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Preface

In 2009, Peel Public Health identified Nurturing the Next Generation as a strategic priority. This report outlines the journey of the Family Health Division since that time and the process we undertook to identify:

- research evidence and a theoretical framework to underpin our work;
- the role of Peel Public Health in early child development;
- the health and social issues faced by Peel families;
- promising approaches to consider when innovating and improving services for families; and
- strategic directions for the Family Health Division.

This report provides background information on why Peel Public Health declared early child development a priority. It provides the evidence upon which our strategic directions are being built, and establishes the foundation for the work of the Family Health Division moving forward.

June 2017
Chapter 1  Nurturing the Next Generation

A Strategic Priority for Peel Public Health

Early childhood is a critically important developmental phase. Early life experiences set a foundation for the entire life course.

Investing early in children’s well-being contributes to an individual’s academic achievement, economic productivity, health behaviours, physical and mental health and, ultimately, the future success and prosperity of communities.

Public health has a mandate to develop and implement public health policies, programs and services that create and enhance supportive environments for children.

In 2009, Peel Public Health’s 10-year strategic plan, Staying Ahead of the Curve, set Nurturing the Next Generation as a strategic priority to help all children in Peel reach their full potential for lifelong health and well-being.¹ Our objectives? To find, implement and evaluate evidence-informed, population-based interventions that:

- promote the health of families in the preconception, prenatal and early parenting periods;
- lead to positive birth outcomes; and
- support secure attachment between infants and their caregivers.

In 2014, Setting the Pace, the second iteration of Peel Public Health’s strategic plan, reaffirmed Nurturing the Next Generation as a strategic priority.²

goals of nurturing the next generation

To support evidence-informed, population-based interventions that promote the health of families from preconception to parenting, ensuring that:

- children are raised and nurtured in an environment of responsive relationships;
- families thrive in safe and healthy communities;
- children and families enjoy healthy nutrition; and
- children experience optimal health and development.

We cannot plan for the future without recognizing the value the next generation has in creating it.

¹ For the full text, see Setting the Pace: A Revision to Peel Public Health’s 10-Year Strategic Plan (2014) at https://www.peelregion.ca/health/health-status-report/strategic-plan.
The Public Health Way

The Public Health Way guides Peel Public Health’s work. This philosophy has three goals, of which the first two are most relevant to Nurturing the Next Generation:

1. Improving and maintaining the health status of the population;
2. Reducing disparities in health status; and
3. Preparing for and responding to outbreaks and emergencies.

Three important principles underpin the Public Health Way:

1. Practice based in science;
2. Ethical practice; and
3. Accountability to the public.

Practice based in science directs public health practitioners to use knowledge derived from empirical research and local health status data by systematically searching for, appraising and applying evidence.

Ethical practice requires judiciously balancing the restriction of individual autonomy with the greater public good.

Accountability to the public ensures the best use of public funds by basing decisions on scientific evidence, while considering the priorities and values of the population served.

Infrastructure Priorities to Improve Public Health Outcomes

Three public health infrastructure priorities support Nurturing the Next Generation by providing tools and resources to evolve our practice:

1. End-to-End Public Health practice; 
2. Workforce development; and 
3. Serving an ethno-culturally diverse population.

End-to-End Public Health practice (E2EPH) reflects the evolution of public health practice. It aims to improve the health status of the population by expanding public health practice beyond delivering standard programs and services. It requires our public health practitioners to learn new skills to solve complex problems to meet the needs of Peel’s unique community. E2EPH methods and tools help us systematically identify and describe local health problems, identify and develop policy or programming options, set priorities, and implement and evaluate interventions (Figure A).

Taking an E2EPH approach in implementing Nurturing the Next Generation challenges us to embrace new approaches in our day-to-day work and new models of service delivery.

Taken together, the Public Health Way and End-to-End Public Health practice direct us to work as upstream as possible to promote health, prevent disease and improve health outcomes.
Figure A: End-to-End Public Health Practice

End-to-End Public Health Practice
Our Approach to Improving Public Health Outcomes

- Define the problem: What is the public health issue?
- Decide what is next for the intervention: Maintain? Adjust? Overhaul? Stop?
- Assess the impact: Did it work?
- Considerations: mandates, health disparity, diversity, ethics, knowledge translation
- Develop options: What can we do about it?
- Decide on intervention: What will we do?
- Implement decision: How do we execute effectively?
Workforce development focuses on developing people within the organization as well as developing the organization itself. We strive to engage staff in work that is interesting and satisfying, and to build their capacity to evolve their practice and work in new ways. E2EPH is one example of workforce development currently underway at Peel Public Health.

Serving an ethno-culturally diverse population requires public health approaches that reflect how cultural factors affect health, health behaviours and the use of services in Peel. As we develop the elements of Nurturing the Next Generation, we need to consider the social, parenting and family values of our diverse community.
Chapter 2  Early Child Development Matters

Research conducted over the past two decades has emphasized the significance of the early years to children’s growth and development. Many facets of early development shape an individual’s lifelong educational achievement, economic productivity, health-related behaviours, and physical and mental health.³

Improving health outcomes and optimizing child development in Peel means focusing our interventions on modifiable determinants of health: those that can be influenced or changed.

Determinants of Health

Human development is complex. Throughout the lifespan, a host of intertwining factors shape and influence our health. Some are factors we are born with, some are determined by our life circumstances, and some are shaped by our environment. These factors, the determinants of health, combine to affect our social, emotional, cognitive and physical health.

The determinants of health include:

- a person’s individual characteristics and behaviours;
- the social and economic environment; and
- the physical environment.⁴

Many determinants of health operate at a societal level. Identifying them helps public health decide which indicators to monitor and what data to collect to recognize health problems and inequalities in health status. We can then use population health and policy approaches to influence those determinants that can be modified. These approaches can ultimately affect the health of individuals, communities and populations.

In 2003, the World Health Organization declared early child development to be a social determinant of health: an important period of development that sets a critical foundation for adulthood.⁵ This reinforces the imperative for public health to use primary prevention strategies in the early years to influence the health trajectories of children.
Early Child Development Science

Advances in the science of early child development have helped better explain how the determinants of health affect children at the biological level. At this level, genes and the environment combine to influence health and developmental outcomes.

Many academics, child development experts, research institutes and governments have made early child development a priority. Scientific research, literature and knowledge translation products have focused on why and how early child development affects lifelong health. Although this work is still emerging, enough evidence exists for making early child development a priority in improving the health of our population.

A full explanation of the science of early child development is beyond the scope of this report. The material that follows briefly describes what we learned about the biological mechanisms of development that helped us better understand how relationships, environments and other factors influence health.

Early Windows of Opportunity

A child’s brain develops most rapidly in the first few years of life. Neuroplasticity is at its peak as neurons rapidly form new connections. As a result, early childhood is a sensitive period for many important facets of development which, in turn, establish the basis for social, emotional, cognitive and physical development beyond the early years.6

Early childhood offers many windows of opportunity to stimulate the brain. Critical capacities like vision, language and brain architecture are most readily developed during these windows. Once this sensitive period has passed, these capacities cannot be easily acquired.

Promoting responsive relationships between parents and their babies is one important way to positively influence development during this sensitive time. Parents and primary caregivers have the most influence on children in the earliest, most vulnerable years. They provide the environments in which children live and the experiences they have. Their relationships with their children greatly influence health and development outcomes. These outcomes include a child’s feelings of security, stress response, literacy (which is affected by the number of words a child hears and learns), and health behaviours in later life.

Age-appropriate nutrition is another important influencing factor. Children need particular nutrients during specific windows of development. For example, to prevent rickets, exclusively or partially breastfed babies require a daily vitamin D supplement from birth to about one year of age. To replace iron stores and prevent anemia, babies require iron-rich foods beginning at six months of age.
In contrast, exposures to specific diseases or environmental toxins can be detrimental to early development and lifelong health. These exposures must be avoided during specific time frames. Examples include prenatal exposure to the rubella virus or toxoplasmosis, and early exposure to tobacco smoke, lead or mercury.

Although no single study outlines all the factors influencing child development and their exact timing, the totality of evidence suggests early childhood is a critical time to promote healthy development and prevent toxic exposures. This directs the timing for health-promoting activities and underscores the need for public health to seek opportunities for early intervention.

**Early Experiences and Biological Embedding**

The science related to early experiences and how they affect health outcomes is largely based on animal studies. Animal studies help elucidate the mechanisms that are likely present in humans.

These studies suggest that adverse experiences in early life impair brain development and neuroplasticity. When exposed to prolonged and early adversity, the hippocampus and amygdala, in particular, show signs of lasting consequences.7

In human contexts, abuse and neglect during a child’s life are associated with negative health outcomes. To foster healthy development, public health has a role to play in identifying and intervening with families whose children are at risk for exposure to abuse and adversity.

