

# THE HEALTH OF TORONTO'S YOUNG CHILDREN

## Volume 3 – The Growing Child



Dr. David McKeown  
Medical Officer of Health

November, 2007

 **TORONTO**  
Public Health

# **THE HEALTH OF TORONTO'S YOUNG CHILDREN**

## **VOLUME 3 – THE GROWING CHILD**

**November, 2007**



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## Authors:

Nancy Day, MHSc, Margaret De Wit, PhD, Paul Fleiszer, MSc, Jan Fordham, RN, MEd, Karen MacCon, PhD, Wil Ng, MHSc, Karen Wade, RN, MScN.

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Metrics & Planning  
Toronto Public Health  
277 Victoria Street, 7th floor  
Toronto, Ontario M5B 1W2

Phone: 416-392-7450  
Fax: 416-338-8126  
Email: [map@toronto.ca](mailto:map@toronto.ca)

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## **TABLE OF CONTENTS**

EXECUTIVE SUMMARY .....	1
PART I: INTRODUCTION.....	8
PART II: DEMOGRAPHIC CONTEXT.....	11
Population Profile.....	11
PART III: NEIGHBOURHOOD AND FAMILY INFLUENCES ON YOUNG CHILDREN'S HEALTH.....	14
Neighbourhood Influences.....	14
Family Influences.....	17
PART IV: YOUNG CHILDREN'S HEALTH OUTCOMES .....	24
Motor, Social, and Cognitive Development .....	24
Readiness to Learn At School .....	25
Body Weight.....	29
Oral Health .....	32
Asthma .....	36
Unintentional Injury .....	39
Abuse and Neglect .....	44
Communicable Diseases, Including Vaccine Preventable Diseases.....	49
PART V: SUMMARY AND CONCLUSIONS.....	54
APPENDIX A: DATA SOURCES, METHODOLOGY AND LIMITATIONS .....	58
APPENDIX B: DEFINITION OF TERMS.....	70
APPENDIX C: LEADING CAUSES OF HOSPITALIZATION, ICD-10, CHILDREN AGE 1 TO 6, TORONTO AND THE REST OF ONTARIO, 2003-2005 COMBINED.....	73
APPENDIX D: LEADING CAUSES OF MORTALITY, ICD-10, .....	
CHILDREN AGE 1 TO 6, TORONTO, 2001-2003 COMBINED.....	74
APPENDIX E: ENTERIC, FOOD AND WATERBORNE DISEASES, CHILDREN AGE 1 TO 6 (RATE PER 100,000), TORONTO AND THE REST OF ONTARIO, 2001-2005.....	75
REFERENCES .....	76

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## LIST OF MAPS

### Map 1

Children Age 1 to 6  
(by Census Tract), Toronto, 2006. . . . . 13

### Map 2

Children Age 1 to 6 Living in Low Income Households  
(by Census Tract), Toronto, 2000. . . . . 16

### Map 3

Senior Kindergarten Children Not Ready to Learn at School  
(by Health Planning Area), Toronto, 2004/05. . . . . 27

### Map 4

Emergency Room Visits due to Unintentional Injury, Children Age 1 to 6  
(by Neighbourhood), Toronto, 2003-2005 Combined . . . . . 43

## LIST OF FIGURES

### Figure 1

Model of Child Health . . . . . 8

### Figure 2

Children Age 1 to 6,  
Toronto and the Rest of Ontario, 1996, 2001, 2006, 2011 and 2016 . . . . . 12

### Figure 3

Overweight or Obese Children Age 2 to 6,  
Toronto and the Rest of Ontario, 2004 . . . . . 31

### Figure 4

Early Childhood Tooth Decay Diagnosis in Children from Birth to Age 6,  
(by Age Groups), Toronto, 2003 . . . . . 35

### Figure 5

Smoke Free Households with Children Age 1 to 6,  
Toronto, 2002, 2004 and 2006. . . . . 37

### Figure 6

Asthma Hospitalization, Children Age 1 to 6,  
Toronto and the Rest of Ontario, 1996/97-2005/06 . . . . . 38

### Figure 7

Leading Reportable Enteric, Food and Waterborne Diseases,  
Children Age 1 to 6, Toronto and the Rest of Ontario, 2001-2005 . . . . . 52

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## LIST OF TABLES

### Table 1

Selected Characteristics of Health Planning Areas with the Highest and Lowest Rates of Children Not Ready to Learn at School, Toronto, 2004/05. . . 28

### Table 2

Children Scoring Low by Developmental Domain Across Health Planning Areas, Toronto, 2004/05 . . . . . 28

### Table 3

Dental Visits by Child's Age, Household Income, and Child's Country of Birth, Toronto, 2003. . . . . 33

### Table 4

Oral Health Indicators, Children Age 5, Dental Indices Survey (DIS), Toronto, 1999/2000 and 2005/06. . . . . 34

### Table 5

Causes of Unintentional Injury Hospitalizations, Children Age 1 to 6, Toronto and the Rest of Ontario, 2003-2005 Combined . . . . . 41

### Table 6

Causes of Unintentional Injury Emergency Room Visits, Children Age 1 to 6, Toronto and the Rest of Ontario, 2003-2005 Combined . . . . . 42

### Table 7

Type of Abuse Investigation, Children Age 1 to 6, Ontario, 2003 . . . . . 46

### Table 8

Vaccine Preventable Diseases, Children Age 1 to 6 (Rate per 100,000), Toronto and the Rest of Ontario, 2001-2005 . . . . . 50



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## EXECUTIVE SUMMARY



### The Health of Toronto's Young Children

*The Health of Toronto's Young Children* is a series of reports that provide the most current available information on the health of Toronto children from birth to age 6. The reports provide a picture of the health of Toronto's youngest residents using a model that identifies two components of young children's health – development and functioning. The model, described in the first report of the series, provides a framework to identify key issues of significance and indicators related to young children's health. It recognizes that diseases, injuries, and disabilities can seriously reduce young children's development and/or functioning temporarily, or in some situations, their health may be affected for their entire lives.

### The Health of Toronto's Young Children: The Growing Child

This third report in the series, *The Health of Toronto's Young Children: The Growing Child*, focuses on the health of Toronto's children age 1 to 6. It provides a population profile of the City's young children, information on neighbourhood and family factors and how these factors contribute positively or negatively to their health. The report also presents information on a range of young children's health outcomes and describes the short and long term consequences of these outcomes on their development and functioning. Available data are woven together with information derived from the literature to provide a picture of health issues of significance to children age 1 to 6 in Toronto. Although the focus of this report is children age 1 to 6, data for children in other age groups are presented when necessary. Toronto children are compared, where possible, to children in the rest of Ontario and/or Canada. The report also identifies important gaps in local health data related to young children's health.

Highlights from this third report include:

#### *Demographic Context*

- In 2006, close to 160,000 children age 1 to 6 lived in Toronto, representing nearly 20% of all Ontario children in this age group.
- Some areas of Toronto have much higher concentrations of children age 1 to 6 than others.

#### *Neighbourhood Influences*

Characteristics of neighbourhoods may interact with circumstances at the individual, family and household levels to confer harm or benefit to the developing child.

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### Neighbourhood Income

- Toronto children age 1 to 6 living in low income families are concentrated in certain neighbourhoods.
- In some census tracts, up to half of the children age 1 to 6 live in deep poverty.
- Children living in low income neighbourhoods have worse health outcomes, on average, than children living in affluent neighbourhoods.

### Neighbourhood Cohesion

- Most Toronto parents of children age 1 to 5 reported high levels of neighbourhood cohesion. These levels were however, significantly lower, on average, than those reported by parents in the rest of Ontario.
- Cohesive neighbourhoods with high levels of social organization and trust can support the socialization of children and enable parents to access supports.

### *Family Influences*

Family sociodemographic characteristics and the quality of the home environment can have a powerful influence on young children.

### Family Income

- In 2000, 30% of Toronto's economic families with children age 1 to 6 were low income. This represents 50,520 children.
- Children from lower income households are more likely to have emotional and behavioural problems, asthma, worse functional health, and be overweight, obese, injured, or victimized.

### Family Structure

- In 2001, the majority (83%) of Toronto children age 1 to 6 lived in two parent families (135,025 children) and 17% lived in lone parent families (27,490 children).
- In 2000, 66% of Toronto children age 1 to 6 living with lone parents lived in low income families compared to 24% of children living with two parents.
- Children living in lone parent families, on average, have higher levels of emotional and behavioural problems, and are less likely to be ready for school learning.

### Housing

- In 2001, 83,390 (51%) Toronto children age 1 to 6 lived in rental housing. The vast majority of low income young children (82%) lived in rental housing.

- 
- Children living in rented homes have worse health outcomes, including emotional and behavioural problems, on average, than children whose families own their homes.

### Family Functioning

- Most Toronto parents of children age 1 to 5 reported high levels of family functioning. On average, these levels were similar to those in the rest of Ontario.
- Positive family functioning contributes to the healthy development and well being of individual family members and can also help to reduce the impact of factors such as low income on children's development.

### Maternal Depression

- Most Toronto mothers of children from birth to age 5 reported low levels of depressive symptoms. On average, these levels were similar to those in the rest of Ontario.
- Maternal depression can impair children's health, especially when depression is severe, support is limited, or there are additional stressors.

### Parenting Practices

- Most Toronto parents of young children reported high levels of positive interaction with their children. On average, levels for children from birth to 23 months were similar to those in the rest of Ontario while levels for children age 2 to 5 were significantly lower than the rest of Ontario.
- Most Toronto parents of children age 2 to 5 reported high levels of consistent parenting. On average, these levels were significantly higher than in the rest of Ontario.
- Children who experience positive parenting practices are less likely to display emotional and behavioural problems or experience injury.
- Most Toronto parents of young children reported low levels of ineffective and punitive parenting. On average, these levels were similar to those in the rest of Ontario.
- Children who experience negative parenting practices exhibit lower levels of prosocial (helping) behaviour and higher levels of emotional and behavioural problems.

### Social Support

- Most Toronto parents of children from birth to age 5 reported high levels of social support. These levels were however, significantly lower, on average, than those in the rest of Ontario.
- Social support can be particularly beneficial to parents in reducing stress, promoting positive parent child interactions, and decreasing the likelihood of child abuse and neglect.

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### ***Motor, Social and Cognitive Development***

As children grow, they develop motor, social, and cognitive skills. These skills enable them to engage in more complex movements and interactions with others.

- 72% of Toronto children under the age of 4 displayed normal motor, social, and cognitive development, 15% displayed advanced development, and 14% displayed delayed development. The results for the rest of Ontario are similar to Toronto.
- In the first 6 years of life children develop important capacities that lay the foundation for later development. These areas of development are interconnected. Delays in one area may impair a child's ability to function in other areas.

### ***Readiness to Learn at School***

Children who begin school with age appropriate motor, language and cognitive development, and adequate social, emotional and communication skills are more able to take advantage of learning opportunities.

- In Toronto, 27.7% of Senior Kindergarten children can be considered not ready to learn at school. This is comparable to provincial and national results.
- In Toronto, the percentage of children not ready to learn ranges from 11.6% to 39.8% across the 41 Health Planning Areas (HPAs). This represents more than a three fold difference between the lowest and highest HPAs.
- In the physical health and well being domain, the percentage of children scoring low ranges from 3.4% to 19.5%. This represents almost a six fold difference across HPAs.
- Greater educational attainment leads to better outcomes in all aspects of well being, including mental and physical health.

### ***Body Weight***

A healthy weight during childhood affects both short and longer term emotional and physical health.

- In 2004, approximately one quarter (27%) of Toronto children age 2 to 3 and approximately one half (48%) of children age 4 to 6 were not eating the recommended amount of vegetables and fruits per day.
- 88% of Toronto parents with children age 1 to 6 reported that at least one parent participated in some form of physical activity with their child two or more times per week; 57% participated four or more times per week.
- In 2004, 20% of Toronto children age 2 to 6 were overweight or obese, similar to the rate in the rest of Ontario.

- 
- Being overweight during childhood can lead to a number of negative health consequences ranging from poor self esteem to asthma, obesity and type 2 diabetes.

### *Oral Health*

Good oral health contributes to children's development and functioning.

- In 2003, 53% of Toronto children age 9 months to 6 years saw a dentist or dental hygienist within the last year; 42% had never had a dental visit. These children were more likely to be younger, living in low and low/middle income households, and born in Canada.
- The prevalence of Early Childhood Tooth Decay (ECTD) in 5 year old children increased from 9.8% in 1999/2000 to 11.6% in 2005/06. Children born outside of Canada were 3.5 times more likely to be diagnosed with ECTD than children born in Canada.
- The percentage of 5 year old children with two or more untreated decayed teeth increased from 9.9% in 1999/2000 to 14.6% in 2005/06.
- Severe tooth decay in young children can affect their speech, growth, nutrition, socialization and learning. Untreated ECTD can contribute to gum diseases, ear infections, and eventually early loss of teeth.

### *Asthma*

Asthma is a chronic respiratory condition; the first attack frequently occurs between 3 to 8 years of age.

- In 2006, 93% of Toronto households with children age 1 to 6 were smoke free. This is a significant increase from 2002 when 74% were smoke free.
- Between 2003 and 2005, asthma was the single leading cause of hospitalization for children age 1 to 6 both in Toronto and the rest of Ontario. Asthma accounted for approximately 13% and 12% respectively, of all hospitalizations for this age group.
- Long term impacts of asthma depend on factors such as the severity of the disease, exposure to triggers, and the quality of the medical management.

### *Unintentional Injury*

Child, family, and neighbourhood or community factors interact to heighten or lower the risk of unintentional injury.

- Between 2000 and 2003, unintentional injury was the most common cause of death among children age 1 to 6 in Toronto, accounting for 20 (18%) of deaths in this age group.
- From 2003 to 2005, unintentional injury accounted for 9% of hospitalizations and 29% of all emergency room visits for children age 1 to 6 in

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Toronto. The true incidence of injuries is much greater than that reflected in hospitalization and emergency room data.

- In some areas of Toronto, the rate of injury related emergency room visits for young children is approximately 2.5 times greater than areas with the lowest rates.
- In addition to the short and long term impacts on the child, injury can impose significant financial and emotional trauma and stress on families and other caregivers.

### *Abuse and Neglect*

Abuse in the early years is associated with physical injury, social, emotional, and behavioural problems, and impaired cognitive functioning.

- Due to the nature of child abuse, it is not possible to identify the true levels occurring in the population.
- Incidence data are not available for Toronto. In Ontario, an estimated 44,299 (5,142 per 100,000) abuse investigations of children age 1 to 6 were conducted by child welfare services in 2003. 45% of these were substantiated, involving an estimated 19,863 children.
- Given the long trajectory of negative consequences for many children who are abused, prevention is critical not only to children's current health but also to their longer term health, well being and success as adults.

### *Communicable Diseases, including Vaccine Preventable Diseases*

Some children can have long term serious consequences and others may even die as a result of a communicable disease.

- Between 2001 and 2005 in Toronto, 64% of communicable diseases reported in children age 1 to 6 were vaccine preventable diseases and 33% were enteric diseases.
- Chickenpox was the most frequently reported vaccine preventable disease. Rates among children ages 1 to 4 and 5 to 9 fluctuate over time for Toronto and the rest of Ontario. From 2003 to 2005, rates were higher in Toronto compared to the rest of Ontario.
- Most vaccine preventable diseases affect a child's ability to attend child care or school, socialize and learn.
- From 2001 to 2005, the rate of enteric diseases for young children in Toronto and the rest of Ontario declined by about 32% and 16%, respectively. Toronto consistently reported higher rates than the rest of Ontario.
- Enteric diseases can disrupt family and social life, and are responsible for absenteeism from child care, school and work.

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### *Disparities in Health*

- There are significant disparities in some aspects of young children’s health in Toronto, specifically readiness to learn at school entry, Early Childhood Tooth Decay, and injury. The data for Toronto show that these disparities are related to factors that include neighbourhood and family income, family structure, and country of birth.

### *Data Gaps*

- There are limited Toronto specific data on child abuse and neglect, mental health outcomes, disability, nutrition, and physical activity. Data gaps present challenges to monitoring the health status of Toronto’s young children and planning appropriate programs. These gaps need to be filled in order to better measure and improve the health of Toronto’s young children.

## PART I: INTRODUCTION

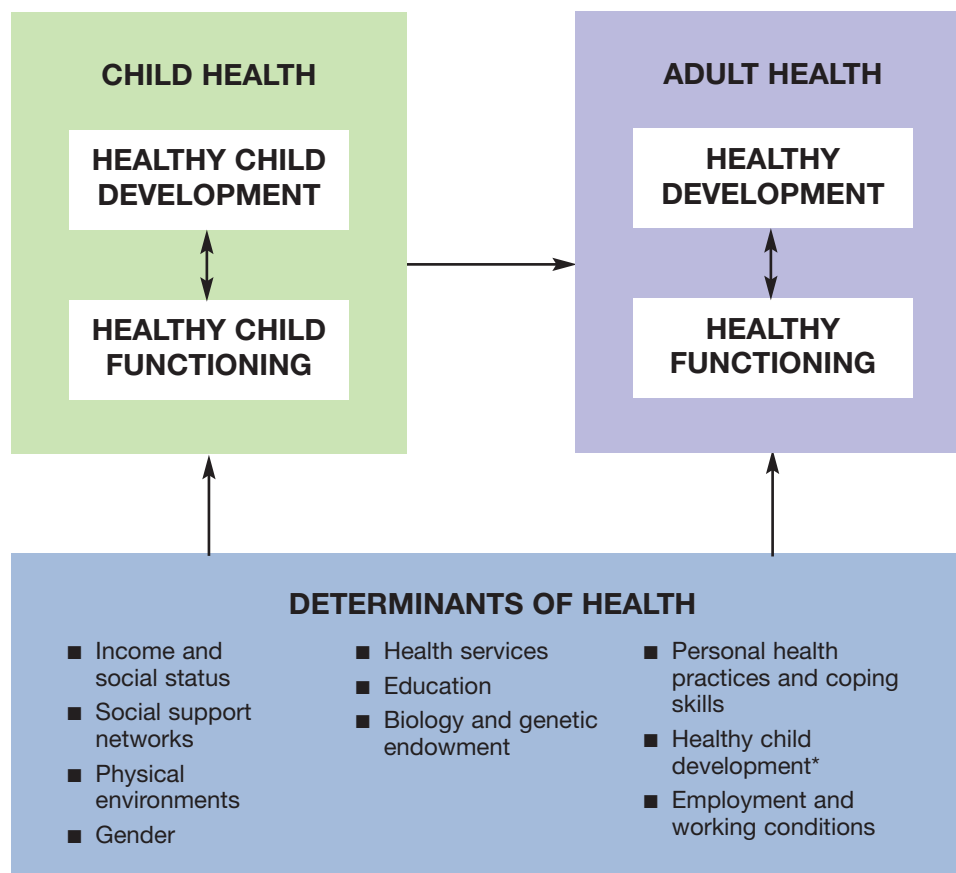
*The Health of Toronto's Young Children: The Growing Child* is the third in a series of reports on the health of Toronto's young children. These reports provide the most current available information on the health of Toronto children from birth to age 6. They are intended to assist Toronto Public Health (TPH) staff, Toronto's Board of Health, City staff in other divisions, and other key stakeholders at the local, provincial and federal levels to improve the health of Toronto's young children.

The first report in the series, *The Health of Toronto's Young Children: Setting the Context*, presented a sociodemographic portrait of Toronto's young children and their families. It also presented a model of child health (Figure 1) which provides a framework for identifying key issues of significance to young children's health and related indicators.



*This is the third in a series of reports that provide the most current available information on the health of Toronto children from birth to age 6.*

**Figure 1 – Model of Child Health**



\* Determinant of adult health

*Child health has two dimensions, development and functioning.*

The model identifies that health has two dimensions, development and functioning, which usually reinforce each other positively. Healthy development involves acquiring a range of physical, cognitive, emotional, social, and communication skills and abilities. Healthy functioning involves using these skills and abilities fully in learning to trust and love caregivers, communicating, playing, and making friends. It also involves having access to and using internal and external resources needed to cope, adapt, realize aspirations, and satisfy everyday needs. Injuries, diseases and disabilities can seriously reduce young children's development and/or functioning either temporarily or, in some situations, for the remainder of their lives. Serious deprivation, or the lack of basic resources, can have serious immediate and long term effects on development and functioning.

*Development and functioning during early childhood influence development and functioning at later stages, creating a 'health trajectory' over a lifetime.*

Development and functioning during early childhood influence development and functioning at later stages, creating a 'health trajectory' over a lifetime. The model recognizes that the determinants of health may affect children's health directly or through their families, neighbourhoods, or their social and physical environments. Analysis of the determinants of health can facilitate the development of policies and programs to directly support young children and their families, create healthy communities, and create health promoting social and physical environments.

The second report in the series, *The Health of Toronto's Young Children: The First Year of Life in Toronto*, focused on the health of Toronto's infants from birth to their first birthday. The report profiled key aspects of Toronto infants' development and functioning, as well as injuries, diseases, and disabilities which can have an impact on development and functioning. The report concluded that the majority of Toronto babies are born healthy and reach their first birthday free from major diseases, disabilities, and injuries. However, the report identified that there is cause for concern regarding the prevalence of low birth weight, congenital anomalies, and insufficient duration of breastfeeding. The report also identified that although the numbers of injuries, poisonings, congenital infections, and vaccine preventable diseases are relatively small, these issues require continued attention, as many are preventable.

*This report focuses on the health of Toronto's children age 1 to 6.*

This third report in the series, *The Health of Toronto's Young Children: The Growing Child*, focuses on the health of Toronto's children age 1 to 6. Part I of the report provides background information on the series, explains the focus of the report, and describes the scope of the report. Part II provides a brief population profile of Toronto's young children age 1 to 6. Part III presents information on neighbourhood and family factors and how these factors interact to contribute positively or negatively to children's health. Part IV presents information on selected health outcomes, including diseases, injuries, and conditions that impact on young children's health. Part V provides a summary of the report and identifies important gaps in local health data related to young children's health.

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Throughout this report, available data are woven together with information derived from the literature to provide a picture of health issues of significance to children age 1 to 6 in Toronto, as well as factors which influence their health. Although the focus of this report is children age 1 to 6, data for children in other age groups are presented when necessary. Toronto children are compared, where possible, to children residing in the rest of Ontario and/or Canada as a whole. When data were not available for the rest of Ontario, data for Ontario including Toronto are presented.

*Available data are woven together with information derived from the literature to provide a picture of health issues of significance.*

A number of national, provincial, and local data bases are used as well as survey data collected specifically for Toronto. Population estimates for this report are based on data from Statistics Canada's 2001 Census of Canada as well as from birth, death and migration records. Data from the 2006 Census of Canada, which were released in July, 2007, are also included.

Data from the National Longitudinal Survey of Children and Youth (NLSCY) are presented for the first time at the Toronto level in this report. The survey is a long term study conducted by Statistics Canada that monitors the development and well being of Canada's children from birth to adulthood. The person most knowledgeable about the child (PMK), usually the mother, completes the survey. TPH in consultation with Statistics Canada, combined 4 cycles of NLSCY data (Cycles 3, 4, 5 and 6) covering the years 1998/99 to 2005/06 in order to obtain enough data to analyze for Toronto. The results for Toronto are often described as "high" or "low" based on their relative place on a scale and are compared to results for the rest of Ontario (see Appendix A).

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## PART II: DEMOGRAPHIC CONTEXT



This section of the report provides an overview of the population of children age 1 to 6 living in Toronto. This includes data from the most recent Census on the number of young children, comparisons to other locations, trends over time, and residential location in the City. This information sets the context for the discussion of neighbourhood and family influences on young children's health and young children's health outcomes, described in Part III and Part IV respectively.

### Population Profile

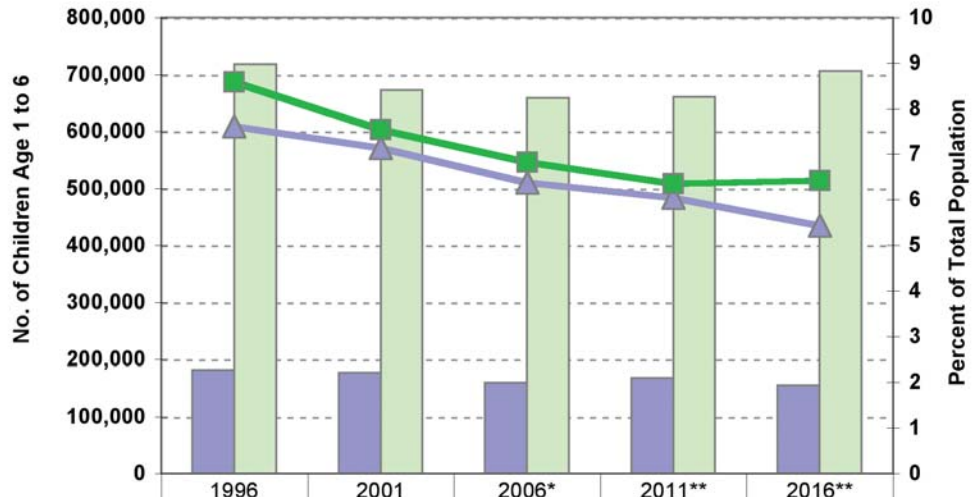
*In 2006, close to 160,000 children age 1 to 6 lived in Toronto, representing nearly 20% of all Ontario children age 1 to 6.*

In 2006, close to 160,000 children age 1 to 6 lived in Toronto, representing 6% of Toronto's total population (Figure 2). Although the number and proportion of Toronto children age 1 to 6 has decreased since 1996, similar to the rest of the province, Toronto children represent nearly 20% of all Ontario children age 1 to 6. The number of young children in Toronto is greater than the total populations for each of Prince Edward Island, Nunavut, Yukon and the Northwest Territories. The number of young children in Toronto is expected to increase slightly by 2011. By 2016, a decrease is expected for Toronto, unlike the rest of Ontario where an increase in the number of young children is expected by 2016. Although the total Toronto population and the population in the rest of Ontario are expected to increase through to 2016, the proportions of the population of young children age 1 to 6 are expected to decrease in both (see Appendix A for details on assumptions for population estimates).

Several trends may account for the decreasing numbers of young children in the City. These include women having fewer children or no children, a decrease in the number of women of childbearing age, which contributes to a decrease in the fertility rate, and more families with young children moving out of the City rather than into the City.

Information from the 2001 Census about the cultural and ethnic diversity of Toronto families with young children can be found in Volume 1 of this report series, *The Health of Toronto's Young Children: Setting the Context*.

