# Early Childhood Development in Canada: Current State of Knowledge and Future Directions

A Discussion Paper for the Public Health Agency of Canada

**Jennifer E. Enns, Marni Brownell, Magdalena Janus, and Martin Guhn**

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**Jennifer E. Enns and Marni Brownell are affiliated with the Manitoba Centre for Health Policy, Rady Faculty of Health Sciences, University of Manitoba.**

**Magdalena Janus is affiliated with the Offord Centre for Child Studies, Department of Psychiatry and Behavioural Neurosciences, McMaster University.**

**Martin Guhn is affiliated with the Human Early Learning Partnership, School of Population and Public Health, University of British Columbia.**

UNIVERSITY OF MANITOBA







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# Executive Summary

This discussion paper aims to summarize and contextualize the current state of knowledge on early childhood development, based on the comprehensive collection of indicators presented in the Canadian Institute of Child Health's 2017 Profile on the Health of Canada's Children and Youth. Drawing on the most recent evidence available on child health and development from the prenatal period to school entry at the age of five, we describe how Canadian families' demographic characteristics, income and employment status, family and community characteristics, access to and use of health services, and health status impact on the early years of their children's lives. Major trends and inequalities are identified, and gaps in knowledge are highlighted in each of these areas. The final chapter presents an overview of current policies, programs and interventions that support early childhood development in Canada.

## Key Findings

The majority of children in Canada are healthy and happy. Childhood illnesses are relatively rare, and most children are born healthy and remain so into adulthood. Many children have families that provide a warm and nurturing home environment and live in neighbourhoods and communities that offer the material and social supports children require to grow and thrive. Children living in Canada have access to universal health and education systems that rank among the best in the world. These resources help establish a positive developmental trajectory that sets them on the path to success. However, despite the many advantages granted to children in Canada, inequalities exist that impact early childhood development and present challenges to some families in ensuring their children have the opportunity to fully participate in society. The circumstances into which children are born determine, to a large extent, their exposure to physical and social environments that promote or compromise healthy development. Our synthesis of the data in the Canadian Institute of Child Health's Profile highlights how the following social determinants of health may impact on early childhood development: single parenthood; teenage motherhood; involvement with the child welfare system; being a newcomer to Canada (e.g., in the case of refugee families); lower household income; lower levels of parental education; poor housing quality; lower availability of quality childcare and early education services; and challenges accessing health and mental health services. Individually and in combination, these living conditions play a role in determining the health and healthy development of young children in Canada.

## Conclusions

Ensuring the well-being of children is a shared responsibility in Canadian society. Significant investments have been made at the national, regional and local levels to help ensure that families facing challenging living circumstances have financial supports, parents are supported in fulfilling their role as nurturing caregivers, and children have access to resources and services that foster their healthy development. These investments were made based on a strong body of evidence for 'what works' to set children on a positive path of healthy development. Continued investment in research and evaluation will allow us to track progress and identify future areas for interventions toward health equity.

# Introduction and Context

Creating a healthy, positive start for every child is a priority for Canada,[1] and our society has a responsibility to help ensure that children grow into healthy, happy and productive adults. While parents usually play the primary role in the nurture and care of their children, families operate within the context of their neighbourhoods, communities, workplaces, public institutions and political structures. Governments shape policies and invest in programs that support early childhood development so that each child has the opportunity to reach their full potential.

In 2018, a Profile on the Health of Canada's Children and Youth from birth to the age of 24 was released by the Canadian Institute of Child Health (CICH) in collaboration with the Public Health Agency of Canada (PHAC). The Profile was developed by a group of more than 100 respected Canadian experts in the health and social sciences, who were tasked with identifying, evaluating, and consolidating key indicators of children's health and development. The resulting web-based resource is a comprehensive assessment of Canadian children's health and development, summarizing the current scientific evidence on Canadian children's well-being within the context of the policies and structural frameworks in which they grow and learn.

The Profile aims to promote a healthier society by providing information on Canada's child population, and by linking it to policies and programs that respond to the needs of Canadian families. This evidence-to-action approach is being advanced by PHAC through a number of its initiatives, including the Profile commissioned by PHAC. This discussion paper presents an overview of current knowledge on early childhood development in Canada to identify what is known and where evidence gaps remain. The paper builds on the Profile by describing the major findings, and discussing them in the context of recent and relevant peer-reviewed and grey literature. Trends, patterns and knowledge gaps are highlighted across Canadian jurisdictions. The paper concludes with an overview of policies, programs and interventions aiming to address inequalities among Canadian families. Selected examples illustrate key interventions and strategies acting at the individual, family and population level to advance and enhance action on early childhood development.

# Chapter 1. Demographic Profile

Since the middle of the 19th century, Canada's population has experienced continuous growth.[2] In the 2016 Census, the total population of Canada was 35.1 million people, which represents a 4.9% increase from the previous Census in 2011. However, in recent years, several factors have contributed to slower growth, including the stabilization of birth rates and fertility rates, an aging population that has led to higher mortality rates, and changing trends in immigration and emigration.

**Notable Trends and Knowledge Gaps**

- Canada's population is growing, but birth rates are lower than in previous decades.
- In 2016, the highest birth rates in Canada were in Nunavut and the Northwest Territories.
- The average age of first-time mothers is increasing.
- About 15% of Canadian children live in single-parent families, which places them at higher risk of experiencing poverty than children in dual-parent families.
- Canada's newcomer population is growing.

## 1.1 Births in Canada

### *Birth and Fertility Rates*

The national birth rate continues to contribute to the growth of the Canadian population, particularly in the Northern Territories. In 2016, there were 383,102 live births in Canada, and the average crude birth rate across all of Canada was 10.9 live births per 1,000 persons.[2] It was highest in Nunavut (25.8 births per 1,000) and Northwest Territories (15.3 births per 1,000), and lowest in Atlantic Canada (8.6 births per 1,000 in Newfoundland & Labrador).[3] The average number of live births in Canada has remained relatively stable over the past 30 years. In 2014, the average national fertility rate was 1.6 births per woman.[4] Overall, Canada's fertility rate has been relatively stable since the mid-1970s, and since that time it has remained below the replacement level of 2.1 births per woman (i.e., the number of children per woman necessary to ensure the replacement of a population, taking mortality into account). Fertility rates have been highest in Nunavut (3.0 births per woman) and lowest in Newfoundland & Labrador (1.4 births per woman).

### *Maternal Age*

In recent decades, there has been a trend toward postponing childbirth until later maternal ages. In 2013, a larger proportion of babies were born to mothers aged 30-39, and a smaller proportion were born to teenage mothers aged 15-19 and mothers aged 20-29, compared to 2003.[5] The average maternal age in Canada has increased from 27.7 years in 1991 to 29.9 years in 2013.[6] While this change may seem insignificant, the present average maternal age is the highest on record for Canada, and there are important population health implications of increasing maternal age. From an obstetric perspective, older maternal age is associated with an increased risk of adverse

outcomes during pregnancy and at birth. For example, older women have a higher risk of gestational diabetes and pre-eclampsia, low birth weight and pre-term births, and miscarriage.[7–9] Older maternal age is also associated with higher infertility,[10] which may mean that older mothers have fewer children. Older parents with young children may experience a greater number of health problems as they age, or have less energy for family activities compared to younger mothers, with a lower likelihood of older grandparents being involved in their grandchildren's lives.[11] Several studies have shown that grandparental involvement in childrearing has positive impacts on child development and well-being; for example, young children in the Millennium Cohort Study who were cared for primarily by their grandparents developed larger vocabularies than those in formal childcare settings[12]; time spent with grandparents has also been shown to contribute to children's psychosocial development.[13] While the full health, social and economic consequences of increasing maternal age have not yet been fully realized, the decision to delay childbearing may contribute to an increased burden for older parents. At the same time, some research suggests that older mothers may provide a more responsive family environment for their children,[14,15] yet it remains unknown whether these effects extend into later years of child development and impact children's social and educational trajectories.[15]

There are also many potential benefits to delayed childbearing. The decision to delay childbearing may make it easier for parents (especially mothers) to achieve higher levels of education[16,17] and employment,[18,19] potentially allowing older mothers to reach a higher income level before the birth of their first child. As a result, children of older mothers may be more likely to live in families where one or both parents have secure employment and higher incomes compared to children of young parents.[18–20] Higher household income is a social determinant of health that has been linked to many positive child development outcomes.[21,22]

### *Teenage Mothers*

The trend towards older maternal age indicates that there are proportionately fewer births to teenage mothers in Canada. While births to teenage women account for a small percentage of total births (just 2.7% in 2013),[23] they represent a substantial challenge to health and social services. Evidence suggests that, in the developed world, teenage mothers and their children are more likely than older mothers and their children to experience negative health and social outcomes during the course of their lives.[24–26] For instance, teenage mothers have higher rates of mental health disorders[27–29] and health-risk behaviours (such as smoking cigarettes or binge drinking).[30,31] They also tend to have lower levels of incomes, socioeconomic status, educational attainment, and social support.[25,29,32] Children of teenage mothers are at higher risk for adverse birth outcomes, such as prenatal death, premature birth, and low birth weight.[33] These children may also experience growth and developmental delays,[34,35] have higher risk of accidental injury and neglect,[36] and struggle academically, further limiting potential opportunities for achieving high levels of education, employment, and financial security.[31]

It is important to acknowledge that many teenagers are warm, nurturing parents, who choose to become parents at a young age for personal, cultural or familial reasons. Yet other teenage parents come from challenging circumstances that may be made more difficult through the experience of having and raising children at a young age. Some teenage parents may face poor

health, social, and economic outcomes and require support to excel at creating a positive parenting environment for their children.[25,28]

## 1.2 Demographics of Young Children

In 2016, there were over 2.3 million children aged 0-5 living in Canada.[37] These children accounted for 6.5% of the Canadian population overall, although they made up a slightly smaller proportion in families living in the Maritime Provinces (5.2% to 5.6%) and a slightly larger proportion in families living in the Prairie Provinces (7.7% to 8.1%), Northwest Territories (8.8%) and Nunavut (13.1%).[38]

### *Ethnocultural Diversity*

Immigration is a major source of Canada's growing population, and continues to contribute to the country's ethnocultural diversity.[39] Canada's immigration policy views immigration as an asset to the its social, cultural and economic vitality.[40,41] Changing patterns of immigration and fertility have contributed to the demographic growth of young children from visible minorities,[39] which is likely to influence how Canada's future demographic profile will be shaped.