Studies of people who have experienced prolonged abuse, adversity, toxic stress or unusually difficult circumstances early in life have shown that these circumstances link to poor health outcomes in later life.

Retrospective studies, such as the Adverse Childhood Experiences Study (ACES) and the study of people exposed to the Dutch famine, provide clues that adverse early experiences may have contributed to disease in adulthood. ACES found that childhood neglect and abuse are associated with later-life risk factors, chronic disease and premature mortality.8 The Dutch famine study, a natural experiment, found increases in infant mortality for those exposed to maternal under-nutrition, and later disease for adults exposed to famine in utero. This study was the first to clearly connect under-nutrition for women during pregnancy with later adverse health outcomes for themselves and their children.9

Studies like these support the need for public health to promote optimal environments and nurturing relationships in early childhood. This will help provide children with the necessities that promote lifelong health and well-being.
Chapter 3  Research to Inform Our Practice

As public health practitioners, our role is twofold: to provide health services that fall squarely within our mandate to meet the priority needs of the population we serve, and to influence health policy and systems to benefit lifelong health.

Identifying a sound theoretical framework and evaluating the highest quality research evidence help us determine where, when and how to best intervene. Building a credible, evidence-informed strategic path for supporting children and families in Peel required grounding Nurturing the Next Generation in a solid theoretical foundation.

Theoretical Foundation

Over the past several decades, a growing body of literature about factors affecting children’s health and development has influenced health care policy, social policy and health care services. Child development experts, organizations, educators, health services providers and governments have contributed to the knowledge surrounding the societal importance of supporting children in their early years.

In 2010, Peel Public Health commissioned a literature review of early child development theories to identify theoretical underpinnings for Nurturing the Next Generation.

Based on this review, we selected A Framework for Reconceptualizing Early Childhood Policies and Programs to Strengthen Lifelong Health developed by the Center on the Developing Child at Harvard University (Figure B).10

This framework incorporates a broad understanding of the policies and programs that work together to influence health and development across the lifespan. It acknowledges the levers that influence community environments, and links them to three foundations of health: factors that set the cornerstones for lifelong health.

The framework identifies those foundations of health as:

1. Stable, responsive relationships;
2. Safe, supportive environments; and
3. Appropriate nutrition.

It sets out how these three foundations of health influence the biology of health, which, in turn, affects health and development throughout the lifespan.
Conceptual Model

Our work to better understand this framework’s foundations of health and their influence on children’s health and development prompted two important questions:

1. What are the actual factors within each foundation that influence children’s health and development?

2. What outcomes across the lifespan do those influencing factors affect?

To answer these questions, we adapted the Biodevelopmental Framework, also developed by Center on the Developing Child at Harvard University, to create the Nurturing the Next Generation Conceptual Model (Figure C).\[11\]

\[11\] A detailed explanation of the Nurturing the Next Generation Conceptual Model can be found at [https://www.peelregion.ca/health/nurturing/resources.htm](https://www.peelregion.ca/health/nurturing/resources.htm).
Figure C: Nurturing the Next Generation Conceptual Model
Four Foundations of Health

Our conceptual model introduces a fourth foundation of health – healthy growth and development – and describes factors within each foundation:

1. **Environment of Relationships**: The quality and reliability of the relationships with the important people in a child’s life, within and outside the family. Factors include the health and well-being of parents, the attachment relationship between parents and their child, and the social connections of parents.

2. **Physical, Chemical and Built Environments**: The physical and emotional spaces in which the child and family live. Factors include home and child care environments, exposure to toxins, family income, neighbourhood design, and the built environment.

3. **Nutrition**: Food intake and eating habits. Factors include food security, the nutritional status of child-bearing women, breastfeeding, infant feeding, and nutrient intake.

4. **Healthy Growth and Development**: The physiological health of young children that has the potential to influence learning, behaviour and health later in life. Factors include maternal pre-pregnancy weight, gestational weight gain, infant’s birth weight, infant’s gestational age, and congenital anomalies.

Our conceptual model shows the relationships between the four foundations of health and sources of adversity, as well as the biological mechanisms that influence learning, behaviour and health outcomes.

**A Multidisciplinary Collaboration**

Analyzing the complex nature of early child development, and how to best influence it, required the perspectives and expertise of many disciplines and stakeholders.

We developed partnerships with academics and specialists who contributed to and helped shape Nurturing the Next Generation. They provided expertise and knowledge related to early child development, public health science, research methodology, and family and community health. This collaborative, interdisciplinary approach fostered valuable relationships that continue to provide opportunities for joint research.

At the same time, the skills and knowledge of our staff were evolving to meet the complex needs of the diverse, growing population of families in Peel. We have built capacity in End-to-End Public Health practice, and have used it to effectively search for and appraise evidence, and conduct our own research to inform our strategic priority.
The Realist Review

In 2010, we undertook a realist review of the literature to identify evidence-informed interventions we could consider to improve outcomes for children and families in Peel.\textsuperscript{12}

In partnership with academics from Trent University, York University, McMaster University and the University of Calgary, Peel Public Health was awarded a $100,000 Canadian Institutes of Health Research (CIHR) Knowledge Synthesis Grant.

A realist review uses key word searches to identify a large, diverse collection of articles. Relevant articles are appraised; those chosen for review are assessed according to the concept of, “what works for whom, under what conditions.” Realist reviews help inform policy development, the design of effective interventions, and innovative approaches. They are particularly useful when examining complex issues.\textsuperscript{12}
Our research focused on answering the question: “What population-level interventions can public health realistically implement to support optimal child well-being (social, emotional and cognitive) from the prenatal period, through infancy, to the end of the first year of life?”

The realist review explored three areas where public health could potentially intervene: parent education, social connectivity and social marketing.

**Parent Education**

Parent education involves building knowledge, skills, capacity and confidence in parents so they can raise healthy children.

Parent education has traditionally been considered part of the public health mandate. Public health departments provide prenatal classes, parenting education programs, one-to-one interventions, telephone counselling, and information sharing on parenting websites.

**Key Findings: Parent Education**

- No single population-level parent education intervention improves child development outcomes.
- Parents want what they need, when they need it. They appreciate a menu of services and convenient options for accessing just-in-time information.
- Increasing parents’ knowledge does not necessarily change their parenting behaviour.
- Parenting education classes are not an effective intervention for many parents, as evidenced by low engagement and high attrition rates.
- When led by engaging and knowledgeable facilitators, parenting education classes can be effective for some participants.

**Social Connectivity**

In this context, social connectivity refers to community connections in the early parenting environment that provide support to children and families.

Social connectivity can be measured by assessing the number and quality of an individual’s relations with others. (The opposite of social connectivity is isolation.)

**Key Findings: Social Connectivity**

- Formal and semi-formal supports in the community are useful to families. They can lead to sustained and valuable informal connections.
- Attempts by agencies to connect parents must incorporate family-friendly approaches, community
development, relationship building, empowerment and respect for diversity.

- Simply bringing parents together is valuable.
- Internet-based social networking sites have the potential to provide informational support to pregnant and parenting families.
- Prenatal classes and activities in a group format, particularly when combined with prenatal care, offer opportunities for pregnant mothers and families to make social connections. These connections are likely to be sustained afterward.
- Before the birth of their children, fathers value opportunities to connect with others in a fathers-only prenatal environment. Once their babies are born, fathers value spending time as a family unit with other families in their community.
- Although father-inclusive practices have been identified, fathers have often been overlooked as a specific audience for supports and services in their children’s early years.

**Social Marketing**

In public health, social marketing means applying marketing principles to influence health behaviours on a large scale.

Marketing concepts and techniques can be used to plan, implement and evaluate interventions designed to influence parenting practices, and to provide societal support to help children and their families.

**Key Findings: Social Marketing**

- An effective social marketing strategy addresses each of four elements: product, price, place and promotion. In public health, many social marketing campaigns focus only on promotion, making them social advertising campaigns which are less effective than if all four elements were taken into account.
- Social marketing campaigns have not traditionally targeted parents. However, they could be used to emphasize the important roles parents play as teachers and role models for their children.
- Social marketing campaigns targeting parents are most effective when parents understand that not changing their behaviour puts their children at risk.
- Social marketing campaigns focused on smoking cessation during pregnancy, breastfeeding, preventing sudden infant death syndrome, and car seat safety have shown some evidence of success.
- Few social marketing campaigns have targeted positive social, emotional and cognitive infant development.
Knowledge Translation

Translating our research findings into knowledge for the broader community was a requirement of the CIHR Knowledge Synthesis Grant.

