CHANGING COURSE 2012
Creating Supportive Environments for Healthy Living in Peel

Region of Peel
Working for you
Public Health
ACKNOWLEDGEMENTS

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FOREWORD

A message from Gayle Bursey, RD, B.A.Sc., M.E.S., Director of Chronic Disease and Injury Prevention

The thoughts in this paper have been fermenting in my mind for most of my 23 years as a public health professional. I must start by thanking the many authors and advisors who have laboured to capture these thoughts in this report. As well, I thank them for adding their own reflections on the complex topic of obesity prevention. However, while obesity is both a complex and complicated subject – a “wicked problem” as the systems literature suggests – the message we have agreed upon is profoundly simple: EAT and MOVE.

There are four important qualifications to the EAT and MOVE message:

1. EAT and MOVE, but do not solely focus on weight. In the past, obesity prevention and reduction efforts have had a significant emphasis upon weight loss. However, we are learning that independent of an appropriate weight, being active and eating in a healthy way can reduce the risk of chronic disease. In our programs and policies that we will develop, in our social marketing campaigns, and even in our daily conversations with clients and with family and friends at home, we must leave the “watching our weight” messages behind and start talking about ways we can support and promote eating well and being active.

2. EAT and MOVE for the enjoyment of it. We need to accept that a person’s best intentions to exercise soon disappear if they force themselves to do something they don’t enjoy, and that reading labels and calculating nutrients works only for a small minority of people. In contrast, you may find hours go by while you are active in your garden or cooking because the activity associated with gardening and cooking is inherently enjoyable to you. Each person’s definition of pleasant healthy eating and activity will vary. It will take some effort to identify and create associated habits, but we have learned from our review that it must be enjoyable for you; otherwise it will be difficult to sustain.

3. EAT and MOVE regularly. The human body was designed to move, and it functions best when it moves regularly; even more frequently than was previously thought. The recent research on sedentariness revealed that sitting for long periods of time – as we do in meetings – actually increases our risk of chronic disease. So we must move, not
just through recreational or occasional activity on weekends, but daily, almost hourly, through the use of sit-stand and treadmill desks, mobile meetings, and active and public transportation.

4. **EAT and MOVE** in a supportive environment. Ultimately, we all make personal choices about eating and physical activity. But why are more and more people becoming overweight and obese? Is it because people are becoming weak willed? Are people now less aware that they need to exercise more and eat less? Or does the problem lie in how and where we live: in an obesogenic environment in which it is easier to access unhealthy food than healthy food, to be pressured for time and dependent upon cars, and more likely to gain weight than to eat in a healthy way and be active? The evidence that social, physical, economic and built environments influence the choices made by individuals is overwhelming. I have struggled professionally with the ethics of instructing the public to be active and eat well when the obesogenic environment and their own body chemistry make this recommendation so difficult to follow. A more responsible approach is to also focus on policy development that would change the environment within which individuals are making decisions that affect their health. New York City has led the way in this area with their work on stairwell use, mobile meetings, bicycle parking bylaws, food policy, urban design and transportation policies.

Each of us (especially health professionals) must take action as individuals. It is easy to become overwhelmed with the challenges related to obesity prevention, but unlike organizations who will need time to change policies, we make eating and activity choices every few hours; therefore, we could make healthy eating and activity decisions right away. I must confess that as the lead for obesity prevention at the Region of Peel, I’ve realized that if I’m to have any credibility when asking the public to change or when advocating for organizational change, I have to demonstrate that I’m making healthy eating and daily activity a priority for myself.

There is no rationale for delaying action. For health professionals in particular, if you find yourself as I did, sitting for long periods of time eating high fat foods while discussing obesity prevention programs and then taking steps to improve the incongruency of the situation. Give out clipboards and have mobile meetings, improve the food served at meetings, and budget for a treadmill desk to use when reading reports or emails. Schedule these changes into the next meeting to make it a habit of the committee. Make it a policy for the team, then the organization, and then ask other organizations to change their policies.

