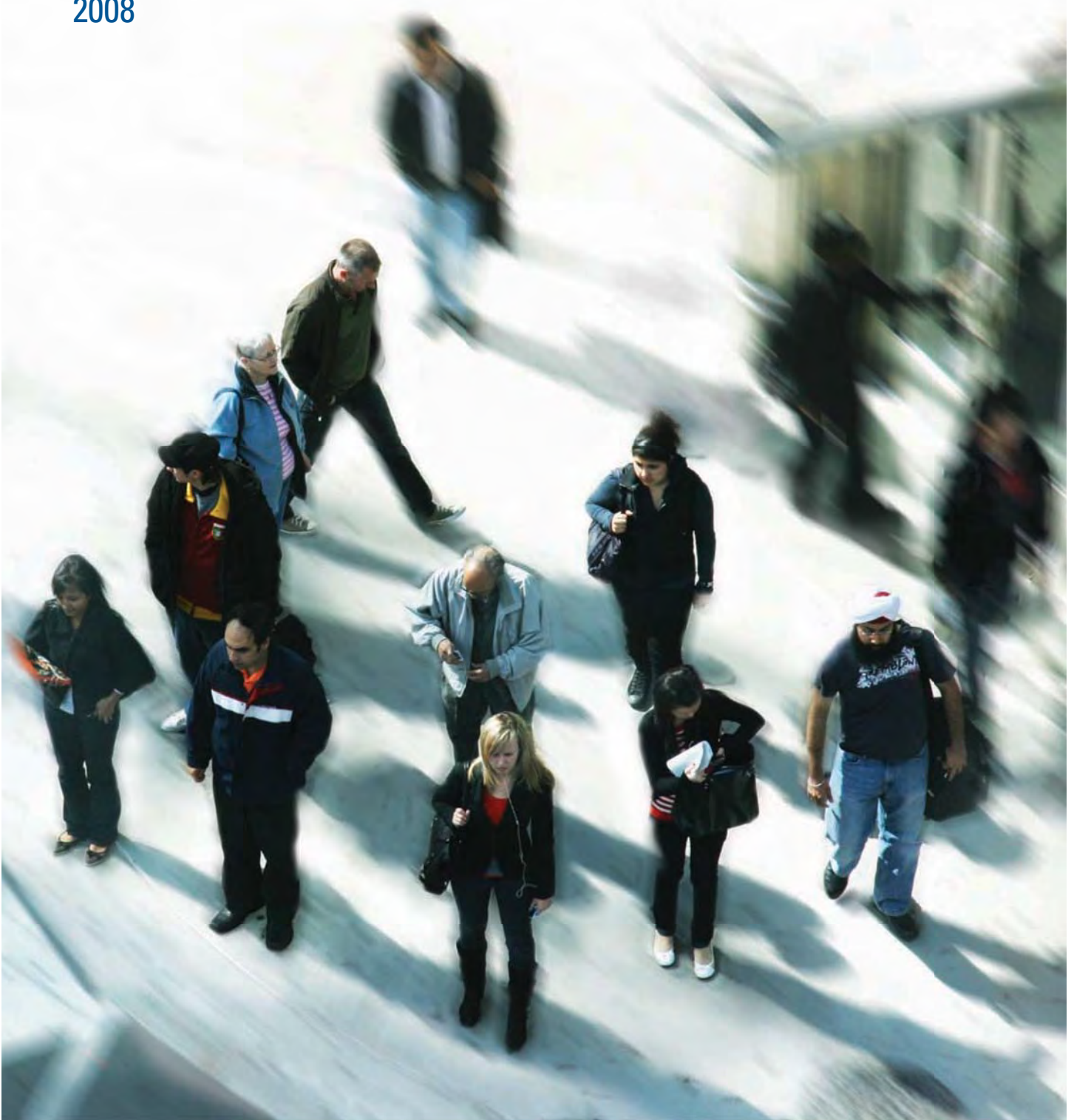


The Unequal City:

Income and Health Inequalities in Toronto

2008



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 **TORONTO** Public Health

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Distribution:

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Executive Summary

This report presents new data for Toronto showing a clear link between health and income across our city. Those areas of Toronto that have a greater proportion of people living with low income experience greater risk factors for illness, higher rates of disease, and death at an earlier age. Areas with a smaller proportion of low income - areas that are relatively richer - have better health. These differences are referred to as health inequalities.

A number of the health inequalities in this report are cause for concern. For example, when compared to residents of high income areas,

- lung cancer incidence was 1.5 times higher for males in the lowest income quintile;
- the gonorrhoea rate among female youth was 3.5 times higher in the lowest income quintile; and
- the percentage of female adults whose last visit to the dentist was more than three years ago was about 4 times greater in the lowest income group.

The report also shows that males in the highest income areas were expected to live 4.5 years longer than males in the lowest income areas. The difference for females was 2.0 years.

The relationship between income and health in Toronto exists for a wide range of health indicators and is consistent with trends found in other jurisdictions. While the picture that emerges from the data is one of significant inequality, for reasons explained in the report, the true differences in health associated with income in Toronto are likely even greater than those documented here.

While the focus in this report is on income, health inequalities are also associated with other social determinants such as racialization, immigration and settlement status, and education. These determinants are linked to and interact with income to influence health. Evidence showing the racialization of poverty in Toronto is one important example of other related factors.

The relationship between income and health in Toronto is not just about the extremes of wealth and poverty. As the data in this report show, for most indicators there is a continuous gradient of health in relation to income - health status improves through each income increment. Toronto residents who live in high income areas are healthier than those living in middle income areas, and those who live in middle income areas are healthier than those living in low income areas. This means that health inequalities affect all Torontonians.

One way of illustrating the impact of health inequalities on the overall health of Toronto's population is to calculate the effect if everyone was as healthy as those with the highest income and best health. Based on the methods used, this would result in:

- nearly 1,100 (18%) fewer premature deaths;
- about 1,300 (20%) fewer low birth weight babies;
- about 1,600 (30%) more children ready to learn at school entry;
- nearly 1,000 (46%) fewer teen pregnancies; and
- more than 30,000 (about 13%) fewer male smokers.

Recent trends toward increasing polarization of income distribution in Toronto raise concerns that the health inequalities documented here may lead to a decline in the overall health status of the city's population.

The health inequalities documented in this report should be seen as unacceptable in a society that places a high value on equal access to good health. These differences represent a missed opportunity to achieve better health for the city as a whole. The reduction of income inequality and measures to reduce poverty should be pursued as priority health strategies. Services such as those provided by Toronto Public Health should be designed to mitigate the impact of income on health by ensuring equal access to universal services and by focusing on reaching people with greater health needs. More information about health inequalities in Toronto must be gathered and analyzed to help guide service delivery, to monitor trends, and to evaluate the effectiveness of interventions.

Changing the patterns of health and income that are described in this report is not the purview of any single agency or level of government. Toronto Public Health will advocate for urgent and comprehensive public policy responses and will collaborate with many others to continue to address the health inequalities that are linked to income and other determinants of health.

Recommendations:

1. The Medical Officer of Health report regularly to the Board of Health on key health inequality indicators for the City of Toronto;
2. The Medical Officer of Health consult with community partners and the Board of Health to incorporate appropriate strategies to reduce health inequalities in the next Toronto Public Health Strategic Plan (2010-2014) and annual service plans, including measures to monitor progress on reducing health inequalities;
3. The Toronto Board of Health send this report to the Premier of Ontario and strongly urge the government to maintain its stated commitment to poverty reduction in Ontario as a public health measure; and
4. The Medical Officer of Health review Toronto Public Health data collection practices and collaborate with partners to strengthen the monitoring of the impact of social determinants on health, including racialization, immigration and settlement status, education and income.

1. Introduction

In 1929, Toronto's Medical Officer of Health, Charles Hastings, wrote:

Every nation that permits people to remain under the fetters of preventable disease, and permits social conditions to exist that make it impossible for them to be properly fed, clothed and housed, so as to maintain a high degree of resistance and physical fitness, and that endorses a wage that does not afford sufficient revenue for the home, a revenue that will make possible the development of a sound mind and body, is trampling a primary principle of democracy under its feet.¹

In the public health language of the day, Hastings was articulating a social determinants approach to health in a rapidly changing urban setting, defining the differences in health status between groups that can be attributed to factors other than biology. The health of Toronto's population in 2008 has improved dramatically since Hastings' era, but as this report demonstrates, health inequalities remain a fundamental feature of the city's health status.

Toronto Public Health defines the reduction of health inequalities as part of its core Vision and Mission.

Vision

A healthy city where all people enjoy the highest level of health and well being.

Mission

Toronto Public Health improves the health of the whole population and reduces health inequalities.

This report describes fifteen key indicators of health inequality by income, providing a reference point from which to engage community partners and the public in efforts to better understand these inequalities and to take action to reduce them.

Current understanding of, and scientific inquiry into, the social causes of health and illness can be traced back through a period of forty years to numerous ground-breaking studies, including the famous "Whitehall Study". For ten years beginning in 1967 this British study followed 17,000 male civil servants to determine if there was a correlation between their employment grade (level of pay and authority) and their health. The data showed higher mortality rates due to coronary heart disease, as well as other causes, in men from lower employment grades compared to those in higher employment grades.²

This study provided one of the first glimpses into what has become a central pillar in our understanding of health inequalities: the social gradient effect. Researchers observed that there was not only a clear link between employment grade and mortality, but also that the results followed a social gradient - the highest rates of mortality were found among those in the lowest employment grade, but dropped steadily as an employee's grade (and level of income and authority) increased. There was a steady, inverse relationship between employment grade and health, up and down this gradient.

Other comparative health studies over time accumulated evidence supporting the gradient effect as a key aspect of health inequalities. Canadian studies have identified this social gradient for income and health when measuring infant mortality rates, life expectancy at birth and age-standardized mortality rates across Canada.³ A recent study of mortality rates across Canada, from 1991-2001, has found that rates increased gradually as socio-economic status decreased, regardless of whether status was determined by education, occupation or income.⁴

Evidence of the social gradient of health has prompted a reconsideration of the notion that only the poor suffer ill health as a result of their social status. It has shown that, since every member of a population can be found on the social gradient, health inequalities affect everyone.

Health inequality relates to differences in health which are linked to social determinants. *Health inequity*, on the other hand, refers to differences which constitute a social injustice because the *inequalities* result from preventable causes - remediable, systemic barriers and forms of social exclusion.

The International Society for Equity in Health (ISEqH) has offered a definition of health equity which has gained broad support:

Equity in health is the absence of systematic and potentially remediable differences in one or more aspects of health across socially, demographically, or geographically defined populations or population subgroups.⁵

Based on longstanding experience in delivering services in the community and an understanding of the evidence gathered by researchers in many jurisdictions, Toronto Public Health has adopted directions and goals for its work that are grounded in the view that health inequalities linked to income *are* inequitable. Our mission to reduce health inequalities is carried forward through this health equity, social determinants approach.

This report comes at a time of growing consensus around the world of the need for local and national stakeholders to take action to reduce health inequalities. The World Health Organization (WHO) has recently sounded a global warning: “Social injustice is killing people on a grand scale”.⁶ This assertion by the WHO’s Commission on Social Determinants of Health applies not just to a world divided between North and South, it also applies to Canada and Toronto.

A number of reference points at the national level provide a Canadian context for this report:

- The 2001 Health Canada *Population Health Template*, which provides a framework for measuring and assessing social determinants of health and health inequalities as key components of an overall population health strategy;⁷
- The 2004 report of the Federal/Provincial/Territorial Advisory Committee on Population Health and Health Security, which includes a working definition of health equity that aligns with the ISEqH definition;⁸
- The 2006 inaugural report of the Health Council of Canada, which describes health inequalities as Canada’s biggest health challenge and recommends the development of national indicators to measure health inequalities and targets to reduce them;⁹
- The 2008 Report of the Chief Public Health Officer of Canada, which emphasizes the need for national, provincial and local action on health inequalities, in light of the fact “evidence shows that people with better incomes, better education and better social supports enjoy better health than those with fewer social and economic opportunities”;¹⁰
- The 2008 Reports of the Canadian Senate Subcommittee on Population Health which, among other things, analyzed government policies to address population health and health inequalities in five OECD countries – Australia, Finland, New Zealand, Norway and Sweden.¹¹

In 2005, Canada signed on to contribute as one of twelve country partners of the WHO Commission on Social Determinants of Health, committing this country to act on any recommendations forthcoming. In view of the final report of the Commission, this should now mean “seeking to frame policies and programmes, across the whole of society, that influence the social determinants of health and improve health equity”.⁶

At a provincial level, the Ontario Public Health Association and the Association of Local Public Health Agencies have requested the province’s Chief Medical Officer of Health to examine how to better address the social determinants of health within the public health context.^{12,13} And the Ontario Health Equity Council, has advocated for action on health inequalities through its *2007 People’s Health Equity and Diversity Charter: A Framework for Action*.¹⁴

At a local level, the Toronto Central Local Health Integration Network (LHIN) recently released a health equity discussion paper, providing recommendations for development of a LHIN health equity strategy.¹⁵ Other LHINs are implementing community engagement processes to ensure that health equity concerns are incorporated in service planning.

While this report focuses on income and health, recent Toronto Public Health reports have summarized local evidence which sheds light on the interplay of income with other social determinants:

- 76% of Toronto children living in low-income households belong to a “visible minority” group (Statistics Canada definition);
- Higher than average poverty rates exist among children under 18 years of age for certain ethno-cultural groups, for example: 47.5% of people of African background; 35.7% Arab and West Asian ; 29.1% Caribbean; 25.3% South Asian; 25.1% South and Central American; 21.4% East Asian ;
- More than half of the children in low income households from racialized groups live in one-quarter of the city’s census tracts. The low income rate for children age 0-14 in racialized groups in these census tracts ranges between 47% and 85%;
- Immigrant parents were almost twice as likely to report their children in poor health compared to parents who had been born in Canada;
- Children born outside Canada are almost 3.5 times more likely to be diagnosed with Early Childhood Tooth Decay (ECTD) than children born in Canada;
- Mothers born in Latin America and the Caribbean had the highest singleton low birth weight rates in Toronto.

Such data help to illuminate patterns of income inequality in Toronto and raise lines of inquiry to further examine the ways in which income and health are linked to broader issues of social exclusion and inequity.¹⁶

“The Unequal City” advances understanding of health inequalities in Toronto by presenting local data on income and health. This must be followed by additional research to deepen our understanding of the social determinants of health in the Toronto setting, and by an action agenda that will shape our response to the inequities in our midst.

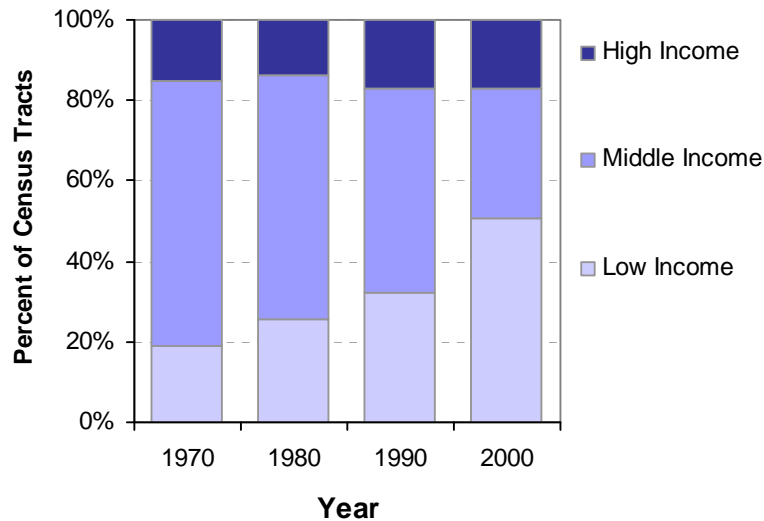
2. Income Inequalities in Toronto

According to the 2006 census, Toronto’s population of 2.5 million had the greatest proportion of people living with low income of the 36 public health units in Ontario. In 2005, 24.5% of Toronto’s population lived below the Statistics Canada low income cut-off (before tax) (LICO), up from 22.6% in 2000. This was twice as high as the rest of Ontario (12% in both 2000 and 2005) and higher than in Canada as a whole (15.3% in 2005).