In February 2012, Peel Public Health, along with our research partners, hosted an interactive, two-day conference titled “Nurturing Matters.” The conference presented findings from the realist review, included presentations by our research partners, and provided opportunities for networking and discussion. It was well attended by internal and external stakeholders, strategic partners, and leaders in the public health community, and sparked interest in Nurturing the Next Generation as a strategic priority.

The research team also presented findings from the realist review at peer-reviewed research conferences and to internal audiences at Peel Public Health.

Two papers from the realist review were published in the peer-reviewed literature:

1. *Parent Education Interventions Designed to Support the Transition to Parenthood: A Realist Review,*\(^ {13}\) and

2. *A Realist Synthesis of Social Connectivity Interventions During the Transition to Parenthood: The Value of Relationships.*\(^ {26}\)
Chapter 4  Data to Drive Our Strategy

The realist review was an important step in helping us identify evidence-informed approaches we could consider as possible public health interventions. To identify the right interventions for our local context, we needed a better understanding of Peel’s population of families with young children, based on local demographic and health status data.

Data analysis and surveillance are core public health functions that help paint a picture of a community’s health. We wanted to learn more about how well Peel families were doing, identify where they could be doing better, and examine inequities in health outcomes. To do that, we undertook an in-depth analysis of indicators related to the four foundations of health.

A broad overview of demographic and health status data helped us better understand the characteristics and health status of children and families in Peel. The Nurturing the Next Generation Data Overview provides a comprehensive selection of the measures that describe our youngest citizens, their families and the community in which they live. It includes data sources, limitations and methods.¹⁴

Demographics

Demographic data describing the characteristics of the people in a community (in terms of their age, culture, country of origin, etc.) help health planners design programs and services that will better meet the needs of the community’s unique population.

Region of Peel

The Region of Peel includes the cities of Brampton and Mississauga, and the Town of Caledon. Over the past 20 years, Peel’s population has grown substantially. Knowing the size of Peel’s population of parents and young children helps us better plan our programs and services, calculate our reach, and budget resources effectively. In 2011, Peel’s population of 1.3 million included approximately 96,500 children up to age six,¹ and 136,000 parents with at least one child up to age six.²

Families

The marital status and age of parents can provide insight into family structure and dynamics. Most Peel parents with children up to age six (87%) are legally married.²

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¹ For details, see Nurturing the Next Generation Data Overview at https://www.peelregion.ca/health/nurturing/resources.htm.
In 2011, Peel’s median maternal age of 31 and paternal age of 34 at the time of their infant’s’ birth were slightly higher than those in Ontario (30 and 33 years, respectively).\textsuperscript{A1}

To better understand Peel families, we also examine family size. In Peel, most families have two or more children.\textsuperscript{B}

Table 1 presents live births by parity. The majority of mothers who gave birth in 2011 in Peel had already given birth at least once.\textsuperscript{A1} However, nearly 40 per cent of infants in Peel were born to first-time mothers.\textsuperscript{A1}

Teenage pregnancies and births can present unique challenges for these young parents, such as maintaining financial stability, completing high school or other higher education, and facing social stigma. The rate of births to teen mothers in Peel is lower than in Ontario.\textsuperscript{A1} In 2011, only 245 infants were born to 15 to 19 year old mothers in Peel.\textsuperscript{A1}

### Table 1

**Live Births by Parity, Peel and Ontario, 2011**

<table>
<thead>
<tr>
<th>Parity</th>
<th>Peel</th>
<th>Ontario</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of live births</td>
<td>Rate per 100 live births</td>
</tr>
<tr>
<td>0</td>
<td>6,283</td>
<td>39.7</td>
</tr>
<tr>
<td>1</td>
<td>6,009</td>
<td>38.0</td>
</tr>
<tr>
<td>2</td>
<td>2,418</td>
<td>15.3</td>
</tr>
<tr>
<td>3+</td>
<td>1,117</td>
<td>7.1</td>
</tr>
</tbody>
</table>

Areas in the north end of Brampton are experiencing growth in the crude birth rate, while some areas, such as Caledon and parts of Mississauga, have rates lower than the overall rate in Peel (Map 1).\textsuperscript{A1, B2}

**Crude birth rate**: the total number of live births among the total population in a given time period per 1,000 population. It does not account for other factors affecting the birth rate, such as the age structure of a population.

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**Map 1**

Rate Ratio\textsuperscript{†} of Crude Live Birth Rate by Data Zone, Peel, 2011

†Rate ratio is calculated as the rate of the data zone divided by the Peel rate (which is 12.2 live births per 1,000 population).

Data zones are denoted by the first letter of the municipality, followed by a number (e.g., C1 denotes Caledon data zone 1).

There were 13 live births (of 15,827) without postal code information that could not be mapped.

**Immigration**

Parents who grew up in another country are raising their children in a context that differs from their own experience. Understanding the background of Peel parents and the ethno-cultural contexts in which they were raised helps service providers better appreciate the unique needs of families in Peel. In addition, this information can help explain observed trends in the data, such as the higher low-birth-weight rates observed in Peel compared to Ontario. Most Peel parents with at least one child under the age of six (68%) are immigrants, of which one in five (22%) immigrated to Canada less than five years ago.

In 2011, the percentage of live births to South-Asian-born mothers in Peel (31%) was about the same as the percentage of live births to Canadian-born mothers in Peel (33%). Comparatively, only nine per cent of live births in Ontario overall are to South-Asian-born mothers.

The region of birth of an infant’s mother and father tend to be the same. This is especially true among South Asians, where 98 per cent of infants with a South Asian-born mother also have a South Asian-born father. Approximately 30 per cent of live births in Peel were to South Asian-born parents.

The challenge of learning a new language after moving to Canada can affect a new immigrant’s ability to learn about and participate in employment, education, services and recreation. One per cent of Peel parents have no knowledge of either English or French.

In Peel, 12 per cent of children between the ages of one and three years have no knowledge of English or French, compared to six per cent of children in Ontario.

**Income, Employment and Education**

Family income, employment and education are important determinants of health. Data about these factors help us better understand the advantages or challenges Peel families may experience when raising their children. Service providers can use this information to respond to the needs of parents, help vulnerable families navigate the health, education and social service systems, and advocate for changes to policies and programs.

Family income helps determine food and housing security, and access to services such as quality child care. To compare families’ incomes, we examined 2011 data related to couple families with two children and lone-parent families with two children.

In 2011, couple families with two children in Peel had a median annual income of $77,170 ($6,430 per month).
Couple families with two children whose 2011 income fell below the low-income measure after-tax had a median annual income of $23,030 ($1,920 per month).

Lone-parent families with two children whose 2011 income fell below the low-income measure after-tax had a median annual income of $19,050 ($1,590 per month) (Table 2).

Incomes at the lowest levels affect parents’ ability to provide their children with the basic requirements of life. They must find affordable housing, use subsidized, licensed child care or unlicensed child care, take public transit, and use food banks.

Approximately 17 per cent of children under the age of six live in low-income families in Peel.\textsuperscript{D1} In 2010, 16,570 children under the age of six lived in private households below the low-income measure after-tax in Peel.\textsuperscript{D1}

Some families are recipients of Ontario Works, a program that offers temporary financial and employment assistance to families below specified income thresholds. In Peel, 13 per cent of Ontario Works recipients have children aged from birth to two years. This proportion remained stable from 2010 to 2015.\textsuperscript{F}

Approximately 76 per cent of Peel parents with at least one child under the age of six are employed.\textsuperscript{G1} Of these, 91 per cent report working full time, and 78

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\textit{Low-income measure after-tax (LIMAT):} a fixed percentage (50\%) of the median adjusted household income, where “adjusted” indicates that household needs are taken into account.\textsuperscript{16} A census family is considered low income when their income is below the low-income measure after-tax for their family type and size.