Research has shown that immigrants often arrive to Canada in better health than those born in this country,[42] which is a phenomenon known as the 'healthy immigrant effect.'[43] However, some immigrant families, particularly refugee families from conflict settings, who were living in substandard conditions, and who may not have had access to health care, may face challenges to their health and social well-being as they settle into life in Canada. For example, they may encounter language barriers, have difficulty navigating the healthcare system or finding appropriate employment, and experience social isolation and/or discrimination.[44] These challenges can adversely impact the physical and emotional well-being of individuals and families, as well as their socioeconomic status, and educational and vocational achievements.[45–47] Effective needs-driven settlement services, including linguistically and culturally appropriate health and social services, can help newcomers to Canada integrate into their physical and social environments and provide stable and nurturing surroundings for their children.[44]

### *Family Structure*

In 2011, about one in five Canadian families had children aged 0-4.[48] Among these, 63% were led by married couples, and 22% were led by common-law couples.[49] Across all of Canada, 15% of children under age 5 lived in single-parent families. The proportion of single-parent families ranged from 12.5% in Quebec to 25% in Nunavut. The 2011 National Household Survey reports that 1,177,000 children under the age of 19 had parents who were divorced, separated, or did not live at the same primary residence.[50] Approximately 70% of these children lived at their mother's residence and 15% lived at their father's residence; 9% spent their time equally divided between the two.

Over the past 50 years, family structures in Canada have become increasingly diverse, influenced in part by social changes to structured gender roles, and facilitated in part by legislative changes, such as: the legalization of and improved access to birth control, the introduction of no-fault divorce legislation, and increasing participation of women and mothers in the workforce.[39] Although the proportion of married couples has decreased over time, this family structure remains

predominant in Canada.[39] The decrease in the proportion of married couples is largely attributable to a rise in common-law relationships, whose proportion has increased three-fold over the last three decades.[39]

The proportion of lone-parent families has also increased over time.[49] Single parents may face more challenges than co-parenting couples. For example, mothers raising children on their own experience higher levels of poverty than families with other parenting structures (including those led by lone fathers), and are also more likely to live in poverty for longer durations.[49] Low pay and unstable employment are more common among lone mothers, and as a result they may have fewer financial resources to overcome the challenges their families face.[51] Stress, high workload and economic strain combine to bring about higher risk of compromised physical and mental health for lone parents.[52] The link between low income and children's mental, physical and developmental health has been well-established, and is thought to be at least partially explained by a lack of stimulating behaviours and home experiences among families experiencing poverty.[53] Children raised in lone-parent families may then also face a higher risk of negative health and social outcomes than their dual-parented peers.[54] Policies and programs that alleviate some of the financial stress experienced by lone parents are important supports for early childhood development.

# 2. Income, Housing, and Labour Market Characteristics

The well-being of children is in many ways shaped by the social determinants of health, which are defined by the World Health Organization as "the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life."[55] Among the social determinants of health, socioeconomic status is a fundamental determinant that is intricately intertwined with other factors. Socioeconomic status is a complex and multi-faceted concept that is often captured and reported using household income. The life-long stepwise association between income and a range of children's developmental health outcomes is so strong and consistent that it has been termed a "gradient effect" and serves as a powerful illustration of inequalities in children's health and well-being within and between societies.[56]

**Notable Trends and Knowledge Gaps**

- Household income is a particularly influential social determinant of early childhood development and life-long health.
- Housing is another influential determinant of children's developmental health. In 2011, 12.5% of Canadian households lived in inadequate housing.
- There is a lack of data in Canada on the prevalence of homeless children, mothers and families. Improved data collection and research are necessary to develop interventions to end homelessness for families with children.

## 2.1 Household Income and Income Inequality

Household income is well-established as a particularly influential social determinant of health.[57] Data on family income from the National Household Survey show that Canadian couples with children saw their median after-tax income increase by 6.6% (from $85,400 to $91,000) between 2000 and 2014,[58] but not all families have shared equally in that distribution. In 2015, 1.2 million children under 18 (or 17% of all children in Canada) lived in low-income households.[59] Compared to families with older children, families with younger children are more likely to be in a lower income bracket, and are more vulnerable to the negative effects associated with low income.[60] For example, studies from the US[61,62] and Canada[63] demonstrate that children living in low-income families are more likely to experience adverse health outcomes, have lower educational achievement, and exhibit more behaviour problems than children in higher-income families.

Income inequality is intricately connected to the health of populations.[64] It is generally understood that greater income inequality within a country corresponds with poorer health in the overall population.[65,66] Although individuals with the lowest incomes are most likely to experience the worst health outcomes, the negative impact of inequality is felt among all individuals[67]: income inequality is linked to higher premature mortality, reduced social cohesion (the willingness of community members to cooperate with each other), and reduced social mobility (the ability of

families to rise out of poverty).[68] Income inequality at the population level can be expressed using the Gini coefficient,[69] which is a measure of the extent to which the distribution of income across a population deviates from a perfectly equal distribution. The Gini coefficient ranges from 0 to 1, with 0 representing perfect equality (all individuals have the same amount of income) and 1 representing perfect inequality (a single individual has all of the income). In other words, the Gini coefficient measures the size of the gap between the wealthy and the poor.

According to a report by the Organization for Economic Co-operation and Development (OECD), Canada experienced a large increase in the Gini coefficient between the 1990s and mid-2000s. In other words, income inequality increased substantially over this time period, resulting in 60% of Canadian families experiencing a decline in market incomes in constant dollars, while the top 20% did very well financially, widening the gap between lower- and higher-income families.[70] In 2015, the Gini coefficient for the population of Canada was reported to be 0.32, placing Canada in 13th place for income equality among 30 OECD countries.[71] The OECD country ranked highest for income equality was Slovenia with a Gini coefficient of 0.25; the US ranked 22nd with a Gini coefficient of 0.39.

## 2.2 Parental Education and Participation in the Labour Force

### *Parental Education*

Education is considered a key policy lever for reducing social inequalities within and between generations.[72] Education empowers parents, and particularly mothers, to participate more fully in the workforce and in society, to improve their health literacy, and to provide a cognitively stimulating environment for their children.[73,74] The latest National Longitudinal Survey of Children and Youth shows that in 64% of two-parent families with children under 6, both parents were either working or in school, while in 34% of two-parent families, only one parent was working or studying.[75] Among lone-parent families, 66% of parents worked or studied. Families living in urban settings were more likely than families in rural settings to have at least one parent who obtained a college or university degree.[76]

Parental educational attainment is strongly associated with developmental outcomes for children. For example, children with less-educated mothers are more likely to have difficulty in the areas of language, vocabulary development, and phonological awareness.[77,78] As they progress from preschool to elementary school, children whose parents have higher levels of education are more likely to perform well on a range of cognitive and social measures.[79] Maternal education has also been shown to have a protective effect on maternal mental health by indirectly improving developmental outcomes for children.[80,81] Higher levels of maternal education may also have longer-term effects on children's academic ability, as they are associated with the higher likelihood that children graduate from high school.[82–84]

### *Mothers in the Workforce*

The vast majority of Canadian women whose youngest child is less than six years old participate in the labour force. In 2016, 73.3% of women with children under 6 worked at a job outside the home.[85] This rate is a result of a sharp rise between 1976 and 1991, and then a slower increase until 2010, at which time it leveled off. In 2010, most working mothers in Canada who had

a child in the last 3 years took some form of leave.[86] Among these women, 83% took paid leave and 21% took unpaid leave, though these were not mutually exclusive. At the time of their leave, 21.8% of mothers were precariously employed. Precarious employment, which includes temporary employment and self-employment with no employees, is a social determinant of health that affects workers with high levels of uncertainty surrounding their compensation, scheduling, future employment, and advancement.[87] Among mothers with young children, an increase in precarious employment may reflect the high demands placed on women who divide their time between caring for their families and working outside of the home. Compared to individuals with greater employment security, precariously employed individuals tend to have lower incomes, and the terms of their employment can negatively impact their physical and mental health, creating further challenges for parenting young children.[87,88] The overall percentage of Canadian workers who are precariously employed has risen over time, and may contribute to the income inequity that exists in Canada.[87,88]