Approximately one-third of Toronto children under six years old lived below the LICO in 2005 compared to 16.0% in the rest of Ontario and 19.3% in Canada. More than 20% of Torontonians aged 65 years and older lived below the LICO in 2005 compared to 9.4% in the rest of Ontario and 14.4% in Canada.

Recent income trends show Toronto at a growing disadvantage. The median household income in Toronto increased by only 7% between 2000 and 2005, compared with 13% for Ontario and 15% for Canada as a whole. Recent research by the University of Toronto’s Centre for Urban and Community Studies¹⁷ found a dramatic reduction (34%) in the percentage of census tracts classified as middle income (Figure 1) between 1970 and 2000. During the same period there was a significant increase in the proportion of census tracts classified as low income, from 19% to 50%. Middle income was described as the range of 20 percent below to 20 percent above the average individual income for the Toronto census metropolitan area (CMA), while low income was more than 20 percent below the Toronto CMA average individual income. This change in the city’s income distribution has continued to 2005, according to the 2006 Census of Canada.

Figure 1: Trends in Census Tract Income¹, Toronto, 1970 to 2000²



¹ Income levels were defined as:

High – more than 20% above the CMA Toronto average individual income;

Middle – 20% below to 20% above the CMA Toronto average individual income; and

Low - more than 20% below the CMA Toronto average individual income.

² Income originally taken from the Canada census and represents the year preceding the census.

Source: The data were taken from Figure 1, page 4 of the report *The Three Cities within Toronto: Income polarization among Toronto neighbourhoods, 1970-2000*, J.D. Hulchanski, Research Bulletin 41, Centre for Urban & Community Studies, University of Toronto, December 2007.

To describe income inequalities in Toronto, this report uses the LICO measure. The LICO is defined as the income levels at which 70 percent or more of a family’s before tax income is spent on food, shelter and clothing.¹⁸ It takes into account the total family income, the number of people supported by that income and the population size of the municipality where they live.

In this report, Toronto’s population is divided into quintiles (five equal sized groups) using the percent of individuals living below the LICO in each census tract. Quintile 1 (Q1) includes the census tracts with the greatest proportion of people living below the LICO and Quintile 5 (Q5) includes census tracts with the least percent of people living below LICO.

Demographic Profile of Toronto by Income

Table 1 compares the LICO quintiles by a number of demographic indicators. There was a broad range of LICO prevalence (0 – 73%) and average household incomes (after tax) across the census tracts in each quintile. The mid-point of the census tract average household income after tax in each quintile shows a step-wise gradient across the quintiles, with Q1 the lowest.

The census tract with the highest average household income after taxes in 2005 also had 12.2% of its population living below the LICO. And the range of census tract average household income after taxes in Q1 (\$25,084 to \$78,270) overlapped those in Q5 (\$49,990 to \$453,239). The range of LICO prevalence and average household incomes within each quintile suggests that Toronto can be described as largely comprised of mixed income neighbourhoods.

Most of the other socio-demographic indicators in Table 1 follow the same gradient across the quintiles as the prevalence of individuals living below the LICO. For example Q1 also had the highest percent of:

- ♦ unemployed people aged 15 years and older;
- ♦ census families headed by a lone parent;
- ♦ seniors living alone;
- ♦ recent immigrants who arrived between 2001 and 2006, and;
- ♦ “visible minorities”.

This pattern suggests that the income quintiles reflect the broader context of many social determinants of health. For the purposes of this report, the quintiles based on the prevalence of LICO serve as a “proxy” (or stand-in) for several other determinants of health.

Table 1: Key Demographic Characteristics by Income Quintile within Toronto and Toronto, 2006

	Income by Quintile ¹					Toronto Total ²
	Q1	Q2	Q3	Q4	Q5	
Population	507,965	481,700	512,510	484,740	508,710	2,495,600
% Living below LICO	40.9	29.5	23.5	18.1	10.5	24.4
Range in census tracts	33.0 – 73.2	26.5 – 32.9	20.9 – 26.4	15.5 – 20.7	0.0 – 15.4	0.0 – 73.2
Average Household Income (after tax) Range	\$25,084 - \$78,279	\$40,199 - \$90,162	\$42,910 - \$85,831	\$51,480 - \$171,484	\$49,990 - \$453,239	\$25,084 - \$453,239
Mid-point	\$43,480	\$49,822	\$56,143	\$63,660	\$94,381	\$56,649
% Unemployed, 15 Years and Over	10.4	8.4	7.4	6.8	5.3	7.6
% Lone Parent Families	27.2	21.6	20.6	17.8	14.6	20.3
% of Children at Home Under 6 Years Old	24.0	20.4	19.1	19.2	18.9	20.4
% of Population 65 + Years Old (seniors) in Private Households	11.1	12.7	14.0	14.2	15.5	13.5
% of Seniors Living Alone	33.8	27.0	25.6	24.3	25.1	26.8
% Immigrant	59.6	56.5	52.4	48.0	33.7	50.0
% Recent Immigrant (2001-2006)	30.0	25.5	18.3	17.5	11.5	21.6
% Visible Minority³	66.9	53.0	49.9	42.3	22.7	46.9
% No Knowledge of English or French	6.9	7.0	6.5	4.2	1.7	5.2
% Private Dwellings Rented	66.7	56.2	42.7	36.7	25.2	45.5

¹ Each Quintile contains approximately 20% of Toronto's total population. The quintiles are made up of census tracts based on the prevalence of people living below the LICO. For example Quintile 1 has the census tracts with the highest prevalence of people living below the LICO.

² Numbers do not add due to data suppression and rounding.

³ Visible Minority is the term used by Statistics Canada to reflect race for the 2006 Canada Census.

Source: 2006 Canada Census, Statistics Canada.

3. Health Inequalities in Toronto

The fifteen indicators on the following pages are drawn from reproductive, reportable disease, cancer incidence, survey and mortality data. Together these indicators provide an overview of health inequality in Toronto.

Analytic Approach

The city population was divided into quintiles using the percent of individuals living below the Statistics Canada low income cut-off (before tax) (LICO) in each census tract, and labelled “income” in this report. Quintile 1 includes the census tracts with the greatest proportion of people living below the LICO and is described as the “lowest” income quintile. Quintile 5 includes census tracts with the least percent of people living below LICO and is labelled as the “highest” income quintile.

For ten of the indicators the health data were also divided into quintiles based on the same census tracts. The quintiles were the unit of analysis.

Five indicators are based on data collected through the Canadian Community Health Survey (CCHS). Data from the CCHS captured both the postal code of the respondent as well as income data. The income data collected allowed the creation of an income adequacy indicator similar to the LICO. The cut-offs do not directly match the LICO but are considered similar for the purposes of this report. Using this income adequacy indicator allows self-reported health behaviour data to be analyzed according to self-reported family size and income.

The analysis presented in this report is based on the work of Mackenbach^{19, 20} and Marmot^{21, 22}, who have presented comprehensive health inequality analyses for the UK, Europe, and the United States.

This section presents one indicator per page. Each page includes a graph presenting the indicator by income group and where appropriate, by sex. The analysis describes health inequalities in terms of the gradient across income groups as well as the gap between the lowest and highest income groups in absolute and relative terms.

The methods used for describing inequalities in health in this report are:

- *Absolute difference* – the difference in the rates of health outcomes between the lowest income group and the highest income group.
- *Relative difference* – the ratio of the rate of health outcomes in the lowest income group compared to the highest income group.
- *Population attributable risk* – the reduction in the occurrence of a health outcome or behaviour if everyone had the rate of the highest income group.
- *Confidence Intervals*. These were calculated for all indices in this report and are presented on all figures and in the data table in Appendix D.

Additional analyses were conducted on the life expectancy at birth and the all-cause premature mortality indicators to further explore the relationship between income and health inequalities in Toronto. This was done by splitting the quintiles in half to create deciles. Only these two indicators had sufficient data for this analysis.

Life Expectancy at Birth

Figure 2a: Life Expectancy at Birth, by Income¹, Males, Toronto, 2001, 2003 & 2004 Combined²

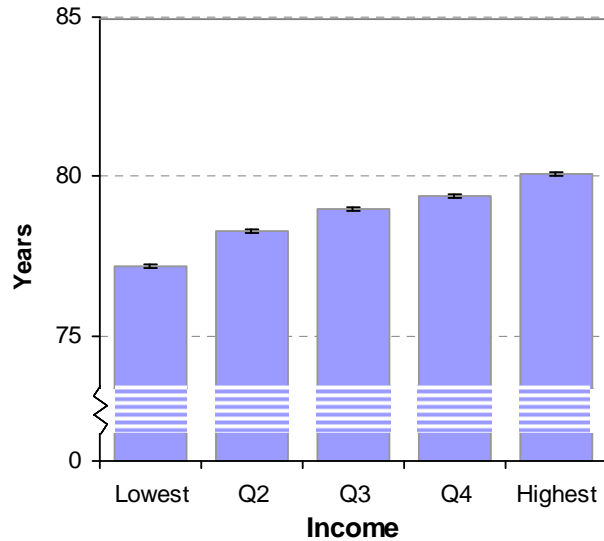
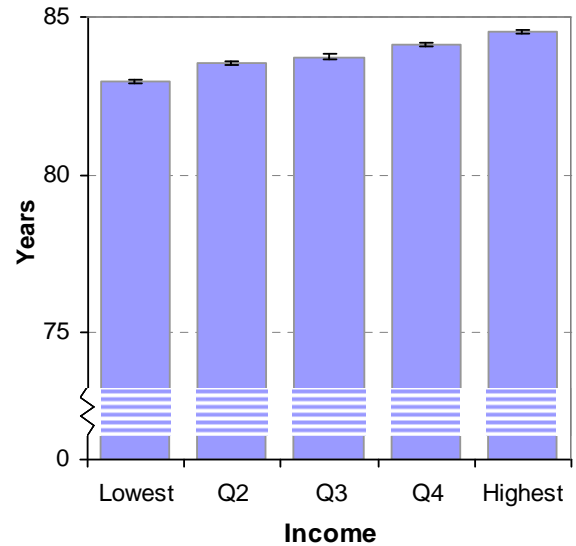


Figure 2b: Life Expectancy at Birth, by Income¹, Females, Toronto, 2001, 2003 & 2004 Combined²



¹ Income is the population quintile by proportion of the population below the LICO in census tracts.

² Mortality data are used from 2001, 2003 and 2004 as these years contain the most current and complete data for postal code. Three years of data are required for this type of analysis.

Error bars (I) denote 95% confidence intervals.

Source: Ontario Mortality Data 2003-2004, Provincial Health Planning Database (PHPDB) Ver. 18.01, Ontario MOHLTC. Ontario Mortality Data 2001, Statistics Canada, June 2008.

Life expectancy at birth represents the average number of years a group born at a specific time will live and is based on the current death rates across age groups. The life expectancy at birth for Toronto males was 78.1 years and for females was 83.0 years.

There was a significant gradient in life expectancy for both males and females across income quintiles in Toronto. The male gradient was steeper than the female gradient. Both follow the same step pattern. Males in the lowest income quintile (Q1) had the lowest life expectancy (77.2 years), and those in the highest income quintile (Q5) had the highest (80.1 years). Females in Q1 also experience the lowest life expectancy (82.9 years), while those in Q5 have the highest (84.5 years).

The absolute difference in life expectancy was 2.9 years for males in the lowest income quintile compared to the highest income quintile. The difference for females was 1.6 years. In relative terms, the male life expectancy in the lowest income quintile was 3.6% lower than the highest quintile, and for females it was 1.9% lower than the highest income quintile.

Life expectancy was also analyzed by income decile (tenth of the population). Males living in the lowest income decile had a life expectancy of 76.3 years and those in the highest income decile had a life expectancy of 80.8 years. Females living in the lowest income decile had a life expectancy of 82.7 years and those in the highest income decile had a life expectancy of 84.7 years. The difference in life expectancy between the lowest and highest income deciles was 4.5 years for males and 2.0 years for females.

Life expectancy in Toronto was higher than for individuals in the rest of Ontario with the exception of males in the lowest income decile.

All Cause Premature Mortality

Figure 3a: All Cause Mortality Rate¹, by Income², Males less than 75 Years, Toronto, 2001, 2003 & 2004 Combined³

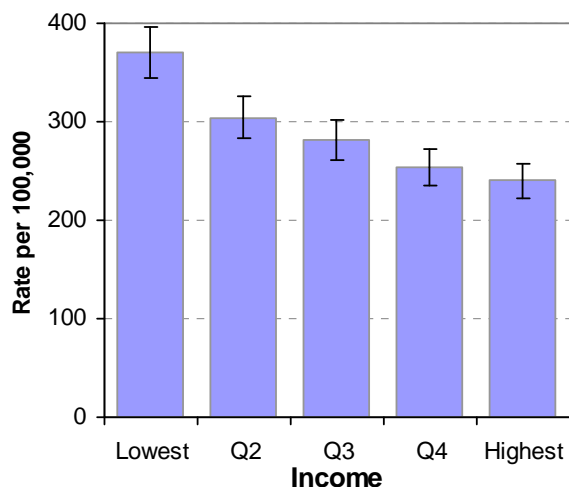
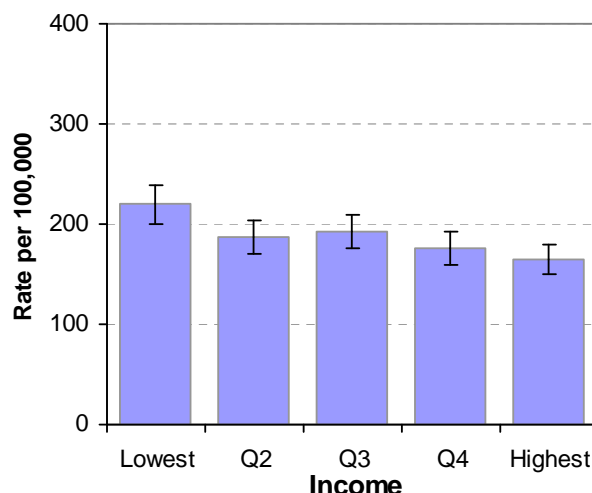


Figure 3b: All Cause Mortality Rate¹, by Income², Females less than 75 Years, Toronto, 2001, 2003 & 2004 Combined³



¹ Age standardized to the 1991 Canadian population. Rate is per 100,000 population per year.

² Income is the population quintile by proportion of the population below the LICO in census tracts.

³ Mortality data are used from 2001, 2003 and 2004 as these years contain the most current and complete data for postal code. Three years of data are required for this type of analysis.

Error bars (I) denote 95% confidence intervals.

Source: Ontario Mortality Data 2003-2004, Provincial Health Planning Database (PHPDB) Ver. 18.01, Ontario MOHLTC. Ontario Mortality Data 2001, Statistics Canada, June 2008.

Premature mortality is defined in this report as death that occurs before the age of 75 years. In Toronto, the age standardized premature death rate was 309 per 100,000 per year for males and 199 per 100,000 per year for females.