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Nurturing the Next Generation

Foundational Report
Table 2
Median Income and Low-Income Measure After-Tax (LIMAT) Median Income by Census Family Type, Peel, 2011

<table>
<thead>
<tr>
<th>Family income category</th>
<th>Census family type</th>
<th>Peel (%)</th>
<th>Ontario (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Couple families with two children</td>
<td>Peel (%)</td>
<td>Ontario (%)</td>
</tr>
<tr>
<td></td>
<td>Median income</td>
<td>Number of families</td>
<td>Median income</td>
</tr>
<tr>
<td>Income below LIMAT</td>
<td>$23,030</td>
<td>9,540</td>
<td>$19,050</td>
</tr>
<tr>
<td>All income levels</td>
<td>$77,170</td>
<td>92,160</td>
<td>$42,470</td>
</tr>
</tbody>
</table>

Source: Tax Filer Data (T1 Family File) 2011, Statistics Canada.

per cent report working more than 40 hours per week.\(^{G1}\) In Peel, 94 per cent of fathers are employed, compared to 59 per cent of mothers.\(^{G1}\)

In addition to long work hours, these Peel parents have longer commute times: their median one-way trip takes 30 minutes, compared to 26 minutes for parents in Ontario.\(^{D2}\) Thirty-six per cent of Peel residents work outside the region.\(^{D1}\)

Most Peel parents are highly educated. Approximately 72 per cent hold a trade or college certificate or diploma, or a university certificate, diploma or degree.\(^{D2}\) Peel has a higher proportion of parents with a university certificate,

Table 3
Highest Level of Education among Parents of Children with at least One Child Younger than Six, Peel and Ontario, 2011

<table>
<thead>
<tr>
<th>Education level</th>
<th>Peel (%)</th>
<th>Ontario (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than high school</td>
<td>7.0</td>
<td>8.6</td>
</tr>
<tr>
<td>High school diploma or equivalent</td>
<td>21.0</td>
<td>20.7</td>
</tr>
<tr>
<td>Apprenticeship or trades certificate or diploma</td>
<td>4.9</td>
<td>6.1</td>
</tr>
<tr>
<td>College, CEGEP or other non-university certificate or diploma</td>
<td>20.9</td>
<td>24.3</td>
</tr>
<tr>
<td>University certificate, diploma, or degree</td>
<td>46.3</td>
<td>40.4</td>
</tr>
</tbody>
</table>

Source: Custom Profile, National Household Survey 2011, Statistics Canada

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Table 4
Institute of Medicine Guideline on Total Weight Gain during Pregnancy, by Pre-pregnancy Body Mass Index (BMI)

<table>
<thead>
<tr>
<th>Pre-pregnancy BMI</th>
<th>Recommended total weight gain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range in kg</td>
</tr>
<tr>
<td>Underweight (&lt;18.5)</td>
<td>12.5-18.0</td>
</tr>
<tr>
<td>Normal (18.5-24.9)</td>
<td>11.5-16.0</td>
</tr>
<tr>
<td>Overweight (25.0-29.9)</td>
<td>7.0-11.5</td>
</tr>
<tr>
<td>Obese (≥30.0)</td>
<td>5.0-9.0</td>
</tr>
</tbody>
</table>

Maternal Weight

The Institute of Medicine (IOM) Guideline sets out the recommended weight gain during pregnancy by pre-pregnancy body mass index (BMI) (Table 4). In recent years, data on pre-pregnancy BMI and gestational weight gain (GWG) indicate these issues require public health action. Maternal BMI and GWG have been linked to a number of maternal and infant health outcomes which include, but are not limited to, gestational diabetes, pregnancy-induced hypertension, preterm births, caesarean section, infant birthweight, breastfeeding, postpartum weight retention and childhood obesity.

Health Status Data

Data about the health status of mothers and infants are essential for making evidence-informed decisions when planning, implementing, and evaluating programs and services. Data about women’s health in their child-bearing years are valuable when developing programs for families who are planning a pregnancy or who already have young children.

Health of Mother

Mothers’ pre-pregnancy lifestyle and health can influence their pregnancy outcomes and their babies’ health. Factors such as diet, exercise, and pre-existing conditions, such as hypertension, diabetes and obesity, can affect maternal and infant health and well-being.

Maternal BMI and GWG require public health action.

Gestational weight gain (GWG): the amount of weight a woman gains during pregnancy from the time of conception until the onset of labour.
In Peel, at this time, we are able to report on the 51 per cent of women who had pre-pregnancy BMI or GWG recorded in the Better Outcomes Registry and Network (BORN) Information System in 2014. We use caution when interpreting Peel data on pre-pregnancy BMI and GWG due to missing data.

Prior to pregnancy, 49 per cent of these women with available data were within a normal BMI, and 35 per cent were overweight or obese. Across all pre-pregnancy BMI categories, only one-quarter of these women (26%) gained the appropriate amount of weight during pregnancy. Over half of the women in the overweight or obese pre-pregnancy BMI categories who were having a singleton gained more weight during their pregnancy than the IOM Guideline recommends (Figure D).

**Obstetrical Complications**

Peel Public Health strives to enable individuals and families to achieve optimal preconception health, experience a healthy pregnancy, have the healthiest newborn(s) possible, and be prepared for parenthood. As part of this overall goal, we are interested in preventing obstetrical complications. Analysis of Peel's available data revealed that higher pre-pregnancy BMI was associated with an increased rate of gestational hypertension, gestational diabetes, caesarean section and high infant birth weight compared to those in the normal BMI category.

In 2014, 0.7 per cent of Peel women entered pregnancy with pre-existing diabetes, while nine per cent of Peel women who gave birth developed gestational diabetes. Mothers in the obese pre-pregnancy BMI category had a higher risk of developing gestational diabetes (16%) than mothers in the normal-weight pre-pregnancy BMI category (6%).

In 2014, approximately four per cent of Peel women who gave birth experienced gestational hypertension. A greater proportion of mothers in the overweight or obese BMI category developed gestational hypertension (5%) than those in the normal BMI category (2%). Obese mothers had approximately three times the rate of gestational hypertension compared to normal-weight mothers.

**Caesarean Section**

The method of birth (i.e., vaginal or caesarean section) affects recovery times and health care costs, with caesarean birth taking longer to recover from and costing more than vaginal birth.

The benefits of having a vaginal birth include reduced blood loss, reduced risk of injury and infection, no risk of complication associated with caesarean surgery, shorter hospital stay, and more rapid recovery.

Overall, 28 per cent of Peel mothers experienced a caesarean section delivery in 2014, and over half of these were planned.
The probability of having a caesarean section increased as a mother’s pre-pregnancy BMI increased. Mothers in the overweight or obese BMI categories had higher rates of caesarean deliveries (33% and 39%, respectively) compared to mothers in the normal-weight category (26%) (Table 5).

 Mothers who gained more weight than the recommended guideline had higher rates of caesarean section delivery (32%) than mothers whose weight gain fell within the guideline (27%) (Table 6).
### Table 5
**Distribution of Deliveries by Maternal Pre-pregnancy Body Mass Index (BMI), Peel, 2014**

<table>
<thead>
<tr>
<th>Delivery method</th>
<th>Per cent of women by maternal pre-pregnancy BMI category (kg/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Underweight (&lt;18.5)</td>
</tr>
<tr>
<td>Caesarean section</td>
<td>19.5</td>
</tr>
<tr>
<td>Vaginal</td>
<td>80.5</td>
</tr>
</tbody>
</table>

Notes: Maternal pre-pregnancy BMI category was missing for 10.9% of singleton live birth records in Peel in 2014. In this region, we are able to report on 51% of women who had a pre-pregnancy BMI or gestational weight gain recorded in the BORN Information System for 2014. Source: Public Health Unit Analytic Reporting Tool (Cube), BORN Information System (BIS), BORN Ontario. Information accessed on March 8, 2016.

### Table 6
**Distribution of Deliveries by Maternal Gestational Weight Gain using Institute of Medicine (IOM) Guideline Recommendations, Peel, 2014**

<table>
<thead>
<tr>
<th>Delivery method</th>
<th>Per cent of women by maternal weight gain by IOM Guideline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Below recommendation</td>
</tr>
<tr>
<td>Caesarean section</td>
<td>24.0</td>
</tr>
<tr>
<td>Vaginal</td>
<td>76.0</td>
</tr>
</tbody>
</table>

Notes: Maternal gestational weight gain status was missing for 20.0% of singleton live birth records in Peel in 2014. In this region, we are able to report on 51% of women who have a pre-pregnancy BMI or gestational weight gain recorded in the BORN Information System for 2014. BORN’s Maternal Weight Gain Recommended Group variable best aligns with the recommended weight gain ranges outlined within the IOM Guideline. Mothers who lost weight during their pregnancy were not included in the Maternal Weight Gain Recommended Group variable. Source: Public Health Unit Analytic Reporting Tool (Cube), BORN Information System (BIS), BORN Ontario. Information accessed on March 3, 2016.

#### Mental Health

The mental health of parents affects the health and well-being of children and families.

Women experiencing depression during pregnancy produce higher levels of stress hormones. These higher levels can result in reduced fetal growth, and are associated with an increased risk for premature labour.22

Mental illness, such as depression and anxiety, during pregnancy or after the birth of an infant, can disrupt the development of a secure attachment.
Untreated parental depression can have long term impacts on children’s health. Young children whose mothers are experiencing depression may experience lasting effects to their brain architecture, and disrupted stress-response systems. Most mothers who develop postpartum mood disorders do so in the weeks or months after their baby’s birth. Mental health issues tend to be under-reported, possibly because of stigma surrounding mental health.