## 2.3 Housing and Homelessness

Housing is another critically important social determinant of health and well-being. The Canada Mortgage and Housing Corporation uses the term 'adequate housing' to describe housing that doesn't require any major repairs, is suitable in terms of its size and the number of bedrooms available, and is affordable for the family living there.[89] Conversely, 'inadequate housing' refers to housing that may be cold, damp, moldy, overcrowded and/or unsafe. Families living in inadequate housing are described as being 'in core housing need'. In 2011, the majority of children in Canada had adequate housing, but 12.5% of Canadian households were in core housing need.[90] Individual jurisdictions in Canada ranged from 9.3% (Prince Edward Island) to 39% (Nunavut) of households being in core housing need.[91]

Adequate housing is considered a basic prerequisite for good health and early childhood development.[92,93] There are multiple ways in which a family's housing conditions can impact a child's day-to-day well-being and development. These pathways include proximal factors (e.g., the physical adequacy and safety of the home environment) and more distal factors (e.g., the neighbourhood in which the home is located, and the school the child attends).[94,95] Children living in crowded, inadequate or unsafe housing conditions are at increased risk of chronic and infectious diseases (including asthma and other respiratory illnesses),[96] and may suffer from malnutrition due to money being needed for housing-related costs.[97]

Housing is intimately linked to household income and the financial resources available to a family. In families living in core housing need, parents are often burdened with stress, which poses challenges to maintaining positive relationships within the family, influences the mental and physical well-being of parents, and may even introduce a higher risk of negative parenting practices.[98,99] Families living in inadequate housing may also have high residential mobility, which can have short- and long-term negative impacts on children's school achievement and socio-emotional development.[100–103]

### *Homelessness and Emergency Shelter Use*

The Government of Canada's recent report on emergency shelter use provides an overview of people experiencing homelessness in Canada.[104] In 2016, an estimated 235,000 Canadians

experienced homelessness, of which 27% were women and 19% were youth. While the number of people using emergency housing shelters has declined over the last decade, Canada's shelter system is still operating at over 90% capacity.[104] Earlier data show that almost 10,000 children under the age of 16 stayed in shelters in Canada in 2009, with their average length of stay over three weeks.[104] As concerning as these trends may be, there are no definitive estimates of the number of young children in Canada who are homeless, and there is a dearth of research on interventions to end homelessness for families with children.[105]

Compared to children with permanent homes, children who are homeless experience many negative impacts on their health, including: hunger; delayed cognitive and emotional development; mental health problems; learning disabilities; and poor physical health including low birth weight, malnutrition, ear infections, and chronic illness.[106,107] Early education is often interrupted and/or delayed for homeless children, and they are twice as likely as children with permanent homes to have a learning disability, repeat a grade, or be suspended from school.[108] Homeless and inadequately housed young children therefore face a high risk of poor developmental outcomes.

# 3. Family and Neighbourhood Context

Families are the first environments with which children interact from birth, and are critically important in providing stimulation, supporting health, and nurturing child development in the early years.[109] A 'family' in this context is considered to be a system in which the behaviours and relationships among all family members are interdependent, and each individual experiences impacts of the family environment. Families provide for children's physical needs, such as food, shelter and clothing; they teach children skills, values and attitudes to help them participate in society, and foster their self-esteem.[109] Certain characteristics of the family can have long-lasting impacts for children's health, social, and educational outcomes, such as the care received by the mother while pregnant, the mental health of the mother as primary caregiver, the parenting style employed by the primary caregiver(s), and the relationship between the caregiver and their children.[109,110]

Young children are similarly influenced by more distal aspects of their environments outside of the family. Neighbourhoods and the communities in which children live can offer safe, enjoyable experiences, and empower them to expand their curiosity, self-reliance, and confidence.[111] Community resources, including opportunities to participate in leisure, cultural and recreational activities, and access to quality childcare and early childhood education programs, can enrich the lives of young children and help them grow into healthy, happy and successful adults.[110,111]

**Notable Trends and Knowledge Gaps**

- The majority of expectant mothers in Canada have good prenatal health, eat well, and avoid harmful behaviours like smoking and drinking alcohol during pregnancy. To a large extent, expectant mothers also report good mental health during and after pregnancy.
- Most parents strive to create a warm and nurturing home environment and have positive relationships with their children; however, some families experience challenges, like living in poverty or experiencing poor mental health, which may make it difficult to maintain a positive home environment.
- Compared to other developed countries, Canada has relatively high rates of children in care of child welfare. The quality and availability of data on children in care needs to be enhanced.
- Opportunities for high quality child care services are important for healthy child development, but are not distributed equally across Canada. Families living in lower-income neighbourhoods, parents with low education, and immigrant families experience challenges accessing child care.

## 3.1 Maternal Health

### *Perinatal Health*

Many maternal factors in the prenatal period, including nutrition and health behaviours, are important determinants of children's health in the early years. Examples include:

- **Folic Acid Intake**: Folic acid is an important nutrient in early pregnancy for lowering the risk of neural tube defects. Dietary guidelines are in place to ensure women of child-bearing age consume an appropriate amount of folic acid.[112]
- **Alcohol Consumption**: Maternal alcohol consumption during pregnancy is an important risk factor for fetal development. Alcohol consumption during pregnancy can lead to Fetal Alcohol Spectrum Disorder (FASD), a neurodevelopmental disability that affects learning, memory, and motor functioning, and causes deficits in social skills and communication.[113]
- **Cigarette Smoking**: The negative health effects of cigarette smoking during pregnancy is also a serious concern, as it has been linked to adverse outcomes including a higher risk of low birth weight, still births, spontaneous abortions, decreased fetal growth, premature births, placental abruption, and Sudden Unexplained Infant Death (SUID).[114]
- **Cannabis Use**: Cannabis was legalized in Canada in 2018. The effects of cannabis or cannabidiol (CBD) on pregnancy and child development are still unknown; however, some studies have linked cannabis use during pregnancy and breastfeeding to low-birth weight, preterm labour, long-term cardiovascular and mental health problems, and short- and long-term developmental and behavioural issues.[115]

The majority of pregnant Canadian women report that they have adequate folic acid intake and do not drink or smoke during their pregnancies. For example, 90% percent of Canadian women who responded to the Maternity Experiences Survey in 2007 reported that they took folic acid supplements during the first three months of their pregnancy.[116] The National Longitudinal Survey of Children and Youth reported that in 2008 only about 11% of women in Canada had consumed alcohol while pregnant[117] and only about 12% had smoked while pregnant.[118] However, there remains a small proportion of women whose circumstances may make it difficult for them to adhere to a healthy lifestyle while pregnant. Living in a low income household, young maternal age, being a single parent, and having poor access to or a distrustful relationship with healthcare providers are all barriers to maintaining good prenatal health.[119,120]

### *Breastfeeding*

Breastfeeding is important for the nutrition, immunologic protection, growth, and development of infants and toddlers,[121] and is recommended by the World Health Organization[122] and by many Canadian organizations (e.g., Health Canada, PHAC, the Breastfeeding Committee for Canada, and the Canadian Paediatric Society) as the exclusive source of nutrition for the first six months, and for up to two years or longer with appropriate complementary feeding. Breastfeeding is not only associated with positive health outcomes for infants, but also decreases postpartum bleeding, protects the mother against certain cancers, and improves her bone health.[121,123] Breastfeeding is also important in strengthening the relationship between mothers and their babies.

In the 2006/07 Maternity Experiences Survey, approximately 90% of Canadian mothers initiated breastfeeding immediately after giving birth.[124] At six months postpartum, 54% of mothers were still breastfeeding, but only 14% were breastfeeding exclusively,[125] falling well short of the World Health Organization's recommendation for exclusive breastfeeding during the first six months of life. Breastfeeding initiation was more common among older mothers, and continuing to breastfeed to at least six months was linked to mothers having higher income and higher education.[126]

### *Maternal Mental Health*

A mother's mental health during and after pregnancy plays a critical role in the developmental health of her children. In 2014, at least 60% of women of child-bearing age who completed the Canadian Community Health Survey reported that they were in very good/excellent physical[127] and mental health.[128] There was, however, a small downward trend in the number of women reporting good mental health from 2010 to 2014. Almost 9% of women of childbearing age reported having experienced a mood disorder in the past year, and they reported an upswing in the frequency of their mood disorders over the past seven years.[129] Maternal mood and anxiety disorders occurring during pregnancy and/or during the mother's post-partum period are linked to delayed growth, delayed cognitive development and behaviour problems in their children,[130–134] providing impetus for better and broader integrated mental health supports to help ensure that children reach their full developmental potential.