There is much to be done, but holding ourselves accountable is the first and perhaps the most important task. It will make the challenges clear. It will also force us to find solutions. For health professionals and health organizations, it will go a long way toward showing our credibility to the public, because how we can recommend that which we are not trying to achieve ourselves? The positive enthusiasm will be contagious and it has the potential to influence the many policies that must change if we are to have a less obesogenic environment and a healthier population.
EXECUTIVE SUMMARY

In recent decades, the prevalence of childhood and adult obesity has been steadily increasing in Canada. The health concern is that obesity increases the risk of several diseases and conditions including type 2 diabetes, cardiovascular disease and some cancers. The prevalence of diabetes is already high in Peel region and with current obesity trends, it is projected that one in six people in our region will be diagnosed with diabetes by 2025. With its mission to protect and promote the health of the public, prevent disease and reduce health disparities, Peel Public Health is compelled to act to address this threat to the health of current and future generations.

Despite decades of exposure to messaging exhorting physical activity, 85 per cent of Canadian adults and 93 per cent of Canadian children and youth do not achieve the minimum level of physical activity necessary to ensure long-term good health and well-being. The public is inundated with confusing and at times conflicting advice regarding the intake of individual nutrients while people continue to make less healthy food choices. We know that providing information is insufficient to achieve behaviour change on a wide scale basis. It is time for a change in approach.

Preventive efforts need to target the immediate and underlying causes of adverse health outcomes. At its most simplistic, a person’s weight is determined by the food they eat and their level of activity. However, the circumstances in which people have been leading their lives over the past 20 to 30 years have changed considerably. Physical activity has been essentially engineered out of people’s lives and has been coupled with abundant, cheap and convenient food that is energy-dense and low in nutrients. These changes to our physical and social environments have exerted powerful influences on people’s overall caloric intake, on the composition of their diets, and on the frequency and intensity of physical activity at work or at school, at home and during leisure time. In striving for greater productivity and convenience, we have inadvertently created an ‘obesogenic environment’ in which our surroundings, opportunities and conditions of life are promoting obesity in our population.

The increasing rates of obesity are the result of a normal response by normal people to an abnormal environment. Realistically, public health’s only hope for tackling the obesity epidemic is to invest in policies and programs that create supportive environments for healthy eating and active living. Until then, individuals’ decisions will be undermined by an environment where healthy choices are unavailable or difficult to make. Peel Public Health will therefore shift its focus from obesity and healthy weights to creating environments that support healthy living, where the healthy choice is the easy default choice for both food and activity choices. While obesity and adverse health outcomes are the motivation for our work, the focus of our attention will be on addressing the upstream causes of unhealthy eating, physical inactivity and sedentary behaviours. Eating and movement are natural human activities, but they need to be re-normalized within our society.
This problem has been building for decades. The challenge is large and the expected timelines long. Based on the best available evidence and expert advice, our starting point is a portfolio of comprehensive, mutually reinforcing components addressing a variety of settings: preschools, schools, workplaces and the built environment. For example, this includes working with child care facilities and schools to increase the availability of healthy food options and to increase physical activity throughout the day. It includes supporting active transportation initiatives to increase students’ activity going to and from schools. It also includes healthy food standards for foods and beverages served in workplace buildings, starting with Regional buildings, as well as encouraging the design of buildings to encourage the use of stairs.

As shown in the above diagram, these types of programs will be supported by cross-cutting initiatives including: achieving policy change at all levels of government, such as policies for food nutrition labelling, advertising to children, transportation standards; a social marketing campaign; and ongoing surveillance, evaluation, research and use of the best available evidence. Furthermore, we intend to focus on healthy equity, diversity and inclusion by working closely with the region’s diverse populations, particularly the South Asian population, due to its relative size and higher than average health risk. Our next steps will be to engage relevant partners to develop multi-year action plans for each of the portfolio components. Now is the time for action and we look forward to learning as we move forward, working with our many partners, to create more supportive environments for health for the people of Peel.
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INTRODUCTION

The mission of Peel Public Health is to protect and promote health, prevent disease and reduce health disparities through a population health approach. In our most recent strategic plan, we highlighted the increasing prevalence of obesity in children and adults, and committed ourselves to addressing the underlying issues driving physical inactivity, unhealthy eating and sedentary behaviours.