The BORN Information System collects and reports data about maternal depression during pregnancy. Additional information is available on anxiety, history of postpartum depression, addiction, bipolar disorder, schizophrenia and other mental health concerns. Approximately four per cent of women in Peel self-reported depression and four per cent self-reported anxiety concurrent with their pregnancies. These results are likely under-reported. Younger and older women more commonly reported maternal depression (Table 7).

Families living with poverty, recent immigration, limited education, insecure housing and/or isolation have difficulty

### Table 7
Prevalence of Maternal Depression Associated with Pregnancy by Age Group, Peel, 2014

<table>
<thead>
<tr>
<th>Maternal age group (years)</th>
<th>Peel</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of pregnant women experiencing depression</td>
<td>Per cent of pregnant women in maternal age group experiencing depression</td>
</tr>
<tr>
<td>&lt; 20</td>
<td>11</td>
<td>7.1</td>
</tr>
<tr>
<td>20 – 24</td>
<td>54</td>
<td>4.4</td>
</tr>
<tr>
<td>25 – 29</td>
<td>96</td>
<td>2.4</td>
</tr>
<tr>
<td>30 – 34</td>
<td>212</td>
<td>3.7</td>
</tr>
<tr>
<td>35 – 39</td>
<td>121</td>
<td>4.2</td>
</tr>
<tr>
<td>40 +</td>
<td>49</td>
<td>7.6</td>
</tr>
<tr>
<td>Missing age data</td>
<td>27</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: Maternal depression status was missing for 4.2% of records in Peel in 2014. Source: Public Health Unit Analytic Reporting Tool (Cube), BORN Information System (BiS), BORN Ontario. Information accessed on January 25, 2016.
meeting their own and their children’s needs. This may lead to stress, an indicator of mental health. One in four parents in Peel (24%) report feeling either “quite a bit stressed” or “extremely stressed.” This is similar to the proportion of parents in Ontario who reported these levels of stress.  

**Health of Infant**

The health of infants at birth can influence health in later life. As an example, birth weight can influence weight in later life. In addition, birth outcomes and early health issues can provide clues to the adequacy of prenatal care and early health services.

By analyzing relevant data, public health can consider primary prevention strategies to ensure children get the best start in life.

**Birth Weight**

Infants with higher birth weights may experience more difficult deliveries and medical complications that may include birth injury and caesarean delivery. Higher maternal pre-pregnancy body mass index and higher gestational weight gain are both associated with high infant birth weight. Higher GWG is also linked with childhood obesity. Although most infants in Peel in 2014 were born with normal birth weights across all maternal pre-pregnancy BMI categories, overweight and obese mothers were more likely to have higher-birth-weight infants compared to normal-weight mothers (Table 8).

### Table 8
**Distribution of Infant Birth Weight by Maternal Pre-pregnancy Body Mass Index (BMI), Peel, 2014**

<table>
<thead>
<tr>
<th>Infant birth weight category</th>
<th>Live births by maternal pre-pregnancy BMI category (kg/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Underweight (&lt;18.5)</td>
</tr>
<tr>
<td></td>
<td>Number</td>
</tr>
<tr>
<td>Low birth weight</td>
<td>44</td>
</tr>
<tr>
<td>Normal birth weight</td>
<td>404</td>
</tr>
<tr>
<td>High birth weight</td>
<td>NR</td>
</tr>
<tr>
<td>Total number of births</td>
<td>NR</td>
</tr>
</tbody>
</table>

NR = Not releasable due to small numbers.
Notes: Maternal pre-pregnancy BMI category was missing for 10.8% of records in Peel in 2014.
In this region, we are able to report on 51% of women who have a pre-pregnancy BMI or gestational weight gain recorded in the BORN Information System for 2014.
Obese mothers give birth to high-birth-weight infants at approximately two-and-a-half times the rate of normal-weight mothers.\textsuperscript{H8}

Overweight and obese mothers have higher-birth-weight infants.

Infants who are born small for gestational age (SGA) can also have health risks. In Peel, the rate of SGA births has increased since 1999, and is higher than the rate in Ontario.\textsuperscript{A1}

Peel’s demographics may explain this result because infants born to some immigrant mothers have lower birth weights than those born to Canadian-born mothers. In particular, mothers born in South Asia or East Asia are more likely to give birth to infants with lower median birth weights compared to Canadian-born mothers.\textsuperscript{A3}

Birth Outcomes

Overall, the rate of infant death is low due to advances in health and preventive care.

Peel’s infant mortality rate has remained relatively stable over time, whereas Ontario’s has declined (Figure E).\textsuperscript{A2, I} Consequently, in 2011, Ontario’s infant mortality rate was lower than Peel’s.

Between 1986 and 2011, the number of infant deaths in Peel fluctuated between 44 and 101 deaths annually.\textsuperscript{A2, I} The small number of infant deaths leads to fluctuating annual rates.

Figure E

Infant Mortality Rate, Peel and Ontario, 1986-2011

Rate of infant deaths per 1,000 live births


Infant Nutrition

Infant Feeding

Breastfeeding offers short and long term benefits for mother and infant. In the first six months of life, breast milk is the only food infants need for healthy development. As breast milk is the optimal source of nutrition for infants, supporting women to predominantly or exclusively breastfeed during the first six months of their infant’s life is an important part of the work of the infant feeding teams at Peel Public Health.

We want to support families in reaching their infant feeding goals. In Peel, approximately 99 per cent of 455 mothers surveyed in 2015 initiated breastfeeding, either in hospital or shortly after discharge. At hospital discharge, 46 per cent breastfed exclusively; two weeks later, approximately 38 per cent continued to do so.

Breastfeeding rates gradually declined as infants grew. By six months, 64 per cent of mothers continued to breastfeed (Figure F, Table 9).

Any breastfeeding: any self-reported attempt to feed the infant at the breast, or feed breast milk or mother’s milk by cup, tube, or bottle. Any breastfeeding is the sum of those who are exclusively breastfeeding and mixed feeding.

Exclusive breastfeeding: feeding an infant only breast milk, with the exception of vitamin and mineral supplements or medicines.

Mixed feeding: giving an infant breast milk in addition to any other liquids or solid foods.

Breastfeeding rates gradually declined as infants grew.

Figure F
Duration of Breastfeeding, Peel, 2015

Note: Weighted data.
Table 9
Rates of Breastfeeding, Peel, 2015

<table>
<thead>
<tr>
<th>Time from hospital discharge</th>
<th>Providing mixed feeding</th>
<th>Exclusively breastfeeding</th>
<th>Not breastfeeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharge</td>
<td>44.4</td>
<td>46.1</td>
<td>9.5</td>
</tr>
<tr>
<td>2 weeks old</td>
<td>56.8</td>
<td>38.2</td>
<td>5.0</td>
</tr>
<tr>
<td>1 month old</td>
<td>58.1</td>
<td>33.3</td>
<td>8.5</td>
</tr>
<tr>
<td>2 months old</td>
<td>57.4</td>
<td>29.8</td>
<td>12.8</td>
</tr>
<tr>
<td>3 months old</td>
<td>54.6</td>
<td>27.1</td>
<td>18.2</td>
</tr>
<tr>
<td>4 months old</td>
<td>51.5</td>
<td>22.8</td>
<td>25.8</td>
</tr>
<tr>
<td>5 months old</td>
<td>52.1</td>
<td>15.7</td>
<td>32.1</td>
</tr>
<tr>
<td>6 months old</td>
<td>57.2</td>
<td>6.7</td>
<td>36.1</td>
</tr>
</tbody>
</table>

Note: Weighted data.

Solid foods should be introduced at or around six months of age, when an infant shows readiness cues. Local data indicate that almost a quarter of infants in Peel (23%) are being introduced to solid foods, such as infant cereal, fruits, vegetables or meat products, too early or too late (at less than five months or over seven months of age).j

**Children’s Health and Development**

Promoting the optimal health and development of our youngest citizens is important to the health of our community. Information about children’s health and development helps public health and other service providers plan for services that may be needed in the preschool years and as children transition to school.

Issues related to children’s health and development are best identified and addressed as early as possible through access to medical, dental and high quality child care and early years services.

**Developmental Monitoring**

Screening programs provide information about the health, developmental status and needs of children during critical early life stages. Two such screening programs in Peel are the enhanced 18-month well-baby visit and the Early Development Instrument (EDI).
The enhanced 18-month well-baby visit is a provincially funded, in-depth visit with a primary care provider to identify concerns or developmental issues at an important early milestone. In 2012, only half of Peel children (51%) received the enhanced 18-month well-baby visit.\textsuperscript{K,L} This represents a lost opportunity to identify needs which might require early intervention.