## 3.2 Family Relationships

### *Parenting Style*

Parenting style has a significant impact on the health and development of young children. A 'responsive' parenting style is an approach that allows children to safely explore their environment, and consistently applying this style of parenting has long been recognized as important for setting a child on a positive trajectory of healthy development.[135] Parental behaviours such as providing positive reinforcement, showing warmth and affection, and adopting consistent disciplinary strategies have been shown to prevent behavioural problems in children.[136] Creating a nurturing environment supports the development of academic competence and positive peer relationships, which, in turn, enhance children's well-being.[137,138] Positive parenting strategies have also been shown to buffer poor outcomes in families experiencing adverse circumstances, such as financial strain or divorce.[139]

In Canada, the majority (94%) of children under age 6 have positive interactions with their parents and experience a consistently positive parenting style.[140] Among respondents to the Survey of Young Canadians, only 11% of all children under 6 had parents who scored low on the consistent parenting style scale.[141] However, certain circumstances make it challenging for parents to provide positive parenting environments, and these parents may require more supports to help nurture their children as they grow. Such circumstances may include stressors related to financial strain, high workload in lone-parent families, lack of social supports, lack of opportunity for education or employment, or (in the case of newcomer parents) language and cultural barriers, including social isolation.[136,142–144]

### *Family Violence, Abuse and Neglect*

At the opposite end of the positive parenting spectrum lies the potential for family violence, abuse and/or neglect of children. Family violence is a serious public health issue linked to a range of short-term and long-term physical, mental, cognitive and behavioural problems.[145–147] In 2014, an average of 3.9% of respondents to the General Social Survey reported that they had experienced violence from their spouse or partner in the past five years.[148] The physical and developmental health effects of exposure to violence at home can last a lifetime.[145,146] Infants and young children who experience violence at home may have trouble forming close parent-child bonds, experience mental health issues including mood/anxiety disorders, and have problems with peer relationships at school.

The consequences of child abuse and neglect are likewise devastating. According to the Canadian Incidence Study of Reported Child Abuse and Neglect, there were over 85,000 substantiated investigations of child maltreatment (abuse and/or neglect) in Canada in 2008; among these, 34% involved exposure to intimate partner violence and 20% involved physical abuse.[149] However, the true prevalence of cases of family violence and child maltreatment is difficult to measure, since reports to welfare services and hospitalization for injuries due to violence or maltreatment are likely only a small fraction of occurrences, while many others go unreported.[150]

### *Children in Care of Child Welfare*

The child welfare system in Canada is designed to protect children from violence and other forms of abuse and neglect by investigating allegations and reports, offering services to parents to help families stay intact, and supervising foster care for children who are removed from their homes. Child welfare agencies operate under provincial/territorial jurisdiction, which each have laws to help ensure the safety and best interest of children in that region. However, the negative effects of children growing up 'in the system' are well established. Children in care commonly experience poor developmental outcomes,[151,152] high rates of mental health problems,[153,154] and even high mortality rates.[155] The child welfare system has often been criticized for systemic issues,[150,156] such as racism, including towards Indigenous peoples, and overly stringent criteria for removing children from their families.[157] Based on available data, there are indications that Canada has one of the highest rates of children in care among developed countries worldwide. Although the quality and availability of relevant data need to be enhanced, Canada's policies related to child welfare may contribute to these outcomes. The negative impacts of the child welfare system point to the need to assess current Canadian child welfare laws, which may not be achieving their intended purpose.

## 3.3 Neighbourhood Built Environment

In addition to the social context of the family, access to local neighbourhood resources (e.g. parks, community recreation centres), quality childcare and early education services shapes many experiences in a child's life.[158] In her 2017 Report on the State of Public Health in Canada, the Chief Public Health Officer also highlights how the built environment directly influences Canadian families' health and healthy living behaviours.[159] Communities and neighbourhoods can be

designed to make healthier choices easier, including making physical activity more appealing and accessible by connecting residential areas to commercial, educational and employment areas through walking and bike paths and good public transit, or by ensuring that gathering places and green space are available and accessible. The quality of the built environment in which a child lives is often closely linked to household income and is considered an important determinant for early childhood development.[160]

### *Recreation and Play*

The neighbourhood built environment influences opportunities for recreation and play, which in turn are important for promoting children's social cohesion, adaptability, and resilience in their early years.[161] Recreation and active play help children improve their physical and emotional health, develop psychosocial skills, and improve their self-esteem.[162] Recreation and active play also have the potential to prevent certain public health issues, such as the rise in sedentary behaviour and obesity that has occurred in recent decades.[163] Over 60% of young children in Canada regularly participate in unorganized sports or other forms of physical activity, including team-based sports, dance, gymnastics or martial arts.[164] However, young children who are members of visible minority groups, recent immigrants, and from low income areas are less likely than their peers who are not visible minorities, not recent immigrants, and not living in a low-income area, respectively, to participate regularly in organized recreational activities.[165]

### *Child Care and Early Education*

Research studies show that early childhood offers a 'window of opportunity' for setting positive child development trajectories,[22] thus young children have much to gain from high-quality child care and early education systems. Child care and early education services are important components of the neighbourhood built environment and may include regulated centre-based child care and family (home-based) child care for infants, toddlers and nursery school or pre-school aged children. Early childhood development experts agree that a holistic, coherent system of care for young children should be a priority for Canada, especially since the majority of parents with young children now work outside the home.[166] The collective body of early childhood literature from the last 20 years demonstrates that quality early childhood services allow children to thrive in enriching environments outside of the home. Affordable child care and early education services also have the potential to increase female workforce participation among women with young children.

The cost of child care and early education programs varies wildly across the country, with the highest costs typically seen in Canada's largest urban centres (i.e., Toronto and Vancouver) and lower costs in the provinces of Prince Edward Island, Manitoba and Quebec.[167] In the above three provinces, provincial governments fund the operational costs of child care and early learning centres, which allows the centres to set more affordable maximum fees.[168] In addition, existing child care and education spaces in many Canadian cities and communities do not meet the demand. Wait lists are common, especially for spaces for infants and toddlers. Child Care Canada estimates that only 24% of children under age 6 are able to access a regulated full-time or part-time child care space.[166] Recent analyses show that children attending child care or early education programs are more likely to be from higher income than lower income families and from non-immigrant than immigrant families, and are more likely to have parents with higher education.[169] These findings

demonstrate how inequalities in access to child care and early learning services may be linked to socioeconomic status.

# 4. Health Services

The availability and quality of health care services are important determinants of health for young children. There are many aspects of health care that support and protect children across the continuum of development, including primary care, hospital care, and screening and prevention services. From the prenatal period through birth, postpartum and early childhood, access to quality health services is considered by many to be a basic human right. However, inequalities in access to health care exist across many populations in Canada. Social, economic and environmental factors such as ethnicity, socioeconomic status and citizenship are important determinants that affect the ability of individuals to access quality health services.[170]

**Notable Trends and Knowledge Gaps**

- Canada's standard of prenatal care ranks high globally, with almost 95% of women beginning care in their first trimester. However, a small proportion of women in Canada face barriers to receiving adequate care during pregnancy.
- Most children in Canada have a regular family physician, nurse practitioner or paediatrician.
- Routine childhood vaccination rates are lower than optimal in Canada.
- Not all Canadian jurisdictions fund screening tests for vision and hearing issues in young children. A delay in the detection of problems may place some children at risk for poor social development and educational achievement.

## 4.1 Prenatal Care

Prenatal care is one of several health services in Canada that aims to improve maternal, fetal and infant health. Prenatal care has been shown to reduce the risk of maternal deaths and other adverse pregnancy and birth outcomes, including miscarriage, premature births, low birth weight, and stillbirths, and is most effective if begun in the first trimester.[171,172] Canada's current standard of prenatal care ranks among the highest globally, with almost 95% of Canadian women starting their prenatal care in the first trimester of pregnancy.[173] A similar proportion of all Canadian women give birth attended by a professionally educated health care provider (70% have an obstetrician/gynaecologist, 15% have a family physician, and about 4% have a midwife),[174] and following the birth of their baby, the majority (93%) of women are contacted by a healthcare provider at home.[175]

However, a small proportion of pregnant women remains at risk for starting prenatal care late or for not receiving prenatal care at all.[120] Risk factors associated with late or no prenatal care include low education, low income, and being pregnant for the first time.[119] Women facing these challenges or other social, economic, geographical and/or structural barriers to obtaining prenatal care are at risk for poor birth outcomes. Challenges expectant mothers may face in obtaining access to prenatal services (particularly in rural/remote communities) include taking time off from work,

arranging transportation to appointments, and arranging childcare for other children during appointments.[119,176] Women living in disadvantaged circumstances, including those experiencing poverty or homelessness, those dealing with mental illness, and those with a history of child welfare involvement, may not seek prenatal care due to distrust of the public healthcare system. To help ensure that women are able to obtain prenatal care and other important preventative services, there is a need for wider implementation of evidence-based interventions that assist with building strong patient-provider relationships and overcoming the multi-dimensional barriers that some populations face.

## 4.2 Primary Care

Family physicians and paediatricians are the key primary care providers for infants and young children in Canada. They provide well-child care and vaccinations, manage acute and chronic conditions, monitor developmental milestones, and screen for potential problems. In some provinces and territories, paediatricians work as primary care providers, while in others they work mainly as consultants.[177] The majority (84%) of Canadian families with children under 12 have a family physician or paediatrician.[178] More than 80% of family physicians and paediatricians work in urban settings, while the remainder work in rural or remote communities, where public health nurses, community nurses and nurse practitioners play a larger role in providing care.[177] This is evident, for example, in Québec and the territories, where only 66% and 40%, respectively, of families with children under 12 have a family physician or paediatrician, and nurses or nurse practitioners more often provide primary care.[178]

### *Vaccinations*

Vaccinations are an important and cost-effective public health measure to protect infants and young children from disease, disability, and premature mortality.[179] Vaccinations have reduced the impact of infectious diseases from being the leading cause of mortality to accounting for less than 5% of all deaths in Canada. Routine childhood vaccination programs include the administration of vaccines against diseases such as measles, mumps, polio and tetanus, as well as rotavirus, varicella (chicken pox), pertussis (whooping cough), seasonal influenza, and meningococcal and pneumococcal infections.