There was a gradient in all cause premature mortality rates for both males and females across income quintiles in Toronto. Males in the lowest income quintile (Q1) had a rate significantly different from all other income quintiles. The gradient for males was steep with the highest mortality rate (370 per 100,000) in the lowest income quintile and a step-wise decrease in rates to 240 per 100,000 in the highest income quintile (Q5). The female gradient was similar to the male gradient but not as steep. Females in the lowest income quintile had a mortality rate (220 per 100,000) that was significantly higher than those in income quintile 4 (187 per 100,000) and quintile 5 (164 per 100,000). The absolute difference in premature mortality rates was 129 per 100,000 for males in the lowest income quintile compared to the highest income quintile. The difference for females was 55 per 100,000. In relative terms, the premature mortality rate for males in the lowest income quintile was 1.5 times the rate in the highest income quintile, and for females it was 1.3 times the rate in the highest income quintile.

Similar to the quintile analysis, the gradient for Toronto males by income decile was steep with the highest premature mortality rate (410 per 100,000) in the lowest income decile decreasing to 208 per 100,000 in the highest income decile. Females in the lowest income decile also had a higher rate (228 per 100,000) compared to those in the highest income decile (155 per 100,000). The difference in premature mortality rates between the lowest and highest income decile was 203 per 100,000 for males and 73 per 100,000 for females.

If everyone in Toronto was as healthy as the highest income decile (D10) there would be 1,086 or 18% fewer premature deaths per year in Toronto.

The all cause premature mortality rate for Toronto males in the lowest income quintile was 7% above the rate for the rest of Ontario. Across all income quintiles for Toronto females, the rates were lower than for females living in the rest of Ontario.

Self-Rated Health

Figure 4a: Percent¹ Rated Health as 'Fair/Poor', by Income², Males Aged 20-64 Years, Toronto, 2001, 2003 & 2005 Combined

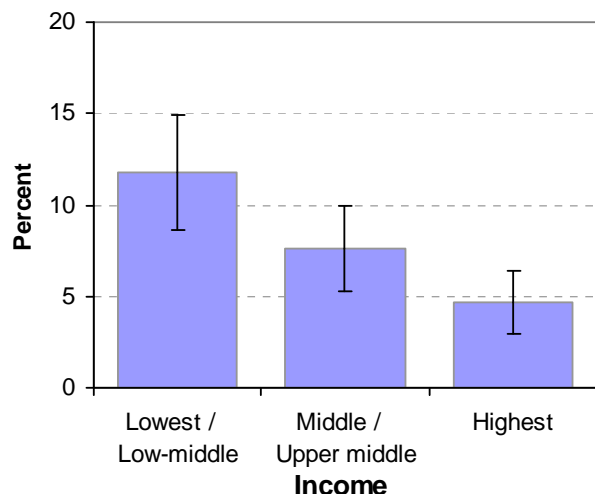
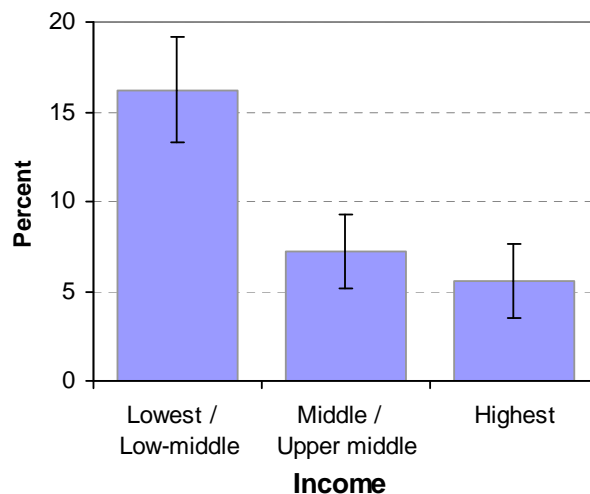


Figure 4b: Percent¹ Rated Health as 'Fair/Poor', by Income², Females Aged 20-64 Years, Toronto, 2001, 2003 & 2005 Combined



¹ Age standardized to the 1991 Canadian population.

² Income is the income adequacy measure used in the CCHS.

Error bars (I) denote 95% confidence intervals.

Source: Canadian Community Health Survey Cycles 1.1, 2.1 and 3.1 .

The Canadian Community Health Survey asked respondents to rate their health as 'excellent', 'very good', 'good', 'fair' or 'poor'. Self-rated health is considered a sentinel indicator for overall health and well-being. Overall, 7% of Toronto male adults and 9% of females aged 20 to 64 years perceived their health as fair or poor.

Among those who reported their health as fair or poor there was a gradient across income category for Toronto males and females (20-64 years). The rate for males in the lowest income category was significantly different from those living in the highest category. Among males, there was a clearly defined gradient where the lowest income category reported the highest level of fair/poor health (12%), and the highest income category reported the lowest (5%). Females showed a similar pattern with a steeper gradient. Females in the lowest income category had a significantly different rate from the other income categories. Females in the lowest income category reported the highest level of fair/poor health (16%), while the highest income category reported the lowest (6%).

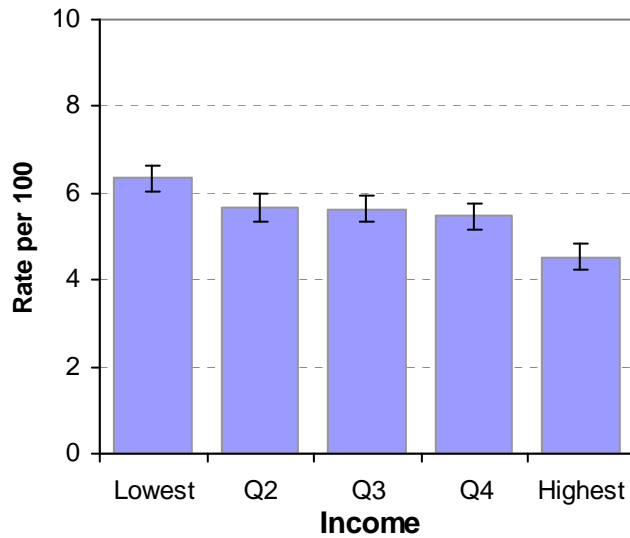
The absolute difference in self-reported fair/poor health status for males between the lowest and highest income categories was 7 percentage points, and for females it was 11 percentage points. In relative terms, males in the lowest income category reported their health as fair/poor 2.5 times more than males in the highest income category. For females, those in the lowest income category reported their health to be fair/poor approximately 3.0 times the percent reported in the highest income category.

If everyone had the rates of the highest income category, there would be 88,735 or 40% fewer adults (20-64 years) reporting their health as fair/poor.

Toronto males and females in the lowest income category reported higher levels of fair/poor health compared to the rate reported by the rest of Ontario. Toronto males in the lowest income category were 37% and females were 67% higher than the related rates in the rest of Ontario.

Singleton Low Birth Weight Rate

Figure 5: Singleton Low Birth Weight¹ Rate², by Income³, Toronto, 2004-2007



¹ Singleton low birth weight includes singleton infants born with a birth weight of less than 2,500 grams.

² Rate is per 100 singleton live births per year.

³ Income is the population quintile by proportion of the population below the LICO in census tracts.

Error bars (I) denote 95% confidence intervals.

Source: Niday Perinatal Database, 2004-2007.

Singleton low birth weight is defined as a birth weight of less than 2,500 grams and excludes multiple births (e.g. twins or triplets). Birth weight is an important determinant of infant health with impacts that extend through childhood and beyond. The overall singleton low birth weight rate for Toronto was 4.5 per 100 singleton births per year.

There was a gradient in the singleton low birth weight rate across income quintiles in Toronto. The difference in the singleton low birth weight rates was significant with the highest rate (6.3 per 100) in the lowest income quintile and a step-wise decrease in rates to 4.5 per 100 in the highest income quintile (Q5).

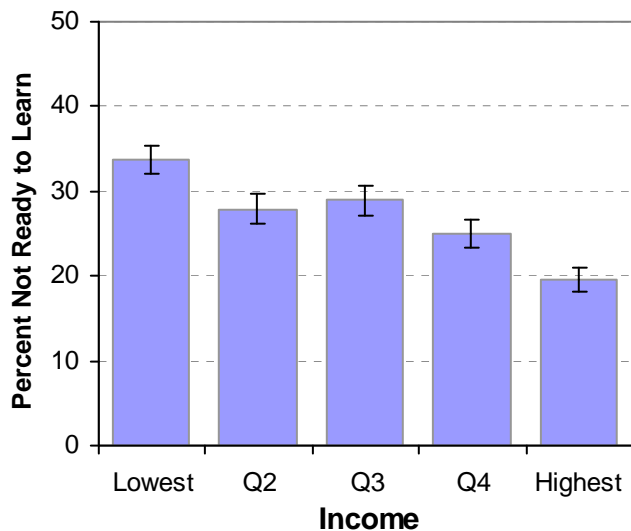
The absolute difference in rate of singleton low birth weight babies was 1.8 per 100 singleton live births in the lowest income quintile compared to the highest income quintile. In relative terms, the singleton low birth weight rate in quintile 1 was 1.4 times the rate in quintile 5.

If all babies in Toronto were born with the low birth weight rate of the highest income quintile (Q5) there would be 1,300 or 20% fewer singleton low birth weight babies born per year.

Toronto's singleton low birth weight rates for all income quintiles were higher compared to the overall rate for the rest of Ontario. The rate in the lowest income quintile was 50% higher than the rate for the rest of the province.

Readiness to Learn

Figure 6: Readiness to Learn at School Entry¹, by Income², Toronto, 2004/05



¹ Readiness to learn at school entry is measured using the Early Development Indicator (EDI) See Appendix B for more information.

² Income is the population quintile by proportion of the population below the LICO in census tracts.

Error bars (I) denote 95% confidence intervals.

Source: Offord Centre for Child Studies, McMaster University, 2007.

Toronto children's learning readiness was assessed through administration of the Early Development Instrument (EDI), a population-based tool for assessing children's readiness to learn at school in five developmental domains. Readiness to learn is considered to be a critical marker for life long success.²³ In Toronto overall 28% of children in kindergarten were considered not ready to learn at school entry.

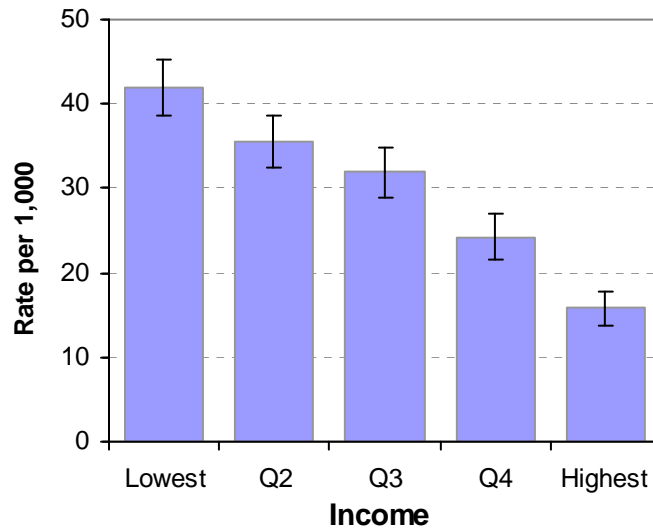
There was a gradient in the percent of children not considered ready to learn at school entry across income quintiles in Toronto. There was a significant difference in the percent of children scored as not ready to learn between children in the lowest income quintile (34%) compared to children in the highest income quintile (20%).

The absolute difference in percent of children not ready to learn at school entry between quintile 1 and quintile 5 was 14 percentage points. In relative terms, the percent of children not ready to learn in the lowest income quintile was 1.7 times the percent in the highest income quintile.

If all senior kindergarten children had same level of readiness to learn as those in the highest income quintile (Q5) there would be 1,600 or 30% more children per year ready to learn at school entry in Toronto.

Teen Pregnancy

Figure 7: Teen Pregnancy¹ Rate², by Income³, Toronto, 2004-2006



¹ Teen pregnancy includes hospital deliveries (live and still born) plus therapeutic abortions.

² Rate is per 1,000 women aged 15 to 19 years per year.

³ Income is the population quintile by proportion of the population below the LICO in census tracts.

Error bars (I) denote 95% confidence intervals.

Source: Teen deliveries (live and stillbirth) Hospital In-Patient Data, and Therapeutic abortions Hospital In-Patient Data, Ambulatory Visits, Day Procedures, 2004-2006, Provincial Health Planning Database (PHPDB) Ver. 18.01, Health Planning Branch, Ontario MOHLTC.

Teen pregnancy represents the number of women aged 15 to 19 years who gave birth (live or stillborn) or had a therapeutic abortion. Teen pregnancy is associated with an increased risk of low birth weight, preterm birth, and postpartum depression.^{24,25} Pregnant teens are more likely to have delays in accessing prenatal care, are less likely to continue their education and may be exposed to increased rates of violence. Their children are at increased risk of health problems.²⁴ In 2004-2006 the annual teen pregnancy rate was 30 per 1,000 in Toronto.

There was a significant gradient in teen pregnancy rates across income quintiles in Toronto. Teens in the lowest income quintile (Q1) had a rate significantly higher than all other income quintiles. The gradient was steep with the highest teen pregnancy rate (42 per 1,000) in the lowest income quintile and a step-wise decrease in rates to 16 per 1,000 in the highest income quintile (Q5).

The absolute difference in teen pregnancy rates was 26 pregnancies per 1,000 in quintile 1 compared to quintile 5. In relative terms, the teen pregnancy rate in quintile 1 was 2.6 times the rate in quintile 5.

If all women aged 15-19 years had the pregnancy rate of the highest income quintile (Q5) there would be 996 or 46% fewer teen pregnancies per year in Toronto.

Toronto's teen pregnancy rates in income quintiles 1, 2, and 3 were higher than the overall rate for the rest of Ontario. The rate in quintile 1 was 64% higher than the rate for the rest of the province.

Smoking

Figure 8a: Percent¹ Current Smoker, by Income², Males Aged 20-64 Years, Toronto, 2001, 2003 & 2005 Combined

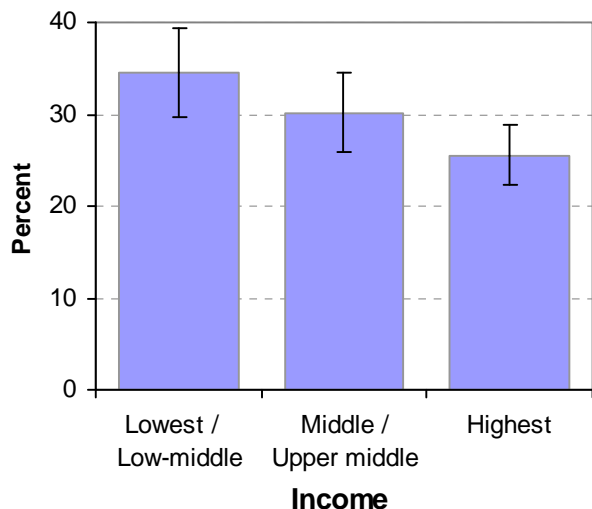
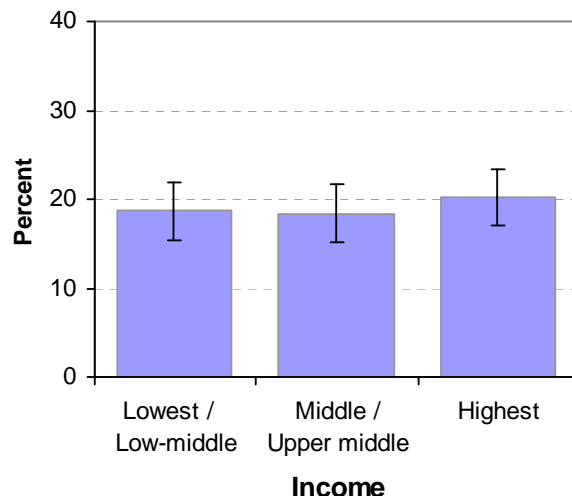


Figure 8b: Percent¹ Current Smoker, by Income², Females Aged 20-64 Years, Toronto, 2001, 2003 & 2005 Combined



¹ Age standardized to the 1991 Canadian population.