We are faced with a formidable challenge reflecting widespread societal shifts over recent decades, resulting in changes in what and how much we eat, and the engineering of physical activity out of our lives. At the present time, many unhealthy behaviours are often the easy, if not, the only choice. The impact on our current and future health is enormous. Fundamentally, this is an issue about healthy and sustainable living for current and future generations.

We must begin to take comprehensive and concerted action to shift existing trends and norms in order to make healthy choices the easy choice. This report describes our in-depth analysis of the situation. Based on available evidence and expert recommendations, we have identified a set of principles to guide us moving forward and developed a portfolio of initiatives for us to initially pursue.

This report is structured in the following manner:

- Chapter 2 provides an overview of the nature of the business of public health: “The Public Health Way”
- Chapter 3 assesses what we know about obesity, unhealthy eating, physical inactivity and sedentary behaviours, and their determinants
- Chapter 4 describes the rethinking of our approach to healthy eating, physical activity and healthy living
- Chapter 5 describes our framework for action
- Following the conclusion, a series of appendices provide further supporting details and a list of references.
THE PUBLIC HEALTH WAY

The Peel Public Health Strategic Plan includes an extensive overview of “The Public Health Way” – essentially, setting out how, as a public health organization, we see the world, the nature of our business, and why we practice the way we do. Focussing on the health of populations to start and stay healthy, public health has four high level goals:

1. The improvement and maintenance of the health status of the population
2. The reduction of disparities in health status
3. Preparation for and response to outbreaks and emergencies
4. Enhancing the sustainability of the healthcare system.

In order to promote and protect the health of the population, public health seeks understanding of trends in health and disease, and the underlying causes or determinants of these health outcomes. This understanding then informs public health actions. The types of issues that public health tackles tend to be complex and influenced by a wide range of factors. As such, public health responses typically need to be comprehensive in nature and employ a variety of approaches, including public awareness and education, social policy, community partnerships, monitoring and enforcement, and in some circumstances, direct service delivery. Overall, public health’s focus is on improving the overall health of the population and reducing disparities in health among sub-populations.

“The Public Health Way” complements the strengths and focuses of clinical health care, which identifies those at greatest risk and provides interventions to reduce that risk. For example, clinical health care will commonly identify individuals at higher risk of heart disease due to high levels of serum cholesterol and/or high blood pressure. A range of treatments may be offered to reduce the levels of these risk factors and thereby lower the risk of acquiring heart disease.
When viewed from a population perspective though, the concept of risk is more complicated. Figure 1.1 shows the relationship between cholesterol levels and rates of death from heart disease (the dotted line). Those with the highest cholesterol levels (>7.5 mmol/l) have the highest rates (i.e., risk) of death, but only account for 8% of the heart disease deaths (the value above the bars), since relatively few people have levels this high (the bars). While those with moderately higher cholesterol levels between 5.5 – 6.0 mmol/l have only moderately elevated rates of death from heart disease, this cholesterol level is associated with 22% of the deaths. The key point is that even though those with the highest cholesterol levels have the highest rates of death due to heart disease, it is the much larger numbers of people at moderate risk that account for a substantial proportion of cases of disease.

An implication of the above figure is that reliance on an approach that provides interventions predominantly to those at highest risk, in this case those with the highest cholesterol levels, does not address the majority of the risk burden, which is borne by those at moderate risk. In addition, treating those at highest risk does not serve to “alter the underlying causes of the disease, but to identify individuals who are particularly susceptible to those causes.”\(^2\) In other words, treating those at highest risk does not address the underlying causes of why individuals at moderate and high risk have elevated cholesterol levels. While the provision of care and treatment is important, it does nothing to address the underlying reasons why elevated cholesterol levels are occurring in the population. Furthermore, while modifiable causes, such as unhealthy eating and physical inactivity, may be recognized, seeking change through a high risk approach is challenging since “life-style characteristics are constrained by social norms.”\(^2\) It is difficult to change behaviour when other people and social cues are reinforcing the adverse behaviour.
A population approach aims to address the limitations of focusing solely on those at highest risk by addressing underlying causes in order to influence the level of risk of the entire population throughout the life cycle. In effect, the intent is to shift the distribution of the disease risk curve to the left, thereby lowering the mean level of a risk factor within a population so that the entire population benefits from improved health status. Figure 2.1 provides an example from Finland where the entire distribution of cholesterol levels was shifted over time and contributed to a substantial decrease in heart disease in that country.