**Figure 2 – Children Age 1 to 6, Toronto and the Rest of Ontario, 1996, 2001, 2006, 2011 and 2016**



Toronto: No. of children age 1 to 6	181,330	176,930	159,600	167,736	154,737
Rest of Ontario: No. of children age 1 to 6	718,210	672,755	658,785	660,781	706,022
% of Toronto population	7.6	7.1	6.4	6.0	5.4
% of Rest of Ontario population	8.6	7.5	6.8	6.3	6.4

\* The Census usually misses or undercounts a small proportion of the population. Following a review of the 2006 Census results for Toronto, City of Toronto staff identified the possibility that the Census may have undercounted more of Toronto's population than usual. Staff continue to investigate this issue.

\*\* Projected population numbers. Extracted: July 2002, Health Planning Branch, Ontario Ministry of Health & Long-Term Care.

Sources: Statistics Canada, 1996, 2001, 2006 (unadjusted) Censuses and Population Projections [2011, 2016], Provincial Health Planning Database.

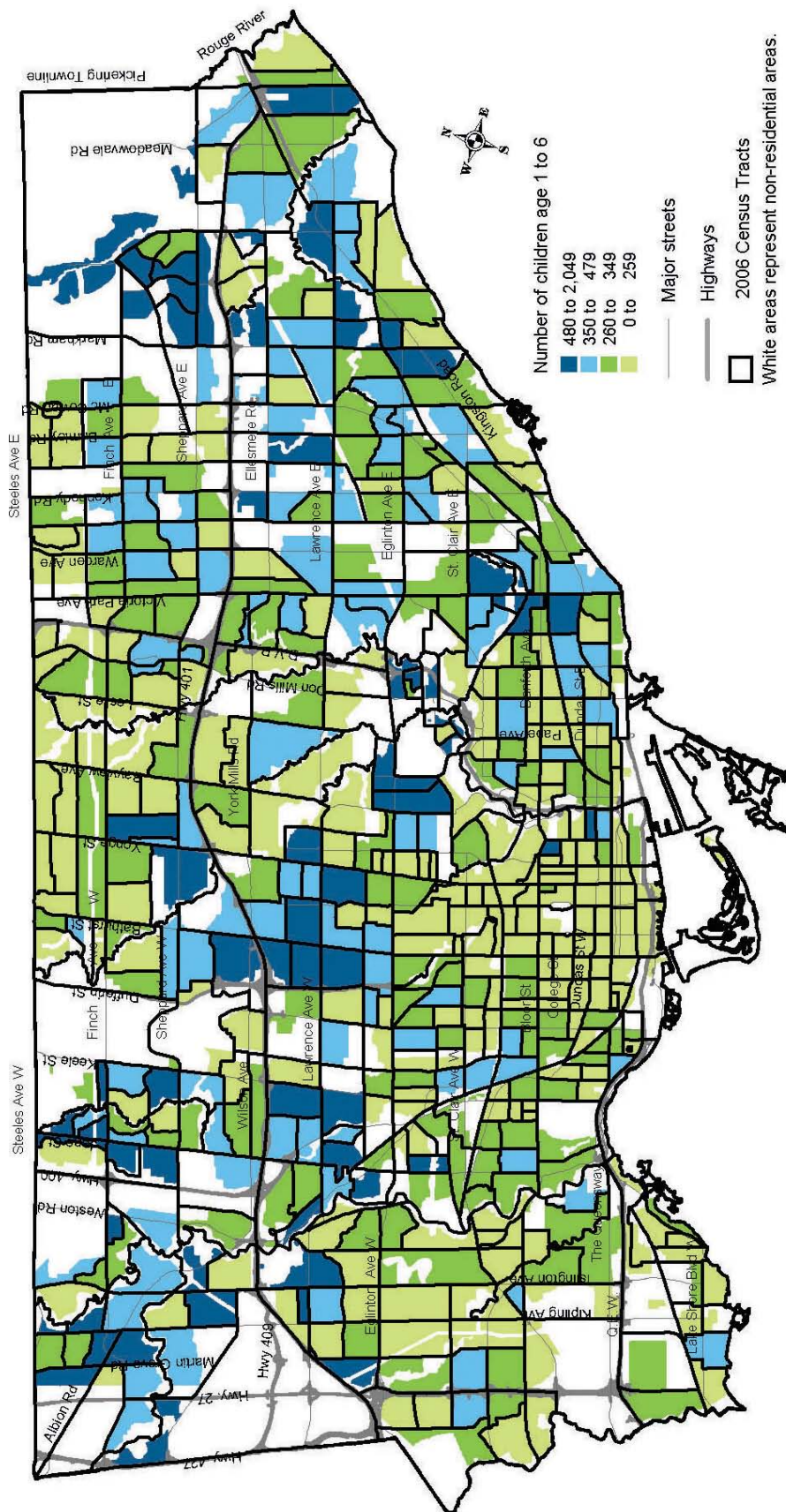
Prepared by: Toronto Public Health.

## Where Young Children Live in the City

Map 1 shows the distribution of Toronto's children age 1 to 6, based on the 2006 Census. Census tracts with the dark blue shading (480 to 2,049 children) are those with the highest numbers of young children age 1 to 6 (see Appendix A for further details). Map 1 shows that young children are not evenly distributed across the City, as there are some areas with much higher concentrations of children age 1 to 6 than others. There are higher concentrations of young children in the north west, north central and eastern areas of the City, with pockets of higher concentrations of children east of the downtown core. As noted in Volume 1 of this series, children's social experiences and opportunities can be affected by the number of children living in neighbourhoods. Understanding the distribution of young children within the City and the circumstances of their environments can assist in identifying priority areas for child health related programs and services.

*Some areas of Toronto have much higher concentrations of children age 1 to 6 than others.*

**Map 1 – Children Age 1 to 6 (by Census Tract), Toronto, 2006**



Census tracts were ranked according to the number of children age 1 to 6 and divided into quartiles. Each quartile includes approximately 25% of these children. The Census usually misses or undercounts a small proportion of the population. Following a review of the 2006 Census results for Toronto, City of Toronto staff identified the possibility that the Census may have undercounted more of Toronto's population than usual. Staff continue to investigate this issue.

Source: Statistics Canada, 2006 Census of Canada.

Prepared by: Toronto Public Health.

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## **PART III: NEIGHBOURHOOD AND FAMILY INFLUENCES ON YOUNG CHILDREN'S HEALTH**

Families are the basic social unit of society; however childrearing also takes place within neighbourhoods and communities.<sup>1</sup> Neighbourhood, family and child related risk and protective factors interact in complex ways to influence children's current and future health.<sup>2</sup> Children exposed to a number of risk factors and conditions at the same time are particularly likely to have health related problems.<sup>3,4,5,6</sup> On the other hand, factors within the child, the family, and the neighbourhood or community can also be sources of support for children and can contribute to positive outcomes<sup>4,6</sup> particularly for those children experiencing significant adversity.

Understanding the roles of both risk and protective factors is important for developing policies and programs that focus on decreasing exposure to risk factors and strengthening protective factors. This section of the report will focus on selected neighbourhood and family related risk and protective factors. Toronto specific data are limited in this area. The information draws heavily on Canadian and other research literature related to factors that influence the health of young children. Toronto level data from the National Longitudinal Survey of Children and Youth are included wherever possible.

### **Neighbourhood Influences**

#### **Introduction**

Until recently, research about factors contributing to children's health has focused primarily on factors within the child, the child's family, and the household. However, Canadian research is currently being conducted to explore the influence of neighbourhood factors on young children's health. Neighbourhoods provide the social context within which young children grow and develop. Although young children are less likely to be directly exposed to neighbourhood influences to the same degree as older children, characteristics of neighbourhoods may interact in complex ways with circumstances at the individual, family and household levels to confer harm or benefit to the developing child.<sup>7</sup>

This section of the report focuses on neighbourhood income and neighbourhood cohesion, two key neighbourhood level indicators which have been shown to influence child health.

#### **Neighbourhood Income**

The ways in which neighbourhood income level may influence children's health is an emerging area of research in Canada. Most of this research suggests that children living in low income neighbourhoods have worse health outcomes in a variety of areas, on average, than children living in affluent neighbourhoods.



*Neighbourhood characteristics may interact with individual, family and household circumstances to confer harm or benefit to the child.*

*Children living in low income neighbourhoods have worse health outcomes, on average, than children living in affluent neighbourhoods.*

*Toronto children age 1 to 6 living in low income families are concentrated in certain neighbourhoods. In some census tracts up to half of the children age 1 to 6 live in deep poverty.*

Toronto's young children age 1 to 6 living in low income families, defined as those with household incomes below Statistics Canada's Low Income Cut-off (LICO), are not evenly distributed across the City. They are concentrated in certain neighbourhoods. Map 2 shows a ring like band of low income neighbourhoods. The highest percentage of low income children are distributed around the core of the City (see Appendix B for further details). To explore the depth of poverty for Toronto's young children, analysis was performed according to the geographic distribution of young children living in deep poverty, defined by those with household incomes 50% or more below the LICO. The analysis revealed that there are some census tracts where up to half of the children age 1 to 6 live in deep poverty.

Neighbourhood income is associated with young children's cognitive abilities, motor and social development<sup>8</sup> and behaviour<sup>8,9,10</sup> with children in lower income neighbourhoods having more problems. Children from lower income neighbourhoods also tend to be less ready to learn at school entry, compared to children from higher income neighbourhoods.<sup>11,12</sup> Neighbourhood income level appears to be influential in the areas of physical health and well being, language and cognitive development, communication skills and general knowledge. It is less influential regarding emotional health and maturity, and social knowledge and competence, two dimensions of readiness to learn which are more strongly influenced by family factors at this age.<sup>12</sup>

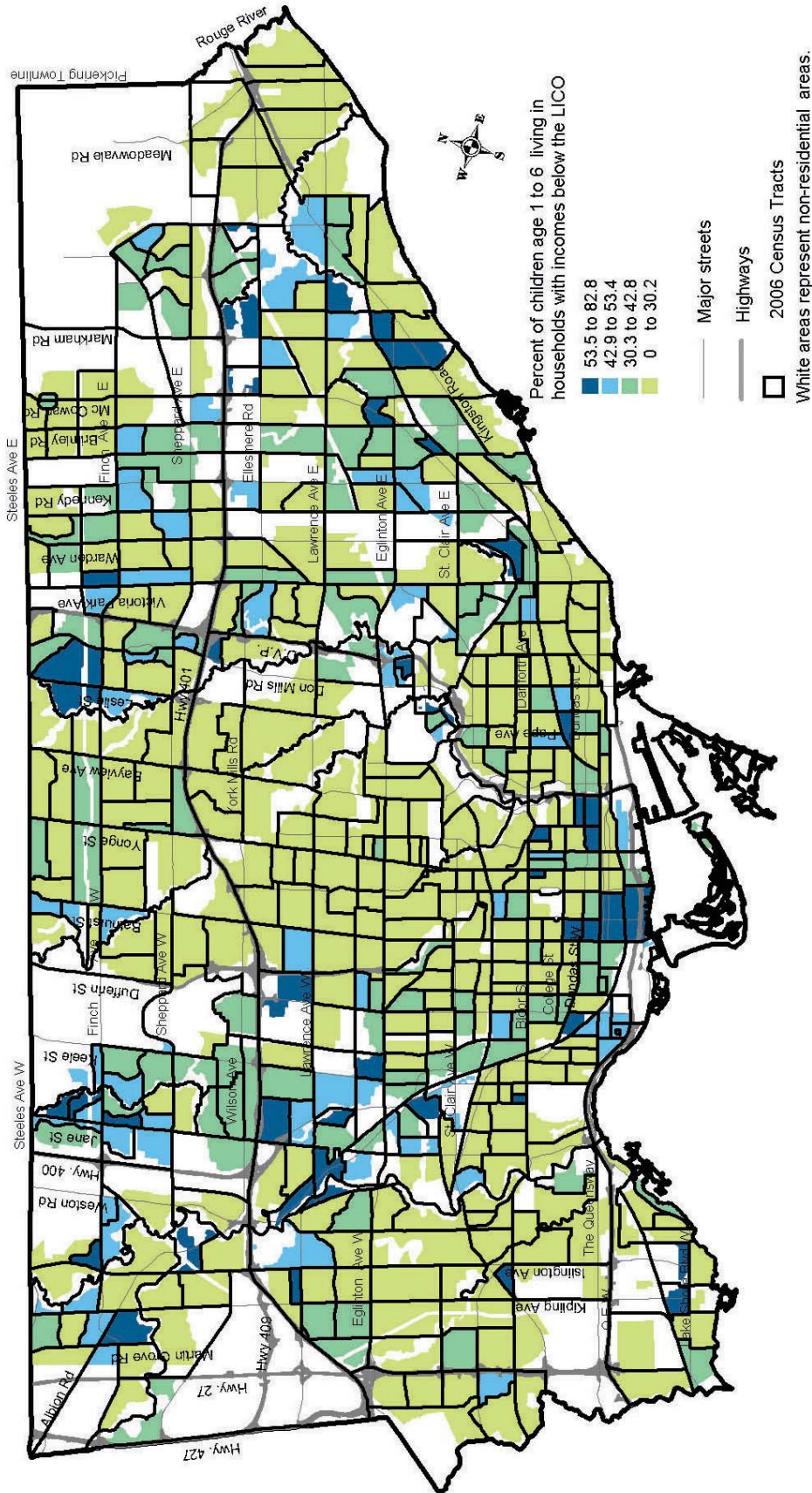
Neighbourhood income level is also associated with young children's physical health outcomes such as risk of injury<sup>7,13</sup> and asthma.<sup>14</sup> Children living in low income neighbourhoods have a higher risk of injury, regardless of their particular household circumstances.<sup>15</sup> Physical environment characteristics such as poor quality housing,<sup>14</sup> fewer safe play areas, and closer proximity to high traffic and industrial areas,<sup>13</sup> which may also result in greater exposure to traffic related air pollutants,<sup>16,17,18</sup> have been found in low income neighbourhoods.

## Neighbourhood Cohesion

The social climate of neighbourhoods can also influence children's health. Neighbourhood cohesion refers to a sense of community and the degree of support community members provide to each other.<sup>19</sup> Cohesive neighbourhoods with high levels of social organization and trust may enable parents to quickly access supports such as child care, when necessary.<sup>20</sup> Cohesive neighbourhoods can support the socialization of children<sup>12</sup> through monitoring children's behaviour and exposing them to positive role models.<sup>11</sup> Chronic stress resulting from inadequate income may undermine mutual support among parents and the collective supervision of children.<sup>12</sup>

*Cohesive neighbourhoods can support the socialization of children and enable parents to access supports.*

**Map 2 – Children Age 1 to 6 Living in Low Income Households (by Census Tract), Toronto, 2000**



Census tracts were ranked according to the percent of children age 1 to 6 who lived households with incomes below the Low Income Cut-off (LICO) (See Appendix B). Census tracts were then divided into quartiles. Each quartile includes approximately 25% of the children living in households with incomes below the LICO. Source: Statistics Canada, 2001 Census of Canada custom tabulations. Prepared by: Toronto Public Health.

*Most Toronto parents of children age 1 to 5 reported high levels of neighbourhood cohesion. These levels were significantly lower than those in the rest of Ontario.*

The National Longitudinal Survey of Children and Youth (NLSCY) uses the Neighbourhood Scale to assess neighbourhood cohesion. Items such as willingness to help neighbours, ensuring children are safe, and keeping a look out for trouble are included in the scale. The scale identifies whether a neighbourhood has a low or high degree of cohesion. Analysis of NLSCY data (Cycles 3 to 6 combined) found that while most Toronto parents of children age 1 to 5 reported high levels of neighbourhood cohesion, levels were significantly lower ( $p < .05$ ), on average, than those reported by parents in the rest of Ontario.

There is some evidence that children in neighbourhoods with safety concerns and low levels of cohesion have a higher risk of emotional, behavioural, and physical health problems,<sup>21</sup> whereas children in safer, more cohesive neighbourhoods have a lower risk of emotional,<sup>22</sup> behavioural,<sup>19,22</sup> motor, social, and verbal problems,<sup>19</sup> as well as a lower risk of injury.<sup>7</sup>

## **Family Influences**

### **Introduction**

*Family sociodemographic characteristics and the quality of the home environment can have a powerful influence on young children.*

Family sociodemographic characteristics as well as key dimensions of the quality of the home environment, can have a powerful influence on young children, including how they react to the people and events around them, what they expect from themselves and others, and how and what they learn.<sup>5,23</sup> These experiences during the early years may start young children off along varying pathways as they move into the school age years and beyond. It is now well established that early experiences establish the architecture of the brain and the trajectories for the learning, behaviour and health of individuals and populations.<sup>1</sup>

This section of the report focuses on selected aspects of the family and home environment which have been shown to influence young children's health, as well as the interrelationships among these characteristics. The specific characteristics discussed are family income, family structure, housing type, family functioning, maternal depression, parenting practices, and the social support available to families.

### **Family Income**

*30% of Toronto's economic families with young children were low income families. This represents 50,520 children.*

Low income is more prevalent among families with children and particularly among families with young children. In 2000, 30% of Toronto's 123,455 economic families with children age 1 to 6 were low income families, according to Statistics Canada's Low Income Cut-off (LICO). This represents 50,520 children age 1 to 6. Visible minority children in Toronto are disproportionately living in low income families. In 2000, 39% of Toronto children from birth to age 5 in visible minority groups lived in low income families.<sup>24</sup>

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Low income limits children's ability to participate in school and community activities,<sup>25</sup> and organized sports.<sup>26</sup> Low income families, on average, are more likely to experience high levels of chronic stress, challenges with family functioning, and have a parent with frequent depressive symptoms, all of which have an impact on the quality of the environment in which the child is growing and developing.<sup>26</sup>

Low income families can experience challenges in providing their young children with sufficient nutritious food. A 2003 survey of Toronto families with children from birth to age 6 found that 34% of families living near or below the LICO relied on only a few kinds of low cost food to feed their children and 8% felt their children were not getting enough to eat.<sup>27</sup> Of the approximately 60,000 Torontonians who use food banks each month,<sup>28</sup> 18% have at least one child 6 years of age or younger. Approximately 80% of food bank users with young children report that there are foods they think they should eat for a healthy diet but cannot afford. One third reported that their young child(ren) went hungry one day or more per month because there was not enough money to buy food.<sup>29</sup>

Young children from lower income households have worse health outcomes on a variety of indicators, on average, than other young children. They tend to experience more emotional and behavioural problems including aggression, antisocial behaviour, conduct problems, hyperactivity and inattention, and emotional disorder and anxiety.<sup>26,30,31</sup> They are generally less prepared for learning on a variety of indicators of school readiness<sup>32</sup> and more likely to experience poorer school outcomes.<sup>33,34</sup> They are also more likely to have worse functional health (a combined measure of vision, hearing, speech, mobility, dexterity, cognition, emotion, pain and discomfort),<sup>26</sup> be overweight or obese,<sup>35</sup> have asthma,<sup>36</sup> and be injured<sup>37</sup> or victimized.<sup>38</sup>

Source of income,<sup>39</sup> depth of poverty,<sup>30</sup> and length of time living in poverty<sup>33,34,38</sup> are important considerations. Canadian children whose families live on income at least 75% below the LICO have the highest rates of poor mental health outcomes.<sup>30</sup> Persistently poor children in welfare dependent families are more likely to experience academic failure by grade 6 than children of working parents never experiencing poverty.<sup>40</sup>

## Family Structure

In 2001, the majority (83%) of Toronto children age 1 to 6 lived in two parent families (135,025 children) and 17% lived in lone parent families (27,490 children).<sup>24</sup>

The impact of family structure on children's health and well being consists of both income and non-income related factors. Child poverty rates are

*Children from lower income households are more likely to have emotional and behavioural problems, asthma, worse functional health, and be overweight, obese, injured, or victimized.*

*83% of Toronto's young children lived in two parent families and 17% lived in lone parent families.*

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disproportionately high among lone parent families. In 2000, 66% of Toronto children age 1 to 6 living with lone parents lived in low income families compared to 24% of children living with two parents. Moreover, while lone parent families constituted only 17% of families with children age 1 to 6, they accounted for 36% of those living below the LICO.<sup>24</sup>

*Children living in lone parent families, on average, have higher levels of emotional and behavioural problems, and are less ready for school learning.*

Children living in lone parent families, on average, have greater levels of emotional and behavioural problems including hyperactivity-inattention, direct and indirect aggression, emotional distress and anxiety.<sup>41</sup> They also experience greater levels of intellectual and psychosocial difficulties<sup>41,42</sup> and are less likely to be ready for school learning.<sup>31</sup> Factors such as family income, family characteristics (e.g., family functioning), parental characteristics (e.g., parenting practices, maternal depression), and community characteristics (e.g., neighbourhood problems) play an important role in explaining differences in outcomes among children from lone parent families.<sup>43</sup>

## Housing

*51% of Toronto's young children lived in rental housing. 82% of low income young children lived in rental housing.*

Housing type and quality, which can influence children's health directly and indirectly, is closely tied to a family's financial resources. In 2001, 83,390 (51%) of Toronto children age 1 to 6 lived in rental housing. The vast majority of low income young children (82%) lived in rental housing.<sup>24</sup> In low income households, housing is often a significant source of stress. Average shelter costs in Toronto increased by more than 20% between 1993 and 2006. Two thirds of low income families with children spent more than 30% of their income on housing in 2003.<sup>44</sup>

*Children living in rented homes have worse health outcomes, on average, than children whose families own their homes.*

Children living in rented homes have worse health outcomes, including emotional and behavioural problems, on average, than children whose families own their homes.<sup>33</sup> Lower quality homes, typical of some rented homes, may increase exposure to indoor pollutants and hazards that pose health risks.<sup>45</sup>

Home ownership is associated with lower levels of emotional and behavioural problems, independent of socioeconomic differences between renters and owners. Home ownership may facilitate the provision of a safe, stable, and stimulating environment for children.<sup>46</sup> Home ownership may have a protective effect due to consistent exposure to schools and other structures and supports in the community. Children whose families move frequently have worse outcomes.<sup>47</sup>

## Family Functioning

Family functioning refers to how family members function together as a unit.<sup>48</sup> The NLSCY family functioning scale provides a global assessment of

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family functioning and an indicator of the quality of the relationship between parents or partners<sup>49,50</sup> (see Appendix A for further details).

Analysis of NLSCY data (Cycles 3 to 6 combined) found that most Toronto parents of children age 1 to 5 reported high levels of family functioning. On average, these levels were similar to those in the rest of Ontario (see Appendix A).

Positive family functioning contributes to the healthy development and well being of individual family members and can also help to reduce the impact of factors such as low income on children’s development.<sup>51</sup> Poor functioning of the family unit can contribute to a range of unfavourable outcomes for both parents and children. Mechanisms leading to disruptions in family functioning are often complex and interrelated. Factors such as maternal depression and ill health, lone parenthood, poverty, and inadequate housing can upset the balance in family functioning.<sup>7</sup>

Poor family functioning is associated with hostile ineffective parenting<sup>52</sup> as well as children’s risk of experiencing injury,<sup>7</sup> and emotional and behavioural problems<sup>5,53</sup> including physical and indirect aggression.<sup>48</sup> Racine & Boyle (2002) found that 6 to 8 year old children living in poorly functioning families had a 35% higher risk of behavioural problems, compared to children living in families with average family functioning.<sup>48</sup>

## Maternal Depression

Depression is a relatively common emotional disorder which is estimated to affect approximately 10% of women with young children. Single mothers and low income mothers have an even higher risk of depression.<sup>5,23</sup> Biological, social, and psychological factors interact to contribute to depression.<sup>54</sup> Depression is characterized by feelings of sadness, irritability, loss of interest and pleasure in activities that are usually enjoyable, sleep disturbances, fatigue, difficulty making decisions and/or concentrating, feelings of guilt, and, in some cases, thoughts of death or suicide.<sup>55</sup> Symptoms of depression vary in severity.

The NLSCY Depression Scale measures the occurrence and severity of symptoms associated with depression, such as loneliness, crying spells, restless sleep, and feeling that everything is an effort.<sup>56</sup> Analysis of NLSCY data (Cycles 3 to 6 combined) found that most Toronto mothers of children from birth to age 5 reported low levels of depressive symptoms. On average, these levels were similar to those in the rest of Ontario.

Maternal depression can have an impact on the entire family. In general, the quality of the relationship between the mother and her partner is diminished.<sup>57</sup> Marital discord,<sup>58,59</sup> and family conflict may increase.<sup>59</sup>

*Most Toronto parents reported high levels of family functioning. These levels were similar to those in the rest of Ontario.*

*Positive family functioning contributes to the healthy development and well being of individual family members and can reduce the impact of low income on children’s development.*

*Most Toronto mothers reported low levels of depressive symptoms. These levels were similar to those in the rest of Ontario.*

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Mothers may experience reduced parenting confidence,<sup>60</sup> increased irritability, hostility, and discouragement,<sup>61</sup> and use harsh and inconsistent discipline.<sup>60,62</sup>

*Maternal depression can impair children's health, especially when depression is severe, support is limited, or there are additional stressors.*

Maternal depression can also impair children's health. Children whose mothers are depressed are more prone to insecure attachments,<sup>58</sup> poor developmental attainment,<sup>63,64</sup> and diminished cognitive<sup>65,66,67</sup> and motor development.<sup>65</sup> They are also more prone to language difficulties,<sup>66</sup> lower levels of prosocial (helping) behaviour,<sup>10</sup> and increased levels of emotional and behavioural problems.<sup>10,53,57,62,63,67,68,69</sup> Emotional and behavioural problems during childhood can translate into problems at school and challenges establishing peer relationships.<sup>23</sup>

The greatest levels of disruption in parent child interactions and children's emotional and behavioural health occur when depression is more severe, or when there are limited supports or coexisting stressors, such as poverty, marital discord, substance abuse, and adolescent parenting.<sup>5,23</sup> Effective family functioning and positive parenting practices can protect children from the effects of maternal depression<sup>67</sup> whereas negative parenting practices can place children at greater risk of experiencing emotional and behavioural problems.<sup>69</sup>

## Parenting Practices

Parenting practices are influenced by factors within the child, the parent, the family, and the broader social context. Positive parenting practices consist of approaches that are child focused, warm and responsive, while, at the same time, firm and consistent in shaping children's behaviour.<sup>70,71</sup>

By contrast, negative parenting practices lack warmth and are characterized by harshness, inconsistency, hostility, punitiveness and disapproval of the child.<sup>70,71,72</sup> Both types of parenting practices are present in all family structures and all socioeconomic status levels. However, there is some evidence that living in poverty is associated with less capacity for supportive, consistent, and involved parenting, that teen parents tend to be more harsh and less consistent when interacting with their young children, and that more highly educated parents tend to be more democratic, child centered, and less punitive than less educated parents.<sup>70,71</sup>

*Children who experience positive parenting practices are less likely to display emotional and behavioural problems or experience injury.*

Parenting practices can influence many aspects of young children's health. Children who experience positive parenting practices tend to exhibit more curiosity and cooperative play and more effective communication.<sup>32</sup> They are also more likely to exhibit prosocial behaviour<sup>31,72</sup> and less likely to display emotional and behavioural problems<sup>5,69,72</sup> such as anxiety<sup>31</sup> and conduct disorder,<sup>5</sup> or to experience injury.<sup>73</sup>

The NLSCY has two scales that measure positive aspects of parenting (see Appendix A). The Positive Interaction Scale measures parent child interaction and includes items such as praising the child and playing games with the child. The Consistent Parenting Scale measures the reliability and regularity of parenting practices and includes items such as how often the child gets away with things that the parent feels should have been punished, and how often the child ignores punishment.