Kindergarten teachers in Peel complete the Early Development Instrument, a questionnaire about children’s readiness to learn. It covers five core domains: physical health and well-being; social competence; emotional maturity; language and cognitive development; and communication skills and general development. The EDI data can help guide the development of new and existing early years programs and services. Scoring below the 10\textsuperscript{th} percentile of the Ontario baseline population on any of the five domains identifies a child as “vulnerable.”\textsuperscript{M} In 2014/15, 30 per cent of senior kindergarten students living in Peel were assessed as vulnerable in one or more domains.\textsuperscript{M} Almost 15 per cent were vulnerable in two or more domains.\textsuperscript{M}

Access to Dental Care

Good oral health is important to a child’s overall health. Peel Public Health provides dental screening programs for children in clinics and schools. In 2013, the Peel Public Health dental programs, Children in Need of Treatment (CINOT) and Healthy Smiles Ontario, screened 18,839 children from birth to age six.\textsuperscript{N} About one in four (4,446) received preventive services, including scaling, sealants, and/or topical fluoride, and about one in five (3,446) received dental treatments such as fillings.\textsuperscript{N}

Access to Child Care

Most parents work full time in Peel, making it important for families to have access to high quality child care. As of December 31, 2015, there were 12,640 licensed, centre-based child care spaces in Peel for children from birth to age 3.8 years, of which 3,847 were subsidized spaces.\textsuperscript{O} Approximately 20 per cent of children from birth to age 3.8 years had access to licensed child care spaces.\textsuperscript{O}

Health and Safety

Smoke Exposure

Second-hand smoke consists of the smoke from a burning tobacco product and exhaled smoke. Second-hand smoke exposure is causally linked to negative health outcomes.\textsuperscript{23, 24} Maternal exposure to second-hand smoke during pregnancy can cause a reduction in birth weight.\textsuperscript{23} Infants exposed to second-hand smoke from postnatal maternal smoking have almost twice the probability of sudden infant death syndrome (SIDS) compared to those who are not exposed.\textsuperscript{23, 24} Parental smoking can cause middle ear disease, lower respiratory illnesses and asthma among children.\textsuperscript{23}

In Peel, smoking has been banned in indoor public spaces for several years.
and, more recently, in outdoor recreational areas. The home is becoming the predominant location for second-hand smoke exposure among children.23

Upon admission to hospital for the birth of their babies, approximately 13 per cent of Peel mothers reported residing with a smoker.24 Moreover, approximately 13 per cent (51,000) of Peel parents living with children less than 18 years of age report being current smokers.25 A greater proportion of fathers (17%) are current smokers compared to mothers (10%) (Table 10).

**Physical Activity**

Physical activity is important for overall health and well-being. It has both short and long term health benefits, and can reduce the risk of developing illnesses such as cardiovascular disease. Data on the level of activity of children under the age of six in Peel are not available.

### Table 10
**Current Smoking Status of Parents† by Sex and Age Group, Peel, 2009 – 2014 Combined**

<table>
<thead>
<tr>
<th>Current Smoker</th>
<th>Number*</th>
<th>Per cent (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL</td>
<td>51,000</td>
<td>12.9 (CI: 10.7 – 15.5)</td>
</tr>
<tr>
<td>SEX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>31,400</td>
<td>16.7 (CI: 12.9 – 21.2)</td>
</tr>
<tr>
<td>Female</td>
<td>19,600</td>
<td>9.5 (CI: 7.3 – 12.2)</td>
</tr>
<tr>
<td>AGE GROUP (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 to 19</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>20 to 29</td>
<td>3,300**</td>
<td>22.5** (CI: 13.1 – 35.8)</td>
</tr>
<tr>
<td>30 to 44</td>
<td>20,500</td>
<td>12.3 (CI: 9.5 – 15.8)</td>
</tr>
<tr>
<td>45 to 64</td>
<td>25,867</td>
<td>13.4 (CI: 9.9 – 17.8)</td>
</tr>
<tr>
<td>65+</td>
<td>NR</td>
<td>NR</td>
</tr>
</tbody>
</table>

† Reflects respondents who are parents (12+ years) living with children under 18 years in the household.

* Number represents the average annual population estimate (i.e., the population estimate was divided by three to account for the three cycles of data in the analysis).

** Use estimate with caution.

CI: 95% confidence interval.

NR: Not releasable due to small numbers.

Table 11  
Leisure Time Physical Activity Level among Parents†, Peel and Ontario, 2011-2014 Combined

<table>
<thead>
<tr>
<th>Activity level</th>
<th>Peel (%)</th>
<th>Ontario (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>15.7 (CI: 11.6 – 20.9)</td>
<td>23.9 (CI: 22.4 – 25.5)</td>
</tr>
<tr>
<td>Moderate active</td>
<td>16.5 (CI: 12.5 – 21.4)</td>
<td>25.0 (CI: 23.3 – 26.7)</td>
</tr>
<tr>
<td>Inactive</td>
<td>67.9 (CI: 61.5 – 73.6)</td>
<td>51.1 (CI: 49.1 – 53.1)</td>
</tr>
</tbody>
</table>

†Reflects respondents who are parents (12+ years) living with children under six years in the household. Respondents are categorized into three physical activity levels according to leisure-time energy expenditure (EE): active (EE of 3.0 kcal/kg/day or more); moderately active (EE 1.5 – 2.9 kcal/kg/day); inactive (EE less than 1.5 kcal/kg/day).

“Not stated,” “don’t know,” and “refused” responses were excluded from the analysis for the table above.

CI: 95% Confidence Interval.

However, parents’ activity levels can influence those of their children.

Approximately 30 per cent of Peel parents report being at least moderately active – significantly less than the provincial rate of 49 per cent (Table 11).²

Safety

To reduce the frequency, severity and impact of preventable injury, Peel Public Health is interested in families living in safe and supportive environments.² This includes environments free from violence of all types.

In 2013, visits to emergency departments in Peel totalled over 8,900 for infants aged birth to 12 months, and over 26,000 for children aged one to four years.² Note that these data may represent multiple visits for an individual infant or child.

The most common reasons cited across both age groups were acute respiratory infections, injury, poisonings, and other infectious and parasitic diseases.²

Neonatal jaundice accounted for 340 cases, representing approximately two cases per 100 infants.²

Experiencing or witnessing violence in family homes can affect children’s physical, social and behavioural health and development. In 2014, Peel Regional Police received 13,505 calls for domestic or family disputes or disturbances.²

From April 2014 to March 2015, Peel Children’s Aid Society investigated 7,625 reports of child abuse and neglect; 416 children aged from birth to 18 years were in care.²
Data Guide Decisions

Health status data about Peel children and families help guide decisions about where we should focus public health resources. In addition, they provide baseline indicators for the well-being of Peel families that we can use to track progress on specific health issues over time.
Chapter 5  Local Context to Sharpen Our Focus

The data analysis outlined in Chapter 4 provided important information about the health status of Peel parents and young children. However, we needed to know more about the early child development environment and the experience of being a parent in Peel to develop effective strategies that would meet the needs of Peel families.

Two original, qualitative research projects. To address this, we undertook two original, qualitative research projects: the Environmental Scan of the Early Child Development Service Sector in Peel, and the Parent Experience Study.

Environmental Scan of the Early Child Development Service Sector

The Environmental Scan of the Early Child Development Service Sector (Environmental Scan) provides a snapshot of this sector in Peel. It presents an overview of Peel’s existing early child development programs, services and initiatives, and assesses the community’s capacity to support healthy child development.

The Environmental Scan was conducted using seven focus groups (42 participants) and 45 semi-structured, key-informant interviews (49 participants).

Participants were recruited using purposive and snowball sampling techniques. These techniques were used to elicit participants from a cross-section of services and programs for families with young children from birth to age two. These included Peel Public Health, other Regional services and the external early child development service sector.

Environmental Scan Participants

Environmental Scan participants included staff members from:
- prenatal and early postnatal programs;
- parenting education programs (including those for young parents and fathers);
- early child education programs;
- family literacy programs;
- developmental services;
- mental health services;
- primary health services;
- newcomer and settlement agencies;
- child protection services; and
- parks and recreation programs.

We asked participants about parents’ needs, the capacity of the community to support early child development, and how programs and services in this sector are relevant to, and support, each of the four foundations of health. Based on their professional experiences, participants described the services they offered, service gaps they had identified, and community strengths.

We analyzed their responses using a directed-content-analysis approach. We applied predetermined categories and codes to the responses, as well as categories and codes that evolved as
we learned more. Multiple coders tested the categories and codes, thereby increasing reliability. We synthesized the results into themes and sub-themes.\(^v\)

**Key Findings: Environmental Scan**

- The early child development service sector in Peel is characterized by strong community leadership, competent staff, and a commitment to service coordination and collaboration.

- Healthy attachment, parent education and skill development are strong components of early child development programming across Peel.