**Figure 2.1**
Shift in the Distribution of Cholesterol in Men in North Karelia, Finland between 1972 and 2007

As illustrated in Figure 2.2, conceptually, a population-based approach to obesity intends to apply strategies that will eventually shift and squeeze the distribution of body mass index (BMI) by increasing the proportion of the population with a healthy weight and decreasing the proportion that are overweight and obese. The next chapter will examine in further detail the extent and nature of the challenge to achieve this shift.

**Figure 2.2**
Illustration of Shifting the Population Distribution Having a Healthy Weight

A simple shift of the population distribution of BMI would increase the proportion of the population with a low BMI, which is associated with adverse health effects. Therefore, the population distribution curve needs to shift, as well as, squeeze or become narrower so that the number of individuals at low BMI levels does not increase. Figure 2.1 illustrates a shift and squeeze phenomenon with cholesterol levels in Finland.

ASSESSING THE SITUATION

Overview

In tackling this strategic priority, we undertook a multi-pronged approach seeking information from a variety of sources, including published scientific literature, expert reviews and their recommendations, and strategy documents from this and other jurisdictions. In addition, we commissioned our own reviews of the evidence and sought advice from a panel of experts from across Canada.

The “epidemic of obesity” has received considerable attention in recent years. Justifiably, concerns have been expressed regarding the many adverse health outcomes associated with elevated body weight. However, viewed through a “public health lens”, the issue of overweight and obesity is merely the more visible reminder or indicator of a broader health challenge for our population.

As illustrated in Figure 3.1, obesity, high blood pressure and high blood cholesterol are risk conditions that lead to a wide variety of adverse health outcomes, including cardiovascular diseases, diabetes, kidney diseases and some cancers. The immediate causes of these risk conditions are the adverse behaviours of physical inactivity and unhealthy eating, which also have direct effects on the disease outcomes independent of the risk conditions. The overall observation is that while obesity clearly is an important part of the causal web for several chronic diseases, it is only part of a much larger picture. In addition, the many influences on physical inactivity and unhealthy eating that are present throughout the lifecycle are not shown in the figure and will be addressed later in this report.
Creating Supportive Environments for Healthy Living in Peel

The following section provides an overview of the burden of these outcomes, risk conditions and health-related behaviours for the population of Peel.

The Magnitude of the Problem

The region of Peel is home to over 1 million residents and includes the cities of Brampton and Mississauga, and the town of Caledon.

Peel’s demographic makeup is characterized by a larger proportion of children, young families, immigrants and visible minorities, compared to Ontario. Approximately half (49 per cent) of Peel’s population are immigrants, of which more than half were born in Asia and the Middle East. In comparison, immigrants represent only 28 per cent of the Ontario population. A

Defining Overweight and Obesity

The World Health Organization (WHO) defines overweight and obesity as “abnormal or excessive fat accumulation that may impair health.” Overweight and obesity are classified through use of the body mass index (BMI), which is calculated by taking weight in kilograms (kg) and dividing it by the square of height in meters (m) (kg/m²). Canadian and international guidelines for body weight classification categorize the level of health risk at a given BMI category. For adults aged 18 years and older, at a BMI equal to or greater than 25 (i.e., overweight), there is, on average, increased risk of developing health problems. At a BMI of equal to or greater than 30 (i.e., obesity), there is, on average, a high risk of developing health problems. 6
The classification of BMI is primarily derived from Caucasian populations. However, research indicates that other ethnic groups may be at a different level of health risk at a given BMI due to differing body proportions (i.e., percentage body fat and body fat distribution). For example, the level of health risk associated with overweight and obesity (e.g., increased risk of type 2 diabetes and cardiovascular disease) at a given BMI appears to be higher for those of South Asian descent. Special consideration for various ethnic groups is relevant to Peel Public Health due to the ethno-cultural diversity of Peel.