Analysis of NLSCY data (Cycles 3 to 6 combined) found that most Toronto parents of children from birth to 23 months and age 2 to 5 reported high levels of positive interaction. On average, Toronto parents of children from birth to 23 months reported similar levels of positive interaction compared to parents in the rest of Ontario. On average, Toronto parents of children age 2 to 5 reported significantly ( $p < .05$ ) lower levels of positive interaction compared to parents living in the rest of Ontario. Most Toronto parents of children age 2 to 5 reported high levels of consistent parenting. On average, Toronto parents of children age 2 to 5 reported significantly ( $p < .05$ ) higher levels of consistent parenting compared to parents in the rest of Ontario.

Children who experience negative parenting practices exhibit lower levels of prosocial (helping) behaviour,<sup>10</sup> and higher levels of emotional and behavioural problems<sup>5,53,71</sup> including anxiety,<sup>74</sup> hyperactivity-inattention,<sup>31</sup> physical aggression,<sup>10,31,71,74,75</sup> and conduct disorder.<sup>5</sup> For example, preschool children who experienced punitive parenting scored nearly 40% higher on a scale of aggressive tendencies (e.g., bullying or being mean) than children exposed to less punitive environments. Children who continued to experience punitive parenting up until 8 to 9 years of age scored nearly 80% higher.<sup>74</sup>

The NLSCY has two scales that measure the negative aspects of parenting (see Appendix A). The Ineffective Parenting Scale measures the level of hostile/ineffective interactions parents have with their child(ren) and includes items such as getting annoyed with the child and telling the child he is not as good as others. The Punitive Parenting Scale measures the level of aversive parent child interactions and includes items such as use of physical punishment.

Analysis of NLSCY data (Cycles 3 to 6 combined) found that most Toronto parents of children from birth to 23 months and age 2 to 5 reported low levels of ineffective parenting. Most Toronto parents of children age 2 to 5 reported low levels of punitive parenting behaviours. On average, these levels were similar to those in the rest of Ontario.

## Social Support

Social support is derived from relationships with others, including family members, friends, co-workers, and neighbours. Support may be emotional,

*Most Toronto parents reported high levels of positive interaction with their children. Levels for children from birth to 23 months were similar to those in the rest of Ontario. Levels for children age 2 to 5 were significantly lower.*

*Most Toronto parents reported high levels of consistent parenting. These levels were significantly higher than the rest of Ontario.*

*Most Toronto parents of young children reported low levels of ineffective and punitive parenting. These levels were similar to those in the rest of Ontario.*

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informational, or tangible and may include financial and practical assistance.<sup>76</sup> There is some evidence that most social support is provided by family members and close relationships.<sup>77</sup>

*Most Toronto parents reported high levels of social support. These levels were significantly lower than those in the rest of Ontario.*

The NLSCY Social Support Scale measures the quality and quantity of perceived social support and includes items such as having family and friends who help someone feel safe, secure, and happy and having people to count on in an emergency.<sup>56</sup> Analysis of NLSCY data (Cycles 3 to 6 combined) found that while most Toronto parents of children from birth to age 5 reported high levels of social support. These levels were significantly lower ( $p < .05$ ), on average, than those in the rest of Ontario.

*Social support can be beneficial in reducing parental stress, promoting positive parent child interactions, and decreasing child abuse and neglect.*

The degree of support available to people and their ability to access support varies according to a number of factors. For example, the physical and social organization of neighbourhoods provides the context for meeting and interacting with people. Personal factors, such as length of residence in a particular community, feelings of connection to others, as well as interpersonal skills, can facilitate or constrain people's ability to access social support. Social support can help protect people from stressful life circumstances and assist them in coping with such experiences.<sup>78</sup>

Social support can be particularly beneficial to parents in reducing stress, promoting positive parent child interactions, and even decreasing the likelihood of child abuse and neglect. Parents experiencing chronic stress require greater levels of support to help them cope effectively.<sup>79</sup> Higher levels of social support are associated with lower levels of parental depression and family dysfunction,<sup>80</sup> fewer relationship problems,<sup>5</sup> higher levels of young children's prosocial (helping) behaviour,<sup>10</sup> and decreased risk of social problems.<sup>5</sup>

## PART IV: YOUNG CHILDREN'S HEALTH OUTCOMES

The preceding section provided information on neighbourhood and family contextual factors and how these factors interact to contribute positively or negatively to children's health. This section of the report focuses on the health outcomes of young children in Toronto, presenting information on children's development and functioning as well as diseases, injuries, and conditions which impact their development and functioning.

Specifically, this section provides information on children's motor, social and cognitive development; readiness to learn at school; body weight; oral health; asthma; unintentional injuries; abuse and neglect; and communicable diseases, including vaccine preventable diseases. The impact on children's current and future health is also described. A variety of data sources are utilized.

### Motor, Social, and Cognitive Development

#### Introduction

As children grow, they begin to develop motor, social, and cognitive skills. These skills enable them to engage in more complex movements and interactions with others. It is important to identify children at risk for, or with early signs of, motor, social, and cognitive developmental delays so that they may benefit from appropriate early intervention.

#### Factors Associated with Low Motor, Social, and Cognitive Development

A range of child related, parent/family, and neighbourhood factors contribute to delays in young children's motor, social, and cognitive development when measured singly or in combination with other measures of development. Child related factors include male gender and low birth weight.<sup>81</sup> Parent/family related factors include maternal immigrant status (perhaps related to language barriers), low socioeconomic status (SES), maternal depression,<sup>64,81</sup> single parenthood, punitive parenting,<sup>81</sup> and low maternal education.<sup>64</sup> Neighbourhood factors include low neighbourhood safety.<sup>81</sup>

#### Motor, Social, and Cognitive Development in Young Children in Toronto

The NLSCY uses the Motor Social Development (MSD) scale to identify whether a child's motor, social and cognitive development is normal, delayed, or advanced.<sup>56</sup> The scale reflects parental assessment of the child's development. Analysis of NLSCY data (Cycles 3 to 6 combined) revealed that 72% of Toronto children under the age of 4 displayed normal motor, social, and cognitive development and 15% displayed advanced development.



*As children grow, they develop motor, social, and cognitive skills which enable them to engage in more complex movements and interactions with others.*

*72% of Toronto children displayed normal development, 15% displayed advanced development, and 14% displayed delayed development. Results for the rest of Ontario are similar.*

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Fourteen percent, or approximately 13,700 Toronto children, displayed delayed motor, social, and cognitive development. The results for the rest of Ontario are similar to Toronto; 72% of children were in the normal category, 14% were in the advanced category and 14% were in the delayed category.

*In the first 6 years of life children develop important capacities that lay the foundation for later development. Delays in one area of development may impair a child's ability to function in other areas.*

*Children who begin school with age appropriate development, and adequate social, emotional and communication skills are more able to take advantage of learning opportunities.*

## **Consequences of Low Motor, Social, and Cognitive Development for Young Children's Health**

In the first 6 years of life children develop important capacities that lay the foundation for later development. During this time children's motor, cognitive, socioemotional, language and self help abilities undergo rapid growth. These areas of child development are interconnected. Delays in one area may impair a child's ability to function in other areas.<sup>82</sup>

## **Readiness to Learn at School**

### **Introduction**

Children who begin school with age appropriate motor, language and cognitive development, and adequate social, emotional and communication skills are more able to take advantage of learning opportunities<sup>83</sup> and are less likely to experience problems such as low achievement and grade failure in the early years.<sup>84,85</sup> Readiness to learn is considered to be a critical marker for life long success.<sup>86</sup>

### **Readiness to Learn at School for Young Children in Toronto**

The Early Development Instrument (EDI) was used to assess children's readiness to learn at school in five developmental domains:

- Physical health and well being;
- Social competence;
- Emotional maturity;
- Language and cognitive development; and,
- Communication skills and general knowledge.

The EDI was administered in all Senior Kindergarten (SK) classrooms of the four district school boards in Toronto in either 2004/05 or 2005/06. Data in this report are based on 20,472 SK children attending these schools and living in Toronto. The average age of the children was 5.7 years and there were equal proportions of boys and girls. Fifteen percent of the Toronto sample was categorized as English as a Second Language (ESL) and 0.3% were French as a Second Language (FSL) (see Appendix A for a more detailed description of the EDI methodology and the Toronto sample).

The scores for each of the five EDI domains were ranked from the lowest score to the highest score in the Toronto sample. Children scoring low (in the bottom 10% of all scores) in one or more EDI domains are categorized as ‘vulnerable’, and considered not ready to learn at school.<sup>87</sup> In Toronto, 27.7% of SK children scored low in one or more EDI domains, and can be considered not ready to learn at school. This is comparable to provincial and national results.

*In Toronto, 27.7% of Senior Kindergarten children can be considered not ready to learn at school, comparable to provincial and national results.*

Variation in readiness to learn within Toronto was also explored as this provides an indicator of areas where children are at increased risk. By examining the disparity in school readiness across Toronto, the influence of broader socioeconomic and community factors on child development can be examined. As child development is not only a function of parenting patterns or family resources, EDI results may also provide an indication of how well local communities are doing in supporting young children and their families. Planning and decision making regarding the allocation of interventions and services at the local level is facilitated through analysis of levels and patterns of child development by neighbourhood.<sup>83</sup>

In Toronto the percentage of children who were not ready to learn ranges from 11.6% to 39.8% across the 41 Health Planning Areas (HPAs). This represents more than a three fold difference between the lowest and highest.

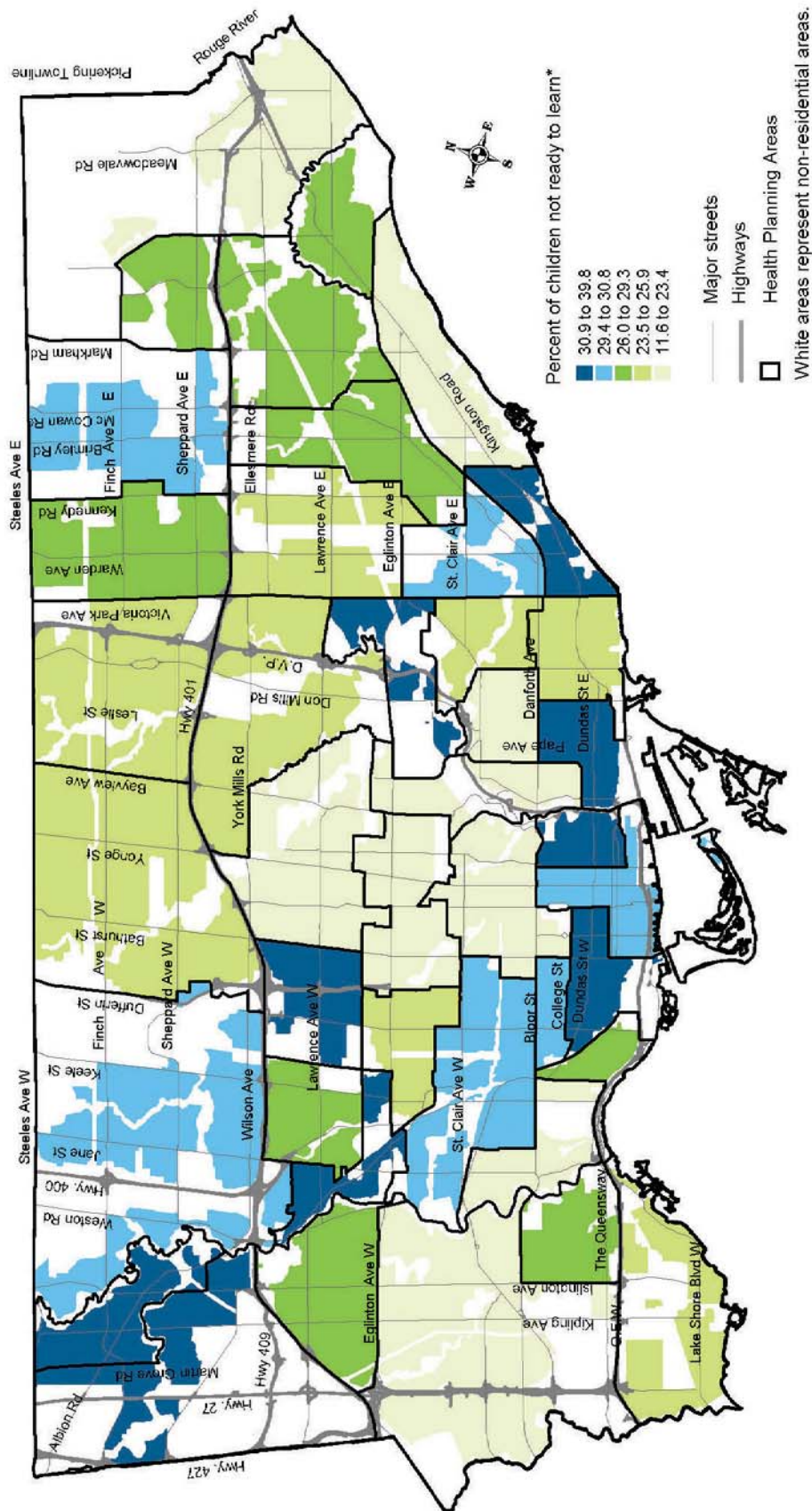
*The percentage of children not ready to learn ranges from 11.6% to 39.8% across the 41 Health Planning Areas (HPAs), more than a three fold difference.*

Map 3 illustrates the disparity in readiness to learn across the City. The HPAs are divided into five groups (quintiles), with the dark blue shading signifying the HPAs with the highest rates of children not ready to learn at school. The highest rates are concentrated in the north west and south central areas of the City, with pockets also evident to the east of the downtown core.

Factors associated with the disparity in readiness to learn across the City were examined. The quintile of HPAs with the highest rates of children not ready to learn also has the highest rates of children from birth to age 6 in low income families (41.4%), lone parent families (20.7%), and SK children identified as English as a Second Language (ESL) (21.5%) (see Table 1).

In addition to examining disparity in overall readiness to learn, disparities in EDI domain scores were analyzed. If children’s school readiness were spread evenly across Toronto, each of the 41 HPAs would have about 10% of children scoring low in each EDI domain. There is tremendous variation in the percent of children scoring low across the HPAs (see Table 2). For example, in the physical health and well being domain, the percentage of children scoring low ranges from 3.4% to 19.5%. This represents almost a six fold difference.

**Map 3 – Senior Kindergarten Children Not Ready to Learn at School\*  
(by Health Planning Area), Toronto, 2004/05\*\***



The 41 Health Planning Areas were sorted by percent of children not ready to learn at school\* and divided into 5 groups (quintiles). Each quintile includes approximately 20% of the children in the Toronto Early Development Instrument (EDI) sample.

\*Scoring low (in the bottom 10% of all scores in the Toronto EDI sample) in one or more of the five EDI domains.

\*\*EDI administered in 2004/05 in three Toronto school boards and 2005/06 in one board.

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

Prepared by: Toronto Public Health.

**Table 1 – Selected Characteristics of Health Planning Areas with the Highest and Lowest Rates of Children Not Ready to Learn at School\*, Toronto, 2004/05\*\***

	Percent of Children Age 0-6 Living in Low Income Families***	Percent of Children Age 0-6 Living in Lone Parent Families	Percent of Sr. Kindergarten Children Identified as ESL****
HPAs with Highest Rates of Children Not Ready to Learn* (Map 3 – areas with darkest shading)	41.4%	20.7%	21.5%
HPAs with Lowest Rates of Children Not Ready to Learn* (Map 3 – areas with lightest shading)	14.8%	9.2%	6.5%

\* Scoring low (in the bottom 10% of all scores in the Toronto Early Development Instrument (EDI) sample) in one or more of the five EDI domains.

\*\* EDI administered in 2004/05 in three Toronto school boards and 2005/06 in one board.

\*\*\* Family income below LICO, see Appendix B.

\*\*\*\* English as a Second Language.

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

Prepared by: Toronto Public Health.

**Table 2 – Children Scoring Low\* by Developmental Domain Across Health Planning Areas, Toronto, 2004/05\*\***

Early Development Instrument (EDI) Domain	Range in Percent of Children Scoring Low* Across 41 Health Planning Areas
Physical Health and Well-Being	3.4% to 19.5%
Social Competence	3.8% to 17.7%
Emotional Maturity	5.8% to 18.5%
Language and Cognitive Development	2.1% to 17.0%
Communication Skills and General Knowledge	2.7% to 22.3%

\* Domain score in the bottom 10% of all scores in the Toronto (EDI) sample.

\*\* EDI administered in 2004/05 in three Toronto school boards and 2005/06 in one board.

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

Prepared by: Toronto Public Health.

## Consequences of Low Readiness to Learn for Young Children’s Health

A number of studies have linked school level vulnerability in Kindergarten with poor academic performance in later grades while school level excellence in kindergarten has been associated with the percentage of children scoring at or above provincially prescribed standards.<sup>83</sup> In the adolescent years and beyond, poor school achievement is associated with lower educational attainment and literacy skills, unemployment, risky health behaviours, and criminal activity.<sup>85</sup> Greater educational attainment leads to better outcomes in all aspects of well being, including mental and physical health.<sup>88,89,90</sup>

*Greater educational attainment leads to better outcomes in all aspects of well being, including mental and physical health.*

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## Body Weight

### Introduction

*Childhood weight affects short and longer term health.*

A healthy weight during childhood is important because it affects both short and longer term emotional and physical health. Childhood overweight and obesity rates in Canada are increasing.<sup>91</sup>

### Factors Associated with Body Weight

*Weight is affected by energy intake, energy expenditure, genetic, environmental and behavioural factors.*

Achieving and maintaining a healthy weight is affected by a diverse range of modifiable and non modifiable factors, including energy intake (food and drink consumed) and energy expenditure (activity level) as well as genetic, environmental and behavioural factors.<sup>92</sup>

### Energy Intake

*27% of Toronto children age 2 to 3 and 48% of Toronto children age 4 to 6 were not eating the recommended amount of vegetables and fruits per day.*

Energy intake is determined by the type and amount of foods and drinks consumed by children. Health Canada's (2007) Eating Well with Canada's Food Guide recommends the types of foods and number of servings that should be consumed for optimal health, growth and development.<sup>93</sup> Data from the 2004 Canadian Community Health Survey (CCHS) showed that slightly more than one quarter (27%\*; 95% CI: 13.7, 39.5) of Toronto children age 2 to 3 ate vegetables and fruits less than 4 times per day, which indicated they were not eating the recommended amount for this age group<sup>§</sup>. This was higher but not statistically different than the rest of Ontario (13%\*; 95% CI: 8.5, 17.7). The same survey also showed that slightly less than half (48%; 95% CI: 33.5, 61.8) of all Toronto children age 4 to 6 ate vegetables and fruits less than 5 times per day, which indicated they were not eating the recommended amount for this older age group<sup>§</sup>. This was similar to the rest of Ontario (52%; 95% CI: 45.7, 58.4). Local level data for consumption of milk and alternatives, grain products, and meat and alternatives, were not available. Foods from these food groups as well as other foods (e.g., fruit flavoured drinks, soft drinks, cookies), also contribute to energy intake and must be considered when assessing total energy intake. Detailed descriptions of the kinds of foods that young children ate, as well as nutrient profiles of food items, have been collected by Statistics Canada as part of the 2004 CCHS. These data have not been released.

### Energy Expenditure

To achieve and maintain a healthy weight, children need to be physically active each day and minimize the amount of time spent on sedentary activities (e.g., watching television, and playing video and computer games).

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\* High sampling variability. Interpret estimate with caution.

§ There is debate about whether the reported frequency of consumption (times per day) of vegetables and fruits is equivalent to actual consumption, as measured by servings per day.<sup>94,95,96</sup> In this report it is assumed that times per day approximates servings per day.

Research suggests that parents' role modeling, support, encouragement and praise act as positive influences in promoting physical activity among children.<sup>97</sup> Results from the 2003 Toronto Perinatal and Child Health Survey (PCHS) revealed that the majority of parents with children age 1 to 6 (88%; 95% CI: 86.2, 90.6) reported that at least one parent participated in some form of physical activity with their child two or more times per week, and over half (57%; 95% CI: 53.8, 60.6) participated four or more times per week.<sup>27</sup>

*88% of Toronto parents reported that at least one parent participated in some form of physical activity with their child two or more times per week; 57% participated four or more times per week.*

Currently, Canada does not have recommended time guidelines for physical activity for children under 6 years. Numerous organizations across the country, including Ontario's Best Start Resource Centre, have been using guidelines from the US National Association for Sport and Physical Education (NASPE) for infants and toddlers (birth to five years). NASPE recommends toddlers and preschoolers should not be still for more than 60 minutes at a time (other than sleeping) and should play actively for 60 minutes to several hours per day.<sup>98</sup>

The 2003 Toronto PCHS identified that approximately 1 in 4 Toronto children (27%; 95% CI: 24.0, 30.2) age 1 to 6 spend more than two hours per day on sedentary activities such as watching TV or videos, using computers, and playing video games or hand held computer games.<sup>27</sup>

### ***Genetic, Environmental and Behavioural Factors***

Children's weight is also influenced by genetic, environmental and behavioural factors. Having parents that are overweight due to familial genetic predisposition or environmental factors, early puberty and early adiposity rebound are risk factors associated with childhood overweight and obesity.<sup>99</sup> Adiposity rebound, which generally occurs at 4 to 8 years of age, refers to an increase in fatty and connective tissue from its lowest point. Children that reach their lowest adiposity point earlier experience a higher risk of adulthood obesity.<sup>100</sup>

Canadian children living in families with incomes below Statistics Canada's Low Income Cut-off (LICO) are more likely to be obese than those living in families with incomes above the LICO (25% versus 16%).<sup>35</sup> Canadian children and adolescents (2 to 17 years old) in households with no members having more than a high school diploma are more likely to be overweight or obese than those in households in which the highest level of education is post secondary graduation.<sup>91</sup>

Parents' eating habits, control, and role modeling are associated with children's eating habits.<sup>101</sup> For example, when families use high fat or high sugar foods as rewards, children learn to prefer these foods. As well, children

whose parents control the amount of food they eat are less able to self regulate their food intake. Children and adolescents who eat fruit and vegetables five or more times a day are substantially less likely to be overweight or obese than those whose consumption is less frequent.<sup>91</sup>

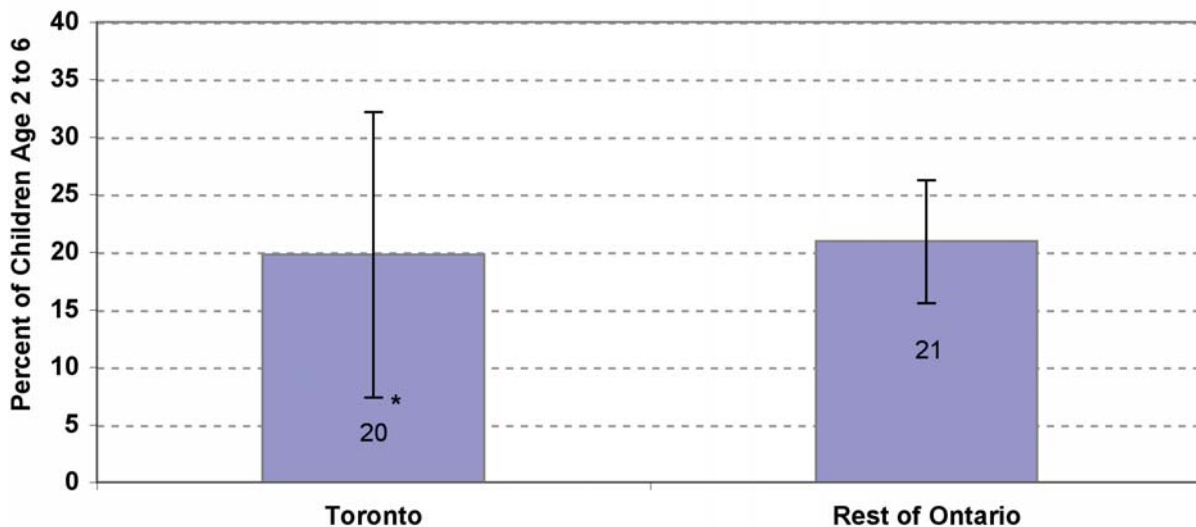
### Overweight and Obesity in Young Children in Toronto

Since children are still growing, their weight is assessed differently than it is for adults. The International Obesity Task Force (IOTF) uses the body mass index (BMI) to determine if children age 2 to 18 are overweight or obese. The focus on overweight and obesity in this report is due, in part, to a lack of scientific research and clinical experience regarding the health effects of being underweight during early childhood. It is also for this reason that the IOTF does not include an underweight classification for children age 2 to 18.<sup>102</sup>

*20% of Toronto's young children were overweight or obese, similar to the rate in the rest of Ontario.*

The 2004 CCHS estimates that 20%\* (95% CI: 7.3, 32.2) of Toronto children age 2 to 6 were overweight or obese, similar to the rate in the rest of Ontario (21%; 95% CI: 15.6, 26.2) (Figure 3).

**Figure 3 – Overweight or Obese Children Age 2 to 6, Toronto and the Rest of Ontario, 2004**



\* High sampling variability. Interpret estimate with caution.  
Error bars (I) denote 95% confidence intervals on the estimates.  
Toronto weighted N = 134,013. Rest of Ontario weighted N = 565,474.  
Source: Canadian Community Health Survey, Cycle 2.2, 2004.  
Prepared by: Toronto Public Health.

\* High sampling variability. Interpret estimate with caution.

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## Consequences of Overweight and Obesity for Young Children's Health

Being overweight during childhood can lead to a number of negative health consequences ranging from poor self esteem to asthma, obesity and type 2 diabetes.<sup>35,103</sup> Childhood obesity has both immediate and long term impacts. It affects growth and development, contributes to health conditions (e.g., coronary heart disease) and carries psychological consequences (e.g., poor body image and self esteem).<sup>104</sup>

Increasingly pediatric overweight is associated with increased health risks during childhood (5 to 19 years), including hypertension, dyslipidemia (high blood lipids) and type 2 diabetes. It has been estimated that by 5 to 10 years of age, 60% of overweight children have one associated cardiovascular risk factor such as elevated total cholesterol, triglycerides, insulin or blood pressure, with 25% having two or more.<sup>105</sup> During the adolescent years, being overweight can lead to emotional problems, poor self image,<sup>106</sup> and social exclusion by peers.<sup>107</sup> Among adults, paediatric overweight is associated with metabolic syndrome, a group of conditions that increase the risk of heart disease,<sup>108</sup> as well as overall adult morbidity and mortality.<sup>109</sup>

*Being overweight during childhood can lead to a number of negative health consequences ranging from poor self esteem to asthma, obesity and type 2 diabetes.*

## Oral Health

### Introduction

Good oral health contributes to children's development and functioning. Children less than 6 years of age usually have primary (baby) teeth, which are necessary for the development of eating habits and speech and to maintain space for incoming permanent teeth. In addition, healthy oral structures affect the child's appearance and influence the development of social skills. Young children can experience a range of oral pathologies, including: mild to severe decay, gum disease, infections in the jaws, injuries involving the teeth, and developmental problems such as cleft lip and palate. This section of the report will focus on tooth decay.