However, while many of these vaccines are covered by health insurance provided by provincial health ministries, vaccination rates in most provinces and territories still fall short of national standards.[180] For example, national rates for completing the recommended schedule of vaccines before age 2 ranged from about 73% (for hepatitis B) to 91% (for polio), while the coverage goal is between 95-99% for most antigens. The 2013 Childhood National Immunization Coverage Survey reports that 2.7% of Canadian children under age 2 receive no vaccinations at all.[181] Determinants of whether or not children are vaccinated include household income, level of parental education, whether children were brought up in a single parent home, and whether they were born outside of Canada.[182] Regional variation in vaccination rates also exists across Canada, and monitoring these rates is further complicated by differing processes and systems for registering vaccinations in the different jusrisdictions.[182] A harmonized vaccination schedule and registration process would be beneficial to aid in collecting and aligning immunization registry

data, identifying children who have not been vaccinated, informing public health campaigns, and monitoring vaccination coverage across Canadian provinces and territories.[179]

### *Screening for Vision and Hearing Problems*

Screening for vision and hearing acuity is another key part of preventive care for young children. It is estimated that 5-10% of preschoolers have vision difficulties that may put them at risk for poor educational outcomes and social development.[183] Hearing loss can likewise cause significant problems for infant and child development if not detected and treated.[179] Receipt of screening for vision and hearing problems is associated with several social determinants of health; for example, a Canadian study showed that children living in higher-income neighbourhoods were more likely to have their vision problems identified early.[184] Infants and toddlers who are diagnosed early and receive appropriate interventions tend to have better language skills, social adjustment scores, and behaviour scores, compared with children who receive vision and hearing services late.[185] Given the lower rates of screening among poorer families and families with lower levels of parental education, children whose parents face challenging circumstances such as these may be less likely to receive vision or hearing screening, and may thus be at higher risk of poor health, social and developmental outcomes.[185,186]

The Canadian Paediatric Society recommends that all children be screened for vision problems between the ages of 3 and 5 years,[183] but only seven Canadian provinces and territories (Yukon Territory, Northwest Territory, British Columbia, Prince Edward Island, Newfoundland & Labrador, New Brunswick and Nova Scotia) have provincially-funded vision screening programs.[187] While all provinces and territories have some form of hearing screening available, only five (British Columbia, Ontario, New Brunswick, Nova Scotia, and Prince Edward Island) have fully implemented universal programs; the rest have partial programs or offer screening for select populations.[188] Universally funded screening programs for vision and hearing problems may help to alleviate inequalities in the receipt of screening and subsequent developmental outcomes among higher and lower income families.

### *Well-Child Visits*

The purpose of well-child visits is to assess young children's growth and development and overall health and well-being. These visits can also be helpful in identifying problems early on in a child's development.[189,190] The Canadian Paediatric Society has advocated for a universal well-child assessment at 18 months.[179] The 18-month visit represents an important opportunity to evaluate a child's progress, guide parents in nurturing their child's development, and identify areas where there may be challenges. For some families, this visit may be the last regularly scheduled visit with a primary care provider before a child enters school. The 18-month mark is a key milestone in a child's development, and occurs during the stage when families go through formative developmental milestones, such as entry into child care or early education programs, behaviour management, and eating and sleeping patterns. An 18-month assessment can provide an important occasion for primary care providers to counsel parents, reinforce healthy behaviours, and screen parents for health issues that may influence early childhood development, including mental health issues, domestic abuse, and substance use. The 18-month assessment may also be an opportunity to ensure parents are aware of available community resources and supports.

Some Canadian provinces and territories (Newfoundland & Labrador, Prince Edward Island, Ontario, and Northwest Territory) incorporate formal developmental surveillance or screening as part of an 18-month well-child visit, during other routine visits, or around vaccination schedules, but there is considerable variation across Canada regarding which health professionals conduct the screening and which instruments they use.[191] As well, there is variation in families choosing whether or not to pursue well-child visits at 18 months.[192] Harmonization of well-child visit schedules and use of a standard developmental assessment tools would help healthcare planners and providers to identify children who are due for an assessment, making it easier for jurisdictions to track coverage of this important public health initiative.[193]

# 5. Health Outcomes

Children's health is an integral part of their emotional, mental, social and physical well-being, and many diverse factors impact on these aspects of development. It is well established that the early years are a key period for establishing life-long health and well-being.[194] While most Canadian infants and young children are generally very healthy, there are also some indicators of poor health in the early years. As well, inequalities in physical and mental health persist between some populations, and access to high-quality health services and medical care alone are not sufficient to overcome these health inequalities.[195] Key social determinants of health, including socioeconomic status, ethnicity, and family composition (e.g., single parenthood), help to explain some of these inequalities and highlight areas for action. The use of health indicators to monitor children's health outcomes can also help inform health care planners and decision makers where children are doing well and where there is room for improvement.

**Notable Trends and Knowledge Gaps**

- While the majority of infants in Canada are born healthy, adverse birth outcomes (including preterm, low birth weight, and small-for-gestational-age births) are still a concern.
- The rate of perinatal deaths in Canada, compared to other industrialized nations, is relatively high.
- Life-threatening illness is relatively rare for young children in Canada. The leading cause of hospitalization in children aged 1-4 is respiratory disease.
- There is a need for better data on the scope of young children with disabilities.

## 5.1 Birth Outcomes

The majority of infants in Canada are born healthy and continue to thrive during infancy.[196] But in some cases, adverse birth outcomes such as low birth weight and congenital anomalies can place infants at risk for poor health and delayed development. Low birth weight continues to be a leading cause of infant morbidity and mortality in Canada, as well as a risk factor for developmental vulnerability.[197] Babies born with low birth weight may be preterm, small for gestational age, or both.[198] Despite high standards for prenatal and perinatal care in Canada, low birth weight, while a relatively rare outcome, remains a persistent challenge. Between 2002 and 2012, the average rate of low birth weight births increased from 5.6% to 6.1%,[199] and in 2014/15, the preterm birth rate in Canada was 7.8%.[200] Congenital anomalies, while not often life threatening, are another important cause of health problems in infancy and potential years of life lost among children. In 2010, there were 11,441 babies born with congenital anomalies, of which heart defects were the most common.[201] However, rates of infant deaths and illness due to heart defects have been declining in recent years as a result of improvements in early diagnosis and surgical treatment. The rate of neural tube defects has also been declining since 1995, largely due to policy and education initiatives focusing on the role of folic acid in preventing these anomalies.[202]

## 5.2 Infant and Child Mortality

In 2012, the infant death rate in Canada was 4.8 deaths per 1,000 live births, representing a total of 1,849 deaths of children in their first year of life.[203] Infant mortality is associated with factors such as the mother's age, health, and socioeconomic status, as well as gestation length and birth weight. A 2018 OECD report has indicated that Canada has higher rates of infant mortality than most other industrialized nations (30th out of 35 OECD countries). [204] However, there are significant variations in the methods used to register deaths among countries, thus caution should be exercised when interpreting international comparisons of infant mortality. For international comparison purposes, adjusted infant mortality rates for Canada are used, and the adjusted rate was lower than the averages for European Union countries and for OECD countries.[205]

Deaths due to Sudden Unexplained Infant Death (SUID) have been declining in recent decades,[206] likely due to several factors such as decreasing numbers of women who smoke during pregnancy (a known risk factor for SUID), and an increase in protective factors such as breastfeeding and having babies sleep on their backs. However, a strong link between poverty and higher rates of SUID is still evident. Among children aged 1-4, the death rate remained stable at 0.2 deaths per 1,000 population between 2000 and 2012.[207] The leading cause of death was unintentional injuries (including vehicle collisions, drowning and suffocation), accounting for 35% of all deaths among children in this age group.[208] Congenital malformations and chromosomal abnormalities (25% of deaths) and cancer (13% of deaths) were other common causes.

## 5.3 Children's Physical and Mental Health

The majority of children in Canada are generally healthy. However, there are a number of physical health conditions that occur among children. The term 'physical health' covers a broad range of health conditions that include injuries, chronic conditions like cancer, asthma, diabetes, and obesity, and some disabilities. Mental health problems, while difficult to assess and diagnose in children under the age of five, include symptoms of emotional/anxiety disorders, hyperactivity, and aggression. It is estimated that as many as 20% of Canadian children will develop a mental health disorder,[209] and those that are diagnosed as children often continue to struggle with mental health problems as an adult.[210]

### *Hospitalization for Illness and Injury*

In 2013/14, there were over 62,000 hospitalizations of infants[211] and almost 56,000 hospitalizations of children aged 1-4.[212] Hospitalization rates for children tend to increase with age, with older children and youth up to age 19 having higher rates than younger children.[213] The hospitalization rates reported here may in part be explained by the rate of illnesses or injuries, and also may reflect factors such as provincial/territorial approaches to the management of care, health practitioner availability and accessibility, and provincial demographics. Among infants, the most common cause of hospitalization was related to perinatal health (accounting for 30% of all hospitalizations), followed by respiratory system diseases like asthma (25%) and congenital anomalies (9%).[214] The most common causes of hospitalization among 1-4 year olds were respiratory diseases (41%), infectious diseases (13%), and unintentional injuries (8%).[215]

### *Chronic Health Conditions*

Life-threatening illnesses in children are relatively rare, but some of the more common childhood illnesses include certain kinds of cancer (e.g., leukemia), diabetes, asthma, and obesity.[216,217] From 2006-2012, for all types of cancer combined, there was an average of 253 incident cases of cancer per million children among children less than one year of age; and 234 incident cases per million children among children aged 1-4 years.[218] Child mortality from cancer has gradually been declining over the last few decades: in 2010, there were 22 deaths per million children, down from 32 deaths per million in 1992.[219] Diabetes prevalence has remained steady at about 0.1% among children aged 1-4 since the early 2000s,[220] and the prevalence of asthma in children aged 0-5 was estimated at 7.3% in 2007.[221] Rates of childhood overweight and obesity have been increasing rapidly in recent years, sparking concern among public health officials and care providers because of well-established links between childhood obesity and negative health outcomes later in life, including illnesses such as diabetes, cardiovascular disease, asthma, and liver and kidney disorders.[217,222] While 2004 data for body mass index (BMI) among Canadian children may be considered outdated, these figures point to 22-25% of children aged 2-5 being overweight and another 10-12% being obese.[221] The above findings lend support for strategies and intervention to promote healthy development of preschoolers.