² Income is the income adequacy measure used in the CCHS.

Error bars (I) denote 95% confidence intervals.

Source: Canadian Community Health Survey Cycles 1.1, 2.1 and 3.1 .

Tobacco use is a major cause of preventable, premature illness and death. In addition people exposed to environmental tobacco smoke experience ill-health effects. Overall in Toronto, 29% of males and 18% of females aged 20 to 64 years were current smokers.

There was a gradient in those who reported current smoking status for Toronto adult males and not for adult females (age 20-64 years) by income category. Males in the lowest income category reported they were current smokers more often than males in the highest income category (35% vs. 26%, respectively). There was a significant difference in male current smoker rates between the lowest and highest income categories.

There was no significant difference among female current smoker rates across income categories. Patterns of tobacco use are more complex for women than for men. Women’s smoking behaviour, both initiation and cessation, is related to many factors including perinatal and prenatal stages in life. For example, smoking rates decrease significantly before and during pregnancy. This and other factors provide a challenge to understanding and interpreting the association between gender, income and smoking prevalence among women.

The absolute difference for males between the lowest and highest income categories was 9 percentage points. In relative terms, males in the lowest income category reported being a current smoker 1.4 times more than males in the highest income category.

If the percent reported by males in the highest income category was applied to all males in the low and middle income categories, there would be 30,240 or 13% fewer male smokers per year between the ages 20-64 years in Toronto.

The level of current smokers among males aged 20-64 years in the lowest income category in Toronto was 12% higher than the rate in the rest of Ontario. Across all income categories for females, the current smoker rates in Toronto were lower than the rate for the rest of Ontario.

Physical Inactivity

Figure 9a: Percent¹ Physically Inactive, by Income², Males Aged 20-64 Years, Toronto, 2001, 2003 & 2005 Combined

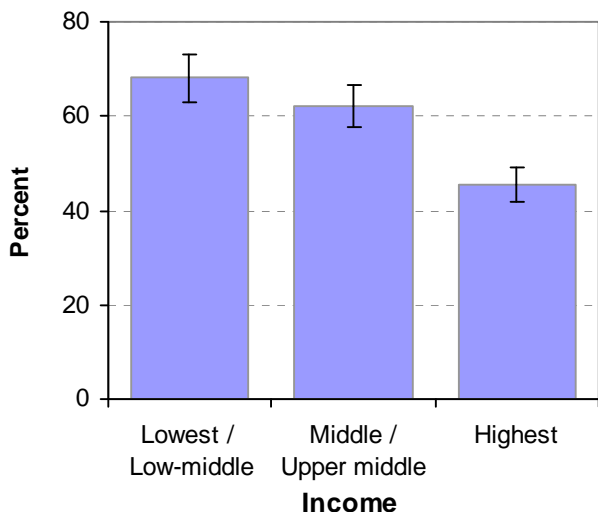
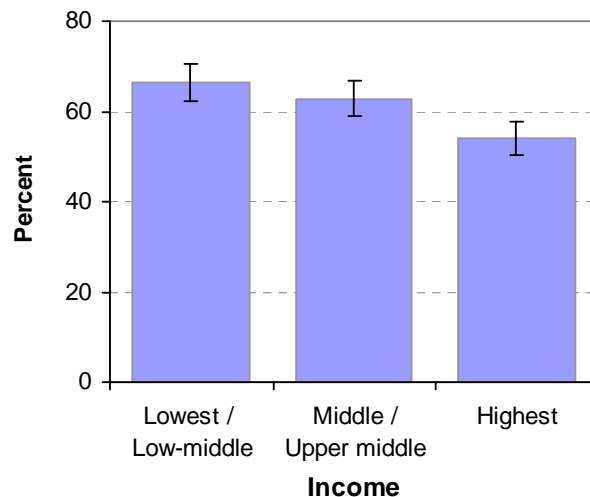


Figure 9b: Percent¹ Physically Inactive, by Income², Females Aged 20-64 Years, Toronto, 2001, 2003 & 2005 Combined



¹ Age standardized to the 1991 Canadian population.

² Income is the income adequacy measure used in the CCHS.

Error bars (I) denote 95% confidence intervals.

Source: Canadian Community Health Survey Cycles 1.1, 2.1 and 3.1 .

Physical inactivity is an important risk factor for many diseases. Physical activity helps to reduce stress, increases energy and contributes to attaining and maintaining a healthy weight. Among Toronto adults overall, 56% of males and 61% reported being physically inactive.

There was a gradient in those who reported being physically inactive for both Toronto males and females (age 20-64 years) by income category. Males aged 20 - 64 years in the lowest income category were the most likely to report being physically inactive (68%), while males in the highest income category reported the lowest level of physical inactivity (45%). Females in the lowest income category had a significantly higher rate of inactivity (66%) compared to those in the highest income category (54%).

The absolute difference for males between the lowest and highest income categories was 23 percentage points, and for females it was 12 percentage points. In relative terms, males in the lowest income category reported being physically inactive 1.5 times more than in the highest income category. Females in the lowest income category reported physical inactivity 1.2 times more than in the highest income category.

If everyone had the percent of physical inactivity as those in the highest income categories there would be 160,800 or 15% fewer adults aged 20-64 years stating they were physically inactive.

Excluding Toronto males in the highest income category, Toronto adults reported higher levels of physical inactivity compared to the rest of Ontario. Males and females in the lowest income category reported higher physical inactivity levels (46% and 29% respectively) than the rest of Ontario.

Overweight/Obesity

Figure 10a: Percent¹ Overweight/Obese, by Income², Males Aged 20-64 Years, Toronto, 2001, 2003 & 2005 Combined

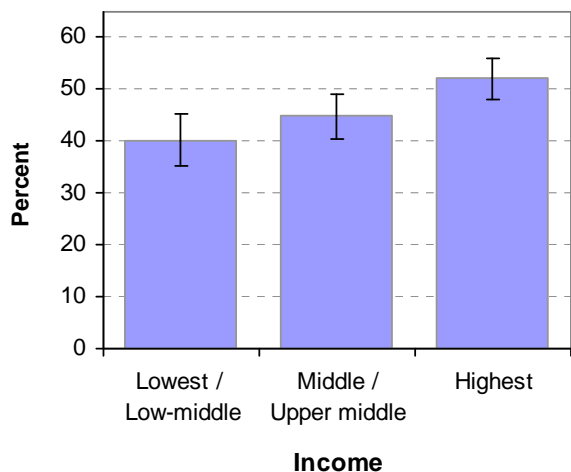
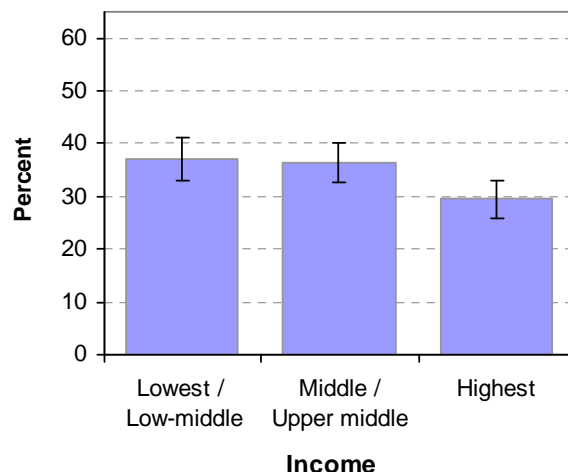


Figure 10b: Percent¹ Overweight/Obese, by Income², Females Aged 20-64 Years, Toronto, 2001, 2003 & 2005 Combined



¹ Age standardized to the 1991 Canadian population.

² Income is the income adequacy measure used in the CCHS.

Error bars (I) denote 95% confidence intervals.

Source: Canadian Community Health Survey Cycles 1.1, 2.1 and 3.1 .

The increasing prevalence of obesity has been called the fastest growing epidemic of our time.²⁶ Increases in obesity and overweight are linked to many common chronic diseases, such as type 2 diabetes, cardiovascular disease, hypertension, osteoarthritis, and some types of cancers.²⁷ The body mass index (BMI), based on height and weight, classifies weight into risk categories - ‘underweight’, ‘acceptable weight’, ‘overweight’ or ‘obese’. Understanding and interpreting the association between gender and income and its impact on obesity is challenging, given that it involves the interaction of genetic, social, cultural, physical and economic environments. Among Toronto adults 45% of males and 34% of females were overweight or obese. These data are based on self-reported heights and weights, which tend to systematically underestimate obesity prevalence.²⁸

There was a gradient for people who reported being overweight or obese (BMI=25+) for both Toronto males and females (age 20-64 years) by income category. The gradient for males was the reverse compared to females. Males in the lowest income category were the least likely to report being overweight or obese (40%) compared to the highest income category (52%). A similar pattern was seen in Canadian males. While the reason for this pattern is not clear, it has been suggested that higher smoking rates and physically demanding jobs may contribute to lower rates of obesity in men with lower levels of income.¹⁰ Males in the lowest income category had a significantly different rate from those in the highest income category. For females, the opposite pattern occurred, where 37% in the lowest income category reported being overweight or obese, compared to 30% in the highest income category. The rate among females in the lowest income category was significantly different from that in the highest income category.

The absolute difference for females aged 20-64 years between the lowest and highest income categories was 8 percentage points. In relative terms, females in the lowest income category reported being overweight or obese 1.3 times more than females in the highest income category.

If all females aged 20-64 years had the same percent as the females in the highest income category, there would be 40,190 or 14% fewer overweight or obese females in Toronto.

Across all income categories for both males and females, the overweight/obesity rates in Toronto were lower than the overall rate in the rest of Ontario.

Lung Cancer Incidence

Figure 11a: Age Standardized Lung Cancer Incidence Rate¹, by Income², Males, Toronto, 1999 - 2003 Combined

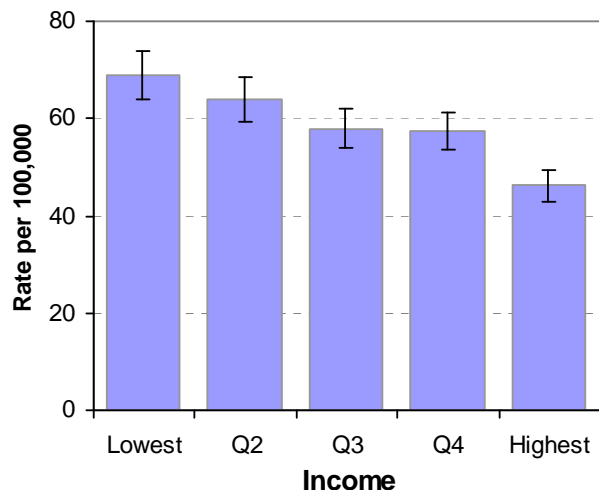
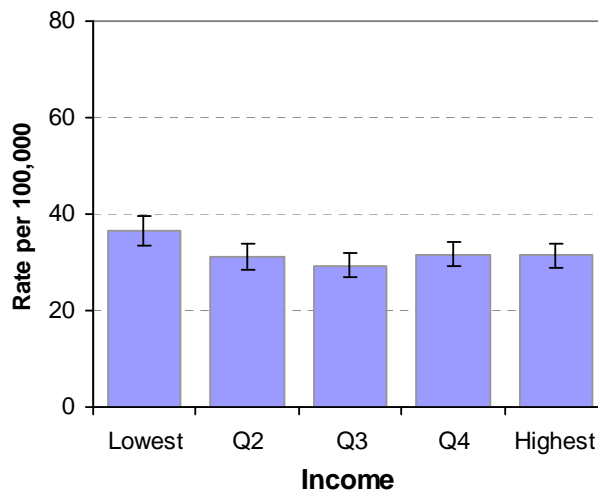


Figure 11b: Age Standardized Lung Cancer Incidence Rate¹, by Income², Females, Toronto, 1999 - 2003 Combined



¹ Age standardized to the 1991 Canadian population. Rate is per 100,000 population per year.

² Income is the population quintile by proportion of the population below the LICO in census tracts.

Error bars (I) denote 95% confidence intervals.

Source: Cancer Care Ontario, Ontario Cancer Registry, 1999-2003, August 2008.

Lung cancer is among the most common form of cancers in Canada and Toronto and the leading cause of cancer deaths. At least 80% of new lung cancer cases among women and 90% among men are attributable to cigarette smoking²⁹ and thus are preventable. The overall age standardized lung cancer rate was 59 per 100,000 per year for males and 33 per 100,000 per year among females in Toronto.

There was a gradient in lung cancer incidence rates for males but not for females across income quintiles in Toronto. Males in the lowest income quintile (Q1) had a rate significantly higher than income quintiles 3, 4, and 5. The highest lung cancer incidence rate for males (69 per 100,000) was in the lowest income quintile with a step-wise decrease in rates to 46 per 100,000. For females, the lowest income quintile had the highest rate (36 per 100,000), however quintile 3 had the lowest rate (29 per 100,000).

The absolute difference in lung cancer incidence rates was 23 per 100,000 for males in the lowest income quintile compared to the highest income quintile. The difference for females was 5 per 100,000. In relative terms, the lung cancer incidence rate in quintile 1 compared to quintile 5 was 1.5 times higher for males and 1.2 times higher for females.

If all males had the lung cancer incidence of the highest income quintile (Q5), there would be 150 or 20% fewer new cases of lung cancer per year in Toronto.

Across all quintiles for both males and females, the lung cancer incidence rates in Toronto were lower than the overall rate for the rest of Ontario.

Cardiovascular Disease Premature Mortality

Figure 12a: Age Standardized Cardiovascular Disease Mortality Rate¹ by Income², Males less than 75 Years, Toronto, 2001, 2003 & 2004 Combined³

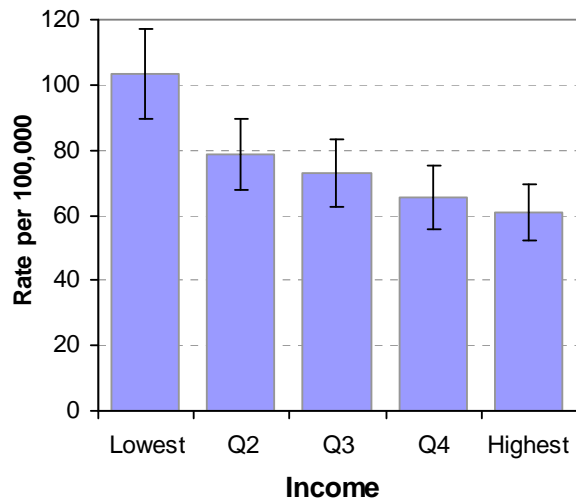
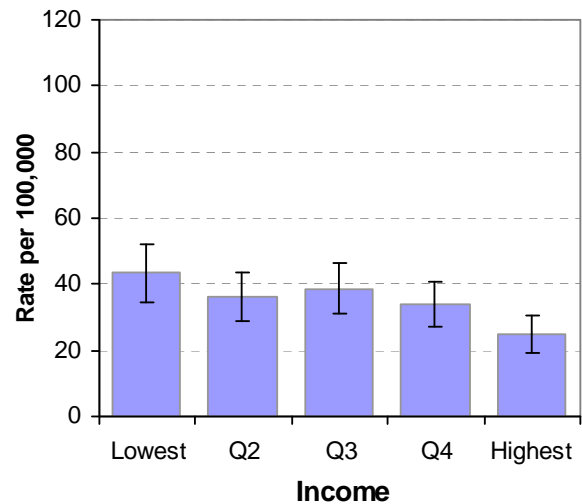


Figure 12b: Age Standardized Cardiovascular Disease Mortality Rate¹ by Income², Females less than 75 Years, Toronto, 2001, 2003 & 2004 Combined³



¹ Age standardized to the 1991 Canadian population. Rate is per 100,000 population per year.