*Good oral health contributes to children's development and functioning.*

### Factors Associated with Tooth Decay

Decay may occur when a child is given a bottle containing liquids (e.g., juice, artificial milk, breast milk). The sugar in the liquids pools around the teeth, particularly the front teeth, mixes with decay causing bacteria, and causes rapidly progressing destruction of the teeth.<sup>110</sup> Decay causing bacteria can also be transmitted from the mother or other caregiver to the child in the first 2 years of life.<sup>111</sup> Early Childhood Tooth Decay (ECTD) refers to aggressive decay in young children's teeth. As the child ages, tooth decay is linked to exposure to dietary sugar, which may be consumed in a variety of foods and drinks (e.g., soft drinks, candies, and cookies). Frequent and high consumption of foods containing sugars, in conjunction with poor oral hygiene, is the major cause of tooth decay.<sup>112</sup> The severity of decay is linked to: the sweetness of the

*Frequent and high consumption of foods containing sugars, in conjunction with poor oral hygiene, is the major cause of tooth decay.*

*53% of Toronto children age 9 months to 6 years saw a dentist or hygienist within the last year; 42% had never had a dental visit. These children were often younger, living in low and low/middle income households, and born in Canada.*

food/drink per exposure; the number of exposures per day; and the length of exposure. Other factors that can influence the prevalence of tooth decay in children include: lack of exposure to fluoride; lack of access to timely and appropriate information; and lack of access to dental care.

A child's first dental visit should occur within 6 months of the eruption of the first tooth or by 1 year of age.<sup>113</sup> Data from the 2003 Toronto Perinatal and Child Health Survey (PCHS)<sup>27</sup> showed that approximately half (53%; 95% CI: 49.9, 56.5) of Toronto children between the age of 9 months and 6 years were reported to have seen a dentist or dental hygienist within the last year, while 42% (95% CI: 38.8, 45.4) had never had a dental visit (Table 3). Children who had never seen a dentist were more likely to be younger, living in low and low/middle income households<sup>†</sup>, and born in Canada.<sup>‡</sup> The most frequently reported reasons for not visiting a dentist within the past year were: "s/he is too young to go" (43%; 95% CI: 38.5, 47.7); and "no need to

**Table 3 – Dental Visits by Child's Age, Household Income, and Child's Country of Birth, Toronto, 2003**

Variable	When Child Last Saw Dentist		
	Within the last year	More than 1 year ago	Never
<b>Child's Age</b>			
9 months to 2 years	16%	1%	83%
3 to 4 years	64%	6%	30%
5 to 6 years	78%	8%	15%
<b>Household Income*</b>			
Low	47%	7%	46%
Low / Middle	42%	7%	51%
Middle / High	59%	2%	39%
<b>Child Born in Canada</b>			
Yes	53%	4%	43%
No	55%	9%	36%
<b>Overall</b>	53%	5%	42%

Note: Data based on Toronto parents with children between 9 months of age and 6 years.

\*Categories for annual household family income were adjusted for household size. See Appendix B for further details.

Source: Toronto Perinatal & Child Health Survey, 2003, Toronto Public Health.

Prepared by: Toronto Public Health.

<sup>†</sup> Categories for annual household family income were adjusted for household size. See Appendix A for further details.

<sup>‡</sup> Thirty percent (95% CI: 24.9, 35.7) of children age 3 to 4 were reported to have never had a dental visit, compared to 15% (95% CI: 10.8, 18.6) of children age 5 to 6. Children from lower income households (low and low/middle income categories) were more likely to have never seen a dentist (48%) when compared to children from higher income households. Toronto children born in Canada were somewhat more likely to have never seen a dentist (43%, 95% CI: 39.4, 46.4) when compared to those not born in Canada (36%, 95% CI: 26.2, 45.2).

go, s/he has no problems” (33%; 95% CI: 28.2, 36.9). “Financial” reasons (6%; 95% CI: 3.7, 8.1) and “time or other scheduling constraints” (2%; 95% CI: 0.7, 3.3) were much less frequently identified.<sup>27</sup>

## Tooth Decay in Young Children in Toronto

There are two local sources of data on the oral health of Toronto’s young children. They are: 1) the Toronto Dental Indices Survey (DIS), 1999/2000 and 2005/06; and, 2) the 2003 Toronto PCHS. Results from the Toronto DIS are based on direct assessments of 5 year old children in school, whereas results from the Toronto PCHS are based on telephone interviews with parents of children from birth to age 6.

Toronto DIS results show that approximately 30% of children age 5 had one or more cavities in any of their teeth in both 1999/2000 and 2005/06. The prevalence of ECTD, defined in the DIS as one or more decayed or filled (due to caries) deciduous anterior (front) teeth,<sup>114</sup> in 5 year old children increased from 9.8% in 1999/2000 to 11.6% in 2005/06 (Table 4). A similar result was found from the 2003 Toronto PCHS where 9.7% of Toronto parents of children age 5 to 6 reported being told by a physician or dentist that their child had ECTD, defined as children who have multiple cavities especially on the front baby teeth.<sup>27</sup> The prevalence of ECTD varied significantly by child’s age and country of birth (Figure 4). The risk was 7.9 times greater for children age 5 to 6 than for children from birth to age 2. Children born outside of Canada were 3.5 times more likely to be diagnosed with ECTD than children born in Canada. This finding is consistent with the greater tendency for parents of children born outside of Canada to indicate that their child had visited a dentist at least once in the past year. Note that one of the limitations of the PCHS data

*The prevalence of Early Childhood Tooth Decay (ECTD) in 5 year olds increased from 9.8% in 1999/2000 to 11.6% in 2005/06. Children born outside of Canada were 3.5 times more likely to be diagnosed with ECTD than children born in Canada.*

**Table 4 – Oral Health Indicators, Children Age 5, Dental Indices Survey (DIS), Toronto, 1999/2000 and 2005/06**

<b>Indicator</b>	<b>1999/2000</b> (n = 1219 children)	<b>2005/06</b> (n = 1169 children)
Experience of tooth decay in any tooth	28.6%	30.4%
Early childhood tooth decay (ECTD)*	9.8%	11.6%
Two or more untreated decayed teeth	9.9%	14.6%
Mean number of decayed, missing/extracted, and filled among deciduous (deft) and permanent teeth (DMFT)	1.2	1.3

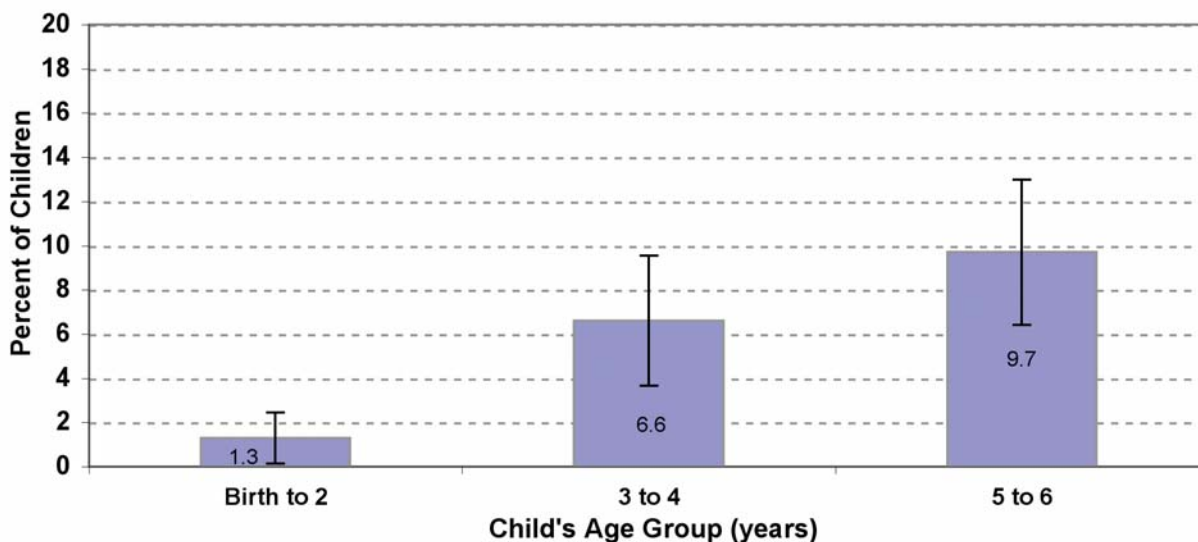
Note: The 1999/2000 data were re-analyzed using 2005/06 coding. Because this standard analysis does not use weights there may be minor adjustments of some indicators.

\* For the analysis of the DIS, ECTD was defined as “one or more decayed or filled (due to caries) deciduous anterior teeth.”

Source: Toronto Dental Indices Survey, 1999/2000 and 2005/06, Toronto Public Health.

Prepared by: Toronto Public Health.

**Figure 4 – Early Childhood Tooth Decay Diagnosis\* in Children from Birth to Age 6, (by Age Groups), Toronto, 2003**



\* Toronto parents were asked if they have ever been told by a physician or dentist that their child had ECTD (children who have multiple cavities especially on the front baby teeth).  
 Error bars (I) denote 95% confidence intervals on the estimates.  
 Source: Toronto Perinatal & Child Health Survey, 2003. Toronto Public Health.  
 Prepared by: Toronto Public Health.

is the difficulty in ensuring that a consistent definition of ECTD was universally understood and applied by health professionals.

*The percentage of 5 year old children with two or more untreated decayed teeth increased from 9.9% in 1999/2000 to 14.6% in 2005/06.*

The percentage of five year old children with two or more untreated decayed teeth increased from 9.9% in 1999/2000 to 14.6% in 2005/06. The mean number of decayed, missing/extracted, and filled deciduous teeth (dft) and permanent teeth (DMFT) for five year olds was similar between 1999/2000 (1.2) and 2005/06 (1.3) (Table 4). These results are comparable to 2003/04 DIS survey data for Hamilton (1.0), Ottawa (1.5), and Peel Region (0.9), three health units with at least 90% of the population having access to fluoridated drinking water.<sup>115</sup>

### Consequences of Tooth Decay for Young Children's Health

*Severe tooth decay in young children can affect their speech, growth, nutrition, socialization and learning.*

Severe tooth decay in young children can affect their speech, growth, nutrition, socialization and learning. Untreated ECTD can contribute to gum diseases, ear infections, and eventually early loss of teeth by extractions. The early loss of baby teeth can contribute to nutritional and speech problems and misalignment of the adult teeth (crooked teeth). The treatment of tooth decay requires invasive procedures and, in severe cases, the child must be given a general anaesthetic. If tooth decay is left untreated, the child may experience pain and may develop dental abscesses. Children who experience

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pain and abscesses associated with severe tooth decay are unable to eat, play and have restful sleep, which may negatively affect their ability to meet developmental milestones and their readiness to learn in school.<sup>116</sup> Pervasive decay is also associated with a higher risk of hospitalizations and emergency dental visits, failure to thrive, activity restrictions, and school absences.<sup>116</sup> Decay in the baby teeth can also affect the healthy development of the permanent teeth, due to an increase in the type and quantity of bacteria in the mouth.

*Untreated ECTD can contribute to gum diseases, ear infections, and eventually early loss of teeth.*

## **Asthma**

### **Introduction**

Asthma is a chronic respiratory condition commonly characterized by episodes of wheezing, breathlessness, chest tightness, and cough, particularly at night or in the early morning. Symptoms may range from mild to severe.<sup>117</sup>

Although the onset of asthma can occur at any age, the first attack frequently occurs between 3 to 8 years of age.<sup>117</sup> In very young children less than 2 years of age, asthma can be difficult to diagnose with certainty. Asthma symptoms in infants and toddlers can look like symptoms of other respiratory problems such as croup, bronchiolitis, or even an obstruction in the airway from an inhaled object. Wheezing at this age often follows a viral infection and may disappear later, without ever leading to asthma.

*Asthma is a chronic respiratory condition; the first attack frequently occurs between 3 to 8 years of age.*

### **Factors Associated with Asthma**

Although a large number of studies of childhood asthma have been conducted, the root cause is still not completely clear. Asthma primarily results from the complex interaction of two groups of factors: 1) individual and familial predisposing factors that make an individual more prone to becoming asthmatic; and, 2) environmental and behavioural factors.<sup>118</sup> Each of these sets of conditions may operate at the level of the individual as well as the environment.

Individual and familial predisposing factors include: a greater tendency to have allergic reactions, possibly the strongest identifiable predictive factor for asthma; sex of the child, with young boys developing asthma at more than twice the rate of young girls;<sup>119,120</sup> familial genetic predisposition, with the risk elevated among children having at least one parent with asthma;<sup>121</sup> and, perinatal factors such as intrauterine immune responses, inadequate oxygenation and inadequate lung maturation.<sup>122</sup> Maternal smoking during pregnancy,<sup>123</sup> and maternal diet are also considered to be important prenatal influences.<sup>124</sup>

*Asthma primarily results from the interaction of individual and familial predisposing factors, and environmental and behavioural factors.*

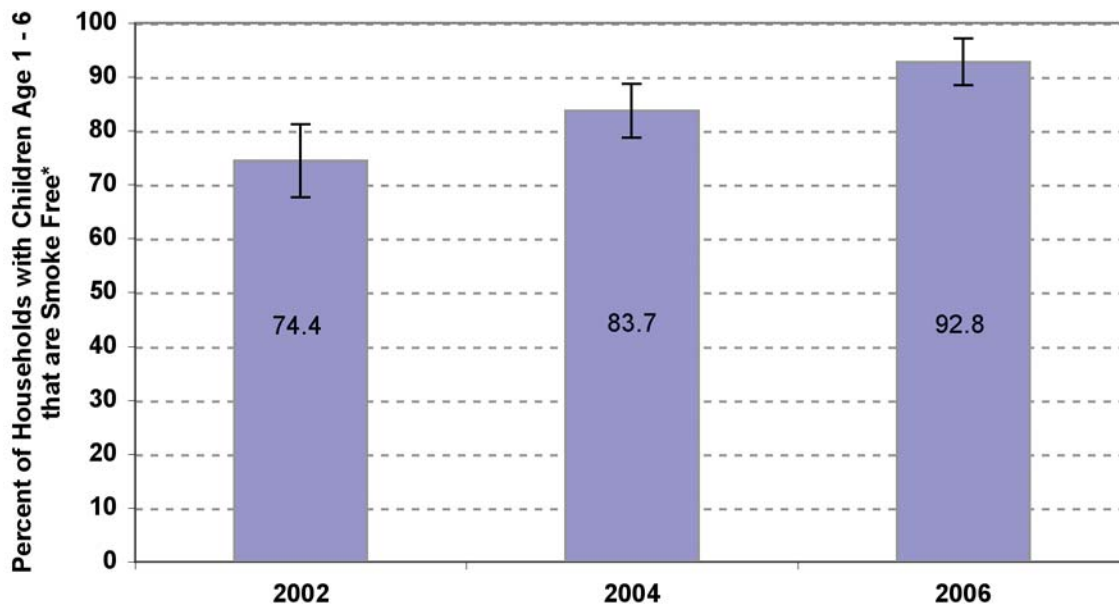
Environmental factors which can trigger asthmatic attacks include exposure to outdoor air pollutants such as ground level ozone and nitrogen dioxide.<sup>18</sup> Timing of exposure during early development may also be critically important in allergic sensitization and later asthma development.<sup>118</sup> Exposure to air pollution from traffic during pregnancy has been linked to increased allergic sensitization<sup>125</sup> and may lead to respiratory symptoms in children by age 2, particularly in those with no family history of asthma.<sup>16</sup>

*In 2006, 93% of Toronto households with young children were smoke free. This is a significant increase from 2002 when 74% were smoke free.*

Exposure to indoor environmental pollutants such as tobacco smoke has also been implicated as an asthma trigger. Most Toronto homes with young children are smoke free. In 2006, 93% (95% CI: 88.5%, 97.1%) of Toronto households with children age 1 to 6 were smoke free. This is a significant increase from 2002 when 74% (95% CI: 67.6%, 81.2%) were smoke free (Figure 5). In the rest of the GTA, the percentage of homes with young children that were smoke free in 2006 was 90.8% (95% CI: 88.9%, 92.7%), similar to the findings for Toronto.

Other indoor environmental pollutants such as cockroach allergen, animal dander and house dust mites can also trigger asthmatic attacks.<sup>51,123,126</sup>

**Figure 5 – Smoke Free Households\* with Children Age 1 to 6, Toronto, 2002, 2004 and 2006**



\* No one regularly smokes inside the home AND visitors are not allowed to smoke in the home.

Error bars (I) denote 95% confidence intervals on the estimates.

Source: Rapid Risk Factor Surveillance System, 2002 - 2006. Extracted August 2007.

Prepared by: Toronto Public Health.

## Asthma in Young Children in Toronto

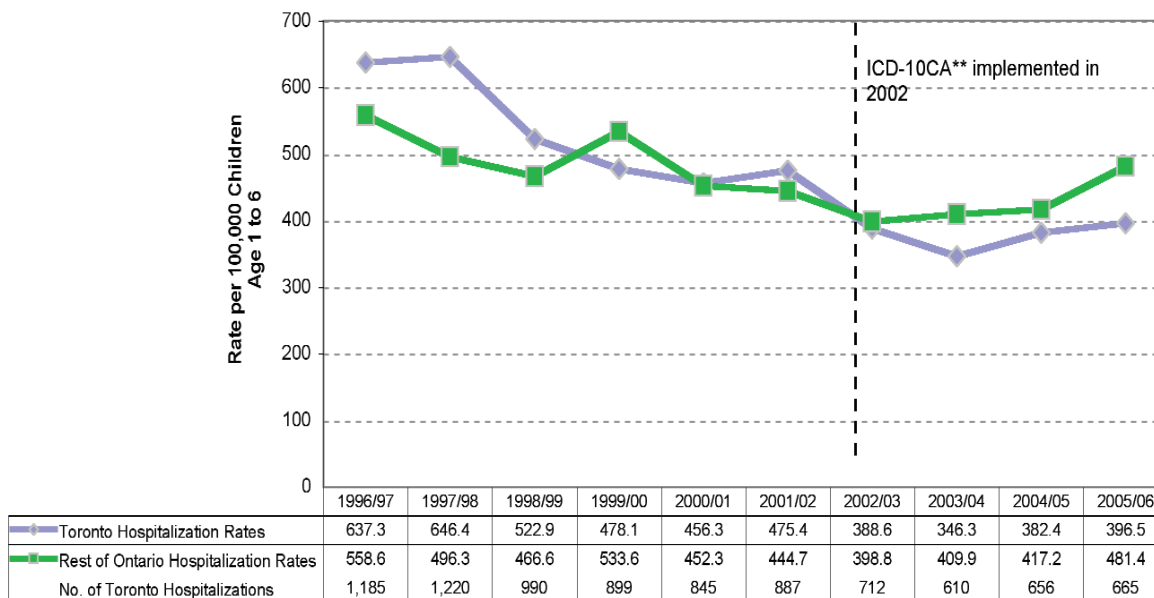
According to data from the National Longitudinal Survey of Children and Youth (NLSCY) (Cycles 3 to 6 combined), 9% (14,431) of Toronto children age 1 to 5 were diagnosed with asthma by a health professional. Recent hospitalization data show that between 2003 and 2005, asthma was the single leading cause of hospitalization for children age 1 to 6 in both Toronto and the rest of Ontario. Asthma accounted for approximately 13% and 12% respectively, of all hospitalizations for this age group (see Appendix C).

Trend data show that between 1996/97 and 2005/06, asthma hospitalization rates for both Toronto and the rest of Ontario gradually decreased. Toronto generally had higher rates during the first 6 years of the period. From 2002/03 onwards, Toronto had lower rates than the rest of Ontario (Figure 6).

Possible explanations for patterns of hospitalization rates may relate to changes in the level of access to care; utilization of services; treatment; and, disease severity.<sup>127,128</sup> In addition, the lower hospitalization rates noted in Toronto since 2002/03 may, in part, be due to the impact of the SARS outbreak on access to Toronto hospitals, which may have continued beyond 2003.

*Between 2003 and 2005, asthma was the single leading cause of hospitalization for young children in both Toronto and the rest of Ontario. Asthma accounted for approximately 13% and 12% respectively, of all hospitalizations for this age group.*

**Figure 6 – Asthma Hospitalization, Children Age 1 to 6, Toronto and the Rest of Ontario, 1996/97 - 2005/06\***



\* Fiscal Year.

\*\* In April 2002, Canada started to use the International Classification of Disease 10 Canada version (ICD-10CA) to code diagnoses in hospitals.

Source: Hospital In-Patient Data 1996 - 2006, Ministry of Health and Long-Term Care, Provincial Health Planning Database (PHPDB).

Downloaded Dec. 13, 2006.

Prepared by: Toronto Public Health.

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Between 2003 and 2005, there were 79 respiratory related emergency room visits per 1,000 among Toronto children age 1 to 6 (40,945 visits). The Toronto rate is approximately one half the rate of 149 visits per 1,000 for the rest of Ontario. In contrast, 26% of all respiratory related visits (10,688 visits) among Toronto children age 1 to 6 were due to asthma, compared to 14% for the rest of the province. Among respiratory related causes, asthma is the most common reason for Toronto children of this age group to visit an emergency room.

## Consequences of Asthma for Young Children's Health

*Long term impacts of asthma depend on factors such as the severity of the disease, exposure to triggers, and the quality of the medical management.*

Canadian and international research studies find that children with asthma miss more days of school than children who do not have these symptoms.<sup>129</sup> This appears to be especially true for children from deprived areas who may not be able to avoid triggers as easily as children from more affluent homes. The family's quality of life is directly influenced by the severity of the child's symptoms. Mild asthma may be easily controlled with medications and by avoiding triggers. A child with more severe asthma may have more frequent attacks and hospitalizations. Constant parental vigilance, bouts of shortness of breath and frequent trips to the hospital may cause considerable stress to the child and family that may be exacerbated by the presence of other life concerns (for example, poverty and available social support).<sup>130</sup>

While asthma may limit children's daily activities and affect their social activities, there is little evidence of major adverse long term social and economic consequences for most children.<sup>129</sup> Long term impacts of asthma on the child as an adolescent and later as an adult will depend on factors such as the severity of the disease, exposure to triggers, and the quality of the medical management.

## Unintentional Injury

### Introduction

*Consequences of unintentional injuries can range from temporary discomfort to developmental delays, permanent disability, and death.*

Unintentional injuries are those that do not result from violence and are not intended to harm the child.<sup>131</sup> The consequences of unintentional injuries for the child can range from temporary discomfort, to developmental delays, permanent disability and even death, depending on factors such as the nature of the injury, the age of the child, and the health care, supportive care and rehabilitation received.<sup>132,133</sup>

### Factors Associated with Unintentional Injury

Child, family, and neighbourhood or community factors interact to heighten or lower the risk of unintentional injury. Injury risk varies by the age, sex and behavioural traits of the child.<sup>134</sup> As children grow, their motor and cognitive

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skills develop and their environment changes, both of which affect their risk of injury.<sup>135</sup> Boys, who are at higher risk of injuries,<sup>73,136</sup> tend to be more active, and engage in more risk taking behaviour than girls.<sup>134</sup> Independent of the age and sex of the child, their temperament and behaviours, such as hyperactivity and aggression, are also linked to an increased risk of injury.<sup>7,137</sup>

Family conditions and attributes including family dynamics, family structure, parenting practices and capabilities (e.g., lower parental reliance on preventive measures and lack of knowledge of normal child development) as well as maternal age, health, and socioeconomic status can influence injury risk.<sup>73,138</sup>

At the neighbourhood and community level, physical environment and social climate may influence childhood injury through factors such as safety of the built environment, proximity to transportation routes and industrial sites, the availability of green space and other recreational outlets, crime levels, and social cohesion.<sup>134</sup>

## Unintentional Injury among Young Children in Toronto

Most injuries sustained by children age 1 to 6 in Toronto and the rest of the province are unintentional. Between 2000 and 2003, unintentional injury was the most common cause of death among children age 1 to 6 in Toronto, accounting for 20 (18%) of all deaths in this age group (see Appendix D). Unintentional injury is the third leading cause of hospitalization and the third leading cause of hospital emergency room visits in Toronto and the rest of Ontario. From 2003 to 2005, unintentional injury accounted for 9% of all hospitalizations and 29% of all emergency room visits for children age 1 to 6 in Toronto.

The true incidence of injuries in young children is much greater than that reflected in hospitalization and emergency room data. Many less serious injuries are largely undocumented as they are treated at home or in the community by health care professionals such as family doctors.

Accidental falls are the leading cause of hospitalization due to unintentional injury to Toronto children age 1 to 6, accounting for almost half (48%) of the total (see Table 5). They are also the leading cause of emergency room visits due to unintentional injury to this age group, accounting for 44% of the total (see Table 6).

Struck injuries include those that result from exposure to inanimate or animate mechanical forces. These injuries are the second leading cause of hospitalization due to unintentional injury to Toronto children age 1 to 6, accounting for one fifth (21%) of the total (see Table 5). They are also the second leading cause of emergency room visits due to unintentional injury

*Child, family, and neighbourhood or community factors interact to heighten or lower the risk of unintentional injury.*

*Unintentional injury was the most common cause of death among young children in Toronto, accounting for 20 (18%) of all deaths in this age group.*

*Unintentional injury accounted for 9% of all hospitalizations and 29% of all emergency room visits for young children in Toronto. The true incidence is much greater.*

**Table 5 – Causes of Unintentional Injury Hospitalizations, Children Age 1 to 6, Toronto and the Rest of Ontario, 2003-2005 Combined**

Cause of Unintentional Injury	Toronto			Rest of Ontario		
	No. of Hospitalizations*	% of Total	Rate per 100,000**	No. of Hospitalizations*	% of Total	Rate per 100,000**
Accidental falls	620	47.8%	120.3	2,786	45.9%	137.2
Exposure to inanimate or animate mechanical forces***	268	20.7%	52.0	1,218	20.1%	60.0
Fire, burn, scalds	121	9.3%	23.5	275	4.5%	13.5
Transport accidents****	101	7.8%	19.6	574	9.5%	28.3
Poisoning	99	7.6%	19.2	723	11.9%	35.6
Drowning	10	0.8%	1.9	51	0.8%	2.5
Suffocation or choking	7	0.5%	1.4	89	1.5%	4.4
Other	70	5.4%	13.6	356	5.9%	17.5
<b>Total (Unintentional Injuries)</b>	<b>1,296</b>	<b>100.0%</b>	<b>251.5</b>	<b>6,072</b>	<b>100.0%</b>	<b>299.1</b>

\* An individual will be counted more than once if they were hospitalized on more than one occasion.