Children's developmental outcomes may suffer as a result of illness in their early years. Several Australian studies have demonstrated that children with chronic conditions are 20-35% more likely than children without chronic conditions to be classified as developmentally vulnerable across all domains of the Australian Early Development Instrument at school entry. Early exposure to infectious and non-infectious diseases has also been shown to be associated with poorer developmental outcomes. In addition, international research indicates that children who are obese at the time of school entry may exhibit developmental vulnerabilities compared to their healthy-weight peers.[223]

In addition to the impacts of illness on children themselves, these conditions often result in significant emotional and financial strain on the family.[224] Parents of chronically ill children typically have higher rates of emotional and/or psychiatric distress than parents of healthy children.[225–227] These mental health issues in caregivers may further negatively impact a child with a chronic condition. Childhood illness has also been shown to limit the ability of the mother of a sick child to be continuously or securely employed,[228] and this is due at least in part to the availability of child care and health services that meet their child's needs.[229] Families with sick children may therefore also be limited to a single income, which may undermine their financial security and place them at greater risk for sliding into poverty. Many of the challenges faced by families with chronically ill children are shared by families who have a child with a mental health problem and/or a child with a disability, as described below.

### *Children's Mental Health*

Mental health problems affect an estimated 1.2 million Canadian children and youth.[209] However, because it is often difficult for young children to express how they feel, mental disorders in this population are likely to be under-recognized and under-reported.[230,231] In young children, mental health problems may influence learning, as well as their physical and emotional development. Using data from the National Longitudinal Survey of Children and Youth and the

Survey of Young Canadians, the Canadian Institute of Child Health reports that as many as 5-10% of children aged 2-5 years exhibit symptoms of emotional/anxiety disorder, hyperactivity/inattention, and physical or indirect aggression.[232] Children in lower income households were more likely than children in higher income households to show more symptoms of emotional/anxiety disorder.[233] In a recent analysis, Strohschein and Gauthier (2018) posit that a positive parenting style could mediate the harmful effects of poverty on the mental health of children, since mental health problems are less common among children whose parents provide ample affection and emotional support and establish standards of appropriate behaviour for their children.[234]

### *Disabilities*

Disabilities in children under the age of five are typically grouped into one of four types: hearing, vision, developmental delay, or chronic condition (e.g. autism, cerebral palsy).[235] Once children enter school and begin standardized testing, learning disabilities and other disabilities related to communication, agility and emotional/psychological function are more likely to be diagnosed. Canada-wide data on the scope of disabilities among young children are critically needed to determine what their health and social needs are so that action can be taken to better support this population.[236] The lack of evidence in the area of disability makes it difficult to plan programs and policies that could assist children and their families in dealing with the daily challenges they face. One of the reasons for this knowledge gap is that disabilities in young children can be difficult to detect.[235] Data on disabilities across Canada were last collected in 2006, at which time the prevalence of disabilities among Canadian children under the age of five was estimated at 1.7%,[237] and there is also some information available on the impact of a child's disability on their parents' employment showing that one or both parents of children with disabilities are often not employed full-time in the labour force, and that their families are often lower income due to the additional demands of caring for children with complex health needs.[238]

# 6. Development at School Entry

As young children grow from being completely dependent to having the ability to act and express themselves independently, they undergo an intense period of physical, emotional and cognitive development.[22] Exposures and events in the early years of a child's life strongly influence their success during their school years. Research shows that infants, toddlers and preschoolers who are exposed to books, ideas, and number concepts, and have opportunities to develop their social and emotional skills in group settings, are most likely to flourish in a school setting.[239] This chapter provides information on developmental indicators of children's school readiness at age five, focusing on the Early Development Instrument (EDI),[240] a Canada-wide measure used to determine developmental vulnerability in kindergarten-age children, and three other measures of academic ability. The EDI measures developmental vulnerability across five domains: physical health and well-being; social competence; emotional maturity; language and cognitive development; and communication skills and general knowledge.

**Notable Trends and Knowledge Gaps**

- On average across Canada, 27% of all children are developmentally vulnerable in at least one developmental domain, as measured by the Early Development Instrument (EDI).
- Results of the EDI and other tests of academic ability show that school readiness at age five is linked to income, with children in higher income neighbourhoods being less developmentally vulnerable and achieving better scores in tests of academic ability than children in lower income neighbourhoods.

## 6.1 The Early Development Instrument

The EDI is a questionnaire developed by Dr. Dan Offord and Dr. Magdalena Janus at the Offord Centre for Child Studies at McMaster University.[240–242] This 103-item questionnaire is completed by kindergarten teachers in the second half of the school year to measure children's ability to meet age-appropriate developmental expectations in five general domains. A measure of developmental vulnerability is obtained by combining the information from all five domains. Children may be assessed as developmentally vulnerable in a single domain or in multiple domains of the EDI. Information from the EDI is not used at the individual level for diagnostic interpretation, but rather at an aggregate level to identify possible population trends. However, EDI data are still individually linkable with administrative and educational records, where such opportunities exist.

## Developmental Domains measured by the EDI

| | |
|---|---|
| ***Physical Health and Well-Being*** | Gross and fine motor skills (e.g., holding a pencil, running on the playground, motor coordination), adequate energy levels for classroom activities, independence in looking after own needs, and daily living skills |
| ***Social Competence*** | Curiosity about the world, eagerness to try new experiences, knowledge of standards of acceptable public behaviour, ability to control own behaviour, appropriate respect for adult authority, cooperation with others, following rules, and ability to play and work with other children |
| ***Emotional Maturity*** | The ability to think before acting, a balance between being too fearful and too impulsive, the ability to deal with feelings at the age-appropriate level, and empathetic responses to other people's feelings |
| ***Language and Cognitive Development*** | Reading awareness, age-appropriate reading and writing skills, age-appropriate numeracy skills, ability to understand similarities and differences, and ability to recite back specific pieces of information from memory. |
| ***Communication Skills and General Knowledge*** | Skills necessary to communicate needs and wants in socially appropriate ways, symbolic use of language, storytelling, and age-appropriate knowledge about the life and world around the child |

### *Findings from Research Focusing on the EDI*

The majority of children in Canada are doing well on each of the five EDI domains. In 2014, approximately one in four children (27%) were vulnerable in one or more areas of development prior to entering Grade 1.[243] About 33% of boys were vulnerable in one or more areas of development compared with 19% of girls, especially in the EDI domain areas of social competence and emotional maturity. Developmental vulnerability was also linked to income: 35% of children living in the lowest income neighbourhoods were vulnerable in at least one domain of the EDI compared to 20% of children in the highest income neighbourhoods.[244] Living in a lower-income neighbourhood was associated with vulnerability in the specific domains of physical health and well-being, language and cognitive development, and communication skills and general knowledge, while living in a higher-income neighbourhood was associated with vulnerability in the domain of emotional maturity. Overall, among children vulnerable in at least one area of development, the greatest degree of vulnerability was in the domain of communication skills and general knowledge, and the lowest vulnerability was in the language and cognitive development domain.

The above findings are consistent with those reported in *Key Health Inequalities in Canada: A National Portrait*, which was produced by PHAC and the Pan-Canadian Public Health Network in 2018.[245] The report found that the proportion of developmental vulnerability in early childhood among children living in the most materially and socially deprived neighbourhoods was more than

twice as high as among children living in the least deprived neighbourhoods. A clear socioeconomic gradient was observed, where the prevalence of developmental vulnerability increased as neighbourhood income and education levels decreased.

## 6.2 Other Tests of Academic Ability

Three tests were administered as part of the 2006/07 National Longitudinal Survey of Children and Youth and the Survey of Young Canadians to measure other facets of academic ability among 4- and 5-year-olds. These tests do not measure childhood development per se, but are tools for assessing complementary aspects important for school learning. The **Peabody Picture Vocabulary Test** assesses a child's receptive (hearing) vocabulary or verbal intelligence by having them look at pictures and identify the picture that matches a word spoken by an interviewer. This test is a simple and relatively reliable way to assess language abilities, but is not closely associated with scholastic aptitude. The **Who Am I? Test** measures the child's ability to conceptualize and reconstruct geometrical shapes and to understand and use numbers, letters and words. The **Number Knowledge Test** assesses a child's ability to understand and use numbers.