² Income is the population quintile by proportion of the population below the LICO in census tracts.

³ Mortality data are used from 2001, 2003 and 2004 as these years contain the most current and complete data for postal code. Three years of data are required for this type of analysis.

Error bars (I) denote 95% confidence intervals.

Source: Ontario Mortality Data 2003-2004, Provincial Health Planning Database (PHPDB) Ver. 18.01, Ontario MOHLTC. Ontario Mortality Data 2001, Statistics Canada, June 2008.

Cardiovascular disease (CVD) is the leading cause of death in Toronto. Many of its risk factors are preventable or modifiable. In Toronto, the age standardized CVD premature death rate (deaths occurring before the age of 75 years) for CVD was 76 per 100,000 per year among males and 35 per 100,000 per year among females.

There was a gradient in CVD premature mortality rates for both males and females across income quintiles in Toronto. Toronto males in the lowest income quintile (Q1) had a rate significantly higher than all other quintiles. The gradient for males was steep with the highest premature mortality rate (103 per 100,000) in the lowest income quintile and a step-wise decrease in rates to 61 per 100,000 in the highest income quintile (Q5). The female gradient for CVD premature mortality was not as clear or as steep, although females in the lowest income quintile had a CVD premature mortality rate that was significantly higher than females in the highest income quintile (44 per 100,000 and 25 per 100,000 respectively).

The absolute difference in CVD premature mortality rates was 42 per 100,000 for males in the lowest income quintile compared to the highest income quintile. The difference for females was 19 per 100,000. In relative terms, the CVD premature mortality rate for both males and females in the lowest income quintile was 1.7 times the rate in the highest income quintile.

If everyone had the rates of the highest income quintile (Q5) there would be 304 or 21% fewer premature deaths per year due to CVD in Toronto.

The Toronto CVD premature mortality rate for males in the lowest income quintile was 13% above the overall rate for the rest of Ontario. Across all quintiles for Toronto females the CVD premature mortality rates were lower than the overall rate in the rest of Ontario.

Chlamydia Infection in Youth

Figure 13a: Chlamydia Infection Rate¹, by Income², Males Aged 15-24 Years, Toronto, 2004-2006 Combined

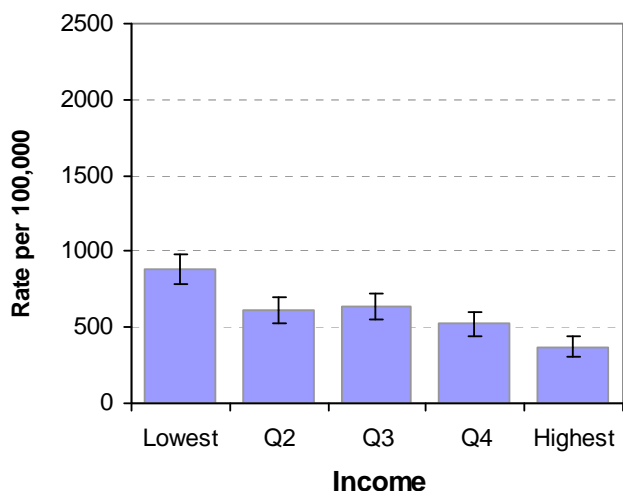
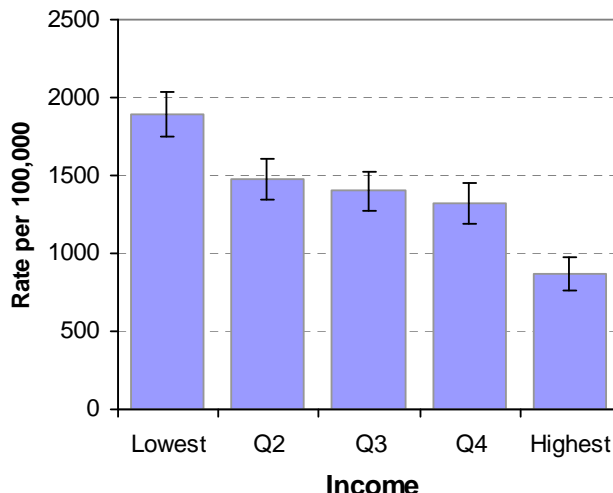


Figure 13b: Chlamydia Infection Rate¹, by Income², Females Aged 15-24 Years, Toronto, 2004-2006 Combined



¹ Rate is per 100,000 population per year.

² Income is the population quintile by proportion of the population below the LICO in census tracts.

Error bars (I) denote 95% confidence intervals.

Source: Integrated Public Health Information System, Toronto Public Health and the Ontario Ministry of Health and Long Term Care.

Sexually transmitted infections, including chlamydia and gonorrhoea, are important to prevent as they can cause serious complications such as pelvic inflammatory disease and infertility. The overall chlamydia infection rate among Toronto youth aged 15 to 24 years was 618 per 100,000 per year for males and 1,418 per 100,000 per year for females.

There was a gradient in chlamydia rates for both males and females aged 15-24 years across income quintiles in Toronto. There was a significant difference in rates between males in the lowest income quintile (883 per 100,000) and males in the highest income quintile (373 per 100,000). Females had a similar pattern and with higher rates. The gradient for females was steep with the highest chlamydia rate (1,889 per 100,000) in the lowest income quintile (Q1) and a step-wise decrease in rates to 872 per 100,000 in the highest income quintile (Q5).

The absolute difference in chlamydia rates for males was 510 per 100,000 in quintile 1 compared to quintile 5. For females it was 1,017 per 100,000. In relative terms, the chlamydia rate in quintile 1 compared to quintile 5 was 2.4 times higher for males and 2.2 times higher for females.

If everyone aged 15-24 years had the rates of the highest income quintile (Q5) there would be 1,236 or 39% fewer cases of chlamydia among youth per year in Toronto.

The chlamydia rates for Toronto males and females in income quintiles 1 to 4 were higher than the rate for the rest of Ontario. In quintile 1 the male chlamydia rate was 90% higher compared to the overall rate in the rest of Ontario and the female rate was 58% higher.

Gonorrhoea Infection in Youth

Figure 14a: Gonorrhoea Infection Rate¹, by Income², Males Aged 15-24 Years, Toronto, 2004-2006 Combined

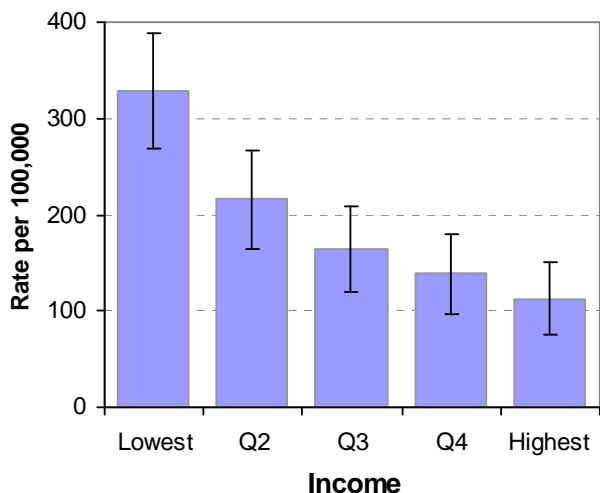
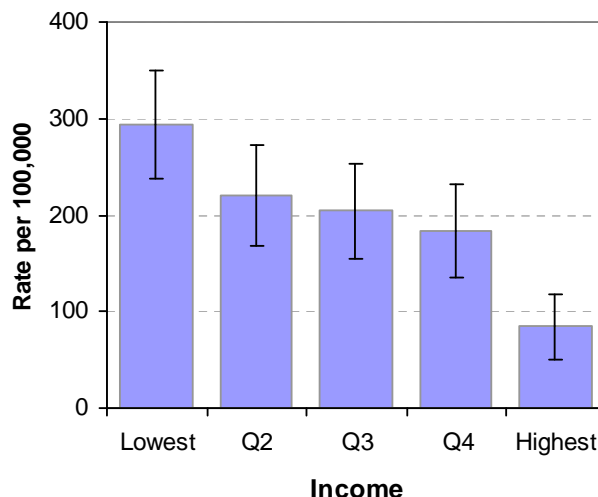


Figure 14b: Gonorrhoea Infection Rate¹, by Income², Females Aged 15-24 Years, Toronto, 2004-2006 Combined



¹ Rate is per 100,000 population per year.

² Income is the population quintile by proportion of the population below the LICO in census tracts.

Error bars (I) denote 95% confidence intervals.

Source: Integrated Public Health Information System, Toronto Public Health and the Ontario Ministry of Health and Long Term Care.

The gonorrhoea infection rate among Toronto youth aged 15 to 24 years was 197 per 100,000 per year for males and 201 per 100,000 per year for females.

There was a gradient in gonorrhoea rates for both males and females aged 15-24 years across income quintiles in Toronto. Males in the lowest income quintile (Q1) had a rate significantly higher from those in quintiles 3 to 5. The gradient for males was steep with the highest gonorrhoea rate (329 per 100,000) in the lowest income quintile and a step-wise decrease in rates to 112 per 100,000. The female rates follow a similar step pattern where the rate in the lowest income quintile (293 per 100,000) was the highest and significantly different from quintile 5 (84 per 100,000).

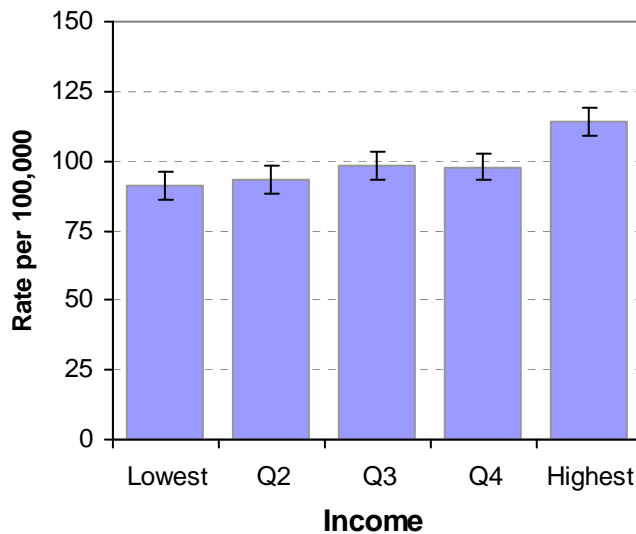
The absolute difference in gonorrhoea rates was 216 per 100,000 for males in the lowest income quintile compared to the highest income quintile. The difference for females was 209 per 100,000. In relative terms, the gonorrhoea rate in quintile 1 compared to quintile 5 was 2.9 times higher for males and 3.5 times higher for females.

If everyone aged 15-24 years had the rates of the highest income quintile (Q5) there would be 317 or 51% fewer cases of gonorrhoea among youth per year in Toronto.

Toronto male rates for gonorrhoea across all income quintiles were higher compared to the rate for the rest of Ontario. The rate in quintile 1 was more than 3.5 times higher. Except for quintile 5, the female rates for gonorrhoea were also higher than the rate for the rest of Ontario. The female rate in quintile 1 was almost 2 times higher.

Breast Cancer Incidence

Figure 15: Age Standardized Breast Cancer Incidence Rate¹, by Income², Females, Toronto, 1999 - 2003 Combined



¹ Age standardized to the 1991 Canadian population. Rate is per 100,000 population per year.

² Income is the population quintile by proportion of the population below the LICO in census tracts.

Error bars (I) denote 95% confidence intervals.

Source: Cancer Care Ontario, Ontario Cancer Registry, 1999-2003, August 2008.

Breast cancer is the most common cancer affecting women in Toronto (100 per 100,000 per year).

There was a reverse gradient in breast cancer incidence rates across income quintiles in Toronto. Females in the highest income quintile (Q5) had a rate significantly higher than all other quintiles. This gradient is similar to that found in other populations. The highest breast cancer incidence rate (114 per 100,000) was in the highest income quintile and a step-wise decrease in rates to 91 per 100,000 in the lowest income quintile (Q1).

The higher breast cancer rates commonly seen among affluent women have been attributed to known risk factors such as delayed childbirth, a greater use of hormone replacement therapy and oral contraceptives.³⁰ In addition, inequalities in access to screening could potentially contribute to the difference in incidence.

The rate of breast cancer in Toronto females in the highest income quintile was 11% above the overall incidence rate in the rest of Ontario.

Dental Visits

Figure 16a: Percent¹ Last Visit to Dentist was More than 3 Years Ago, by Income², Males Aged 20-64 Years, Toronto, 2001, 2003 & 2005 Combined

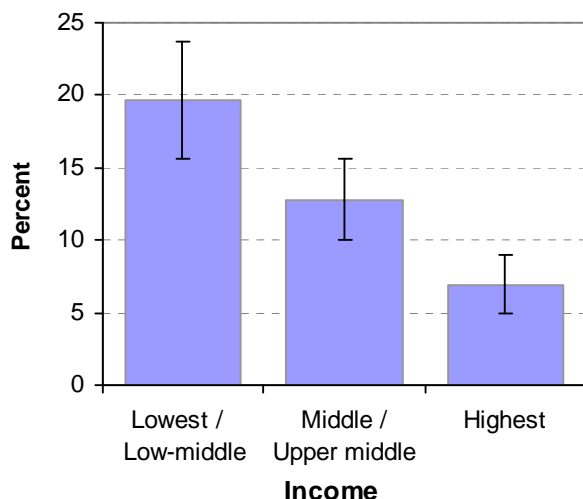
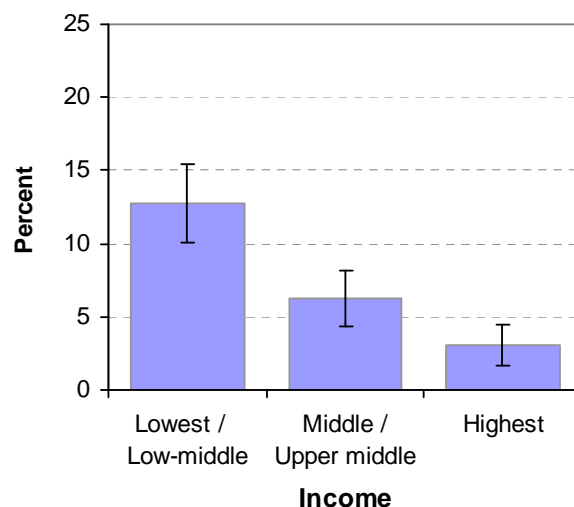


Figure 16b: Percent¹ Last Visit to Dentist was More than 3 Years Ago, by Income², Females Aged 20-64 Years, Toronto, 2001, 2003 & 2005 Combined



¹ Age standardized to the 1991 Canadian population.

² Income is the income adequacy measure used in the CCHS.

Error bars (I) denote 95% confidence intervals.

Source: Canadian Community Health Survey Cycles 1.1, 2.1 and 3.1 .