\*\* Average annual rate 2003-2005.

\*\*\* Exposure to inanimate or animate mechanical forces includes struck against or by inanimate mechanical forces; discharge from firearms; explosion and rupture; exposure to noise, vibration or high-pressure jet; foreign body or object entering into or through eye or orifice or skin; hit, struck, kicked, bitten or scratched by another person; striking against or bumped into another person; bitten, crushed or struck by mammals or reptiles; contact with marine animal or with plant thorns, spines and sharp leaves.

\*\*\*\* Transport accidents include pedestrian; pedal cyclist; occupant of motor vehicle, or railway train or streetcar and other types of vehicles; water transport accidents; air and space transport accidents; and other unspecified transport accidents.

Source: Hospital Separation Data, Provincial Health Planning Database, Health Planning Branch, Ontario Ministry of Health & Long-Term Care.

Download date: August 27, 2007.

Prepared by: Toronto Public Health.

to this age group, accounting for approximately one third (33%) of the total (see Table 6).

All other types of unintentional injuries combined, account for 31% of hospitalizations and 22% of emergency room visits due to unintentional injury to Toronto children age 1 to 6. Of these other types of injuries: fires, burns and scalds account for 9% of hospitalizations but only 2% of emergency room visits; transport accidents account for 8% of hospitalizations and 4% of emergency room visits and poisoning accounts for 8% of hospitalizations but only 3% of emergency room visits. Differences in the percentages between hospitalizations and emergency room visits reflect the relative severity of the consequences of these injuries. Suffocation or choking and drowning make up less than 1% of both unintentional injury related hospitalizations and emergency room visits among Toronto children age 1 to 6 (see Tables 5 and 6).

Map 4 shows the distribution of emergency room visits for children age 1 to 6, with unintentional injuries, by Toronto's 140 neighbourhoods. Children

**Table 6 – Causes of Unintentional Injury Emergency Room Visits, Children Age 1 to 6, Toronto and the Rest of Ontario, 2003-2005 Combined**

Cause of Unintentional Injury	Toronto			Rest of Ontario		
	No. of Visits*	% of Total	Rate per 100,000**	No. of Visits*	% of Total	Rate per 100,000**
Accidental falls	21,181	44.4%	4,109.6	103,749	40.3%	5,110.1
Exposure to inanimate or animate mechanical forces***	15,873	33.3%	3,079.7	95,095	37.0%	4,683.8
Transport accidents****	1,670	3.5%	324.0	10,662	4.1%	525.1
Poisoning	1,405	2.9%	272.6	8,366	3.3%	412.1
Fire, burn, scalds	1,094	2.3%	212.3	5,818	2.3%	286.6
Suffocation or choking	53	0.1%	10.3	227	0.1%	11.2
Drowning	21	0.0%	4.1	141	0.1%	6.9
Other	6,368	13.4%	1,235.5	33,099	12.9%	1,630.3
<b>Total (Unintentional Injuries)</b>	<b>47,665</b>	<b>100.0%</b>	<b>9,248.0</b>	<b>257,157</b>	<b>100.0%</b>	<b>12,666.0</b>

\* An individual will be counted more than once if they were hospitalized on more than one occasion.

\*\* Average annual rate 2003-2005.

\*\*\* Exposure to inanimate or animate mechanical forces includes struck against or by inanimate mechanical forces; discharge from firearms; explosion and rupture; exposure to noise, vibration or high-pressure jet; foreign body or object entering into or through eye or orifice or skin; hit, struck, kicked, bitten or scratched by another person; striking against or bumped into another person; bitten, crushed or struck by mammals or reptiles; contact with marine animal or with plant thorns, spines and sharp leaves.

\*\*\*\*Transport accidents include pedestrian; pedal cyclist; occupant of motor vehicle, or railway train or streetcar and other types of vehicles; water transport accidents; air and space transport accidents and other unspecified transport accidents.

Source: National Ambulatory Care Reporting System data, Provincial Health Planning Database, Health Planning Branch, Ontario Ministry of Health & Long-Term Care.

Download date: August 27, 2007.

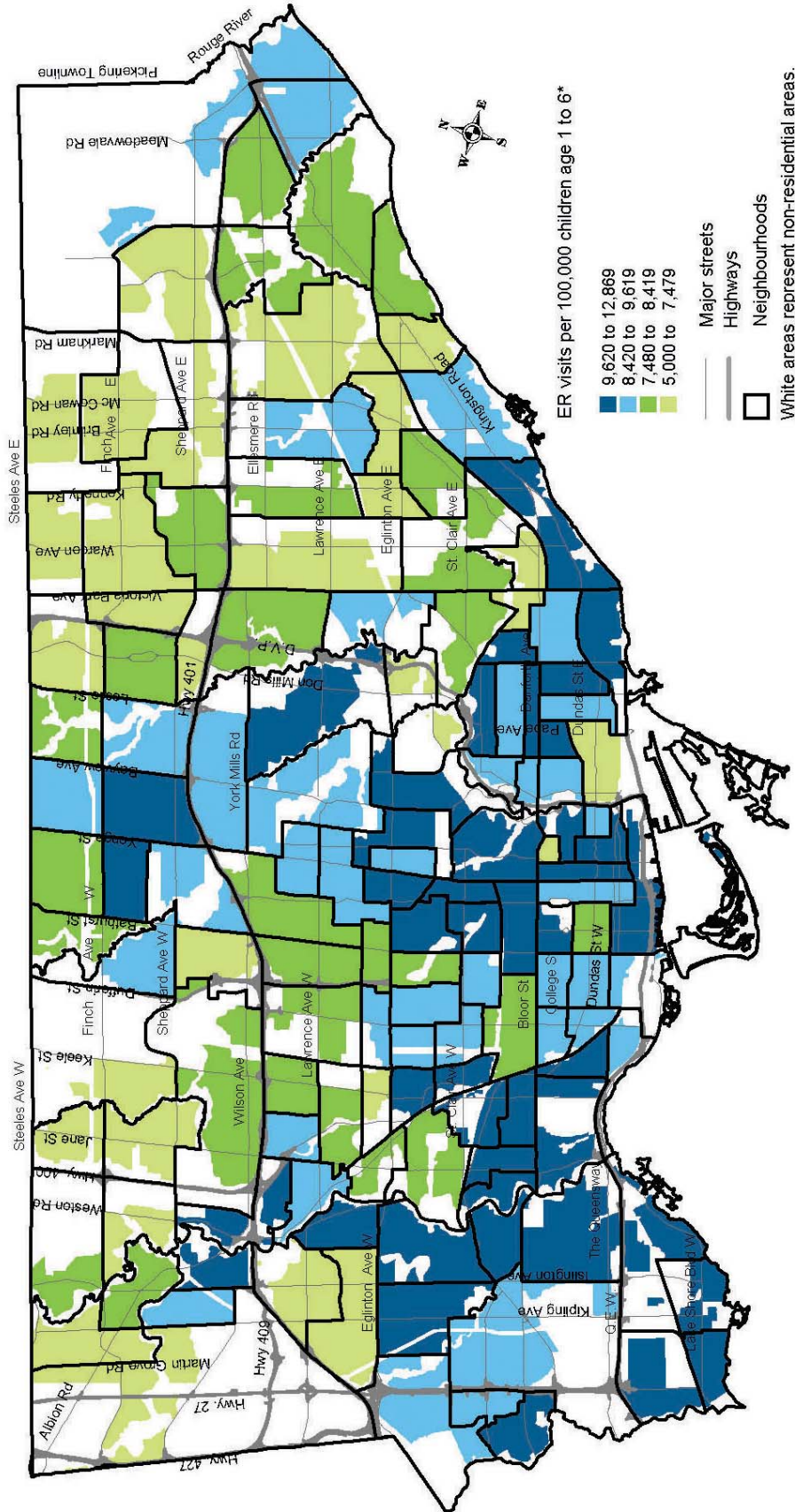
Prepared by: Toronto Public Health.

are mapped according to place of residence. Areas depicted in dark blue (the top category in the map legend), indicate neighbourhoods with the highest rates of emergency room visits for young children due to unintentional injuries. Childhood injuries of this nature are not evenly distributed across Toronto as there are some areas with much higher rates than others. The highest rates are generally found in the central and western areas of the City. In some of these areas, the rate is approximately 2.5 times greater than in areas with the lowest rates.

*In some areas of Toronto, the rate of injury related emergency room visits for young children is approximately 2.5 times greater than areas with the lowest rates.*

Compared to the rest of Ontario, Toronto children age 1 to 6 have lower overall rates of unintentional injuries requiring emergency room visits or hospitalizations. Toronto children in this age group have lower rates of injury related emergency room visits and hospitalizations for accidental falls, struck injuries, transport accidents, poisonings, suffocation or choking and drowning. However, the hospitalization rate for fire, burn, and scald injuries among Toronto children age 1 to 6 is nearly 80% higher than the rate in the

**Map 4 - Emergency Room Visits due to Unintentional Injury, Children Age 1 to 6  
(by Neighbourhood), Toronto, 2003 – 2005 Combined**



Neighbourhoods were ranked according to the number of emergency room (ER) visits and divided into quartiles. Each quartile includes approximately 25% of these ER visits.

\*Average annual rate 2003-2005

Source: National Ambulatory Care Reporting System, Provincial Health Planning Database version 17.0 May 2007.  
Prepared by: Toronto Public Health.

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rest of Ontario despite the fact that the rate of emergency room visits due to fire, burns, and scalds are approximately 60% lower. Fire, burn and scald injuries among Toronto children age 1 to 6 may be more severe than those experienced by children of the same age group in the rest of Ontario.

## Consequences of Unintentional Injury for Young Children’s Health

Consequences of unintentional injuries are related to the type of injury, the nature of the injury, the age of the child, and the health care received following the injury. Consequences may range in severity from temporary discomfort and pain, to loss of motor and cognitive functioning, developmental delay, permanent disability, reduced quality of life and even death. Severe injuries to children are most frequently related to motor vehicle collisions (occupants, pedestrian, and bicycle), burns, and some types of falls.<sup>139,140</sup> In addition to the short and long term impacts on the child, injury can impose significant financial and emotional trauma and stress on families and other caregivers.<sup>132,133</sup> There are also enormous financial burdens for society, including those associated with immediate treatment and long term rehabilitation.

*In addition to the short and long term impacts on the child, injury can impose significant financial and emotional trauma and stress on families and other caregivers.*

## ABUSE AND NEGLECT

### Introduction

Child abuse occurs when a parent/caregiver, guardian or other adult mistreats or neglects a child, resulting in injury, emotional or psychological harm, or substantial risk of harm to the child. There are five general categories of abuse: physical abuse, emotional abuse, neglect, sexual abuse, and exposure to domestic violence (see Appendix B for definitions). This section of the report will address all five categories of abuse.

*Given the negative consequences for many children who are abused, prevention is critical not only to children’s current health but also their longer term health, well being and success.*

Child abuse is a complex issue that has detrimental effects on young children. The short and long term impact of abuse is related to factors such as the type, severity, frequency and duration of abuse, how children process their experiences, and the nature and timing of interventions related to the abuse. Given the long trajectory of negative consequences for many children who are abused, prevention is critical not only to children’s current health but also to their longer term health, well being and success as adults.

### Factors Associated with Child Abuse

Although a definitive cause for abuse has not been identified, it is well accepted that multiple interacting risk factors at the child, family, neighbourhood, community and societal levels contribute to the occurrence of child abuse and that the probability of being abused increases with the presence of multiple risk factors. Child characteristics associated with

*Multiple interacting risk factors at the child, family, neighbourhood, community and societal levels contribute to child abuse.*

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increased risk of abuse include low birth weight, difficult temperament, passivity, and limited intellectual functioning. Family characteristics include young maternal age, low education, a childhood history of abuse, substance dependency, and lone parenthood. Neighbourhood and community characteristics include violence, lack of social cohesion, and lack of adequate and accessible resources such as housing and child care. Societal level factors include poverty and tolerance of violence.<sup>141</sup>

## Abuse and Neglect of Young Children in Toronto

*Due to the nature of child abuse, it is not possible to identify the true levels occurring in the population.*

Due to the nature of child abuse, it is not possible to identify the true levels occurring in the population. Only abuse that comes to the attention of authorities such as the police, child protection agencies, or hospitals is formally identified. Official incidence reports therefore likely underestimate abuse for a number of reasons. Children may be reluctant to disclose abuse for fear of not being believed or stigmatized, for fear of negative repercussions for themselves or their family, or because they blame themselves for the abuse. The public may be reluctant to report abuse because of the still prevailing view that family life is a private matter.<sup>142</sup> Some professionals may not recognize and/or report child abuse because of insufficient training or because they do not view themselves as responsible for dealing with problems of violence within the family.<sup>143</sup>

*Incidence data are not available for Toronto. In Ontario, an estimated 44,299 abuse investigations of young children were conducted by child welfare services. Forty five percent of these were substantiated, involving an estimated 19,863 children.*

Currently, child abuse incidence data are not available for Toronto. The most recent data on the incidence of abuse are available at the provincial level through the 2003 Ontario Incidence Study of Reported Child Abuse and Neglect (OIS).<sup>144</sup> This study estimates that 44,299 (5,142 per 100,000) abuse investigations of children age 1 to 6 were conducted by child welfare services in 2003<sup>§§</sup>. Investigations led to cases being classified as substantiated, unsubstantiated or suspected. Forty five percent of these investigations were substantiated, involving an estimated 19,863 children. Fifteen percent of investigations involved more than one type of substantiated abuse. As shown in Table 7, when only the primary category of substantiated abuse was considered, the majority of children were exposed to domestic violence (40%) and neglect (26%), followed by physical abuse (16%), emotional abuse (15%) and sexual abuse (3%).

Among substantiated cases, there is variation in the type of abuse by age and sex. Girls birth to age 3 were more likely to experience physical abuse and emotional abuse than boys, whereas boys in this age group were more likely to experience sexual abuse, neglect, and exposure to domestic violence. In the 4 to 7 year old age group, girls continued to be more likely to experience

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§§ The OIS 2003 estimates are reported on the basis of the number of child abuse investigations conducted during 2003, as opposed to the number of investigated children. For children investigated more than once in a year, each investigation is included in the estimates.

**Table 7 – Type of Abuse Investigation, Children Age 1 to 6, Ontario, 2003**

Type of Abuse	No. of Children	Rate per 100,000	Percent
Substantiated	19,863	2,306	45%
Exposure to domestic violence	8,006	929	40%
Neglect	5,199	604	26%
Physical	3,105	360	16%
Emotional	3,054	355	15%
Sexual	500	58	3%
Suspected	4,324	502	10%
Unsubstantiated	20,112	2,335	45%
<b>Total</b>	<b>44,299</b>	<b>5,142</b>	<b>100%</b>

Source: Ontario Incidence Study of Reported Child Abuse and Neglect – 2003. Custom Tabulation provided on December 12, 2006.

Prepared by: Toronto Public Health.

emotional abuse. Boys were more likely to experience more types of abuse including physical abuse, sexual abuse and neglect. Girls and boys were equally likely to experience exposure to domestic violence.

In Ontario, an estimated 20,112 (2,335 per 100,000) abuse investigations of children age 1 to 6 were unsubstantiated and 4,324 cases (502 per 100,000) were suspected. Unsubstantiated or suspected cases should not be easily dismissed or considered as over reporting. These cases often return to the child welfare system and the decision to substantiate may be based more on the available evidence than on the degree of harm sustained by the child. An examination of a sample of physical abuse cases from the 1998 Canadian Incidence Study of Reported Child Abuse and Neglect found that one third of suspected cases and almost half of unsubstantiated cases were referred to child and/or family support programs. Forty percent of suspected case files and close to 20% of unsubstantiated case files were kept open for ongoing child welfare services.<sup>145</sup>

Action is being taken by the Ministry of Children & Youth Services to improve the collection and reporting of incidence rates by individual child protection agencies so that comparable information for young children age 1 to 6 to that found in the OIS are made available at the local level.

Some Toronto level data are available from the Toronto Police Services, the Provincial Health Planning Database, and local child protection agencies. These sources provide a partial picture of the prevalence of child abuse among Toronto children. The data only represent the cases of child abuse that come to the attention of authorities and most likely only the most severe cases.

*Toronto Police conducted a total of 1,133 investigations of abuse against young children. Of these, 52% (588 investigations) were for physical harm, 24% (273) were for sexual offences, 16% (179) were for neglect/abandonment and 0.4% (5) were related to a child's death.*

Toronto Police Services collects data on child abuse investigations (see Appendix A for further details). In 2005 and 2006, the Toronto Police conducted a total of 1,133 investigations of abuse against children age 1 to 6 (338 per 100,000). Of these, 52% (588 investigations) were for physical harm, 24% (273) were for sexual offences, 16% (179) were for neglect/abandonment, and 0.4% (5) were related to a child's death. It is not clear from the data provided if any of the deaths were related to domestic violence. As Toronto Police Services uses different ways of categorizing child abuse investigations, it is not possible to draw comparisons between the Toronto Police Services data and the OIS data.

Toronto data from the Provincial Health Planning Database on child injury or poisoning as a result of assault/violence also provide some information regarding the prevalence of child abuse. Approximately 19% of all injury or poisoning related deaths among children age 1 to 6 in Toronto between 2000 and 2003 were a result of assault/violence (5 deaths or 1 child per 100,000). In the rest of Ontario, during the same time period, approximately 9% of injury or poisoning related deaths in this age group were a result of assault/violence (9 deaths or 0.5 per 100,000). In 2003 to 2005, a very small percent (1.6%) of all injury or poisoning related hospitalizations of children age 1 to 6 were due to assault/violence (3.9 children per 100,000). The numbers were comparable to the rest of Ontario (3.7 children per 100,000).

For children age 1 to 6, Toronto child protection agencies were able to provide data on the number of children in care (i.e., those children for whom a child protection agency has assumed custody and responsibility). Children typically go into care when the potential risk is significant. Children are usually in care on a temporary basis. In extremely severe family situations, the child may be made a Crown ward by the court. Crown wards are permanent wards of the province until age 18, or until they are adopted. During this time a children's aid society assumes the rights and responsibilities of the parent.<sup>146</sup> Data from the Children's Aid Society of Toronto (CAST) and the Catholic Children's Aid Society (CCAS) indicate that in 2006, 757 children or 451 per 100,000 children age 1 to 6 living in Toronto were in care. This rate has remained relatively stable for at least 2 years. A limitation of these data is that a child may be counted more than once if he/she is in care at different points in time (see Appendix A).

### **Consequences of Abuse for Young Children's Health**

Due to their size and overall vulnerability, younger children are often more susceptible to physical harm. Thus physical injury is one of the immediate consequences of abuse. Abuse, and in particular neglect, in the early years can lead to poor growth and development due to a lack of nutrition, attention, and nurturance.<sup>141</sup>

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Abuse in the early years is also associated with social, emotional, and behavioural problems, such as aggression, conduct problems, low self esteem, depression, anxiety, social withdrawal, and difficulties in peer relationships.<sup>147,148,149</sup> These problems can persist into later childhood.<sup>147,148,149</sup> Abuse in early childhood is associated with impairment of cognitive functioning. Abused children have been shown to score lower on intelligence tests, and display less perseverance, more distractibility, and reduced ability for controlling their emotions and actions compared to children who have not been abused.<sup>147,150</sup> Problem solving skills, school performance, and ability to cope with new or stressful situations are also negatively affected.<sup>148</sup> Children who are abused in the first six years of life are more likely to experience harmful effects in later middle childhood, or display more behavioural or emotional problems than those who are abused later in childhood.<sup>147,148,151</sup>

*Abuse in the early years is associated with physical injury, social, emotional, and behavioural problems, and impaired cognitive functioning.*

The impact of abuse is also related to factors such as the type, severity, frequency and duration of the abuse, the co-occurrence of different types of abuse, how children process their experiences, how they perceive the perpetrator, and the nature and timing of intervention, if any.<sup>147,152,153</sup> Factors associated with abuse that may worsen its effects include poverty, lone parenthood, and low education.<sup>141</sup>

Neglected children have more severe cognitive and academic deficits than children who have not been abused or children who have been physically abused.<sup>148</sup> Children who witness violence in the home experience difficulties similar to children who experience other types of abuse. They may continue to experience problems in adolescence and adulthood.<sup>154</sup> Chronic abuse in early childhood is a strong predictor of peer rejection and aggression<sup>147</sup> and is associated with anxiety and depression.<sup>155</sup> Abuse that is both long lasting and severe in early childhood is associated with higher rates of delinquency.<sup>147</sup>

The longer term effects of early childhood experiences of abuse have been studied in adolescents and adults who report childhood abuse and neglect. The age at which the child experienced abuse is frequently not identified. In general, individuals who are abused as children are at higher risk for mental health problems and developing serious psychiatric problems such as depression, post traumatic stress disorder, and personality disorders in adolescence or adulthood.<sup>141,156,157</sup> They are also more likely to experience unstable intimate relationships,<sup>158</sup> and to become involved in crime<sup>141,159</sup> and violent behaviour.<sup>141</sup> One longer term study of children harmed before five years of age<sup>160</sup> found that, in adolescence, they were more likely to be absent from school, less likely to anticipate going to college, and had higher levels of aggression, anxiety/depression, and other psychological problems than their non abused peers.

*Young children who experience abuse are at higher risk for mental health problems and are more likely to experience unstable intimate relationships, and to become involved in crime and violent behaviour.*

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## Communicable Diseases, Including Vaccine Preventable Diseases

*Some children can have longer-term serious consequences and die as a result of a communicable disease.*

*64% of communicable diseases reported in young children were vaccine preventable and 33% were enteric diseases.*

### Introduction

Young children can experience a range of communicable diseases. Most children recover from communicable diseases without long term consequences. Some children can have longer-term serious consequences and others may even die as a result of a communicable disease. Toronto Public Health only receives reports of communicable diseases affecting children which are deemed reportable under the Health Protection and Promotion Act (HPPA). This section of the report focuses only on reportable communicable diseases.

Between 2001 and 2005 in Toronto, 64% of communicable diseases reported to the Medical Officer of Health in children age 1 to 6 were vaccine preventable diseases (VPDs) and 33% were enteric diseases. Although other reportable communicable diseases are known to affect children (e.g., tuberculosis), this section will focus on the two most prevalent groups of diseases, accounting for 97% of reportable communicable diseases affecting children in Toronto.

### Factors Associated with Vaccine Preventable Diseases

Vaccine preventable diseases (VPDs) that can be acquired in childhood include influenza, chickenpox, pertussis (whooping cough), pneumococcal disease, meningococcal disease, *Haemophilus influenzae B* (Hib), measles, mumps, rubella, hepatitis B, diphtheria, tetanus, and polio. In general, these diseases can be prevented if appropriate and timely vaccination is provided to children.

According to the *Day Nurseries Act* (DNA), every child attending a day nursery in Ontario must have a record of immunization for diphtheria, pertussis, tetanus, polio, Hib, measles, mumps and rubella. The *Immunization of School Pupils Act* (ISPA) requires that school students be immunized against diphtheria, tetanus, polio, measles, mumps and rubella according to the schedule set out by the province. In addition, the National Advisory Committee on Immunization (NACI) recommends that children be immunized against chickenpox, pertussis, and Hib. All of these vaccines are offered to all Ontario children free of charge. Currently in Ontario, immunization for hepatitis B occurs at grade 7.

## Vaccine Preventable Diseases in Young Children in Toronto

Chickenpox<sup>‡‡</sup> was the most frequently reported VPD among Toronto children age 1 to 4 and 5 to 9 in all years from 2001 to 2005 (Table 8). Although rates of chickenpox among children continue to fluctuate for Toronto and the rest of Ontario, rates were higher in both age groups for Toronto compared to the rest of Ontario from 2003 to 2005. Publicly funded chicken pox vaccination became available in Ontario in September 2004 for children around their first birthday. In January 2005 it became available for children age 5 years who had not previously had chickenpox.

Influenza was the second most common VPD reported among Toronto children age 1 to 6 from 2001 to 2005. Toronto's rate of influenza in young children is comparable to the rate reported for the rest of Ontario in 2004 and 2005.

Pertussis rose to become the third most common VPD reported among Toronto children age 1 to 6 in 2005. This resulted largely from an outbreak that

*Chickenpox was the most frequently reported vaccine preventable disease. Rates among children ages 1 to 4 and 5 to 9 fluctuate over time for Toronto and the rest of Ontario. From 2003 to 2005, rates were higher in Toronto compared to the rest of Ontario.*

**Table 8 – Vaccine Preventable Diseases, Children Age 1 to 6 (Rate per 100,000), Toronto and the Rest of Ontario, 2001-2005**

Vaccine Preventable Disease	Toronto					Rest of Ontario				
	2001	2002	2003	2004	2005	2001	2002	2003	2004	2005
Chickenpox (1-4 years)	330.7	487.4	550.1	746.1	461.0	423.7	586.1	490.1	449.2	145.7
Chickenpox (5-9 years)	801.9	808.8	1,062.7	1,840.2	1,243.9	733.5	1,068.7	922.3	1,098.2	316.1
Influenza	23.6	69.9	83.4	17.5	82.3	23.4	81.5	141.7	20.0	72.2
Pertussis	7.0	4.9	0.6	4.7	41.1	0.0	9.7	18.7	15.8	13.7
Pneumococcal disease	3.8	21.3	21.0	19.2	8.9	1.6	1.4	0.7	0.9	0.7
Mumps	0.5	0.0	0.6	0.0	0.6	0.6	0.4	0.7	0.6	0.0
Meningococcal disease	0.5	0.5	0.0	0.0	0.0	8.2	8.0	7.3	11.1	14.9
Measles	0.5	0.0	1.7	0.0	0.0	0.0	0.0	0.1	0.6	0.3
Rubella	0.5	0.0	0.6	0.0	0.0	0.1	0.0	0.0	0.0	8.2

Notes: 1. No cases of diphtheria, tetanus, or polio have been reported in Toronto over the past 5 years.  
 2. Only Meningococcal disease (invasive) was included in the Meningococcal disease rate.  
 3. Only *Streptococcus pneumoniae* (invasive) was included in the Pneumococcal disease rate.

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

Data as of: July 26, 2007.

Prepared by: Toronto Public Health.

<sup>‡‡</sup> Chickenpox cases cannot be broken down for children age 1 to 6 because reports of chickenpox are received in aggregate numbers based on defined age categories (<1, 1-4, 5-9, 10-14, 15-19, 20-24, 25-29, etc). The number of cases of chickenpox among children age 1 to 4 exceeds that of all other diseases combined.