1) The **Peabody Picture Vocabulary Test**. The majority (about 86%) of children from 4 to 5 years of age scored at the average or advanced level on the Peabody Picture Vocabulary Test.[246]

2) The **Who Am I? Test**. The majority (just over 81%) of children from 4 to 5 years of age scored average or advanced on the Who Am I test.[247]

3) The **Number Knowledge Test.** The majority (almost 84%) of 4 to 5 year-olds scored average or advanced on the Number Knowledge test.[248]

In 2010/11, children living in urban and rural communities scored relatively equally on the Peabody Picture Vocabulary, Number Knowledge and Who Am I school readiness tests.[249] The mean scores for all three tests were better among children living in higher income communities than among those in lower income communities. The mean scores on the Peabody Picture Vocabulary Test were also higher among those children who do not identify with a visible minority group than among those who do identify with a visible minority group. Children from visible minority groups had higher mean scores on the Who Am I test than do those who are not from visible minority groups.[250] Children whose families had come to Canada in the 10 years prior to the survey had lower mean scores on the Peabody Picture Vocabulary and Number Knowledge school readiness tests than non-recent immigrants.[251]

# 7. Policies and Programs Supporting Early Childhood Development

Early childhood is a critical window of time when policies and programs that support key aspects of child development can help establish long-term upwards trajectories of health and well-being, foster the ability to excel in academic settings, and provide strong opportunities for future employment and financial stability. The trends reported throughout this paper are consistent with those reported by Canada's Chief Public Health Officer a decade ago in 2009: children from families with lower socioeconomic status are more likely to experience ill health and less likely to have their basic needs met.[252] However, children's developmental trajectories are not set in stone at birth – interventions and public policies can intervene to mitigate negative influences on health at critical points across the life course.[252]

Below, we present an overview of individual-, family- and population-level interventions and initiatives that aim to address some of the inequalities in early childhood development revealed by the data on child health and development in the CICH Profile and highlighted in the body of this paper. This overview is not meant to be comprehensive, but rather provides select examples of public policies and programs that focus on addressing key social determinants of health in alignment with the Chief Public Health Officer's current priorities.[253] In the report, children and youth are identified as one of six key populations facing inequalities in health outcomes.

## 7.1 Interventions for Mothers of Young Children

### *Maternal Nutrition and Breastfeeding*

Maternal nutrition before and during pregnancy can have long-lasting impacts on child development. Optimal maternal and fetal outcomes depend on the intake of sufficient nutrients to meet the requirements for growth and development.[254] While poor maternal nutritional status is related to adverse birth outcomes (e.g. low birth weight and preterm birth), a nutrient-rich diet is associated with a more appropriate infant birth weight and higher rates of maternal and infant survival.[255] Breastfeeding is critical for early infant-parent attachment, with important long-term effects on infants' psychological development.[256] Breastfeeding stimulates brain development and acts as an infant's first vaccine against life-threatening and chronic illnesses; it is also associated with higher IQ in later years.[256] The World Health Organization recommends exclusive breastfeeding for the first six months of a child's life and sustained breastfeeding for up to two years or longer with appropriate complementary feeding to provide optimal nutrition, immunologic protection, and growth and development of infants and toddlers.[257]

Examples of programs that support maternal nutrition and breastfeeding include:

- The **Canada Prenatal Nutrition Program**, a Public Health Agency of Canada community-based program operating in more than 2,000 communities across Canada, aims to support the health and well-being of pregnant women and new mothers and their infants who are living in challenging circumstances by providing nutrition counselling, prenatal vitamins, food and food coupons, health and lifestyle counselling, breastfeeding education, education on infant care and child development, and referrals to other services[258];

- The **Baby-Friendly Initiative** describes a continuum of care for hospitals and community health services in ten evidence based-steps to optimally support breastfeeding for new mothers.[259]

### *Maternal Mental Health*

Maternal mental health disorders such as depression and anxiety can have a negative impact on their children's development, as they may adversely affect a mother's ability to breastfeed, the strength of mother-child bonding, and the ability of parents to provide a nurturing home environment.[133,260] However, mental disorders occurring in the perinatal period and in the years following the birth of a child can be treated. Interventions that aim to improve maternal mental health and enhance parenting can support the healthy growth and development of children.

Examples of the types of mental health supports available to new mothers include:

- **Counselling/therapy approaches** that support the psychological well-being of new mothers, e.g., cognitive behavioural therapy[261] and interpersonal psychotherapy[262,263];
- **Pharmacological treatments**, such as anti-depressants and anti-anxiety medications;
- **Community-based interventions** focused on building relationships, improving parenting skills and raising self-esteem, such as participation in parenting support groups.[264]

Through extensive review and consultation processes, national organizations such as the Canadian Mental Health Association and the Mental Health Commission of Canada have identified mental health issues as high urgency, and have developed recommendations for actions to improve the mental health of Canadians.[265–267] The resulting frameworks and strategies to advance these recommendations have a population scope that includes improving leadership on mental health initiatives, ensuring access to mental health services, and supporting research and data collection. However, these organizations also provide services to individual Canadians who are experiencing mental illness by facilitating access to mental health services and connecting individuals to local mental health supports and resources in the areas where they live.

## 7.2 Interventions for Families

### *Financial Supports*

A variety of factors influence the socioeconomic status and degree of financial security of Canadian families in today's society. For example, single parents may face challenges in securing well-being for themselves and their children because they have, on average, lower income levels, fewer material resources and fewer employment opportunities than dual-parent families.[268] Families in which one or both parents have low levels of education and are precariously or inadequately employed may have limited financial resources, with little opportunity to improve their employment situation. The diversity of policies and programs that provide supports to Canadian families can be considered as a reflection of the distribution of socioeconomic and social factors, since they often address different population groups with different programs and services. Policies and programs that aim to bolster the financial security of low-income families can help

parents with the cost of raising children, reduce stress and family conflict, and support the well-being of all family members.[269]

Examples of financial supports for parents with young children include:

- Employment insurance maternity benefits, offered to biological (and surrogate) mothers, and employment insurance parental benefits, offered to parents caring for a newborn or newly adopted child(ren)[270];
- Child benefits, including the Canada Child Benefit, a tax-free monthly payment to eligible families to subsidize the cost of raising children under the age of 18, and the Child Disability Benefit, a tax-free benefit to families with a child under the age of 18 with severe and prolonged impairment in physical or mental functioning;[271]
- Tax credits such as the GST/HST credit, which is automatically calculated when parents file their income tax and benefit return;
- Other benefits, income supplements and cash transfer programs, such as the provincial child benefits offered to low-income families in, for example, Ontario,[272] Nova Scotia,[273] and Manitoba[274–276];
- Social development organizations, such as The United Way and regional social planning councils, aim to build and strengthen communities through multiple means, including working to minimize the impacts of poverty and income security on families, and assisting parents with skills training and employment.

### *Parenting Supports*

Parenting support programs are broadly defined as programs that enhance parenting effectiveness by providing guidance towards a clear parenting philosophy and a set of positive parenting skills and strategies.[277,278] Community-based parenting programs are designed to connect parents to educational and material resources to promote the health and social development of their children, provide them access to local peer groups and social support networks that help them to feel less isolated, and refer them to other agencies and services to help resolve health and lifestyle issues.[279,280]

Examples of parenting support programs for parents of young children include:

- Home visiting programs like the Nurse Family Partnership for first-time mothers, which has been evaluated extensively in the US and is now being adapted for the Canadian context,[281] and the Families First Home Visiting program offered in the province of Manitoba, which has been shown to improve parenting skills and reduce instances of child maltreatment through use of a strength-based, family-centered approach, especially among families already experiencing parenting challenges[282,283];
- Parenting supports, like the intervention program Triple P–Positive Parenting Program,[278] give parents confidence in their parenting skills, alter child behaviour, and help families learn ways to cope with stress by building resiliency and resourcefulness;
- The Public Health Agency of Canada's Nobody's Perfect Program[284] is a facilitated, community-based parenting program designed to meet the needs of parents who are young, single, socially or geographically isolated, or who have low income or limited formal education. The program promotes positive parenting, increases parents'

knowledge of child health, safety and behavior, and improves parents' self-esteem and coping skills;

- The Community Action Program for Children[285] is another PHAC program that delivers comprehensive, culturally appropriate intervention and prevention programs to support the health and social development of children and families and to increase the recognition of at-risk communities and their needs. Examples of activities offered through these programs include parenting support and coping skills, drop-in programs for parents and children, outreach and home visiting, and literacy development;
- Community-based and/or religious organizations across Canada offer programming for various ethnic and cultural groups to strengthen parental and family capacity.

## 7.3 Strategies to Address Inequalities in Early Childhood Development

### *Childcare and Early Education*

A national child care strategy is one important way to fight inequalities in early childhood development. Collaborative efforts by federal and the provincial/territorial Ministers Most Responsible for Early Learning and Child Care have resulted in a framework for high-quality child care and early learning opportunities with emphasis on accessibility, affordability and inclusiveness.[286] The framework states that the governments:

> "…agree that the further development of early learning and child care systems is one of the best investments that governments can make to strengthen the social and economic fabric of our country."