- Service providers recognize Peel Public Health as a leader in nutrition. However, they believe changes in the Peel Public Health service delivery model have led to gaps in nutrition education and supports for families with young children.

- Gaps were identified in mental health services for children and adults, early identification of developmental delays, supports for family relationships, and children’s physical activity.

- Long waitlists, staff burnout, and ineffective communication and outreach strategies are common challenges across the early child development service sector.

- Early child development service sector staff experience challenges when responding to the needs of ethno-culturally diverse families.

- The early child development service sector is confusing and difficult for parents to navigate.

- Peel’s built environment increases families’ social isolation and limits their access to services.

- Peel lacks local policy and advocacy initiatives that focus on outcomes for children.

The Environmental Scan provided valuable information on the capacity of the programs and services offered by the early child development community in Peel, and identified existing gaps.

A limitation of the study was under-representation of faith-based organizations, ethno-cultural groups, web-based support systems, informal groups and grassroots agencies that support parents and early child development in Peel.

**The Parent Experience Study**

Our realist review drew attention to an important gap: the parent perspective is often missing when programs and services are developed.

\(^v\) For a full description of the Environmental Scan, see Nurturing the Next Generation Early Child Development Service Sector Review: Key Findings from the Environmental Scan at https://www.peelregion.ca/health/nurturing/resources.htm.
We undertook the Parent Experience Study to gain insight from local parents and learn more about becoming a parent in Peel. Peel Public Health staff partnered with Trent University and members of Peel’s early child development community (e.g., staff from Ontario Early Years Centres, recreation centres and public libraries) to recruit a diverse group of Peel parents with children from birth to age two.

We collected data using 23 semi-structured focus groups (150 participants) and open-ended online surveys (118 participants). Parents were asked to identify and describe the positive and challenging experiences of being new parents in Peel, and the formal and informal supports they found helpful.

Focus group participants were recruited by staff from participating organizations and by staff from other identified groups of parents with young children. Focus groups were facilitated by Peel Public Health staff with faculty and students from Trent University.

The online component was intended to engage parents who may not access formal services. Potential participants were recruited through notifications on our Parenting in Peel Facebook page, and through postcards left at community centres, libraries and other child-serving organizations. Three hundred potential participants opened the link to the survey; 118 (39%) completed it.

Data were analyzed using verbatim transcripts and qualitative methodology. A public health staff member, paired with students and researchers from Trent University, independently reviewed the transcripts. Data were categorized and coded into themes.

Seventeen themes emerged from this analysis: four were positive experiences, and 13 were considered challenging.

### Key Findings: Parent Experience Study

- Becoming a parent was a significant life transition that included the loss of familiar roles and behaviours, and the stress of learning new ones. The quality of this transition affected a parent’s sense of competence, fulfillment and well-being.

- In addition to the birth of their baby, parents experienced a second major transition toward the end of their parental leave period. This was a particularly stressful time as parents contemplated the costs and benefits of returning to work and paying for child care.

- Some parents felt emotionally, socially and/or geographically isolated. They were learning parenting skills and knowledge on their own without the benefit of family members or experienced peers.

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vi For a full description of the Parent Experience Study, see Nurturing the Next Generation Parent Experience Study: A Picture of Parenting in Peel at https://www.peelregion.ca/health/nurturing/resources.htm.
• Some parents reported having limited family members to turn to for help, or being unable to connect with their old friends who were at different life stages.

• Parents who became socially connected experienced a great sense of relief as they gained both informational and social support.

• Parents experienced anxiety from wanting to, but not knowing how to, “do things right.”

• Other challenging experiences included the stresses of managing exhaustion, learning new skills, making satisfying decisions about child care and employment, negotiating changing relationships, and forming secure and meaningful new identities as parents.

• The ease with which parents transitioned to parenthood depended on their personal and social supports, and whether or not they accessed community resources.

In addition to these general key findings, we learned more detailed information about parents’ needs within each foundation of health.

• **Environment of Relationships:** Many parents voiced that they felt socially and emotionally isolated. Many newcomers, in particular, talked about missing extended family who could provide advice and help with child rearing responsibilities.

• **Physical, Chemical and Built Environments:** Parents described experiencing geographic isolation as a result of services located far from where they lived and transportation challenges. Parents identified using public transit, in particular, as difficult.

• **Nutrition:** Parents identified needs related to infant nutrition and feeding. Many found breastfeeding more challenging than expected. They reported receiving conflicting nutrition information from multiple service providers, which confused them. They were unclear about what foods to introduce and when.

• **Healthy Growth and Development:** Parents expressed concerns about their baby’s development and their own knowledge about developmental milestones. They felt unprepared for the frequent transitions in early infant life, such as feeding and sleep transitions, infant growth, and what their babies were capable of at different stages.

The qualitative nature of the Parent Experience Study provided robust insight into the lives of parents in Peel and the challenges they face in the transition to parenthood. It provides us with clear opportunities to make a difference to the parenting experience in Peel.

The study was not intended to represent all parents in Peel. Under-represented groups included fathers, single parents, teen or young parents, parents of children with special needs, parents from same sex couples, and parents who did not speak English. Further, the parents recruited from early child development organizations may have been different in nature from parents who do not seek formal supports.
Context Deepens Understanding

Together, the findings from the Environmental Scan of the Early Child Development Service Sector and the Parent Experience Study helped us better understand the parenting context in Peel. Specifically, we were better able to identify the strengths of the early child development service sector and the unique experiences of being a parent in Peel. Together, the foundations of health, the findings of the realist review, the data analysis and this new understanding of the parenting context in Peel provided the evidence we needed to determine the strategic focus for the Family Health Division.
Chapter 6  Determining the Priorities for the Family Health Division

Identifying a framework to guide our work, examining the literature on the science of early child development, analyzing local health status data, and studying the findings from Peel-specific qualitative research helped us better understand the health and social issues of families from a Peel perspective. Guided by End-to-End Public Health practice, we synthesized what we learned to clearly identify the needs of children and families in Peel.

Guided by the Public Health Mandate

We used the Nurturing the Next Generation Conceptual Model to underpin and organize the data we collected into the four foundations of health: environment of relationships; physical, chemical and built environments; nutrition; and healthy growth and development. Within each foundation, we analyzed the findings to identify and describe the health and social problems experienced by Peel families.

Through facilitated discussion and consensus, Family Health Division staff and decision-makers used the Ontario Public Health Standards for Family Health and the Public Health Way to identify the needs of Peel families that align with the public health mandate. Questions we considered in the decision-making process included:

- What is the magnitude of the problem?
- Does the need fit within the public health mandate?
- What is the extent of the Family Health Division’s possible involvement?
- Is there work already being done in this area?
- Should Peel Public Health be doing more or less?

Answering these questions provided additional context and helped determine key areas where public health could make a difference.

Guided by Need

Three critical needs were identified as determinants of health that significantly affect the well-being of children and families in Peel:

- Families need adequate financial resources;
- Children and families need secure access to healthy foods; and
- Families need access to affordable, flexible and high quality child care.

As outlined in Chapter 3, determinants of health fundamentally influence lifelong social, emotional, cognitive and physical health. As we develop interventions to optimize early child...
development, we must explicitly consider these three identified determinants of health for families and children in Peel.

**Critical Determinants of Health for Children and Families in Peel**

- Adequate financial resources.
- Secure access to healthy foods.
- Access to affordable, flexible, high-quality child care.

In addition to these three critical determinants of health, we identified 12 needs of Peel families where public health has either a primary role in delivering a program or service, or a secondary role in supporting programs and services delivered by other organizations (Figure G).

These 12 needs reflect key areas where public health can positively influence the lifelong health and well-being of children. Using the foundations of health as a lens, we identified areas of focus where we can begin to strategically align our work in the Family Health Division to better meet the needs of families and children in Peel.

- **Environment of Relationships.** Area of focus: Social connectedness.
  - Children and families need formal and informal supports.
  - Children and families need support to manage stress and address mental health issues.
  - Children and families need to live free from violence and neglect.

- **Physical, Chemical and Built Environments.** Area of focus: Smoke-free homes.
  - Babies developing in utero need to be protected from exposure to alcohol and toxic substances.
  - Children need to be protected from second-hand smoke.
  - Children need to be protected from accidental falls and poisonings.

- **Nutrition.** Area of focus: Infant and child nutrition.
  - Babies need to be breastfed for as long as possible.
  - Children need to eat healthy foods.

- **Healthy Growth and Development.** Areas of focus: Maternal BMI and gestational weight gain; physical activity.
  - Pregnant women and women of child-bearing age need to achieve and maintain a healthy body weight.
  - Parents and young children need physical activity.
  - Children’s developmental issues need to be identified as early as possible.