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began toward the end of that year, the associated increase in testing and the introduction of a more sensitive test to detect the bacteria causing pertussis.

Pneumococcal disease was the fourth most common VPD reported among Toronto children age 1 to 6 in 2005. During the preceding 3 years however, it ranked as the third most common, ahead of pertussis. Over the 5 year period, Toronto rates were consistently higher than those in the rest of Ontario.

Between 2001 and 2005, there were a total of 9 cases of measles, mumps, and rubella combined in Toronto children age 1 to 6. There were less than 5 cases of meningococcal disease. Although there were a small number of cases of hepatitis B (less than 5), 28 children were reported as carriers. Over the same period, there were no cases of diphtheria, tetanus, polio, and Hib disease (invasive) among Toronto children age 1 to 6. The absence of these diseases in Toronto over the five year time period can be attributed to high rates of immunization against these VPDs, most of which are required by the ISPA for school entry.

Overall VPD rates among Toronto children age 1 to 6 jumped from 22 cases per 100,000 in 2004 to 124 cases per 100,000 in 2005. The increase in pertussis cases as noted above accounts for most of this increase.

### **Consequences of Vaccine Preventable Diseases for Young Children's Health**

VPDs pose varying degrees of threat to a child's health depending on the specific disease, the age of the child and the status of their immune system. Many Toronto families are new immigrants who come from countries that have a higher prevalence of particular VPDs. Often, families return to their home country for visits. If family members are not adequately immunized, the risk of children in these families acquiring VPDs can be increased.

*Most vaccine preventable diseases affect a child's ability to attend child care or school, socialize and learn.*

Most VPDs affect a child's ability to attend child care or school, socialize and learn. Family members and other caregivers may need to miss work or find alternate caregivers to care for the sick child. Although the rates of some VPDs (e.g., chickenpox and influenza) are higher, their impact on child functioning is generally short term and the vast majority of children make a complete recovery. Complications from some less frequently occurring VPDs (e.g., meningococcal disease and hepatitis B) can be particularly serious for children. Invasive meningococcal disease causes meningitis, a bacterial infection of the brain and spinal cord, which can result in brain damage and death in some children. Thirty to 50% of young children who become infected with hepatitis B become chronic carriers. Chronic infection causes liver damage, which may lead to cirrhosis (scarring of the liver), liver cancer, or death from liver failure.<sup>161</sup> Throughout their entire lives, chronic carriers risk spreading the virus to others, particularly members of their households.

## Factors Associated with Enteric Diseases

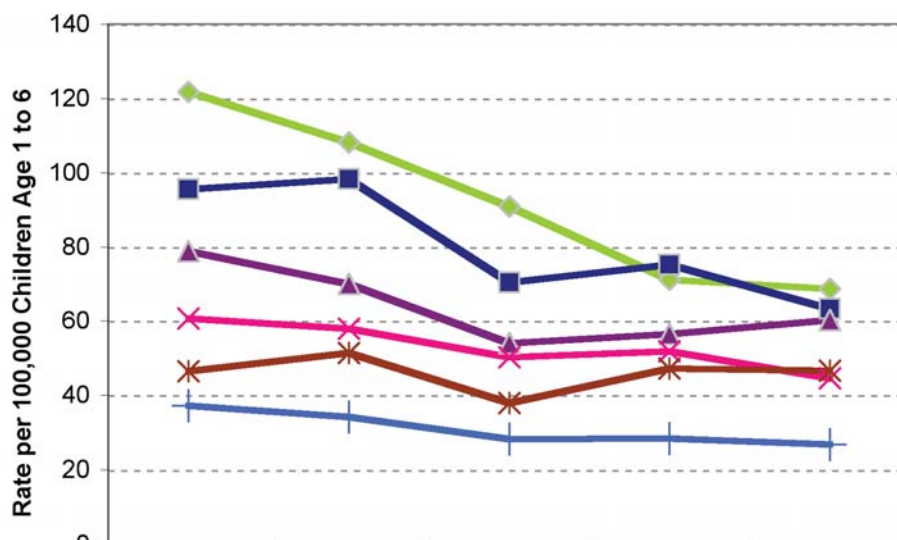
Enteric diseases are transmitted by ingestion of contaminated food or water or contact with another infectious individual and can spread via the fecal-oral route due to poor hand washing practices. There is an increased risk of enteric diseases in settings where groups of children are having diaper changes.<sup>162</sup> Visiting a country that has a high prevalence of enteric diseases also increases the risk of becoming ill.

*The rate of enteric diseases for young children in Toronto and the rest of Ontario declined by about 32% and 16%, respectively. Toronto consistently reported higher rates than the rest of Ontario.*

## Reportable Enteric Diseases in Young Children in Toronto

Enteric, food, and waterborne diseases accounted for the second highest rate of reportable diseases in children age 1 to 6, for both Toronto and the rest of Ontario from 2001 to 2005. During this period, the rate of these diseases in Toronto and the rest of Ontario declined by about 32% and 16%, respectively. Toronto consistently reported higher rates than the rest of Ontario (Figure 7).

**Figure 7 – Leading Reportable Enteric, Food and Waterborne Diseases, Children Age 1 to 6, Toronto and the Rest of Ontario, 2001 - 2005**



	2001	2002	2003	2004	2005
Toronto: Campylobacter enteritis	121.7	108.1	90.8	71.1	68.6
Toronto: Salmonellosis	95.4	98.2	70.4	75.2	63.2
Toronto: Giardiasis	78.8	69.9	53.9	56.5	60.2
Rest of Ontario: Campylobacter enteritis	60.6	57.9	50.2	51.8	44.5
Rest of Ontario: Salmonellosis	46.4	51.3	37.8	47.1	46.6
Rest of Ontario: Giardiasis	37.1	34.1	28.2	28.3	26.7

Source: Reportable Disease Information System and Integrated Public Health Information System, Toronto Public Health and Ontario Ministry of Health & Long-Term Care. Data as of: June 14, 2006. Population Estimates (1996-2005), Provincial Health Planning Database, Extracted: December 2006, Health Planning Branch, Ontario Ministry of Health & Long-Term Care.

Prepared by: Toronto Public Health.

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The most common enteric diseases are *Campylobacter* enteritis, salmonellosis and giardiasis. Verotoxin producing *E. coli* (VTEC) infection is another enteric disease, which although rare can have severe manifestations. *Campylobacter* enteritis and salmonellosis rates in Toronto were both one-and-a-half times as high as the rest of Ontario, while giardiasis was twice as high (Figure 7 and Appendix E). The number of VTEC infections among children 1 to 6 in Toronto was variable between 2001 and 2005, ranging between 3.0 and 10.2 per 100,000.

*These illnesses can disrupt family and social life, and are responsible for absenteeism from child care, school and work.*

### **Consequences of Enteric Diseases for Young Children's Health**

Symptoms of enteric diseases include diarrhea and abdominal pain. *Campylobacter* enteritis, salmonellosis, and giardiasis, are usually self limiting and rarely require hospitalization. These illnesses however, can disrupt family and social life, and are responsible for absenteeism from child care, school and work. Less frequently occurring enteric diseases such as yersiniosis and shigellosis usually result in time limited mild disease. Conversely, VTEC infections are associated with diarrhea ranging from mild and non-bloody to stools that are virtually all blood. In severe cases children can develop haemolytic uremic syndrome (HUS) (acute renal failure). Children under 5 years old are at greatest risk of developing HUS.<sup>163</sup> HUS requires intensive care which may include dialysis. A small proportion of people with HUS have immediate complications. Others have lifelong complications such as blindness, paralysis, and persistent kidney failure and 3 to 5% of people die.<sup>164</sup>

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## PART V: SUMMARY AND CONCLUSIONS

This report, *The Health of Toronto's Young Children: The Growing Child*, focuses on the health of Toronto's children age 1 to 6 years. It provides a population profile of the City's young children, information on neighbourhood and family factors, and how these factors interact to contribute positively or negatively to their health. The report also presents information on a range of young children's health outcomes and describes the short and/or long term consequences of these outcomes on their development and functioning.



Close to 160,000 children age 1 to 6 live in Toronto, representing nearly 20% of all Ontario children in this age group and 6% of Toronto's total population. Although young children are less likely to be directly exposed to neighbourhood influences than older children, neighbourhood, family and child related risk and protective factors interact in complex ways to influence various aspects of children's current and future health. In 2000, the most recent year for which data are available, over 30% of Toronto's economic families with children age 1 to 6 were low income families, representing over 50,000 children. Child poverty rates are disproportionately high among visible minority and lone parent families with young children. Children living in poverty are concentrated in certain neighbourhoods throughout Toronto and up to 50% of children age 1 to 6 in some areas of the City live in deep poverty. Low income families with young children are experiencing challenges with acquiring stable and affordable housing, as well as with providing their children with sufficient nutritious food.

Although Toronto specific data are not available on the impact of income on the following health outcomes, the literature suggests that living in a low income family during early childhood is associated with academic problems, functional health problems, overweight and obesity, asthma, and both intentional and unintentional injury. In addition to its impact on health outcomes, living in low income limits children's ability to participate fully in recreational, school and community activities. Young children are largely dependent on their parents for their care. Low income families, on average, are more likely to experience high levels of chronic stress, which can, in turn, have a negative impact on their young children.

Most Toronto parents of young children report high levels of neighbourhood cohesion, social support, family functioning, and positive parenting practices and low levels of maternal depression and negative parenting practices. While the reported levels of neighbourhood cohesion, social support, and positive parent child interaction (for children age 2 to 5 only) were high, they were on average, lower relative to the rest of Ontario. The literature suggests that neighbourhood and family related factors are often interrelated and associated with a range of social, emotional, and behavioural problems as well as increased risk of intentional and unintentional injury.

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The majority of Toronto's young children display normal or advanced motor, social and cognitive development, up to 47 months of age, and are ready to learn at school entry. As well, the majority are free from conditions and diseases such as overweight and obesity, tooth decay, including Early Childhood Tooth Decay (ECTD), communicable diseases, and asthma. Exposure to environmental tobacco smoke in the home, one of the contributing factors to asthma, has decreased.

There is reason for concern however, as some Toronto children are experiencing developmental challenges as well as diseases, injuries and conditions which can negatively affect their short and long term health. Fourteen percent of Toronto's children under the age of 5 years exhibit delayed motor, social, and cognitive development and over 1 in 4 Senior Kindergarten children are vulnerable in one or more areas of learning readiness. Motor, social and cognitive developmental capacities in the first 6 years of life lay the foundation upon which later development is built. Readiness to learn at school entry is positively associated with later academic performance and is a critical marker for life long health, well being, and success.

One in 5 Toronto children, age 2 to 6, is overweight or obese. Approximately one quarter of Toronto children age 2 to 3, and one half of Toronto children age 4 to 6 do not eat the recommended amounts of vegetables and fruits per day. Approximately 1 in 4 Toronto children age 1 to 6 spend more than two hours per day on sedentary activities. Childhood obesity affects growth and development, contributes to health conditions such as type 2 diabetes and coronary heart disease, and carries psychological consequences such as poor body image and self esteem.

Intentional and unintentional injuries are also a significant concern. Twenty Toronto children, age 1 to 6, died from unintentional injuries between 2000 and 2003. Although Toronto's rates of emergency room visits and hospitalizations for unintentional injury are lower than the rates in the rest of Ontario more work needs to be done. Most unintentional injuries are preventable and the consequences of some injuries can be severe, resulting in developmental delay, permanent disability, and reduced quality of life for both the child and family. Five Toronto children, age 1 to 6, died as a result of assault and violence between 2000 and 2003. Child welfare services in Ontario conducted over 44,000 investigations in 2003, 45% of which were substantiated. These figures do not reflect the true extent of abuse and neglect as many incidents are not reported to child welfare services. Abuse during early childhood is associated with physical injury, social, emotional, and behavioural problems as well as impaired cognitive functioning. Young children who experience abuse are more likely to experience mental health problems and to engage in crime and violent behaviour in later years.

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Tooth decay and asthma are also issues requiring continued attention. In 2005/06 approximately 30% of Toronto's 5 year old children had one or more cavities. Early Childhood Tooth Decay (ECTD), a severe form of tooth decay, has increased. Approximately 12% of 5 year old Toronto children were diagnosed with ECTD in 2005/06. ECTD is associated with gum disease, ear infections, and loss of teeth, which can contribute to nutritional and speech problems. Decay in the baby teeth can also affect the healthy development of the permanent teeth. Despite recommendations that children should have their first dental visit within 6 months after the first tooth has erupted or by 1 year of age, over 42% of Toronto children between 9 months and 6 years of age have never had a dental visit.

Nine percent of Toronto's children age 1 to 5 were diagnosed with asthma. Asthma is the single leading cause of hospitalization among Toronto's children age 1 to 6. Although most children with asthma do well with appropriate medical management, asthma can limit children's daily activities, including their social relationships.

There are significant disparities in some aspects of young children's health in Toronto, specifically readiness to learn at school entry, ECTD, and injury. The data for Toronto show that these disparities are related to neighbourhood and family income, family structure, and country of birth. For example, there is a 3 fold difference in children's readiness to learn across the City. In some geographic areas, approximately 40% of children are not ready to learn at school. These high rates are associated with high rates of low income, single parent status, and English as a Second Language (ESL) status. There are some areas of the City where the rate of unintentional injury related hospital emergency room visits for children age 1 to 6 is approximately 2.5 times greater than for areas with the lowest rates. Factors accounting for this difference are not yet well understood at the Toronto level. Young children not born in Canada have a 3.5 times higher risk of Early Childhood Tooth Decay, compared to young children born in Canada. It is noteworthy that children not born in Canada were more likely to have visited a dentist at least once, providing the opportunity for diagnosis.

Reducing these disparities is critical, both for disadvantaged children whose lifelong opportunities are affected, and for Canadian society, which has set expectations that its youngest citizens grow up healthy, achieve academic success and economic independence, and engage constructively with others as adult citizens. Every child in Toronto deserves the opportunity for healthy growth and development and long term health. Children who do not get a good start in life have difficulties achieving their potential. No child should live in poverty. All children must receive adequate nutrition, have adequate housing, and be cared for in nurturing and stimulating environments. Supporting families and creating safe and cohesive communities in an effort to provide the best possible environment for children are critical

*There are significant disparities in some aspects of young children's health in Toronto, specifically readiness to learn at school entry, Early Childhood Tooth Decay, and injury. These disparities are related to factors that include neighbourhood and family income, family structure, and country of birth.*

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investments. The information presented in this report can be used to inform discussion regarding policy levers and program initiatives to enhance health outcomes for Toronto's children and decrease disparities in health outcomes. Toronto Public Health, in collaboration with key stakeholders, must continue to strive to reach this fundamental goal.

*There are limited Toronto specific data on child abuse and neglect, mental health outcomes, disability, nutrition and physical activity.*

This report highlights the need to continue to monitor the health of young children in Toronto and to obtain a more complete picture of their health. This includes a better understanding of sociodemographic, neighbourhood, and family related factors and how these factors shape health outcomes and influence disparities in health outcomes in the Toronto context. There are limited Toronto specific data on child abuse and neglect, mental health outcomes, disability, nutrition and physical activity. Data gaps present challenges to monitoring the health status of Toronto's young children and planning appropriate programs. These gaps need to be filled in order to better measure and improve the health of Toronto's young children.

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## **APPENDIX A: DATA SOURCES, METHODOLOGY AND LIMITATIONS**

### **Census Data**

Conducted by Statistics Canada, the Census provides information about Canada's demographic, social and economic characteristics.

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.

The Census is conducted every 5 years. The most recent census took place on May 16, 2006. As of August 2007 only the total population counts and the counts by age and sex had been released for the 2006 Census. Therefore, data from the 2001 Census are used throughout the Demographic Context, and Neighbourhood and Family Influences sections of this report.

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, and some individuals or groups refuse to participate. Statistics Canada takes this into account and estimates an 'under coverage' rate. Statistics Canada has 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 led 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. It is for these reasons that estimates derived from the 2001 Census were used for the intercensal estimates (years between 2001 and 2006) and the population projections (2011 and 2016 - Figure 2) shown in this report.

### **Canadian Community Health Survey (CCHS) 2004, Cycle 2.2**

The CCHS is a joint initiative of Statistics Canada and Health Canada aimed at providing health information at the regional and provincial levels. The CCHS Cycle 2.2 - Nutrition is the first survey to provide national nutrition data since the Nutrition Canada Survey was carried out almost 35 years ago. This cross sectional survey, conducted in 2004, provides information at the national, provincial, and local levels. The majority of interviews were completed face to face and conducted using the computer assisted interviewing method.

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Survey respondents come from all age groups living in private occupied dwellings in the ten provinces in Canada. The total Toronto sample was 1,304 representing a population of 2,575,900. Data collection occurred between January 2004 and December 2004.

The food intake data, used in this report, are provided by the parent of the child. Therefore, these data may be subject to inaccurate recall and lack of knowledge of what the child consumed when not with the parent.

The body mass index information is based on the physical measuring of the height and weight of the child. Weight is assessed differently for children and adults, as children are still growing. The 2004 CCHS Cycle 2.2 uses the International Obesity Task Force cut offs.

### **Daily Bread Food Bank's Survey of People Accessing Emergency Food Programs**

The Daily Bread Food Banks in the Greater Toronto Area conduct an annual survey of clients of member neighbourhood food banks and regional partners. Food bank usage data are drawn from an overall sample of 1,306 Toronto food bank users, including 236 with children from birth to age 6. Interviewers targeted 3% of food bank users and attempted to randomly select respondents.

Data were collected between February 13 and March 31, 2006. Food Banks included were limited to those locations that agreed to participate and had the resources to undertake the data collection. The survey excluded non-Daily Bread affiliated organizations and thus is incomplete for Toronto.

### **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,

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- 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.<sup>165</sup>

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 Scholaire 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

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only) if their first language is not English or French, respectively, and they are not fluent enough to easily follow the classroom educational activities.<sup>166</sup>

Data for this report are analyzed according to Toronto's 41 Local Health Planning Areas (HPAs) which are aggregations of the 140 Toronto neighbourhoods. This level of aggregation, while less detailed than the neighbourhood level, ensures adequate numbers of participating children in each geographic area. Children are accounted for in the HPA 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.<sup>87</sup>

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;<sup>167</sup>
- 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 the 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.<sup>83</sup>

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## Hospital Separation Data

Hospital separation data are collected by the Canadian Institute for Health Information (CIHI). A hospital separation may be due to death, discharge home, or transfer to another facility. The main diagnostic code gives the primary reason for the hospital stay or "most responsible diagnosis". Comorbidity, where a patient may have more than one disease or condition, contributes uncertainty to classifying the reason for the hospital stay.

From 1997 to March 31, 2002, the reasons for hospital stay were coded using the Ninth Revision of the International Classification of Diseases (ICD-9). Since April 1, 2002, the reasons for hospital stay were coded using the Tenth Revision of the International Classification of Diseases Canadian edition (ICD-10CA/CCI).

Ontario residents treated outside of the province are excluded, however, less than 0.5% of hospitalizations for Ontario residents are out of province.

Hospital separation records are the most comprehensive and accessible source of morbidity information and as such are often a proxy for the true level of morbidity in the population. However they are limited in use due to:

- not all conditions, diseases and injuries result in hospitalization;
- one person may be hospitalized several times for the same condition, disease or injury within one year;
- a person may be discharged from more than one hospital (when transferred) for the same condition, disease or injury.

Thus hospitalization data provide only a crude measure of the prevalence of a condition.

Hospitalization data are also influenced by factors that are unrelated to health status such as availability and accessibility of care, administrative policies, hospital procedures and changes in treatment protocols.

Data are reported using calendar year. However, trends in asthma are reported using the fiscal year to acknowledge the change in coding standards from ICD-9 to ICD-10.

For all indicators, data are analyzed by the residence of the patient, not where the hospitalization occurred. The leading causes of hospitalization due to unintentional injury and for all causes are reported for 2003 to 2005 calendar years. The data are combined across these 3 years to ensure the numbers are large enough to report. Counts of hospital separations are suppressed when there are less than 5.

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## Maps

Maps in this report present health indicators for different levels of geography in Toronto. Two present data at the census tract level, one uses the 140 neighbourhoods, and one other uses the 41 health planning areas. Census tracts are used to define neighbourhoods and in turn, neighbourhoods are used to define health planning areas.

Different levels of geography are used because not all data can be presented at the census tract level. The smallest level of geography to which the health indicator could be mapped was used.

## 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 comorbidity can contribute some uncertainty as to underlying cause(s) of death.

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 change in coding has impacted some disease categories more significantly than others, thus preventing trend analysis from including the years prior to the implementation of the ICD-10 for some diseases. Other diseases (e.g., asthma) were not affected by the change in coding and trend analysis are possible.

## National Ambulatory Care Reporting System (NACRS)

Visits to hospital based and community based ambulatory care are recorded in the National Ambulatory Care Reporting System (NACRS) and kept by the Canadian Institute for Health Information (CIHI). Ambulatory care visits represent the newest available source of morbidity information and include data from day surgery, outpatient clinics and emergency room departments (ER's) throughout Ontario.

The Ontario NACRS database started in July 2000. Data used for this report are for the most recent calendar years available in NACRS.

Data collection methods may vary by facility since data abstracting standards and guidelines included in the CIHI manual may be open to interpretation. Thus, the way the data are supplied to CIHI may not be consistent across all facilities.

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## National Longitudinal Survey of Children and Youth (NLSCY)

The National Longitudinal Survey of Children and Youth (NLSCY) is a comprehensive survey which follows the development and well-being of children in Canada from birth to early adulthood. The survey monitors children's development and measures the incidence of various factors that influence their development, both positively and negatively. The survey began in 1994 and is jointly conducted by Statistics Canada in partnership with Social Development Canada.

For the first time, data from the NLSCY are being reported at the Toronto level. Toronto Public Health, in consultation with Statistics Canada, combined 4 cycles of NLSCY data (Cycles 3, 4, 5 and 6) covering the years 1998/99 to 2005/06 in order to obtain a sufficient sample size to analyze for Toronto. The Toronto sample for children from birth to age 5 was 1,896 representing approximately 154,500 children. All results presented in this report were weighted and bootstrapped according to the statistical requirements specified by Statistics Canada.

The results from the NLSCY in this report are based on data reported by the person most knowledgeable (PMK) about the child. Usually, this is the mother. The majority of scales in the survey measure the relative presence or absence of a behaviour, circumstance or condition. The following NLSCY scales are used in this report: neighbourhood cohesion, family functioning, maternal depression, social support, parenting styles, and motor social development.

The **neighbourhood cohesion scale** is based on question items that include: “*If there is a problem around here, the neighbours get together to deal with it*”, “*People around here are willing to help their neighbours*” etc. The **family functioning scale** consists of question items that include: “*Planning family activities is difficult because we misunderstand each other*”. The **maternal depression scale** uses question items that include: “*In the past week, I did not feel like eating*”, “. . . *my sleep was restless*”, etc. The **social support scale** is based on question items that include: “*If something went wrong no one would help me*”, “*There is no one I feel comfortable with talking about problems*” etc. Measures of **parenting practices** were based on responses to questions asked of the PMK on behaviours associated with parent child interaction and ineffective, punitive, and consistent parenting. Lastly, the **motor social development scale** consisted of items that measured dimensions of the child’s motor, social and cognitive development. A more detailed description of each scales may be found in the NLSCY guidebook<sup>††</sup>.

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†† More information describing the NLSCY and sampling may be found at <http://www.hrdc-drhc.gc.ca/sp-ps/arb-dgra/nlscy-elnej/home.>, and <http://www.chass.utoronto.ca/datalib/codebooks/cstdli/nlscy.htm>

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The NLSCY scales are not intended to be diagnostic. This report therefore describes where individual results fall on the scale (i.e., “high” or “low”). Average scale scores in Toronto were compared to the rest of Ontario using a test of means. The NLSCY scales used in this report are not designed to report the percent of children who have a specific condition or behaviour, or are exposed to specific parenting practices or neighbourhood conditions. The Motor Social Development scale is the only scale used in this report where there are predefined thresholds.

The limitations of these data include the small sample size per cycle for Toronto that requires data to be collapsed from four cycles of data collection. This will hide changes that occur over time. In addition, reports by PMKs may not reflect the true prevalence of the behaviours and conditions under study. The nature of the scales used limits the level of understanding of the behaviours and conditions in the Toronto population, without further analysis and research.

### **Ontario Dental Indices Survey (DIS)**

The Ontario Dental Indices Survey (DIS) collects data on the oral health status and treatment needs of children for use at the public health unit level. Data is obtained by trained dental hygienists who conduct direct assessments of children’s teeth and periodontal tissues. The DIS was conducted every 4 years starting in 1990. In 2005 it became an annual survey.

Toronto Public Health conducts the assessments on a probability sample of children ages 5, 7 and 13 from the Toronto District School Board and the Toronto Separate School Board schools. Data in this report are based on assessments for 5 year old children only.

Children who are absent from school on the day of the DIS, schooled at home or who refuse are excluded. Children living on native reserves, military bases, in institutions or attending private schools are also excluded.

### **Ontario Incidence Study of Child Abuse and Neglect (OIS) 2003<sup>144</sup>**

The 2003 Ontario Incidence Study (OIS) is the third provincial study examining the incidence of reported child abuse and neglect and the characteristics of the children and families investigated by Ontario child welfare services. It was conducted in conjunction with the 2003 Canadian Incidence Study by a national team of researchers from several universities (McGill, Toronto, Calgary and Memorial) and the Public Health Agency of Canada.

The 2003 OIS data were collected directly from investigating social workers in the fall of 2003. The sample included 7,172 child investigations conducted by 361 child welfare workers in a representative sample of 16 Child Welfare Service Areas across Ontario.

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The data are limited to reports investigated by child welfare services. They do not include cases that were screened out, not investigated, only investigated by the police, and never reported. Assessments provided by the investigating child welfare workers were not independently verified. Although the OIS includes Toronto data, it was not possible to extract data at the local level for methodological and ethical reasons.

## Population Projections

Population projections are estimates about the size, composition and distribution of the population which reflect past trends in fertility, mortality and migration. The population projections used in this report are produced by the Ontario Ministry of Finance.

Population estimates used the following assumptions for fertility, mortality, and migration.<sup>168</sup>

### *Fertility*

The total fertility rate for the province is assumed to increase slightly from 1.53 to 1.55 children per woman by the end of the projection period. This is an almost constant fertility assumption, and mean age at childbirth is assumed to increase to 31 years.

At the Census Division (CD) level, the fertility assumptions were developed using a ratio methodology. Annual ratios of total fertility rates of CD to Province were calculated for each year from 1986 to 1997. The analysis revealed a movement towards a reduction of regional fertility rate disparities between 1986 and 1997. The ratios of fertility rates for CD to Province observed in 1997 were then applied to the fertility level assumed at the Ontario level to provide the assumed value for each year of the projections at the CD level.