Poor oral health reduces quality of life, employability and sociability. Untreated dental infections can also contribute to chronic diseases such as cardiovascular and respiratory illnesses, and diabetes. Generally people who visit the dentist annually do this on a preventative basis. Those who haven't had a dental visit for three years or more tend to see the dentist for longstanding, untreated, and / or end stage oral diseases.³¹ Among Toronto adults, 12% of males and 7% of females reported that the last time they visited a dentist was more than 3 years ago.

There was a gradient across income categories among Toronto males and females aged 20-64 years who reported their last dental visit was more than 3 years ago. Males in the lowest income category had a significantly different rate from those in the highest income category. For males aged 20 – 64 years, there was a clearly defined gradient where the lowest income category was the most likely to report that their last visit to the dentist was 3 or more years ago (20%), compared to the highest income category (7%). Females showed a similar step-wise decrease. The rate for females in the lowest income category was significantly higher than the other income categories. Among females aged 20-64 years, 13% in the lowest income category reported their last visit to the dentist was 3 or more years ago, compared to 3% of females in the highest income category.

The absolute difference between the lowest and highest income categories was 13 percentage points for males and 10 percentage points for females. In relative terms, males in the lowest income category reported that it was 3 or more years since their last visit to the dentist 2.8 times more than males in the highest income category. Similarly females in the lowest income category reported 4.1 times more than females in the highest income category.

If everyone aged 20-64 years had the percent of the highest income category, there would be 107,883 or 51% fewer adults reporting their last visit to the dentist was 3 or more years ago in Toronto.

Toronto males and females in the lowest income category were 53% and 46% higher than the rate for the rest of Ontario.

4. Discussion

Overview of Methods

The Unequal City presents fifteen high-level, Toronto-specific health indicators for which there were sufficient, good quality data to investigate the distribution of health outcomes and risk factors by income groupings. Income was chosen for this report because it is a significant determinant of health that correlates well with other measures of disadvantage and is available for the indicators selected.

Data for ten of the health indicators did not have income data directly linked to the health data for individuals. Therefore using data from the Census, the Toronto population was divided into five equal sized groups (quintiles) based on the proportion of the population living below the Statistics Canada low income cut-off (before tax) (LICO). Two of these ten indicators were further analyzed by breaking the Toronto population into ten equal sized groups (deciles). Five indicators came from the Canadian Community Health Survey (CCHS) which includes data on self reported health and family income. This report used the CCHS income adequacy indicator because it takes into consideration family characteristics similar to the LICO.

The indicators and analysis in this report provide a point-in-time look at health inequalities. This method of assessing health inequalities is one of several commonly used methods in health inequality research. It assumes that the income of a family at the time the health data are collected is a proxy for the income that an individual experienced through a lifetime.

Three methods were used to estimate inequalities in health in this report. They were:

- *Absolute difference* – the difference in the rates of health outcomes between the lowest income group and the highest income group.
- *Relative difference* – the ratio of the rate of health outcomes in the lowest income group compared to the highest income group.
- *Population attributable risk* – the reduction in the occurrence of a health outcome or behaviour if everyone had the rate of the highest income group.

Overview of Results

Twelve of the fifteen indicators show a clear gradient. People in the lowest income quintile (Q1) had the poorest health, with a step-wise improvement in health to the highest income quintile (Q5). Breast cancer incidence in women and self-reported overweight/obesity rates in adult males had a reverse of this gradient. There was no gradient among female adult smokers.

Several differences of concern were found in comparing the lowest income group to the highest income group:

- lung cancer incidence was 1.5 times higher for males in the lowest income quintile;
- the gonorrhoea rate among female youth was 3.5 time higher in the lowest income quintile; and
- the percent of female adults whose last visit to the dentist was more than three years ago was about four times greater in the lowest income quintile.

In addition, males in the highest income decile were expected to live 4.5 year longer than males in the lowest income decile. The difference for females was 2.0 years.

Based on the methods used, if everyone was as healthy as those in the highest income group, there would be:

- nearly 1,100 (18%) fewer premature deaths;
- about 1,300 (20%) fewer low birth weight babies;
- about 1,600 (30%) more children ready to learn at school entry;
- nearly 1,000 (46%) fewer teen pregnancies; and
- more than 30,000 (13%) fewer male smokers.

Understanding the Results

There is a significant body of knowledge from Canada and around the world that provides context for Toronto's results. For example, one recent Canadian study followed a cohort of adults over a ten year period, from 1991 to 2001, using a family income adequacy measure and individual education, occupation, immigrant, minority and aboriginal status information. In this study the gap in life expectancy over income quintiles was 6.8 years for men and 4.3 years for women. These differences were greater than those estimated by neighbourhood level analysis such as are used in this report. The study found similar gradients for education and occupation but not for immigrant or visible minority groups.⁴

Other Canadian cities have also compiled data to measure health inequalities, and a group of urban public health agencies including Toronto Public Health have collaborated with the Canadian Population Health Initiative to document the relationship between socioeconomic status and health in urban Canada as a whole. The results of this work will be published in November 2008.

The true extent of the health inequalities presented in this report is likely underestimated, for several reasons. The "Canadian census mortality follow-up study, 1991 through 2001" was able to link data from the 1991 census with individual tax filer data and mortality data. This study found that "...a much greater disparity was revealed by individual and family income compared with neighbourhood income".³² A larger difference in health inequalities in this report would likely be seen if data on income and health could be linked for each individual in Toronto. However, most health databases currently do not permit this linkage. Therefore, the unit of analysis for this report is the quintile, which is an aggregation of census tracts characterized by a wide range of incomes and proportion of the population living below the LICO. This mixing of neighbourhood income tends to reduce the apparent relationship between income and health when analysed at the census tract level.

Table 1 shows there is a step-wise gradient across quintiles for the percentage of the population that is immigrant, and more specifically, recent immigrant. The same Canadian study showed that "Compared with the Canadian-born population, mortality rates were substantially lower among immigrants, particularly recent immigrants".³² The high proportion of immigrants and recent immigrants in Toronto may mask the true extent of health inequalities related to income in the city.

Finally, the five indicators in this report which are derived from CCHS telephone surveys likely under-represent the most marginalized groups in the Toronto population who tend to have lower incomes. The omission of these extremes will tend to reduce the differences observed.

The relationship between income and health in Toronto should be interpreted in light of trends in income inequality. Income trends indicate an increasing polarization of income in the city, with the middle income group shrinking and the low income group growing. This raises a critical question about the future health of Torontonians. If this trend in income distribution continues, will health inequalities in Toronto increase and will overall health worsen?

Some of the factors underlying the relationship between income and health have been documented in Toronto, and serve to guide efforts to reduce health inequalities. Each year Toronto Public Health measures the cost of eating a nutritious diet using a standard food pricing survey tool, the Nutritious Food Basket. The survey results in recent years have demonstrated that individuals and families living on low incomes cannot afford to eat nutritious food, with predictable consequences for their health. Since the income of many of these Torontonians, such as those on social assistance or working for minimum wage, is determined by public policy, their lack of access to nutritious food and the resulting health inequalities are amenable to a public policy solution.

The picture of health inequalities in Toronto includes some positive features. The overall health of Torontonians is better on a number of indicators than the rest of Ontario. This may be due to a combination of factors that include the "healthy immigrant" effect, the health benefits generated by neighbourhood mixing and the impact over time of a range of social supports. Such health assets cannot be taken for granted and must be cultivated and protected as part of a deliberate public policy strategy to promote health equity.

Continued monitoring of the relationship between social determinants and health is needed to better understand patterns and trends in Toronto and to design, implement and evaluate efforts to address health inequalities.

5. Conclusion

This report presents clear evidence that health inequalities related to income exist in Toronto across a wide range of health indicators. These trends are consistent with those found in other jurisdictions. For reasons explained in the report's discussion of the data and methodology, the true differences in health associated with income in Toronto are likely even greater than those documented here.

While the focus of this report is on income, it is important to recognize that health inequalities are associated with other social determinants such as racialization, immigration and settlement status, and education. These determinants are linked to, and interact with, income to influence health.

The relationship between income and health in Toronto is not just about the extremes of wealth and poverty. As the data in this report demonstrates, for most indicators there is a continuous gradient of health in relation to income. In other words, health status tends to improve with each increment of income. This means that health inequalities affect all Torontonians.

Recent trends toward increasing polarization of income distribution raise concerns that the health inequalities documented here may lead to a decline in the overall health status for Toronto's population.

The health inequalities documented in this report should be seen as unacceptable in a society that places a high value on equal access to good health. These differences represent a missed opportunity to achieve better health for the city as a whole. The reduction of income inequality and measures to reduce poverty should be pursued as priority health strategies. Services such as those provided by Toronto Public Health should be designed and implemented so as to mitigate the impact of income on health by ensuring equal access to universal services focusing on reaching people with greater health needs. More information about health inequalities in Toronto should be gathered and analyzed to help guide both advocacy and service delivery, to monitor trends, and evaluate the effectiveness of interventions.

Recommendations:

1. The Medical Officer of Health report regularly to the Board of Health on key health inequality indicators for the City of Toronto;
2. The Medical Officer of Health consult with community partners and the Board of Health to incorporate appropriate strategies to reduce health inequalities in the next Toronto Public Health Strategic Plan (2010-2014) and annual service plans, including measures to monitor progress on reducing health inequalities;
3. The Toronto Board of Health send this report to the Premier of Ontario and strongly urge the government to maintain its stated commitment to poverty reduction in Ontario as a public health measure; and
4. The Medical Officer of Health review Toronto Public Health data collection practices and collaborate with partners to strengthen the monitoring of the impact of social determinants on health, including racialization, immigration and settlement status, education and income.

Appendix A – Definition of Terms

Confidence Interval

A 95 percent confidence interval (CI₉₅) is a range of values around the indicator estimate that has a 95% probability of including the true value. The size of the CI₉₅ relates to the precision of the estimate.

Determinants of Health

Determinants of health include the full spectrum of factors and their interactions known to influence and contribute to health (Health Canada, 2001), and may be individual-level factors as well as broader social, economic, structural, and political factors. These include income; social support networks; education; employment and working conditions; social environments; physical environment; healthy child development; personal health practices; individual capacity and coping skills; biology and genetic endowment; health services; gender; and culture (including racism).⁷

Gap

The absolute and relative differences in health status between the most and least advantaged groups in a population.

Gradient

A step-wise distribution in health indicators that runs through society, where those that are poorest generally have the poorest health outcomes, and those in the middle generally experience poorer health outcomes than those in the higher social levels.

Health

Health is “a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity, is a fundamental human right and that the attainment of the highest possible level of health is a most important world-wide social goal whose realization requires the action of many other social and economic sectors in addition to the health sector”.³³

Health Inequality

Health inequalities are “differences in health status experienced by various individuals or groups in society. These can be the result of genetic and biological factors, choices made or by chance, but often they are because of unequal access to key factors that influence health like income, education, employment and social supports”.¹⁰

Health Inequity:

Health Inequities are systematic and potentially remediable differences in one or more aspects of health across socially, demographically, or geographically defined populations or population subgroups.⁵

Low Income Cut-Off Before Taxes (LICO)

Low income cut-off is based on the total income for the family, the number of people in the family and the population size of the community they live in. the cut-offs are the “income levels at which families or persons not in economic families spend 20% more than average [i.e. 70% plus] of their before tax income on food, shelter and clothing.” The LICO before taxes for a municipality of 500,000 or more in 2005 was¹⁸:

Family Size	LICO	Family Size	LICO	Family Size	LICO	Family Size	LICO
1	\$20,778	3	\$31,801	5	\$43,791	7+	54,987
2	\$25,867	4	\$38,610	6	\$49,389		

Rest of Ontario

The rest of Ontario refers to data presented for all residents of Ontario, minus or excluding the residents of the City of Toronto.

Toronto

In this report “Toronto” or “city” refers to the City of Toronto and the data presented focus exclusively on the population living in the City of Toronto (2006 population 2.65 million).

Some reports use “Toronto” to refer to a larger geographic area that Statistics Canada labels the Toronto Census Metropolitan Areas or Toronto CMA. The Toronto CMA includes the City of Toronto, plus 23 surrounding municipalities and has a collective total population of approximately 5.2 million. Another geographic group that is sometimes confused with the City of Toronto is the Greater Toronto Area (GTA), which includes the Toronto CMA, Oshawa-Whitby CMA , and the City of Burlington and has a collective total population of approximately 5.6 million.

Appendix B – Methodology

Selection of Indicators

Various reports and work from around the world were reviewed to see which indicators were being used to describe and quantify health inequality at the local level. In some cases a subset of indicators was used to monitor progress on narrowing the gap while others were used to inform policy and program decisions. Building on the work of others and an understanding of the determinants of health, a set of potential indicators was identified. This list was further reduced due to the lack of census tract level data for Toronto. In Ontario, data used to describe the health status of a population suffers from many limitations, including incomplete data on postal code. This geographic level of data is important when trying to identify, describe and quantify health inequalities. Thus the indicators used in this report were selected based on:

- (1) their use by other jurisdictions to describe and/or monitor health inequality;
- (2) the availability of data at the census tract level in Toronto; and
- (3) relevance to overall health in Toronto.

The initial list of possible health indicators, as well as those included in this report, are a mix of health outcomes and health-related behaviours. Health outcomes, such as disease, disability, or death, are modifiable through their risk factors and it can take decades before seeing a significant change in the health outcome itself. The selected health behaviours relate either directly or indirectly to health outcomes and are modifiable through a combination of individual, legislative, structural or collective action. Changes in health-related behaviours can be seen in a shorter timeframe and relate either directly or indirectly to later changes in health outcomes.

Analytic Approach

Quintiles based on Census data

The relationship between income and health is well established. Therefore, income was used to describe health inequalities in this report. More specifically, the prevalence of people living below the pre-tax low-income cut-off (LICO) was used as the way to subdivide the population of the city. There are many ways to sub-divide the population for this type of analysis. The LICO was selected for the analysis in this report as it combines income, number of people that income supports as well as the size of the municipality where the family lived. In addition, Table 1 shows the same distribution as the prevalence of LICO of several other social determinants across the created income quintiles.

All census tracts were categorized into five income quintiles, for each census year (2001 and 2006). Quintile 1 (Q1) had the greatest proportion of the population living below LICO and Q5 had the least. Each of the five income quintiles represents approximately 20% of the total Toronto population. Between 2001 and 2006 almost 40% of census tracts moved to a different quintile. Less than 5% moved more than 1 quintile up or down in 2006 compared to 2001 quintile groupings.

The methods used to construct the income quintiles were applied consistently for all health outcome/behaviour indicators. Health data from 2001 and 2002 used the census tracts that made up the 2001 income quintiles and health data from 2003 to 2007 used the 2006 census tract quintile groupings. This processed the health data as closely as possible to the income data inters of time. Thus the income quintiles used in this report do not represent geographic areas, rather the characteristic of the prevalence of LICO.

Health inequalities

The health indicators presented in this report were analyzed based on the work of Mackenbach^{19, 20} and Marmot.^{21, 22} These authors have presented comprehensive inequality analyses on health indicators from a variety of geographical areas.

This report focuses on measuring health inequalities in Toronto in terms of the gradient across income groups as well as measuring the gap between income groups. The gap in performance on an indicator between the other income groups and the reference group can be measured in absolute or relative terms.

The methods used for estimating inequalities in health in this report are:

- *Absolute difference* (lowest minus highest income group) The rate difference – because it reflects the actual (absolute) size of the disparity.
- *Relative difference* (lowest income / highest income group) The higher the value of the ratio or difference, the greater the inequality.
- *Population attributable risk calculation* (PAR%) – PAR% is the percent of the incidence of a disease in the population (exposed and non-exposed) that is due to exposure. It is the percent of the incidence of a disease in the population that would be eliminated if the exposure were eliminated.
- Confidence Intervals were calculated for all indices in this report and are presented on all figures and in the data table in Appendix D.