The twelfth need is evidenced by a priority population of young parents (aged 15 to 24) who have needs in all four foundations of health. They require particular attention due to their complex needs and high potential for poor health outcomes for themselves and their children.
Figure G: Identified Needs of Children and Families in Peel

<table>
<thead>
<tr>
<th>FOUNDATIONS OF HEALTH</th>
<th>NEEDS OF FAMILIES AND CHILDREN</th>
<th>AREAS OF FOCUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment of Relationships</td>
<td>Children and families need formal and informal supports.</td>
<td>Social Connectedness</td>
</tr>
<tr>
<td></td>
<td>Children and families need support to manage stress and address mental health issues.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Children and families need to live free from violence and neglect.</td>
<td></td>
</tr>
<tr>
<td>Physical, Chemical &amp; Built Environments</td>
<td>As babies develop in utero, they need to be protected from exposure to alcohol and toxic substances.</td>
<td>Smoke-Free Homes</td>
</tr>
<tr>
<td></td>
<td>Children need to be protected from second-hand smoke.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Children need to be protected from accidental falls and poisonings.</td>
<td></td>
</tr>
<tr>
<td>Nutrition</td>
<td>Infants need to be breastfed for as long as possible.</td>
<td>Infant &amp; Child Nutrition</td>
</tr>
<tr>
<td></td>
<td>Children need to eat healthy foods.</td>
<td></td>
</tr>
<tr>
<td>Healthy Growth &amp; Development</td>
<td>Pregnant women, and women of childbearing age, need to achieve and maintain a healthy body weight.</td>
<td>BMI &amp; Gestational Weight Gain Physical Activity</td>
</tr>
<tr>
<td></td>
<td>Parents and young children need physical activity.</td>
<td></td>
</tr>
<tr>
<td>Priority Population with Needs in all Four Foundations</td>
<td>Children’s developmental issues need to be identified as early as possible.</td>
<td>Health, Social &amp; Education</td>
</tr>
<tr>
<td></td>
<td>Young mothers (15 – 24 years) and their infants have complex needs.</td>
<td></td>
</tr>
</tbody>
</table>
Taken together, the identified determinants of health and 12 needs of families and children in Peel will drive the strategic directions of the Family Health Division going forward.

**Early Strategic Directions**

We have identified early areas of strategic focus for each foundation of health. As new information and resources emerge, these areas may change or expand to meet the changing needs of families to improve the health outcomes of children in Peel.

**Environment of Relationships**

It is critical for parents to be able to access and benefit from formal and informal supports. The research evidence demonstrates that parents who receive adequate support, or who perceive support is there when they need it, are less stressed and can better respond to their children’s needs.

Although the early child development service sector provides some measure of support for parents, parents told us it is confusing to navigate. Often they are not aware of supports available to them. Parents also said they felt isolated, emotionally and geographically. Peel families come from many countries, and many do not have family to support them in their parenting journey. Even families native to Canada can find themselves without family or friends nearby to help them or offer parenting advice.

Our initial work in the environment of relationships foundation will be to ensure all Peel families receive the supports they need. Beginning in the Healthy Babies Healthy Children program, we want all eligible families to be identified and receive the formal supports and linkages they need. Strategies will also be developed to facilitate building informal networks for all families to promote better child development outcomes.

**Physical, Chemical and Built Environments**

Families need to live, work and play in places where the built environment fosters community and active transportation, and minimizes their exposure to toxins. We will work in concert with the Peel Public Health strategic priorities Living Tobacco-Free and Supportive Environments for Healthy Living to ensure maximum impact for families and children in Peel.

The most important toxin to which young children in Peel are exposed is tobacco smoke. Thirteen per cent of Peel parents living with children less than 18 years of age are current smokers, and 31,400 Peel residents report being exposed to second-hand smoke in their homes daily or almost daily. We will work to advance this priority, in partnership with Peel Living, to promote smoke-free affordable housing in Peel Region as a...
first step to creating safe, supportive environments for Peel children.

We are advocating for built environments that better meet families’ needs for neighbourhood walkability and local public transportation. By influencing local and provincial policy, we are also improving environments in child care settings so they promote more opportunities for physical literacy and physical activity.

**Nutrition**

Children must receive adequate, healthy nutrition across the early development continuum from the preconception period onward to fuel their lifelong health and development. Healthy parents are more likely to give birth to healthy infants. Infants who are breastfed and who receive the right foods at the right times are more likely to reach appropriate growth, weight and developmental milestones.

Additionally, as infants grow into toddlers, they need to be cared for in settings that provide healthy eating environments and positive role models to promote lifelong healthy habits.

Only 64 per cent of Peel infants are breastfed to six months; 23 per cent of infants are introduced to solid foods too early or too late.1 To improve nutrition for infants, we are working with hospitals to positively influence their infant feeding practices and to support them in their Baby-Friendly Initiative journeys. We will also provide breastfeeding support services in the community through our clinics, home visits, telephone help-line, peer support program, the *Parenting in Peel* website and Facebook page, and other innovative strategies.

Peel parents and early years service providers see Peel Public Health as a credible source of nutrition information. We will continue to develop strategies to respond to parents’ needs, and to requests about infant feeding and introducing complementary foods. We will provide early years service providers with tailored information, education, sample menus and recipes. By continuing our work to influence local and provincial policy, and Early Childhood Educator post-secondary education curriculum, we aim to ensure children in licensed child care settings receive healthy foods in a positive eating environment.

**Healthy Growth and Development**

The physiological health of parents and their children can influence children’s learning, behaviour and health in later life. This foundation focuses on the modifiable factors public health can influence by bringing trends in the data to light and by partnering with others who can take action on an individual level.

Too many women in Peel are overweight or obese when they become pregnant,2 and subsequently gain too much weight during pregnancy.2 These factors are associated with pregnancy complications and negative, long term health outcomes for mothers and their babies. Our early work in this foundation

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1. Add references to sources used in the document.
2. Add references to sources used in the document.
is focused on examining the data, influencing the quality of the data, and reviewing the research on pre-pregnancy weight and weight gain in pregnancy. Strategies to overcome these health challenges will be developed over time using research evidence.

Many children in Peel start school with developmental vulnerabilities that have not been identified early enough. This is evidenced by reports of the Early Developmental Index which identifies 30 per cent of Peel children as vulnerable in one or more domains. We are examining more closely the existing and emerging data related to children’s development, and will be exploring interventions to improve screening for children before they reach school age.
Chapter 7  The Way Forward

Nurturing the Next Generation focuses on optimizing early child development. Overwhelming evidence shows that intervening in the prenatal and early years can contribute positively to lifelong health and well-being. The Public Health Way and End-to-End Public Health practice direct us to work as upstream as possible to promote health, prevent disease and improve health outcomes. Working to improve outcomes for the youngest members of our community, even before they are born, aligns with this mandate.

Nurturing the Next Generation is theory-based, evidence-informed and data-driven. It is grounded in research and analysis. The realist review uncovered promising approaches to consider when innovating and improving services for families and children. Our analysis of demographic and health status data clearly identified health and social issues that affect the well-being of families and children in Peel. Learning about the experiences of Peel parents and analyzing the local data underscored the Peel-specific challenges families face.

The four evidence-based foundations of health provide a framework and direction for focusing our public health practice. This framework has helped identify specific opportunities and potential settings where public health might intervene in children’s early years.

Nurturing the Next Generation is our commitment to Peel families and their children that they are important and valued. We aim to support families throughout their transition to parenthood, using rigorous methods and tools, and robust processes. We will collaborate with other levels of government, researchers, community partners, parents and others to keep children and families at the forefront when important decisions are being made.

The Family Health Division’s strategic plan is focused on improving outcomes within the four foundations of health to ensure our actions target the factors that matter most to children’s development. As public health practitioners, we are confident that building our strategy on the work done to date will positively affect health outcomes for families and children in Peel.

Our challenge now is to act strategically. We need to identify and implement the most effective and responsive public health interventions for families with young children in Peel. We will achieve this by engaging staff and continuing to develop their skills and knowledge, applying End-to-End Public Health practice, collaborating, and challenging the status quo.
Our strategic directions are starting points. They will expand and grow as we make progress on improving health outcomes, as opportunities arise, and as we decide how best to use our resources. We are driving toward improving long term outcomes that will lead to lifelong positive health behaviours, educational achievement, economic prosperity, and physical and mental health.

We have a societal responsibility to help nurture the next generation. Parents cannot do it alone. How we support families now, and in the future, will influence the health trajectories of all of our children and ultimately improve the health of our population.
Acknowledgements

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The report was reviewed by the Managers in Family Health, Susan Alfred, Debbie Chang and Cheryl Morin; the Director of Family Health, Anne Fenwick; and the Associate Medical Officer of Health, Dr. Megan Ward.
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