### *Mortality*

Life expectancy for Ontario is assumed to increase from its recent level to reach 81.0 years for males and 84.5 years for females by 2028. Male life expectancy is expected to progress at a faster pace than female life expectancy.

At the CD level, the mortality assumptions were developed using a ratio methodology. Annual ratios of life expectancy at birth for CD to Province were calculated for each year from 1986 to 1997. The projections use the most recent ratios and hold them constant throughout the projection period.

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## *International Migration*

### **1. Immigration**

The immigration level for Ontario is set at 115,000 at the beginning and is increased to 120,000 in 2004-2005. This level is held constant thereafter. The projected immigration shares for each Census Division and the age sex distribution of immigrants have been updated to reflect the revised immigration estimates provided by Statistics Canada. For most CDs, the shares remain constant throughout the projection period. The recent age sex distribution of immigrants is also assumed to remain constant.

### **2. Emigration**

The level of net emigration from Ontario has increased significantly in the three most recent years, from 25,000 in 1996/97 to over 30,000 in 1998/99. These figures are a measure of net emigration. Net emigration is assumed to remain unchanged at its estimated current level. Projected shares of emigration for each CD were obtained by applying the recent percentage distribution of provincial emigrants by CD to the assumed total levels for Ontario. Recent age sex distributions were applied and assumed to remain constant.

## **Rapid Risk Factor Surveillance System (RRFSS)**

The RRSS is an ongoing telephone survey occurring in various public health units across Ontario. The survey asks questions regarding risk behaviours, knowledge, attitudes, and awareness of topics important to public health. The survey is conducted by the Institute for Social Research at York University, on behalf of all RRFSS participating health units.

Each month, in each health unit area, a random sample of 100 adults aged 18 years and older is interviewed.

The RRFSS sample is generally representative of Toronto's population as a whole but tends to over represent higher education levels and under represent households with less than \$20,000 annual income.

## **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.

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There is possibility of considerable under reporting of cases for some communicable diseases. Under reporting can be due to several factors, including: low morbidity and incentive for testing, no health care sought, lack of awareness of appropriate diagnostic testing by physicians, and inability to isolate an appropriate organism due to specimen sample size, timing, or other technical factors.<sup>169</sup>

Reports of chickenpox are received in aggregate numbers based on defined age categories. Chickenpox counts could not be broken down for 1 to 6 year olds for this report.

### **Toronto Child Protection Agency Child Abuse Data**

Toronto child protection agency data included in this report come from the Children's Aid Society of Toronto (CAST) and the Catholic Children's Aid Society (CCAS). CAST and CCAS conduct 96% of all child abuse investigations in Toronto.

At this time, Toronto child protection agencies do not have the capacity to provide comparable information to that found in the OIS. The only available data for children age 1 to 6 that could be obtained from CAST and CCAS were the number of children in care, that is, those children for whom a child protection agency has assumed custody and responsibility. Action is being taken by the Ministry of Children & Youth Services to improve the collection and reporting of incidence rates by individual child protection agencies.

A limitation of these data is that a child can be counted more than once by virtue of being in care at different points in time within the same year.

### **Toronto Perinatal and Child Health Survey (PCHS), 2003**

Conducted by TPH, the PCHS is a population based survey that describes the prevalence of selected risk and protective factors related to child health outcomes in Toronto.

The Toronto PCHS was administered from March 1, through April 7, 2003. One thousand randomly selected parents with children from birth to age six, residing in the City of Toronto participated in this survey.

Interviews were only conducted in English, hence results may not be generalizable to the non English speaking population. The survey also over represents mothers, parents with higher education levels, and parents who are not recent immigrants.

Household annual income as reported by PCHS respondents was categorized according to Statistics Canada year 2000 Low Income Cut-offs for Toronto. Income was adjusted for family size and categorized as follow:

Family Size	Total Annual Household Income		
	Low Income	Low/Middle Income	Middle/High Income
2 or 3 Person Family	less than \$20,000	\$20,000 - \$29,999	greater than or equal to \$30,000
4 or 5 Person Family	less than \$30,000	\$30,000 - \$39,999	greater than or equal to \$40,000
6 or More Person Family	less than \$40,000	\$40,000 - \$49,999	greater than or equal to \$50,000

### Toronto Police Services Child Abuse Data

Toronto Police Services collects data on child abuse offence investigations and categorizes these data into cases of physical harm, sexual offences, neglect/abandonment, death, and other. Toronto Police Services could not provide information on the number of charges laid as a result of these investigations. In addition, a child can be counted more than once by virtue of being included in a police investigation at more than one time within the same year.

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## **APPENDIX B: DEFINITION OF TERMS**

### **Child Abuse and Neglect<sup>144</sup>**

#### *Physical Abuse*

Physical abuse occurs when a child is suspected to have suffered or to be at substantial risk of suffering physical harm at the hands of his or her caregiver. Physical abuse includes hitting with the hand or object, shaking, pushing, grabbing or throwing, punching, kicking, or biting, poisoning, abusive use of restraints, burning, choking, and other severe forms of physical assault.

#### *Emotional Abuse*

Emotional abuse occurs when a child has suffered or is at substantial risk of suffering from mental, emotional, or developmental problems caused by overtly hostile, punitive treatment, or habitual or extreme verbal abuse (threatening, belittling, etc.). The following are also categorized as emotional abuse: non-organic failure to thrive, emotional neglect (e.g., inadequate nurturance/affection), and exposure to non intimate partner violence.

#### *Child Neglect*

Child neglect includes situations in which children have suffered harm, or their safety or development has been endangered as a result of the caregiver's failure to provide for or protect them. Neglect includes abandonment, failure to supervise or protect the child from physical harm and sexual abuse, allowing or encouraging the child to commit criminal behaviour, failure to provide essential needs, medical attention or psychological/psychiatric treatment and failure to ensure school attendance.

#### *Sexual Abuse*

Sexual abuse includes various acts including penetration, attempted penetration, oral sex, fondling, sex talk, voyeurism, exhibitionism, and exploitation.

#### *Exposure to Domestic Violence*

Exposure to domestic violence occurs when a child has been a witness to violence occurring between the caregivers (or a caregiver and his/her partner) or indirectly witnessed the violence, for example, by seeing the physical injuries on his/her caregiver.

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## Confidence Intervals

A confidence interval is an interval in which a measurement falls, corresponding to a given probability. (<http://mathworld.wolfram.com/ConfidenceInterval.html>)

## Economic Family

Economic family refers to a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common law or adoption. A couple may be of opposite or same sex. Foster children are included. (<http://www.statcan.ca/english/concepts/definitions/eco-family.htm>)

## Enteric Disease

Enteric diseases are gastrointestinal diseases caused by infectious agents that are shed in the feces and can contaminate food or water sources.<sup>170</sup>

## Low Income

Low income is defined according to Statistics Canada's Low Income Cut-off (LICO) (see below), a relative measure based on the percentage of income spent on basic needs by an average family, adjusted for family size and geographic place of residence. A household falls below the LICO if it spends more than 20 percentage points above the average comparative household on food, clothing, and shelter. (<http://www.statcan.ca/english/freepub/75-202-XIE/2005000/technote1.htm>)

## Low Income Cut-offs (LICO)

Statistics Canada's Low Income Cut-off (LICO) is a relative measure based on the percentage of income spent on basic needs by an average family, adjusted for family size and geographic place of residence. A household falls below the LICO if it spends more than 20 percentage points above the average comparative household on food, clothing, and shelter. In Toronto, the LICO for a family of four was \$34,572 in 2000 and \$37,253 in 2003. The LICO is more sensitive to changes in the business cycle and purchasing power of the dollar than other income measures such as the Low Income Measure (LIM). Low income rates from the 2001 Census are not strictly comparable with those from previous Censuses due to changes in the definition of economic families beginning in 2001. (<http://www.statcan.ca/english/freepub/75-202-XIE/2005000/technote1.htm>)

## Low Income Families

Family income is the sum of income of each adult in the family. Low income families are economic families with annual incomes that fall below Statistics

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Canada's pre tax Low Income Cut-offs (LICOs). If the economic family income is below the cut-off, all individuals in that family are considered to be in low income. In other words, "persons in low income" should be interpreted as persons who are part of low income families, including persons living alone whose income is below the cut-off. Similarly, "children in low income" means children who are living in low income families. (<http://www.statcan.ca/english/freepub/75-202-XIE/2005000/technote1.htm>)

### **Low Income Households**

A household is defined as a person or group of persons residing in a dwelling. The Survey of Labour and Income Dynamics defines households and families according to the living arrangements on December 31 of the reference year. Residents of Canada are also defined at those points in time. Household income is the sum of incomes of all adults in the household. Low income households are those with annual incomes that fall below Statistics Canada's pre tax Low Income Cut-offs (LICOs). (<http://www.statcan.ca/english/freepub/75-202-XIE/2005000/technote1.htm>)

### **Person Most Knowledgeable (PMK)**

In the NLSCY, the person most knowledgeable (usually the mother) is the person reporting about child's behaviour.

### **Visible Minority**

The concept of visible minority membership generally refers to all populations of non-European and non-Aboriginal origin. Beginning with the 1996 Census of Canada, however, the ability for respondents to self identify has replaced this standard classification (<http://www.statcan.ca/english/concepts/definitions/vis-minorit.htm>).

## APPENDIX C: LEADING CAUSES OF HOSPITALIZATION, ICD-10, CHILDREN AGE 1 TO 6, TORONTO AND THE REST OF ONTARIO, 2003 - 2005 COMBINED

Cause of Child Hospitalization (ICD-10)	Toronto		Rest of Ontario	
	Number	Percent	Number	Percent
Respiratory System	5,050	33.2%	26,024	35.9%
Asthma	1,990	13.1%	8,950	12.3%
Digestive System	1,762	11.6%	8,060	11.1%
Injury and Poisoning and Other Consequences of External Causes	1,369	9.0%	6,653	9.2%
Symptoms, Signs and Abnormal Clinical and Laboratory Findings	1,295	8.5%	5,957	8.2%
Infectious and Parasitic Diseases	1,187	7.8%	6,625	9.1%
Blood and Blood Forming Organs and Certain Disorders of Immune Mechanism	610	4.0%	1,772	2.4%
Congenital Malformations, Deformations and Chromosomal Anomalies	602	4.0%	2,573	3.5%
Other	3,335	21.9%	14,848	20.5%
<b>Total</b>	<b>15,210</b>	<b>100.0%</b>	<b>72,512</b>	<b>100.0%</b>

Source: Provincial Health Planning Database (PHPDB), Hospital Separation Data, 2003-2005

Download Date: Dec 13, 2006.

Prepared by: Toronto Public Health.

## **APPENDIX D: LEADING CAUSES OF MORTALITY, ICD-10, CHILDREN AGE 1 TO 6, TORONTO, 2001 - 2003 COMBINED**

<b>Cause of Death (ICD-10)</b>	<b>Number</b>	<b>Percent</b>
External Causes of Mortality & Morbidity (including Injury and Poisoning)	27	24.3%
Unintentional Injuries and Poisoning	20	18.0%
Intentional Injuries and Poisoning	5	4.5%
Unclassified	2	1.8%
Neoplasms	17	15.3%
Congenital Malformations, Deformations & Chromosomal Abnormalities	14	12.6%
Circulatory System Diseases	10	9.0%
Symptoms, Signs & Abnormal Clinical & Laboratory Findings	10	9.0%
Respiratory System Diseases	8	7.2%
Infectious & Parasitic Diseases	7	6.3%
Digestive System Diseases	7	6.3%
Endocrine, Nutritional & Metabolic Diseases	5	4.5%
Nervous System	4	3.6%
Blood & Blood Forming Organs & Certain Disorders of Immune Mechanism	2	1.8%
<b>Total</b>	<b>111</b>	<b>100.0%</b>

Source: Provincial Health Planning Database (PHPDB), Mortality Data, 2001-2003.

Download Date: July 26, 2007.

Prepared by: Toronto Public Health.

**APPENDIX E: ENTERIC, FOOD AND  
WATERBORNE DISEASES, CHILDREN AGE 1 TO 6  
(RATE PER 100,000), TORONTO AND  
THE REST OF ONTARIO, 2001 - 2005**

Reportable Disease	Toronto					Rest of Ontario				
	2001	2002	2003	2004	2005	2001	2002	2003	2004	2005
<i>Campylobacter</i> enteritis	121.7	108.1	90.8	71.1	68.6	60.6	57.9	50.2	51.8	44.5
Salmonellosis	95.4	98.2	70.4	75.2	63.2	46.4	51.3	37.8	47.1	46.6
Giardiasis	78.8	69.9	53.9	56.5	60.2	37.1	34.1	28.2	28.3	26.7
Yersiniosis	20.9	22.9	23.3	18.7	22.7	9.2	10.6	8.2	11.2	9.1
Shigellosis	10.2	18.6	7.9	7.6	12.5	3.8	8.5	3.9	4.6	4.6
Cryptosporidiosis	9.1	7.1	6.8	10.5	6.0	12.6	10.6	13.9	13.0	10.5
Amebiasis	4.3	9.8	6.8	5.8	4.8	2.4	1.6	1.5	1.2	2.4
Hepatitis A	12.9	7.6	4.5	4.7	4.2	1.1	1.4	1.5	2.2	1.0
Verotoxin-producing <i>E. coli</i> infection	8.0	3.3	10.2	9.3	3.0	10.6	13.5	10.2	9.0	7.0
Typhoid fever	4.8	2.7	2.8	2.9	3.0	0.7	0.1	0.4	1.9	1.0
Paratyphoid fever	0.5	0.0	1.1	0.6	0.6	0.0	0.3	0.0	0.6	0.7
Cyclosporiasis	0.5	0.0	0.6	0.0	0.6	0.0	0.1	0.1	0.1	0.0
Listeriosis	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Reportable Disease Information System and Integrated Public Health Information System, Toronto Public Health

Data as of: June 14, 2006

Prepared by: Toronto Public Health

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## REFERENCES

- <sup>1</sup> McCain, M.N., Mustard, J.F., & Shanker, S. (2007). *Early years study 2: Putting science into action*. Toronto, Ontario: Council for Early Child Development.
- <sup>2</sup> Bronfenbrenner, U., & Morris, P.A. (1998). The ecology of developmental processes. In R.M. Lerner (Ed.), *Theoretical models of human development, 5th Edition, Volume 1* (pp. 993-1027). New York, New York: Wiley.
- <sup>3</sup> Appleyard, K., Egeland, B., van Dulmen, M.H.M., & Sroufe, L.A. (2005). When more is not better: The role of cumulative risk in child behaviour outcomes. *Journal of Child Psychology and Psychiatry*, 46(3), 235-245.
- <sup>4</sup> Jenkins, J., & Keating, D. (1998). *Risk and resilience in six and ten year old children* (Catalogue No. W-98-23E). Ottawa, Ontario: Applied Research Branch, Human Resources Development Canada.
- <sup>5</sup> Landy, S., & Tam, K.K. (1998). *Understanding the contribution of multiple risk factors on child development at various ages* (Research Report W-98-22E). Hull, Quebec: Applied Research Branch, Human Resources Development Canada.
- <sup>6</sup> Sameroff, A. (2005). Early resilience and its developmental consequences. In R.E. Tremblay, R.G. Barr, & R. DeV Peters (Eds.), *Encyclopedia on early childhood development* (pp. 1-6). Montreal, Quebec: Centre of Excellence for Early Childhood Development. Retrieved from <http://www.enfantencyclopedie.com/Pages/PDF/SameroffANGxp.pdf>.
- <sup>7</sup> Soubhi, H., Raina, P., & Kohen, D. (2001). *Effects of neighbourhood, family, and child behaviour on childhood injury in Canada* (Catalogue No. W-01-1-6E). Hull, Quebec: Applied Research Branch, Human Resources Development Canada.
- <sup>8</sup> Kohen, D.E., Brooks-Gunn, J., Leventhal, T., & Hertzman, C. (2002). Neighbourhood income and physical and social disorder in Canada: Association with young children's competencies. *Child Development*, 73(6), 1844-1860.
- <sup>9</sup> Boyle, M.H., & Lipman, E.L. (2002). Do places matter? Socioeconomic disadvantage and behavioural problems of children in Canada. *Journal of Consulting and Clinical Psychology*, 70(2), 378-389.
- <sup>10</sup> Romano, E., Tremblay, R.E., Boulerice, B., & Swisher, R. (2005). Multilevel correlates of childhood physical aggression and prosocial behaviour. *Journal of Abnormal Child Psychology*, 33(5), 565-578.
- <sup>11</sup> Hertzman, C., McLean, S.A., Kohen, D.E., Dunn, J., & Evans, T. (2002). *Early development in Vancouver: Report of the community asset mapping project (CAMP)*. Vancouver, British Columbia: Human Early Learning Partnership.
- <sup>12</sup> Oliver, L., Dunn, J.R., Kohen, D.E., & Hertzman, C. (2007). Do neighbourhoods influence the readiness to learn of kindergarten children in Vancouver? A multilevel analysis of neighbourhood effects. *Environment and Planning*, 39(4), 848-868.

- 
- <sup>13</sup> Faelker, T., Pickett, W., & Brison, R.J. (2000). Socioeconomic differences in childhood injury: A population based epidemiologic study in Ontario, Canada. *Injury Prevention*, (6), 203-208.
- <sup>14</sup> Fauth, R.C. (2004). The impacts of neighbourhood poverty deconcentration efforts on low-income children's and adolescents' well-being. *Children, Youth and Environments*, 14(1), 1-55.
- <sup>15</sup> Reading, R., Haynes, R., & Shenassa, E.D. (2005). Neighbourhood influences on child injury risk. *Children, Youth, and Environments*, 15(1), 165-185.
- <sup>16</sup> McConnell, R., Berhane, K., Yao, L., Jerrett, M., Lurmann, F., Gilliland, F. et al. (2006). Traffic, susceptibility, and childhood asthma. *Environmental Health Perspectives*, 114(5), 766-772.
- <sup>17</sup> Schwartz, J. (2004). Air pollution and children's health. *Pediatrics*, 113(Supplement 4), 1037-1043.
- <sup>18</sup> Wigle, D.T. (2003). *Child health and the environment*. New York, New York: Oxford University Press.
- <sup>19</sup> Kohen, D., Hertzman, C., & Brooks-Gunn, J. (1998). *Neighbourhood influences on children's school readiness* (Research Report W-98-15E). Hull, Quebec: Applied Research Branch, Human Resources Development Canada.
- <sup>20</sup> Fone, D., Dunstan, F., Lloyd, K., Williams, G., Watkins, J., & Palmer, S. (2007). Does social cohesion modify the association between area income deprivation and mental health? A multilevel analysis. *International Journal of Epidemiology*, (36), 338-345.
- <sup>21</sup> Hertzman, C. (2004). *Making early childhood development a priority: Lessons from Vancouver*. Vancouver, British Columbia: Canadian Center for Policy Alternatives (British Columbia Office).
- <sup>22</sup> Curtis, L.J., Dooley, M.D., & Phipps, S.A. (2004). Child well-being and neighbourhood quality: Evidence from the Canadian National Longitudinal Survey of Children and Youth. *Social Science and Medicine*, 58, 1917-1927.
- <sup>23</sup> Shonkoff, J.P., & Phillips, D.A. (2000). *From neurons to neighborhoods: The science of early childhood development*. Washington, D.C.: Institute of Medicine of the National Academies, The National Academies Press.
- <sup>24</sup> Statistics Canada, 2001 Census of Canada. *Census custom tabulations*.
- <sup>25</sup> Canadian Council on Social Development. (2006). *The progress of Canada's children and youth 2006*. Ottawa, Ontario: Author.
- <sup>26</sup> Ross, D., & Roberts, P. (1999). *Income and child well-being: A new perspective on the poverty debate*. Ottawa, Ontario: Canadian Council on Social Development.
- <sup>27</sup> Toronto Public Health. (2005). *Toronto Perinatal and Child Health Survey 2003*. Toronto, Ontario: Author.

- 
- <sup>28</sup> Daily Bread Food Bank (2006). *Who's hungry: 2006 profile of hunger in the GTA*. Toronto, Ontario: Author.
- <sup>29</sup> Daily Bread Food Bank (2006). *2006 custom tabulations*.
- <sup>30</sup> Offord, D.R., & Lipman, E.L. (1996). Emotional and behavioural problems. In Human Resources Development Canada, & Statistics Canada (Eds.), *Growing up in Canada: National Longitudinal Survey of Children and Youth* (pp.119-126). Ottawa, Ontario: Statistics Canada.
- <sup>31</sup> Tremblay, R.E., Boulerice, B., Foster, H., Romano, E., Hagan, J., & Swisher, R. (2001). *Multi-level effects on behavioural outcomes in Canadian children* (Research Report W-01-2E). Hull, Quebec: Applied Research Branch, Human Resources Development Canada.
- <sup>32</sup> Thomas, E.M. (2006). *Readiness to learn at school among five-year-old children in Canada* (Catalogue No. 89-599-MIE. No. 004). Ottawa, Ontario: Statistics Canada.
- <sup>33</sup> Curtis, L., & Phipps, S. (2000). *Economic resources and children's health and success at school: An analysis with the National Longitudinal Survey of Children and Youth* (Research Report W-01-1-4E). Ottawa, Ontario: Applied Research Branch, Human Resources Development Canada.
- <sup>34</sup> Phipps, S., & Lethbridge, L.N. (2006). *Income and the outcomes of children*. (Analytical Studies Branch Research Paper Series Catalogue No. 11F0019MIE-No.281). Ottawa, Ontario: Minister of Industry.
- <sup>35</sup> Statistics Canada. (2002). National Longitudinal Survey of Children and Youth: Childhood obesity, 1994 to 1999. *The Daily, Friday October 18, 2002*.
- <sup>36</sup> Lethbridge, L.N., & Phipps, S.A. (2005). Chronic poverty and childhood asthma in the Maritimes versus the rest of Canada. *Canadian Journal of Public Health*, 96(1), 18-23.
- <sup>37</sup> Birken, C.S., & MacArthur, C. (2004). Socioeconomic status and injury risk in children. *Paediatrics and Child Health*, 9(5), 323-325.
- <sup>38</sup> Bagley, C., & Mallick, K. (2000). Prediction of sexual, emotional, and physical maltreatment and mental health outcomes in a longitudinal cohort of 290 adolescent women. *Child Maltreatment*, 5(3), 218-226.
- <sup>39</sup> Lefebvre, P., & Merrigan, P. (1998). *Family background, family income, maternal work and child development* (Working Paper No. 78). Montreal, Quebec: Université du Québec à Montréal.
- <sup>40</sup> De Civita, M., Pagani, L.S., Vitaro, F., & Tremblay, R.E. (2007). Does maternal supervision mediate the impact of income source on behavioral adjustment in children from persistently poor families? *The Journal of Early Adolescence*, 27(1), 40-66.
- <sup>41</sup> Kerr, D., & Beaujot, R. (2002). Family relations, low income, and child outcomes: A comparison of Canadian children in intact-, step-, and lone-parent families. *International Journal of Comparative Sociology*, 43(2), 134-152.

- 
- <sup>42</sup> Dooley, M., Curtis, L., Lipman, E., & Feeney, D. (1998). Child psychiatric disorders, poor school performance and social problems: The roles of family structure and low-income. In M. Corak (Ed.), *Labour markets, social institutions and the future of Canada's children* (pp. 107-127) (Catalogue No. 89-553). Ottawa, Ontario: Statistics Canada.
- <sup>43</sup> Ross, D.P., Roberts, P.A., & Scott, K. (1998). *Mediating factors in child development outcomes: Children in lone-parent families* (Research Report No. W-98-8E). Hull, Quebec: Applied Research Branch, Human Resources and Social Development Canada.
- <sup>44</sup> Wellesley Institute. (2006). *Framework for the blueprint to end homelessness in Toronto*. Toronto, Ontario: Author.
- <sup>45</sup> Olden, K. (1996). Editorial: A bad start for socioeconomically disadvantaged children. *Environmental Health Perspectives*, 104(5), 462-463.
- <sup>46</sup> Lipman, E.L., Boyle, M.H., Dooley, M.D., & Offord, D.R. (1998). *Children and lone-mother families: An investigation of factors influencing child well-being* (Research Report W-98-11E). Hull, Quebec: Applied Research Branch, Human Resources Development Canada.
- <sup>47</sup> DeWit, D.J., Offord, D.R., & Braun, K. (1998). *The relationship between geographic relocation and childhood problem behaviour* (Research Report W-98-17E). Hull, Quebec: Applied Research Branch, Human Resources Development Canada.
- <sup>48</sup> Racine, Y., & Boyle, M. (2002). Family functioning and children's behaviour problems. In J.D. Willms (Ed.), *Vulnerable children: Findings from Canada's National Longitudinal Survey of Children and Youth* (pp. 199-209). Edmonton, Alberta: The University of Alberta Press.
- <sup>49</sup> Miller, I.W., Ryan, C.E., Keitner, G.I., Bishop, D.S., & Epstein, N.B. (2000). The McMaster approach to families: Theory, assessment, treatment, and research. *Journal of Family Therapy*, 22, 168-189.
- <sup>50</sup> Statistics Canada. (2006). *Microdata user guide, National Longitudinal Survey of Children and Youth, cycle 6, September, 2004 to June, 2005*. Ottawa, Ontario: Author.
- <sup>51</sup> Human Resources Development Canada and Health Canada (2003). *The well-being of Canada's young children: Government of Canada report*. Ottawa, Ontario: Author.
- <sup>52</sup> Jones, C., Clark, L., Grusec, J., Hart, R., Plickert, G., & Tepperman, L. (2002). *Poverty, social capital, parenting and child outcomes in Canada* (Final Report. SP-557-01-03E). Gatineau, Quebec: Applied Research Branch, Human Resources Development Canada.
- <sup>53</sup> Thomas, H., & Boyle, M. (2002). *Improving the mental health of young children in Toronto: Needs assessment and literature review*. Toronto, Ontario.
- <sup>54</sup> Dubovsky, S.L., & Buzan, R. (1999). Mood disorders. In R.E. Hales, S.C. Yudofsky, & J.A. Talbott (Eds.), *Textbook of psychiatry 3rd Edition* (pp. 479-565). Washington, D.C.: American Psychiatric Press.