Comparison with the lowest proportion of low income stratum, rather than with an average level (or the best level of a particular health indicator), was decided as the methodological approach because the health of this stratum indicates a minimum level that could be biologically possible for everyone. Far more health equity-relevant information can be gained from consistently using the most privileged group as the reference for comparisons.³⁴ Assessment of significant differences between income groups, across the gradient, was based on whether the confidence interval of each group overlapped with the point estimate of the other income groups. Since Toronto Public Health is interested in improving the health of all Torontonians, interpretation of the data is discussed when the health behaviour or health outcome values for the highest proportion of low income group were worse than values for the lowest proportion of low income group.

95 % Confidence Intervals

Assessment of significant differences between income groups, across the gradient, was based on whether the confidence interval of each group overlapped with the point estimate of the other income groups. Ranges of rates for health/ behaviour outcomes for each census tract were not produced because census tracts were not the unit of analysis for this report. Rather, the unit of analysis was income quintiles which are aggregations of census tracts.

Age-standardized Rates

Direct standardization of data with the 1991 Canadian population were used to account for differences in the age-structures of the populations being compared.

Appendix C – Data Sources and Limitations

Canadian Community Health Survey (CCHS) Data

The CCHS is a joint initiative of Statistics Canada and Health Canada aimed at providing health information at the regional and provincial levels. Data for this cross-sectional survey was collected between January and December, for the specific years used in this report, from persons aged 12 or older living in private occupied dwellings in all provinces and territories. With the exclusion of individuals living on Indian Reserves and on Crown Lands, institutional residents, full-time members of the Canadian Forces, and residents of certain remote regions, the CCHS covered approximately 98% of the Canadian population aged 12 and over.

The survey sampled one randomly selected respondent per household, either through face-to-face or telephone interview. The CCHS is weighed to account for proportional representation of groups with different characteristics. The health behaviour data, used in this report, are self-reported. Therefore, these data may be subject to inaccurate recall and social acceptability bias.

The CCHS excludes people living on Indian reserves and Crown Lands, residents of institutions, full-time members of the Canadian forces, and some residents in remote areas. The telephone frame methodology used by the CCHS only covers people with listed phone numbers and who are at home when the surveyor calls. Undercoverage of potential respondents is a growing problem with the increasing popularity of cellular phones. This undercoverage can bias the results. Complex, multi-stage weighting strategies are used to moderate these and other biases (i.e., non-response).

Three cycles of CCHS data were combined to stabilize the estimates in this report. This means that changes over time will not be seen, however the larger sample allows for potential patterns in the data across income categories to be shown.

CCHS Cycle	Year	Sample Size
Cycle 1.1	2000/01	2,382
Cycle 2.1	2003	3,107
Cycle 3.1	2005	3,042

The CCHS created an income adequacy variable that combined self-reported family income and size, similar to the Statistics Canada low income cut-off measure. The income data was captured using ranges of income and thus the do not exactly match the LICO. For the analysis in this report the first 2 categories of the income adequacy variable were combined to ensure sufficient sample size and to ensure that all respondents living below the LICO were included in this category.

Cancer Incidence Data

Cancer Care Ontario (CCO) operates the Ontario Cancer Registry (OCR). The OCR is the largest patient-specific population-based cancer incidence registry in Canada and it covers the entire province of Ontario, registering all newly-diagnosed cases of invasive neoplasia, except non-melanoma skin cancer.

The majority of the source reports come from pathology reports, out-patient surgery discharge notifications from Canadian Institute for Health Information (CIHI), in-patient discharge notification from CIHI, and notifications from the regional cancer centres and Princess Margaret Hospital. In addition mortality data from the Registrar General are obtained to match with registered cases and it also provides some Ontario cases which had not been registered. Finally for data sources, a small number of notifications come from other provinces that have diagnosed or treated Ontario residents.

Based on an independent case-finding study conducted in Ontario in 2002, the weighted estimate of the completeness of ascertaining histologically confirmed cases (all sites combined), diagnosed in 1996, was 98.5%. The diagnostic criterion method estimates that the percentage of registered cases that have been microscopically verified is 83.0% for women and 82.0% for men.³⁵

Census Data

Conducted by Statistics Canada, the Census provides information about Canada's demographic, social and economic characteristics. The Census is conducted every five years. The most recent census took place on May 16, 2006.

The Census includes every person living in Canada on Census Day, as well as Canadians who are abroad. Information can also be obtained for smaller levels of geography such as cities and areas within a city.

Although Statistics Canada attempts to count every person, some people or groups are missed or underrepresented in each Census. For example, people may be traveling, some dwellings are hard to find, some are homeless and some individuals or groups refuse to participate. Statistics Canada takes this into account and estimates an 'under coverage' rate. Statistics Canada reported a 2006 population for the City of Toronto of 2,503,281. When the under coverage is taken into account, however, the population could be between about 2,630,000 and 2,705,000.

The 2006 Census counted an unexpectedly high number of unoccupied dwelling units. This has lead City staff to suspect that the Census may have missed more households than usual. Statistics Canada advises that population estimates based on the 2006 Census counts, adjusted for net under coverage, will be available in the fall of 2008.

Census Tract A small geographic area in and urban centre with an urban core population of 50,000 or more. Each census tract has a population of approximately 2,500 to 8,000. In 2006 there were 527 census tracts in Toronto.¹⁸

Low Income Cut-off (LICO) The prevalence of people living below the low income cut-off before taxes (LICO) used for the analysis in this report came from both the 2001 and 2006 censuses. The 2001 LICO was used to categorized census tracts into quintiles for health outcome data that occurred closer to 2001. This included the 2001 mortality data. The other indicators, using the LICO quintile analysis where categorized using the 2006 LICO categories.¹⁸

Early Development Instrument (EDI) Data

The EDI is administered in the form of a checklist that is completed by a Kindergarten teacher after he or she has been acquainted with the child for at least three months. The data collected show patterns of development and vulnerabilities of children in 5 domains of child development:

- Physical health and well being (Child is healthy, independent, ready each day, etc);
- Social competence (Child plays, gets along with others and shares, is self confident, etc);
- Emotional maturity (Child is able to concentrate, help others, is patient, not aggressive or angry, etc);
- Language and cognitive development (Child is interested in reading and writing, can count and recognize numbers, shapes, etc); and,
- Communication skills and general knowledge (Child can tell a story, communicate with adults and children, articulate themselves, etc.).

The instrument also collects information on child demographic characteristics as well as characteristics related to the child's English or French as a Second Language Status. Each child's EDI assessment is analyzed so that a child receives a score between 0 and 10 for each of the 5 domains. A score of 10 means that the child is doing everything he or she should be doing all of the time in relation to the given domain, whereas a score of 0 means he or she is not doing any of them at any time.

Prior research shows that the EDI is a valid instrument for assessing school readiness at the group level. However, teacher to teacher variation in assessment is an ongoing challenge and it is for this reason that assessment or comparisons at the individual, classroom and school level are not considered to be reliable.³⁶

The four district school boards in Toronto administered the EDI in all Senior Kindergarten (SK) classrooms in either the 2004/05 or 2005/06 school year. This includes the Toronto District School Board (TDSB), the Toronto Catholic District School Board (TCDSB), and the French language school boards: Conseil Scolaire de district du Centre Sud-Ouest (CSDCSO) and Conseil scolaire de district catholique du Centre-Sud (CSDCCS). The results

form the basis of the Toronto 2004/05 EDI SK cohort. This cohort is the first to include the majority of SK students from all Toronto boards and as such, provides a baseline of children’s developmental readiness in Toronto.

The Toronto sample of 20,472 SK children analyzed for this report includes children from the Toronto cohort who live in Toronto. The number of 5 year old children in Toronto in 2006, according to preliminary results of the 2006 Census, was 26,115. The Toronto cohort does not include children who attend a private school; or are home schooled; or who live in Toronto but attend a school outside of the city. The Toronto sample taken from this cohort, excludes children who:

- are identified as having either exceptional or special needs or whose special needs status is unknown;
- are identified as not in class for more than one month or whose attendance status is unknown; or
- are missing information for 2 or more EDI domains.

The average age of the children at the time of completion was 5.7 years, with an equal proportion of boys and girls. Fifteen percent of the Toronto sample is categorized as English as a Second Language (ESL) and 0.3% are French as a Second Language (FSL). Children are identified as having ESL status (English language schools only) or FSL status (French language schools only) if their first language is not English or French, respectively, and they are not fluent enough to easily follow the classroom educational activities.³⁷

Data for this report were analyzed according to quintiles of census tracts based on the prevalence of people living below the LICO, from the 2006 census. This level of aggregation, while not related to a specific school or neighbourhood, ensures adequate numbers of participating children in each geographic area and the ability to address the question of whether there is disparity across LICO quintiles in Toronto. Children are accounted for in the census tract in which they live, whether or not they attend school in that area, since children spend the first 5 years of their lives in families and communities that influence their development.

The EDI scores for each developmental domain are ranked and subsequently divided into categories representing the lowest scores to the highest scores in the Toronto sample. Children scoring low (in the bottom 10% of all scores) in one or more of the five EDI domains are categorized as “vulnerable” in terms of school readiness and considered not ready to learn at school.³⁸

The cut-off points used to classify the individual EDI domain scores are the 10th, 25th and 75th percentile scores for the Toronto sample and the categories are defined as follows:

- Children who score at or below the 10th percentile score, i.e. the bottom 10% of the sample, are categorized as “vulnerable” in terms of school readiness within the given EDI domain. The interpretation of “vulnerable” is that the child is, on average, more likely to be limited in his or her development in this area than a child who receives scores above the 10th percentile cut-off;³⁹
- Children who score above the 10th percentile score and at or below the 25th percentile score are considered “at risk” to experience difficulties at school;
- Children who score above the 25th and below the 75th percentile score are considered “on track” and “ready” for school; and,
- Children who score at or above the 75th percentile score are considered to be doing well in terms of their developmental skills, “on track” and “very ready” for school.

Results of the EDI can be interpreted in two ways: prospectively, i.e., how children’s school readiness will impact their success at school and what can be done to improve this; and retrospectively, toward the early years of future cohorts. Prospective applications have established the predictive validity of EDI in relation to subsequent school achievement scores during grades three and six. The retrospective view takes a preventive as opposed to a curative approach in supporting the improvement of the first 5 years of life to ensure a positive impact on development.⁴⁰

Mortality Data

The Office of the Registrar General obtains mortality data from death certificates that were completed by physicians. Residential information is based on the deceased person's geographic place of residence. Since 1993, Ontario residents who died outside of the province are excluded from the Provincial Health Planning Database. Causes are those that initiated the sequence of morbid events leading to death, and co-morbidity can contribute some uncertainty as to underlying cause(s) of death.

Three years of data were required to be aggregated to support the analysis conducted for the report across LICO quintiles. Over recent years the completeness and accuracy of address information, especially postal code, in the mortality files have improved. Over 15% of records were either missing a postal code or had an invalid postal code in the 2002 data file. Therefore mortality records from the years 2001, 2003 and 2004 were used in this report due to the level of completeness of the postal code data.

The change in coding from the ICD-9 to the ICD-10 coding standards in 2000 may affect the comparability of rates with those coded using the previous version of the ICD coding standard. The data used in this report were for the years 2001, 2003 and 2004, thus are not directly affected by the change in coding standards.

Niday Perinatal Database

The Niday Perinatal Database collects pregnancy and birth data on all newborns and mothers in the Greater Toronto Area. Data is either entered directly by the nurse or midwife caring for the mother and baby or is extracted from patient care documents such as patient's charts or electronic health records. To ensure high data quality, all variables included in the database are defined in an operation manual to ensure consistency of definitions; staff in hospitals/sites using the database were formally trained on data entry and reporting capabilities; the system is automated to assist with accurate data entry, and data quality reports are prepared to identify errors in the system.

The low birth weight (LBW) data used in this report combined the years 2004 to 2007 to ensure sufficient data to see potential patterns across the LICO quintiles. The LBW rates for each quintile are per year.

Reportable Communicable Disease Data

Toronto Public Health is responsible for collecting case information on reportable communicable diseases. Physicians and laboratories are required to report specific communicable disease cases that fulfill laboratory or clinical case definitions and are listed as reportable by the Health Promotion and Protection Act.

Provincial summaries, compiled by the Ontario Ministry of Health and Long Term Care's Public Health Branch, were used to compare rates in the rest of Ontario.

There is possibility of considerable under reporting of cases for some communicable diseases.

Teen Pregnancy Data

Teen pregnancy is based on hospital delivery data and therapeutic abortion data for women aged 15 to 19 years in 2004 to 2006.

Hospital delivery data captures the number of women who deliver at least one live or stillborn infant in an Ontario hospital. These deliveries are coded to the home address of the woman. While it does not capture at-home births, it does include unregistered births, thereby making it more complete than vital statistics data. Most teen deliveries would occur in a hospital. Records with missing, incorrect or non-Toronto postal codes could not be allocated to a census tract.

Therapeutic abortion data captures data on the number of women who undergo a therapeutic abortion in a hospital or a clinic in Ontario.

Appendix D – Health Inequality Indicators

Table 2a: Health Inequality Indicators¹, by Income² within Toronto, Toronto Overall and the Rest of Ontario

Indicator and (95% Confidence Interval) Annualized	Data Years	Toronto					Rest of Ontario	
		Income by Quintiles						Toronto Overall
		Lowest	Q2	Q3	Q4	Highest		
Life expectancy at birth (years) – Males	2001, 2003, 2004	77.2 (77.1 – 77.3)	78.3 (78.2 – 78.4)	79.0 (78.9 – 79.1)	79.4 (79.3 – 79.4)	80.1 (80.0 – 80.1)	78.1 (78.0 – 78.2)	
Life expectancy at birth (years) – Females	2001, 2003, 2004	82.9 (82.9 – 83.0)	83.5 (83.5 – 83.6)	83.7 (83.7 – 83.8)	84.1 (84.1 – 84.2)	84.5 (84.5 – 84.6)	83.1 (83.0 – 83.2)	
All Cause Mortality Rate – Males less than 75 years of age (age standardized per 100,000)	2001, 2003, 2004	369.5 (343.6 – 395.4)	304.4 (282.6 – 326.2)	281.2 (260.5 – 301.9)	253.8 (234.6 – 273.1)	240.4 (222.6 – 258.2)	308.8 (299.1 – 318.4)	
All Cause Mortality Rate – Females less than 75 years of age (age standardized per 100,000)	2001, 2003, 2004	219.7 (200.4 – 238.9)	186.6 (169.6 – 203.6)	192.5 (175.5 – 209.6)	176.1 (160.2 – 192.0)	164.4 (149.9 – 178.9)	199.4 (191.7 – 207.1)	
Singleton low birth weight rate (per 100 singleton births)	2004- 2007	6.3 (6.1 – 6.6)	5.7 (5.4 – 6.0)	5.6 (5.3 – 5.9)	5.5 (5.1 – 5.8)	4.5 (4.2 – 4.8)	5.6 (5.5 – 5.8)	
Readiness to learn at school entry (%)	2004 / 05	33.8 (32.2 – 35.4)	27.9 (26.3 – 29.6)	28.9 (27.2 – 30.6)	24.9 (23.3 – 26.6)	19.5 (18.1 – 20.9)	27.5 (26.7 – 28.2)	
Teen Pregnancy Rate (per 1,000 females 15 to 19)	2004- 2006	41.9 (38.7 – 45.2)	35.5 (32.3 – 38.7)	31.9 (29.0 – 34.9)	24.3 (21.6 – 26.9)	15.9 (13.8 – 17.9)	30.1 (28.8 – 31.3)	
Lung Cancer Incidence Rate – Males (age standardized per 100,000)	1999- 2003	68.9 (64.0 – 74.3)	63.9 (59.5 – 68.7)	57.9 (53.8 – 62.3)	57.4 (53.5 – 61.7)	46.2 (42.9 – 49.7)	59.3 (57.4 – 61.2)	
Lung Cancer Incidence Rate – Females (age standardized per 100,000)	1999- 2003	36.6 (33.5 – 40.1)	31.1 (28.4 – 34.1)	29.4 (26.8 – 32.2)	31.7 (29.1 – 34.6)	31.4 (29.0 – 34.1)	32.8 (31.6 – 34.1)	