Investments allocated under the national child care strategy are meant to address rising costs in child care fees across Canada,[168] especially among families who are "more in need', which includes lower-income families, Indigenous families, lone-parents families, families in underserved communities, families working non-standard hours, and families with children with varying abilities. The central objective of this initiative is to enhance learning and early child care systems by addressing the local and regional priorities for long-term capacity building. Child care and early education are also platforms on which early identification of gaps and subsequent intervention can be highly effective. Addressing problems early in the life course can reduce spending in many areas further down the road: cost-benefit analyses estimate that for every dollar spent on early education, there is a future economic benefit of up to seven times that amount.[287]

### *Income*

Canada's 'Opportunity for All' Poverty Reduction Strategy has committed new investments totaling $22 billion that will support the social and economic well-being of Canadians.[288] The Strategy has also set an official measure of poverty for the first time in Canada's history, and has developed specific targets for reducing poverty, chronic homelessness and core housing need. A National Advisory Council on Poverty oversees the investments being made, engages Canadians with lived experience of poverty, and tracks and reports on poverty indicators to monitor progress. Some examples of the investments made that impact on early childhood development include:

- The Canada Child Benefit, which helps with the cost of raising children;

- Starting in 2019, the Canada's Workers Benefit (replacing the Working Income Tax Benefit), which will bolster the individual incomes of lower-income workers and working parents.

### *Housing and Homelessness*

Ensuring adequate housing for Canadian families is another important strategy to support child development. Canada's National Housing Strategy, which was implemented in 2017, aims to reduce chronic homelessness and lift families out of core housing need to create livable, thriving communities.[289] The strategy will provide:

- a housing benefit for eligible families and individuals living in social housing, or housed in the private market but struggling to make ends meet;
- financial support for community interventions and preventative strategies to combat homelessness; and,
- an emphasis on data collection to address gaps in evidence around the housing needs of vulnerable populations (e.g., seniors, refugees, and LGBTQ2 individuals) and to foster innovative intervention research in the area of housing.

The strategy will first focus on vulnerable Canadians, including women and children fleeing family violence, seniors, Indigenous Canadians, people living with a disability, and people living with mental health problems and addictions. It will align with other initiatives that are working to create more jobs, increase access to healthcare and education, and prevent violence against women.

# Conclusions

The early years of a child's life are a time of rapid growth and development, and the physical and social environments in which children live during this critical period have a profound influence on their health and development. Children who have adequate housing and family income, experience positive parenting styles and have supportive communities and neighbourhoods, have access to healthy food, have ample opportunities for play, live near quality child care and early education centres, and have good access to health care services tend to be healthier and better equipped for the challenges they face growing up.

The CICH's updated Profile on the Health of Canada's Children and Youth has provided an opportunity to consolidate and evaluate what we know about the factors that shape the health and well-being of young Canadian children and their families. This paper summarizes and discusses these findings in the context of the published and grey literature on early childhood development. This synthesis highlights a striking pattern, demonstrating a strong gradient in the social determinants of health among outcomes important for early childhood development. The social gradient is illustrated in the summary table (below), in which we have consolidated the evidence in the CICH Profile on the three most-studied social determinants of health (income, parental education, and urban/rural geography) to show how these determinants impact early childhood development outcomes. The findings are in agreement with a large body of literature pointing to social determinants in general (and household income in particular) as major determinants of how well or poorly children develop from the prenatal period onward. However, while many social determinants, including level of parental education, place of residence (urban/rural), and housing quality (among others) are most definitely important for healthy child development, individually, none appear to have as pervasive and widespread an impact on early child and family outcomes as household income. Income inequalities among Canadian families continue to contribute to the developmental inequalities between children from higher and lower income households.

What can be done to address the gaps in children's development? This synthesis emphasizes how many of the levers for improving the health and well-being of Canadian children lie outside of the health system. Early childhood may be improved through social investments, in areas such as education, childcare, nutrition, recreation, and other areas outside of the health sector. The multi-faceted nature of addressing the social determinants of health makes it difficult for any single department or organization to reduce inequities among Canadian families. Evidence shows that intersectoral action is needed to better address the barriers faced by families living in challenging circumstances.[290] The call for intersectoral action may be facilitated through factors identified by the Canadian Council on Social Determinants of Health in a report on the implementation of multi-sectoral ECD initiatives: having a strong vision and clear mandate; maintaining strong leadership at the community level and in non-health sectors; and building strong relationships at all levels and across all sectors.[291]

### Where to from here?

Canadian governments, provincial/territorial agencies, and various community groups across Canada have all contributed to policies and programs that are intended to help families

overcome health inequalities through addressing the social determinants of health. In this paper, we have highlighted a number of national strategies that address the social determinants of health, such as initiatives on creating affordable housing, bolstering the income of families with young children, and increasing the availability of high quality childcare and early education services. Programs for lower income, single parent, and other vulnerable populations are also in place at the provincial, regional and local levels to protect and support young children and families in need. Stable, long-term, multi-level government investment in these and other evidence-based policies and programs can help to reduce social and economic inequalities among Canadian families. Where opportunities exist for scaling up programs that have been shown to be effective at improving health and social outcomes, these should be examined with the goal of implementation.

There is a need for stronger governance to improve early childhood development. For example, provincial and territorial governments would benefit from an inter-ministerial committee focusing on interventions and outcomes for young children. This model has been successfully implemented in Manitoba, where Healthy Child Manitoba has functioned for many years as a cross-departmental strategy that puts children and families first, and engages with community partners and researchers to implement evidence-based programs. Such strategies can support new partnerships between governments and research centres, such as the partnership between Healthy Child Manitoba and the Manitoba Centre for Health Policy, and advance health policies by using scientific evidence as the basis for decision making. Other examples of partnerships between early child development researchers, policy makers and community organizations include the Human Early Learning Partnership at the University of British Columbia and the Offord Centre for Child Studies at McMaster University.

The consolidation of early childhood development indicators in the CICH Profile represents the efforts of many experts in the field. Maintaining and growing the Profile would support future research, monitoring, and exploration on Canada's progress towards reducing health inequalities for children. As well, evaluating the interventions that are currently working to address social and health inequities, with a focus on efforts to decrease structural and system-level barriers, would provide valuable evidence to inform areas where funding could be applied to greatest effect. Complete and up-to-date information on child well-being is lacking in several areas, including, most notably, for children in care and children with disabilities; uniform and consistent data collection and regular reporting of outcomes are essential for building a solid evidence base.

We all recognize that children need a network of support – this includes their parents, families and broader community, but also the socio-political environment in which they live. Children benefit most when governments adopt child- and family-friendly policies that provide parental benefits, flexible workplace leave, quality early learning and child care programs, and adequate income for all.

**Impact of the Social Determinants of Health on Early Childhood Development**

| Early Childhood Development Outcome | Social Determinants of Health | | |
|---|---|---|---|
| | Income | Parental Education | Geography |
| ***Labour Force Participation*** | | | |
| Mother participated in labour force before/during pregnancy, received maternal benefits after pregnancy | ⇧ | ⇧ | |
| ***Maternal Health*** | | | |
| Mother supplemented her folic acid intake before and during pregnancy | ⇧ | ⇧ | |
| Prenatal care was initiated late (after the first trimester) | ⇩ | ⇩ | |
| Mother was contacted by a healthcare provider after the birth | No difference | No difference | |
| Mother reported symptoms of post-partum mental illness | ⇩ | ⇩ | |
| Mother was breastfeeding 6 months after giving birth | ⇧ | ⇧ | |
| ***Family and Neighbourhood Context*** | | | |
| Positive parent-child relationships and family functioning | ⇧ | | No difference |
| Green space available in the neighbourhood | ⇧ | | |
| Children participated in organized sports | ⇧ | | No difference |
| Children participated in music, art or other non-sport activities | ⇧ | | Urban |
| ***Health and Health Services*** | | | |
| Asthma | | | Urban |
| Infant mortality | ⇩ | | |
| Children obtained recommended amount of physical activity | | No difference | |
| Children had symptoms of mental illness | ⇩ | | |
| Children were overweight or obese | ⇩ | ⇩ | Rural |
| ***Developmental Health*** | | | |
| Children were vulnerable in at least one developmental domain at school entry | ⇩ | | |

For income and parental education, (⇧) indicates that the outcome is more likely as the SDOH increases, and (⇩) indicates that the outcome is more likely as the SDOH decreases. Geography is shown as a dichotomous SDOH (outcome more likely in either urban or rural setting).

Data are from the 2018 CICH Profile on the Health of Canada's Children and Youth. Blank cells indicate that no data on this SDOH were available in the Profile.

# Strengths and Limitations of the Data Source

The data that form the basis of this discussion paper are from the CICH's Profile on the Health of Canada's Children and Youth. The Profile provides a comprehensive assessment of the health and well-being of Canada's young people in an easy-to-read format, and is published online, making it interactive and accessible to many audiences. The accessibility of the Profile's data aligns with the findings of a report produced by the Canadian Council on Social Determinants of Health, which investigated ways of improving healthy child development through capacity building.[292] Specifically, the report indicated a need to make multi-sectoral data accessible to as wide an audience as possible, which is accomplished by the CICH Profile.

Despite these positive attributes, use of the CICH Profile to examine early childhood development has some limitations. Indicators of child health and development were chosen for inclusion in the Profile based on the specific interests and expertise of committee members, which may inadvertently have placed undue emphasis on some areas of health and well-being over others. The Profile is a secondary collection from many different sources, and so is limited by the availability of current data from its primary data sources. As well, the nature of the Profile as a catalogue of child health indicators does not allow for ranking or comparisons of which indicators are most important for early child development.

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