- 
- <sup>55</sup> American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders, 4th Edition*. Washington, D.C.: Author.
- <sup>56</sup> Statistics Canada & Human Resources Development Canada. (1995). *National Longitudinal Survey of Children: Overview of survey instruments from 1994-95 data collection cycle 1* (Catalogue No. 9502). Ottawa, Ontario: Minister of Industry.
- <sup>57</sup> Black, M.M., Papas, M.A., Hussey, J.M., Dubowitz, H., Kotch, J.B., & Starr, R.H. (2002). Behaviour problems among preschool children born to adolescent mothers: Effects of maternal depression and perceptions of partner relationships. *Journal of Clinical Child and Adolescent Psychology*, 31(1), 16-26.
- <sup>58</sup> Cicchetti, D., Rogosch, F.A., & Toth, S.L. (1998). Maternal depressive disorder and contextual risk: Contributions to the development of attachment insecurity and behaviour problems in adulthood. *Development and Psychopathology*, 10(2), 283-300.
- <sup>59</sup> Dawson, G., Ashman, S.B., Panagiotides, H., Hessel, D., Self, J., Yamada, E., & Embry, L. (2003). Preschool outcomes of children of depressed mothers: Role of maternal behaviour, contextual risk, and children's brain activity. *Child Development*, 74(4), 1158-1175.
- <sup>60</sup> Kavanaugh, M., Halterman, J.S., Montes, G., Epstein, M., Hightower, A.D., & Weitzman, M. (2006). Maternal depressive symptoms are adversely associated with prevention practices and parenting behaviours for preschool children. *Ambulatory Pediatrics* 6(1), 32-37.
- <sup>61</sup> Lovejoy, M.C., Graczyk, P.A., O'Hare, E., & Neuman, G. (2000). Maternal depression and parenting behaviour: A meta-analytic review. *Clinical Psychology Review*, 20(5), 561-592.
- <sup>62</sup> Beck, C.T. (1999). Maternal depression and child behaviour problems: A meta-analysis. *Journal of Advanced Nursing*, (29)3, 623-629.
- <sup>63</sup> Boyle, M.H., & Pickles, A.R. (1997). Influence of maternal depressive symptoms on ratings of childhood behaviour. *Journal of Abnormal Child Psychology*, 25(5), 399-412.
- <sup>64</sup> To, T., Guttman, A., Dick, P.T., Rosenfield, J.D., Parkin, P., Tassoudji, M. et al. (2004). Risk markers for poor developmental attainment in young children. Results from a longitudinal national survey. *Archives of Pediatric and Adolescent Medicine*, 158, 643-649.
- <sup>65</sup> Petterson, S.M., & Albers A.B. (2001). Effects of poverty and maternal depression on early child development. *Child Development*, 72(6), 1794-1813.
- <sup>66</sup> Sohr-Preston, S.L., & Scaramella, L.V. (2006). Implications of timing of maternal depressive symptoms for early cognitive and language development. *Child and Family Psychology Review*, 9(1), 65-83.
- <sup>67</sup> Somers, M.A., & Willms, J.D. (2002). Maternal depression and childhood vulnerability. In J.D. Willms (Ed.), *Vulnerable children: Findings from Canada's National Longitudinal Survey of Children and Youth* (pp. 211-228). Edmonton, Alberta: University of Alberta Press.

- 
- <sup>68</sup> Elgar, F.J., Curtis, L.J., McGrath, P.J., Waschbusch, D.A., & Stewart, S.H. (2003). Antecedent-consequence conditions in maternal mood and child adjustment problems: A four-year cross-lagged study. *Journal of Clinical Child and Adolescent Psychology*, 32 (2), 362-474.
- <sup>69</sup> Gartstein, M.A., & Sheeber, L. (2004). Child behaviour problems and maternal symptoms of depression: A mediational model. *Journal of Child and Adolescent Psychiatric Nursing*, 17(4), 141-150.
- <sup>70</sup> Chao, R.K., & Willms, J.D. (2002). The effects of parenting practices on children's outcomes. In J.D. Willms (Ed.), *Vulnerable children: Findings from Canada's National Longitudinal Survey of Children and Youth* (pp. 149-167). Edmonton, Alberta: The University of Alberta Press.
- <sup>71</sup> Miller, F., Jenkins, J., & Keating, D. (2002). Parenting and children's behaviour problems. In J.D. Willms (Ed.), *Vulnerable children: Findings from Canada's National Longitudinal Survey of Children and Youth* (pp. 167-181). Edmonton, Alberta: The University of Alberta Press.
- <sup>72</sup> Boyle, M.H., Jenkins, J.M., Georgiades, K., Cairney, J., Duku, E., & Racine, Y. (2004). Differential-maternal parenting behaviour: Estimating within- and between-family effects on children. *Child Development*, 75(5), 1457-1476.
- <sup>73</sup> Soubhi, H., Raina, P., & Kohen, D. (2004). Neighbourhood, family and child predictors of childhood injury in Canada. *American Journal of Health Behavior*, 28(5), 397-409.
- <sup>74</sup> Thomas, E.M. (2004). *Aggressive behaviour outcomes for young children: Change in parenting environment predicts change in behaviour* (Catalogue No. 89-599-MIE-No.001). Ottawa, Ontario: Ministry of Industry.
- <sup>75</sup> Cote, S.M., Vaillancourt, T., Barker, E.D., Nagin, D., & Tremblay, R.E. (2007). The joint development of physical and indirect aggression: Predictors of continuity and change during childhood. *Development and Psychopathology*, 19, 37-55.
- <sup>76</sup> Langford, C.P.H., Bowsher, J., Maloney, J.P., & Lillis, P.P. (1997). Social support: A conceptual analysis. *Journal of Advanced Nursing*, 25, 95-100.
- <sup>77</sup> Stewart, M.J. (2000). Social support, coping, and self-care as public participation mechanisms. In M.J. Stewart (Ed.), *Community nursing: Promoting Canadian's health, 2nd Edition* (pp. 83-104). Toronto, Ontario: W.B. Saunders.
- <sup>78</sup> Moos, R.H., & Mitchell, R.E. (1982). Social network resources and adaptation: A conceptual framework. In T.A. Wills (Ed.), *Basic processes in helping relationships* (pp. 213-232). Toronto, Ontario: Academic Press.
- <sup>79</sup> Hashima, P.Y., & Amato, P.R. (1994). Poverty, social support, and parental behaviour. *Child Development*, 65(6), 394-403
- <sup>80</sup> Ryan B.A., & Adams, G.R. (1998). *Family relationships and children's school achievement: Data from the NLSCY* (Research Report No. W-98-13E). Hull, Quebec: Applied Research Branch, Human Resources Development Canada.

- 
- <sup>81</sup> To, T., Cadarette, S.M., & Liu, Y. (2001). Biological, social, and environmental correlates of preschool development. *Child Care, Health, and Development*, 27(2), 187-200.
- <sup>82</sup> Landy, S. (2002). *Pathways to competence: Encouraging healthy social and emotional development in young children*. Baltimore, Maryland: Paul H. Brookes Publishing Company.
- <sup>83</sup> Janus, M., & Offord, D. (2000). Readiness to learn at school. *ISUMA: Canadian Journal of Policy Research*, 1(2), 71-75.
- <sup>84</sup> Guo, G., Brooks-Gunn, J., & Harris, K.M. (1996). Parental labor-force attachment and grade retention among urban Black children. *Sociology of Education*, 69, 217-236.
- <sup>85</sup> Karoly, L.A., Kilburn, M.R., & Cannon, J.S. (2005). *Early childhood interventions: Proven results, future promise* (Labor and Population Monograph Series). Santa Monica, California: Rand Corporation.
- <sup>86</sup> 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.
- <sup>87</sup> 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 [http://www.offordcentre.com/readiness/files/EDI\\_Handbook\\_Jul07.pdf](http://www.offordcentre.com/readiness/files/EDI_Handbook_Jul07.pdf).
- <sup>88</sup> Feinstein, L., & Duckworth, K. (2006). *Development in the early years: Its importance for school performance and adult outcomes*. London, England: Centre for Research on the Wider Benefits of Learning.
- <sup>89</sup> Hammond, C., & Feinstein, L. (2006). *Are those who flourished at school healthier adults? What role for adult education?* London, England: Centre for Research on the Wider Benefits of Learning.
- <sup>90</sup> Sabates, R., Feinstein, L., & Skaliotis, E. (2007). *Determinants and pathways of progression to level 2 qualifications: Evidence from the NCDS and BHPS*. London, England: Centre for Research on the Wider Benefits of Learning.
- <sup>91</sup> Tjepkema, M., & Shields, M. (2005). *Nutrition: Findings from the Canadian Community Health Survey – Measured obesity: Overweight Canadian children and adolescents* (Catalogue No. 82-620-MWE2005001). Ottawa, Ontario: Statistics Canada.
- <sup>92</sup> Ministry of Health and Long-term Care. (2004). *2004 Chief Medical Officer of Health report. Healthy weights, healthy lives* (Catalogue No. 2242949). Toronto, Ontario: Queen's Printer for Ontario.
- <sup>93</sup> Health Canada. (2007). *Eating well with Canada's Food Guide*. Ottawa, Ontario: Author.

- 
- <sup>94</sup> Li, R., Serdula, M., Bland, S., Mokdad, A., Bowman, B. & Nelson, D. (2000). Trends in fruit and vegetable consumption among adults in 16 US States: Behavioral risk factor surveillance system, 1990-1996. *American Journal of Public Health*, 90(5), 777-781.
- <sup>95</sup> Field A.E., Colditz, G.A., Fox, M.K., Byers, T., Serdula, M., Bosch, R.J. et al. (1998). Comparison of 4 questionnaires for assessment of fruit and vegetable intake. *American Journal of Public Health*, 88(8), 1216-1218.
- <sup>96</sup> Traynor, M.M., Holowaty, P., Reid, D.J., & Gray-Donald, K. (2006). Vegetable and fruit food frequency questionnaire serves as a proxy for quantified intake. *Canadian Journal of Public Health*, 97(4), 286-290.
- <sup>97</sup> Kremarik, F. (2000). A family affair: Children's participation in sports (Catalogue No. 11-008). *Canadian Social Trends* (Autumn), 20-24.
- <sup>98</sup> National Association for Sport and Physical Education. (n.d.). *Active start: A statement of physical activity guidelines for children birth to five years*. Retrieved from [http://www.aahperd.org/NASPE/template.cfm?template=ns\\_active.html](http://www.aahperd.org/NASPE/template.cfm?template=ns_active.html).
- <sup>99</sup> Whitaker, R.C., Wright, J.A., Pepe, M.S., Seidel, K.D., & Dietz, W.H. (1997). Predicting obesity in young adulthood from childhood and parental obesity. *New England Journal of Medicine*, 337, 869-873.
- <sup>100</sup> Whitaker, R.C., Pepe, M.S., Wright, J.A., Seidel, K.D., & Dietz, W.H. (1998). Early adiposity rebound and the risk of adult obesity. *Pediatrics*, 101(3), 1-6.
- <sup>101</sup> Wardle, J., Guthrie, C., Sanderson, S., Birch, L., & Plomin, R. (2000). Food and activity preferences in children of lean and obese parents. *International Journal of Obesity*, 25, 971-977.
- <sup>102</sup> Cole, T.J., Bellizzi, M.C., Flegal, K.M., & Dietz, W.H. (2000). Establishing a standard definition for childhood overweight and obesity worldwide: International survey. *British Medical Journal*, 320, 1240-1247.
- <sup>103</sup> Willms, D. (2003). Commentary-Early childhood obesity: A call for early surveillance and preventive measures. *Canadian Medical Association Journal*, 171(3), 243-244.
- <sup>104</sup> Koplan, J.P., Liverman, C.T., & Kraak, V.I. (Eds.) (2005). *Preventing childhood obesity: Health in the balance*. Washington, D.C.: Institute of Medicine of the National Academies, The National Academies Press.
- <sup>105</sup> Freedman, D.S., Dietz, W.H., Srinivasan, S.R., & Berenson, G.S. (1999). The relation of overweight to cardiovascular risk factors among children and adolescents. *Pediatrics*, 103, 1175-82.
- <sup>106</sup> Falkner, N.H., Neumark-Sztainer, D., Story, M., Jeffery, R.W., Beuhring, T., & Resnick, M.D. (2001). Social, educational and psychological correlates of weight status in adolescents. *Obesity Research*, 9(1), 32-42.
- <sup>107</sup> Strauss, R.S., & Pollack, H.A. (2003). Social marginalization of overweight children. *Archives of Pediatrics & Adolescent Medicine*, 157(8), 746-752.

- 
- <sup>108</sup> Vanhala, M.J., Vanhala, P.T., Keinanen-Kiukaanniemi, S.K., Kumpusalo, E.A., & Takala, J.K. (1999). Relative weight gain and obesity as a child predict metabolic syndrome as an adult. *International Journal of Obesity*, 23, 656-659.
- <sup>109</sup> Dietz, W.H. (1998). Childhood weight affects adult morbidity and mortality. *Journal of Nutrition*, 128, 411s-414s.
- <sup>110</sup> U.S. Department of Health and Human Services. (2000). *Oral health in America: A report of the Surgeon General*. Rockville, Maryland: U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health.
- <sup>111</sup> Mouradian, W.E., Wehr, E., & Crall, J.J. (2000). Disparities in children's oral health and access to dental care. *Journal of the American Medical Association*, 284(20), 2625-2631.
- <sup>112</sup> U.K. Department of Health: Dental and Ophthalmic Services Division. (2005). *Choosing better oral health: An oral health plan for England*. Retrieved from <http://www.dh.gov.uk/assetRoot/04/12/32/53/04123253.pdf>.
- <sup>113</sup> Canadian Dental Association. (2005). *Your oral health - Your child's first visit*. Retrieved from [http://www.cdaadc.ca/en/oral\\_health/cfy/dental\\_care\\_children/first\\_visit.asp](http://www.cdaadc.ca/en/oral_health/cfy/dental_care_children/first_visit.asp).
- <sup>114</sup> Leake, J.L., Goettler, F., Stahl-Quinlan, B., & Stewart, H. (2001). *Report of the sample survey of the oral health of Toronto children aged 5, 7, and 13*. Toronto, Ontario: Toronto Public Health. Retrieved from [http://www.toronto.ca/health/hsi/pdf/hsi\\_child\\_oral\\_health.pdf](http://www.toronto.ca/health/hsi/pdf/hsi_child_oral_health.pdf).
- <sup>115</sup> Bowes, R., & Ito, D. (2006). *Report to the Ontario Association of Public Health Dentistry*. Ontario, Canada.
- <sup>116</sup> Sheiham A. (2006). Dental caries affects body weight, growth and quality of life in pre-school children. *British Dental Journal*, 201, 625-626.
- <sup>117</sup> Hockenberry M.J., & Wilson, D. (Eds.). (2007). *Wong's nursing care of infants and children 8th Edition*. St. Louis, Missouri: Mosby Inc.
- <sup>118</sup> Salam, M.T., Li, Y.F., Langholz, B., & Gilliland, F.D. (2004). Early-life environmental risk factors for asthma: Findings from the Children's Health Study. *Environmental Health Perspectives*, 112(6), 760-765.
- <sup>119</sup> Bjornson, C.L., & Mitchell, I. (2000). Gender differences in asthma in childhood and adolescence. *Journal of Gender Specific Medicine*, 3, 57-61.
- <sup>120</sup> Selgrade, M.K., Lemanske, R.F. Jr., Gilmour, M.I., Neas, L.M., Ward, M.D., Henneberger, P.K. et al. (2006). Induction of asthma and the environment: What we know and need to know. *Environmental Health Perspectives*, 114(4), 615-619.
- <sup>121</sup> Ministry of Health and Long-term Care. (2000). *Taking action on asthma, Report of the Chief Medical Officer of Health* (Catalogue No. 7610-4232310). Toronto, Ontario: Queen's Printer for Ontario.
- <sup>122</sup> Bracken, M.B., Belanger K., Cookson, W., Triche, E., Christian, D., & Leaderer, B. (2002). Genetic and perinatal risk factors for asthma onset

---

and severity: A review and theoretical analysis. *Epidemiologic Reviews*, 24(2), 176-189.

<sup>123</sup> Yeatts, K., Sly, P., Shore, S., Weiss, S., Martinez, F., Geller, A. et al. (2006). A brief targeted review of susceptibility factors, environmental exposures, asthma incidence, and recommendations for future asthma incidence research. *Environmental Health Perspectives*, 114(4), 634-640.

<sup>124</sup> Devereux, G., Barker, R.N., & Seaton, A. (2002). Antenatal determinants of neonatal immune responses to allergens. *Clinical & Experimental Allergy*, 32(1), 43-50.

<sup>125</sup> Al-alem, U., Lendor C., Kong, J., Garfinkel, R., Chew, G., Perzanowski, M. et al. (2006). Association of mouse, cockroach and dust mite IgE levels at age 2 with traffic-related exposure and respiratory symptoms in an inner-city birth cohort. *Journal of Allergy Clinical Immunology*, 117(2), Supplement 1, s178 – s178.

<sup>126</sup> Richardson, G., Eick, S., & Jones, R. (2005). How is the indoor environment related to asthma? Literature review. *Journal of Advanced Nursing*, 52(3), 328-339.

<sup>127</sup> Blais L., Beauchesne, M., & Levesque, S. (2006). Socio-economic status and medication prescription patterns in pediatric asthma in Canada. *Journal of Adolescent Health*, 38(5), 607.e9-607.e16.

<sup>128</sup> Kozyrskyj, A.L., & Hildes-Ripstein, G.E. (2002). Assessing health status in Manitoba children: Acute and chronic conditions. *Canadian Journal of Public Health*, 93(Supplement 2), s44-s49.

<sup>129</sup> Milton, B., Whitehead, M., Holland, P., & Hamilton, V. (2004). The social and economic consequences of childhood asthma across the life course: A systematic review. *Child Care, Health and Development*, 30(6), 711-728.

<sup>130</sup> Halterman, J.S., Yoos H.L., Conn, K.M., Callahan, P.M., Montes, G., Neely, T.L. et al. (2004). The impact of childhood asthma on parental quality of life. *Journal of Asthma*, 41(6), 645-653.

<sup>131</sup> Morrongiello, B.A. (2003). *Unintentional injury prevention – Priorities for research, capacity building, and knowledge translation*. Ottawa, Ontario: Canadian Institutes of Health Research and the Canadian Injury Research Network.

<sup>132</sup> Deal, L.W., Gomby, D.S., Zippiroli, L., & Behrman, R.E. (2000). Unintentional injuries in childhood: Analysis and recommendations. *The Future of Children*, 10(1), 4-22.

<sup>133</sup> SmartRisk. (2005). *Ending Canada's invisible epidemic – A strategy for injury prevention*. Toronto, Ontario: Author.

<sup>134</sup> Soubhi, H. (2004). The social context of childhood injury in Canada: Integration of the NLSCY findings. *American Journal of Health Behavior*, 28(Supplement 1), s38-s50.

- 
- <sup>135</sup> Miller, T.R., Romano, E.O., & Spicer, R.S. (2000). The cost of childhood unintentional injuries and the value of prevention. *The Future of Children*, 10(1), 137-163.
- <sup>136</sup> Ministry of Health and Long-term Care (2002). *2002 Chief Medical Officer of Health report. Injury: Predictable and preventable* (Catalogue No. 7610-4237592). Toronto, Ontario: Queen's Printer for Ontario.
- <sup>137</sup> Schwebel, D.C., Brezausek, C.M., Ramey, S.L., & Ramey, C.T. (2004). Interactions between child behaviour patterns and parenting: Implications for children's unintentional injury risk. *Journal of Pediatric Psychology*, 29(2), 93-104.
- <sup>138</sup> Birken, C., Parkin P., To, T., & MacArthur, C. (2006). Analysis. Trends in rates of death from unintentional injury among Canadian children in urban areas: Influence of socioeconomic status. *Canadian Medical Association Journal*, 175(8), 857-868.
- <sup>139</sup> Osmond, M.H., Brennan Barnes, M., & Shephard, A.L. (2002). A 4 year review of severe pediatric trauma in eastern Ontario: A descriptive analysis. *The Journal of TRAUMA, Injury, Infections, and Critical Care*, 52, 8-12.
- <sup>140</sup> Macpherson, A.K., Rothman, L., McKeag, A., & Howard, A. (2003). Mechanism of injury affects 6 month functional outcome in children hospitalized because of severe injuries. *The Journal of TRAUMA, Injury, Infection, and Critical Care*, 55(3), 454-458.
- <sup>141</sup> Peirson, L., Laurendeau, M., & Chamberland, C. (2001). Context, contributing factors, and consequences. In I. Prilleltensky, G. Nelson, & L. Peirson, (Eds.), *Promoting family wellness and preventing child maltreatment* (pp. 41-123). Toronto, Ontario: University of Toronto Press.
- <sup>142</sup> Tonmyr, L., & Doering, L. (2004). The scope of child maltreatment in Canada. *Health Policy Research Bulletin*, 9, 12-15.
- <sup>143</sup> Tilden, V.P., Schmidt, T.A., Limandri, B.J., Chiodo, G.T., Garland, M.J., & Loveless, P.A. (1994). Factors that influence clinicians' assessment and management of family violence. *American Journal of Public Health*, 84(4), 628-633.
- <sup>144</sup> Fallon, B., Trocmé, N., MacLaurin, B., Knoke, D., Black, T., Daciuk, J., & Felstiner, C. (2005). *Ontario Incidence Study of reported child abuse and neglect, OIS 2003: Major findings report*. Toronto, Ontario: Centre of Excellence for Child Welfare.
- <sup>145</sup> Durrant, J.E., & Gonzalez, M. (2005). *Substantiation of punishment abuse reports to the Canadian child welfare system: Implications for research and practice. Report submitted to the Public Health Agency of Canada, Injury and Child Maltreatment Section, March 14, 2005*. Ottawa, Ontario.
- <sup>146</sup> Ontario Association of Children's Aid Societies. (2007). *What is CAS?* Retrieved from <http://www.oacas.org/childwelfare/faqs.htm#whatis>.

- 
- <sup>147</sup> Manly, J.T., Kim, J.E., Rogosch, F.A., & Cicchetti, D. (2001). Dimensions of child maltreatment and children's adjustment: Contributions of developmental timing and subtype. *Development and Psychopathology*, 13, 759-782.
- <sup>148</sup> Hildyard, K.L., & Wolfe, D.A. (2002). Child neglect: Developmental issues and outcomes. *Child Abuse & Neglect*, 26, 679-695.
- <sup>149</sup> Moss, K. (2004). Kids witnessing family violence. (Catalogue No. 11-008). *Canadian Social Trends*, 73, 12-16.
- <sup>150</sup> Egeland, B., Sroufe, L.A., & Erickson, M. (1983). The developmental consequences of different patterns of maltreatment. *Child Abuse & Neglect*, 7, 459-469.
- <sup>151</sup> Keiley, M.K., Howe, T.R., Dodge, K.A., Bates, J.E., & Pettit, G.S. (2001). The timing of child physical maltreatment: A cross-domain growth analysis of impact on adolescent externalizing and internalizing problems. *Development and Psychopathology*, 13, 891-912.
- <sup>152</sup> De Marco, R. (2004). Maltreatment outcomes: Immediate and long-term. *Health Policy Research Bulletin*, 9, 19-23.
- <sup>153</sup> Emery, R.E., & Laumann-Billings, L. (1998). An overview of the nature, causes, and consequences of abusive family relationships: Toward differentiating maltreatment and violence. *American Psychologist*, 53(2), 121-135.
- <sup>154</sup> Hotton, T. (2003). *Childhood aggression and exposure to violence in the home* (Catalogue No. 85-561-MIE-No.002). Ottawa, Ontario: Statistics Canada.
- <sup>155</sup> Éthier, L.S., Lemelin, J., & Lacharité, C. (2004). A longitudinal study of the effects of chronic maltreatment on children's behavioural and emotional problems. *Child Abuse & Neglect*, 28, 1265-1278.
- <sup>156</sup> Arnow, B.A. (2004). Relationships between childhood maltreatment, adult health and psychiatric outcomes, and medical utilization. *Journal of Clinical Psychiatry*, 65(12), 10-15.
- <sup>157</sup> Edwards, V.J., Holden, G.W., Felitti, V.J., & Anda, R.F. (2003). Relationship between multiple forms of childhood maltreatment and adult mental health in community respondents: Results from the adverse childhood experiences study. *American Journal of Psychiatry*, 60(8), 1453-1460.
- <sup>158</sup> Colman, R.A., & Widom, C.S. (2004). Childhood abuse and neglect and adult intimate relationships: A prospective study. *Child Abuse & Neglect*, 28, 1133-1151.
- <sup>159</sup> Pollak, S. (2004). The impact of child maltreatment on the psychosocial development of young children. In R.E. Tremblay, R.G. Barr, & R. DeV Peters (Eds.), *Encyclopedia on early childhood development* (pp. 1-6). Montreal, Quebec: Centre of Excellence for Early Childhood Development. Retrieved from <http://www.enfant-encyclopedie.com/Pages/PDF/PollakANGxp.pdf>.

- 
- <sup>160</sup> Lansford, J.E., Dodge, K.A., Pettit, G.S., Bates, J.E., Crozier, J., & Kaplow, J. (2002). A 12-year prospective study of the long-term effects of early child physical maltreatment on psychological, behavioral, and academic problems in adolescence. *Archives of Pediatrics & Adolescent Medicine*, 156(8), 824-830.
- <sup>161</sup> Gold, R. (2006). *Your child's best shot: A parent's guide to vaccination 3rd Edition*. Ottawa, Ontario: Canadian Paediatric Society.
- <sup>162</sup> Pickering, L., Baker, C., Long, S., & McMillan, J. (Eds.). (2006). *Red book: 2006 report of the Committee on Infectious Disease 27th Edition*. Elk Grove Village, Illinois: American Academy of Pediatrics.
- <sup>163</sup> Heymann, D. (Ed.). (2004). *Control of communicable diseases manual 18th Edition*. Washington, D.C.: American Public Health Association.
- <sup>164</sup> Centers for Disease Control and Prevention. (2006). *Escherichia coli O157:H7*. Retrieved from [http://www.cdc.gov/ncidod/dbmd/diseaseinfo/escherichiacoli\\_g.htm#What%20are%20the%20long-term%20consequences%20of%20infection](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/escherichiacoli_g.htm#What%20are%20the%20long-term%20consequences%20of%20infection).
- <sup>165</sup> 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.
- <sup>166</sup> Janus, M. (2005). *Early Development Instrument guide 2004/2005*. Offord Centre for Child Studies. McMaster University. Retrieved from <http://www.offordcentre.com/readiness/files/2005.EDI.ENG.Guide.pdf>.
- <sup>167</sup> 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.
- <sup>168</sup> Ontario Ministry of Finance. (2000). *Ontario Population Projections, 1999-2028*. Retrieved from <http://www.gov.on.ca/FIN/english/demogeng.htm>.
- <sup>169</sup> Toronto Public Health. (2005). *Reportable communicable diseases in Toronto: Technical notes to accompany monthly summary*. Retrieved from [http://www.toronto.ca/health/cdc/communicable\\_disease\\_surveillance/statistics\\_and\\_reports/monthly\\_reports/index.htm](http://www.toronto.ca/health/cdc/communicable_disease_surveillance/statistics_and_reports/monthly_reports/index.htm).
- <sup>170</sup> Toronto Public Health. (2007). *Communicable diseases in Toronto 2005*. Toronto, Ontario: Author.