Table 2a: Health Inequality Indicators¹, by Income² within Toronto, Toronto Overall and the Rest of Ontario

Indicator and (95% Confidence Interval) Annualized	Data Years	Toronto					Toronto Overall	Rest of Ontario
		Income by Quintiles						
		Lowest	Q2	Q3	Q4	Highest		
Cardiovascular Disease Mortality Rate – Males less than 75 years of age (age standardized per 100,000)	2001, 2003, 2004	103.1 (89.4 - 116.9)	78.7 (67.7 - 89.7)	72.8 (62.4 - 83.2)	65.4 (55.7 - 75.0)	60.9 (52.1 - 69.6)	75.5 (70.8 - 80.2)	91.1 (88.4 - 93.8)
Cardiovascular Disease Mortality Rate – Females less than 75 years of age (age standardized per 100,000)	2001, 2003, 2004	43.5 (34.8 - 52.1)	36.2 (28.7 - 43.6)	38.7 (31.1 - 46.3)	33.8 (26.9 - 40.7)	25.0 (19.5 - 30.6)	35.1 (31.9 - 38.3)	46.4 (44.4 - 48.4)
Chlamydia infection rate - Males aged 15-24 years (per 100,000)	2004 - 2006	883.0 (783.7 - 982.3)	608.3 (522.1 - 694.5)	641.0 (553.9 - 728.1)	521.8 (440.3 - 603.4)	373.1 (304.3 - 441.8)	617.6 (579.0 - 656.2)	463.9
Chlamydia infection rate - Females aged 15-24 years (per 100,000)	2004 - 2006	1,888.7 (1,745.5 - 2,032.0)	1,474.1 (1,340.5 - 1,607.7)	1,399.3 (1,270.4 - 1,528.2)	1,326.5 (1,194.9 - 1,458.2)	872.0 (765.9 - 978.1)	1,417.6 (1,359.1 - 1,476.1)	1,192.3
Gonorrhoea infection rate, - Males aged 15-24 years (per 100,000)	2004 - 2006	328.6 (268.0 - 389.2)	216.2 (164.8 - 267.6)	164.4 (120.2 - 208.5)	138.2 (96.2 - 180.2)	112.2 (74.5 - 150.0)	196.7 (175.0 - 218.5)	70.5
Gonorrhoea infection rate - Females aged 15-24 years (per 100,000)	2004 - 2006	293.3 (236.8 - 349.7)	220.6 (169.0 - 272.3)	204.0 (154.8 - 253.2)	183.7 (134.7 - 232.7)	84.1 (51.1 - 117.0)	201.0 (179.0 - 223.0)	100.5
Breast Cancer Incidence Rate – Females (age standardized per 100,000)	1999- 2003	90.9 (85.8 - 96.2)	93.5 (88.6 - 98.7)	98.1 (93.2 - 103.3)	97.9 (93.0 - 103.0)	114.4 (109.4 - 119.6)	100.1 (97.9 - 102.4)	101.9 (100.7 - 103.1)

¹ Indicators is presented as the percent of the population with the 95% confidence interval shown below.

² Income quintiles are based on the census tract prevalence of LICO and each quintile contains 20% of Toronto's total population.

Table 2b: Health Inequality Indicators (% per year), by CCHS Income Levels within Toronto, Toronto Overall and the Rest of Ontario, 2001, 2003 and 2005 Combined¹

Indicator and (95% Confidence Interval) Annualized	Toronto				Toronto Overall	Rest of Ontario
	Income Level			Highest		
	Lowest / Low-middle	Middle / Upper-middle	Highest			
Self-rate health is Fair/Poor – Males aged 20- 64 years	11.8 (8.6 - 15.0)	7.6 (5.3 - 9.9)	4.7 (3.0 - 6.4)	7.3 (6.0 - 8.6)	8.6 (8.2 - 9.0)	
Self-rate health is Fair/Poor – Females aged 20- 64 years	16.2 (13.3 - 19.2)	7.2 (5.2 - 9.3)	5.6 (3.5 - 7.6)	9.3 (8.1 - 10.6)	9.7 (9.3 - 10.1)	
Current Smoker – Males aged 20 – 64 years	34.5 (29.6 - 39.3)	30.1 (25.8 - 34.4)	25.6 (22.2 - 28.9)	29.4 (27.1 - 31.7)	30.9 (30.2 - 31.6)	
Current Smoker – Females aged 20 – 64 years	18.7 (15.4 - 22.0)	18.4 (15.2 - 21.6)	20.2 (17.1 - 23.4)	18.2 (16.5 - 20.0)	24.7 (24.1 - 25.3)	
Physically Inactive – Males aged 20 – 64 years	68.1 (63.1 - 73.1)	62.2 (57.7 - 66.7)	45.4 (41.6 - 49.3)	55.7 (55.3 - 58.2)	46.8 (46.0 - 47.6)	
Physically Inactive – Females aged 20 – 64 years	66.3 (62.2 - 70.4)	62.8 (58.8 - 66.8)	54.1 (50.3 - 57.8)	60.8 (58.7 - 63.0)	51.6 (50.9 - 52.3)	
Overweight / Obese – Males aged 20 – 64 years	40.2 (35.1 - 45.2)	44.8 (40.5 - 49.2)	52.2 (48.2 - 56.1)	46.6 (44.0 - 49.1)	60.2 (59.4 - 60.9)	
Overweight / Obese – Females aged 20 – 64 years	37.2 (33.2 - 41.2)	36.5 (32.6 - 40.3)	29.5 (25.9 - 33.1)	33.7 (31.6 - 35.8)	40.7 (40.1 - 41.4)	
Last Dental visit more than 3 years ago – Males aged 20- 64 years	19.6 (15.6 - 23.7)	12.8 (10.0 - 15.6)	6.9 (4.9 - 8.9)	11.7 (10.3 - 13.2)	12.8 (12.3 - 13.3)	
Last Dental visit more than 3 years ago - Females aged 20- 64 years	12.8 (10.0 - 15.5)	6.3 (4.4 - 8.2)	3.1 (1.7 - 4.5)	7.2 (6.1 - 8.3)	8.8 (8.4 - 9.2)	

¹ Indicators are presented as the percent of the population per year and the 95% confidence interval shown below.
Source: Canadian Community Health Survey (CCHS) Cycles 1.1, 2.1 and 3.1, 2001, 2003, 2005.

References

1. Hastings, Charles J. (1919). Democracy and Public Health Administration. *American Journal of Public Health* Vol.IX N2: 81-86.
2. Marmot, M.G., Shipley, M.J., Rose, G. (1984). Inequalities in Health: specific explanations of a general pattern? *Lancet* 1984 i: 1003–1006.
3. Wilkins, R. Berthelot, J-M. & Ng, E. (2002). “Trends in mortality by neighbourhood income in urban Canada from 1971 to 1996.” *Health Reports* (Statistics Canada, Catalogue 82-003) Supplement 13: 1- 28. Retrieved from www.statcan.ca/bsolc/english/bsolc?catno=82-003-S20020016353.
4. Wilkins, R., Tjepkema, Mustard, C., & Choinière, R. (2008). “The Canadian census mortality follow-up study, 1991 through 2001” *Health Reports* (Statistics Canada, Catalogue 82-003) 19(3): 25-43. Retrieved from www.statcan.ca/english/freepub/82-003-XIE/82-003-XIE2008003.htm.
5. International Society for Equity in Health. Definitions. Retrieved October 14, 2008 from www.iseqh.org/workdef_en.htm.
6. Commission on the Social Determinants of Health (2008). *Closing the gap in a generation: Health equity through action on the social determinants of health. Final report of the Commission on the Social Determinants of Health*. Geneva, World Health Organization.
7. Health Canada. (2001). *The Population Health Template: Key elements and actions that define a population health approach*. Ottawa, ON: Health Canada, Population and Public Health Branch.
8. Health Disparities Task Group. (2004). *Reducing Health Disparities – Roles of the Health Sector: Discussion Paper*. Health Disparities Task Group of the Federal/Provincial/Territorial Advisory Committee on Population Health and Health Security. Ottawa, ON: Public Health Agency of Canada. Retrieved from www.phac-aspc.gc.ca/ph-sp/disparities/ddp-eng.php.
9. Health Council of Canada. (2006). *Health Care Renewal in Canada: Clearing the Road to Quality, Annual Report to Canadians 2005*. Toronto: ON. Retrieved from www.healthcouncilcanada.ca/en/index.php?option=com_content&task=view&id=70&Itemid=72.
10. Butler-Jones, D. et al. (2008). *The Chief Public Health Officer’s Report on the State of Public Health in Canada*. Ottawa, ON: Health Canada.
11. Senate Subcommittee on Population Health. (February 2008). *Population Health Policy: International Perspectives*. First Report of the Subcommittee on Population Health of the Standing Committee on Social Affairs, Science and Technology. Ottawa: ON. The Senate of Canada. Retrieved from www.parl.gc.ca/39/2/parlbus/commbus/senate/Com-e/soci-e/rep-e/rep07feb08-e.pdf.
12. Ontario Public Health Association (OPHA). (2005). *Determinants of Health: Resolution adopted by the Ontario Public Health Association*. Retrieved from www.opha.on.ca/ppres/2005-03_res.pdf.
13. Association of Local Public Health Agencies (alPHA). (2005). *Determinants of Health as a Mandatory Public Health Program*. Toronto: ON. Retrieved from http://www.alphaweb.org/docs/lib_007754507.pdf.
14. Health Equity Council (2007). *2007 People’s Health Equity and Diversity Charter: A Framework for Action*. Toronto: ON.
15. Gardiner, B. (2008). *Health Equity Discussion Paper*. Toronto Central LHIN, Toronto: ON.
16. Toronto Public Health. (2007). *Impact of Poverty on the Health of Children from Racialized Groups*. Report to the Toronto Board of Health, Toronto: ON.
17. Hulchanski, J.D. (2007). *The Three Cities within Toronto: Income polarization among Toronto’s neighbourhoods, 1970-2000*. Centre for Urban and Community Studies, University of Toronto. Retrieved August 25, 2008 from www.urbancentre.utoronto.ca/pdfs/researchbulletins/CUCSRB41_Hulchanski_Three_Cities_Toronto.pdf.

-
18. Statistics Canada. (2006). Census Data Dictionary. Retrieved September 12, 2008 from www12.statcan.ca/english/census06/reference/dictionary/fam020.cfm.
 19. Mackenbach, J.P., Kunst, A.E. (1997). Measuring the magnitude of socioeconomic inequalities in health: an overview of available measures illustrated with two examples from Europe. *Social Science Medicine* 44:757-71.
 20. Mackenbach, J.P., Kunst, A.E., Groenhouf, F., Borgan, J.K., Costa, G., Faggiano, F. et al. (1999). Socioeconomic inequalities in mortality among women and among men: an international study. *American Journal of Public Health* 89:1800-6.
 21. Marmot, M.G., Smith, G.D., Stansfeld, S., Patel, C., North, F. et al. (1991). Health inequalities among British civil servants: the Whitehall II study. *Lancet* 337:1387-93.
 22. Marmot, M. (2001). Inequalities in Health. *New England Journal of Medicine* 345:134-36.
 23. Hertzman, C., Kershaw, P., Irwin, L., Trafford, K., & Wiens, M. (2006, April 26-28). *Seven uses of the EDI: The case of British Columbia*. Hertzman Centre of Excellence for Early Childhood Development. Colloquia Presentation. Vaudreuil, Québec.
 24. Aretakis, D.A. (2004). *Teen Pregnancy*. In: M. Stanhope & J. Lancaster (Eds). *Community & Public Health Nursing* (6th ed). (pp. 808-825). St. Louis, Missouri: Mosby.
 25. Stewart, D.E., Robertson, E., Dennis, C-L., Grace, S.L., & Wallington, T. (2003). *Postpartum Depression: Literature Review of Risk Factors and Interventions*. Prepared for Toronto Public Health by The Women's Health Program, University Health Network.
 26. Di Ruggiero, E., Frank, J., & Moloughney, B. (2004) Strengthen Canada's Public Health System Now. *Canadian Journal of Public Health* 95(1):5, 11.
 27. Health Canada (2003). *Canadian Guidelines for Body Weight Classification in Adults*.
 28. Gorber, S.C., Shields, M., Tremblay, M.S., McDowell, I. (2008). The feasibility of establishing correction factors to adjust self-reported estimates of obesity. *Health Reports* (Statistics Canada, Catalogue 82-003) 19(3):71-82.
 29. Health Canada (2001). *The 2001 Progress Report on Tobacco Control*. Retrieved September 15, 2008 from www.hc-sc.gc.ca/hl-vs/pubs/tobac-tabac/prtc-relct-2001/cigarette-eng.php.
 30. Brown, S.B.F., Hole, D.J., & Cooke, T.G. (2007). *Breast cancer incidence trends in deprived and affluent Scottish women*. *Breast Cancer Research and Treatment* 103:233-238.
 31. Toronto Public Health (2008). *Improving Access to Dental Care for Low Income People*. Report to the Toronto Board of Health, Toronto: ON.
 32. Wilkins, R., Tjepkema, Mustard, C. & Choinière, R. (2008). "The Canadian census mortality follow-up study, 1991 through 2001" *Health Reports* (Statistics Canada, Catalogue 82-003) 19(3): 22. Retrieved from www.statcan.ca/english/freepub/82-003-XIE/82-003-XIE2008003.htm.
 33. World Health Organization (1978). *Declaration of Alma-Ata*. Retrieved from www.who.int/hpr/NPH/docs/declaration_almaata.pdf.
 34. Braveman, P. (2006). Health Disparities and Health Equity: Concepts and Measurement. *Annual Review of Public Health* 27:167-194.
 35. Holowaty, E. & King, M.J. (2008). Personal communiqué. Cancer Care Ontario (September 19, 2008).
 36. Hymel, S., Le Mare, L., & McKee, W. (2006, April). *The early development inventory (EDI): An examination of validity*. Paper presented the Annual Meeting of the American Educational Research Association, San Francisco. CA.

-
37. Janus, M. (2005). *Early Development Instrument guide 2004/2005*. Offord Centre for Child Studies. McMaster University. Retrieved from www.offordcentre.com/readiness/files/2005.EDI.ENG.Guide.pdf.
 38. Janus, M., Brinkman, S., Duku, E., Hertzman, C., Santos, R., Sayers, M. et al. (2007). *The Early Development Instrument: Population-based measure for communities: A handbook on development, properties, and use*. Offord Centre for Child Studies. McMaster University. Retrieved from www.offordcentre.com/readiness/files/EDI_Handbook_Jul07.pdf.
 39. Kershaw, P., Irwin, L., Trafford, K. & Hertzman, C. (2005). *The British Columbia atlas of child development 1st Edition*. Victoria, British Columbia: Human Early Learning Partnership and Western Geographical Press.
 40. Janus, M. & Offord, D. (2000). Readiness to learn at school. *ISUMA: Canadian Journal of Policy Research* 1(2), 71-75.