The prevalence of overweight and obesity is most often assessed at a population level using self-reported weights and heights to calculate BMI. Although self-reported BMI is a practical tool to monitor trends in overweight and obesity within and between populations, it is the self-reporting that may lead to inaccuracies, as respondents tend to overestimate height and underestimate weight. For example, in 2008 in Canada, the prevalence of obesity was 17.4 per cent by self-report compared to 25.4 per cent by measurement.

To overcome the challenges of using BMI as a measurement, additional methods of assessment are necessary. Waist circumference measurement, waist-to-hip ratio and waist-to-height ratio, are regarded as better indicators of obesity related health risk because they measure abdominal obesity and provide information on the distribution of fat.

Physical fitness is protective against cardiovascular disease and diabetes independent of BMI. In other words, maintaining a level of fitness can counter some of the obesity related health risks of weight gain over time. A variety of measures (e.g., aerobic fitness, flexibility, muscular endurance and muscular strength) can be used in addition to BMI and waist circumference for a more complete picture of fitness and the relationship to current health status and future risk of disease.

Prevalence of Obesity and Overweight

In Canada, the rates of obesity have increased significantly over the past 30 years, from six per cent in 1985 to 15 per cent in 2004 (self-reported BMI); and from 14 per cent in 1978 to 23 per cent in 2004 (measured BMI). From the Canadian Health Measures Survey, the prevalence of measured overweight and obesity was 61 per cent in 2008-09, with approximately 37 per cent overweight and 24 per cent obese. Among children, 26 per cent of Canadian children were overweight or obese (nine per cent overweight, 17 per cent obese).

In Peel, rates of overweight and obesity are of similar concern to those at a national level. In 2007/08 approximately half of Peel adults (aged 18 and older) were classified as overweight (36 per cent) and obese (15 per cent). In 2011, as part of a Student Health Survey, Peel Public Health measured heights and weights of more than 7,500 children and youth in grades 7 to 12. Findings were alarming as 37 per cent of the males and 27 per cent of the females were classified as overweight/obese. Males were more likely than girls to be classified as obese (16 per cent and nine per cent respectively). Table 3.1 indicates that the proportion of children and youth classified as overweight/obese was found to be highest in the younger grades.
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Body Composition and Fitness Profiles

Results from the 2010 Canadian Health Measures Survey (CHMS), report that muscular strength has decreased significantly for men and women aged 20 to 59 years, and flexibility also declined for both sexes among those aged 20 to 39 years, and for men aged 60 to 69 years. The declines in fitness were most pronounced in young adults, who demonstrated the largest percentage with a waist circumference that place them at high risk for health problems. Similar to adults, the fitness levels among Canadian children have declined significantly since 1981. In 2007–09, a typical 12-year-old boy and girl had significantly lower muscular strength and flexibility than their 1981 counterpart.

Peel Public Health assessed the fitness levels of students in grade nine as part of the 2011 Student Health Survey. Results from this assessment indicate that more than one-third of males and nearly half of females in grade nine failed to meet current standards of acceptable cardiorespiratory fitness, and approximately three-quarters of all grade nine students’ musculoskeletal fitness scores fall within a range that is associated with some to considerable health risks.

Obesity and Demographic Variables

Overweight and obesity are influenced by a complex combination of biological, socioeconomic, environmental, behavioural and cultural factors. The prevalence of overweight and obesity varies within and between populations based on demographic variables, including income, ethnic origin and immigrant status.

In general, individuals with higher income levels are less likely to be at risk for overweight and obesity compared to lower income individuals. This pattern is true for females in Peel, where the prevalence of obesity declines with rising income. However for Peel males, there is an increased prevalence of obesity with rising income levels.
The rates of overweight and obesity are different among various ethnic groups. For example, 59 per cent of Ontario residents of Latin American origin report being overweight or obese in comparison to only 26 per cent of East/Southeast Asian origins.\(^8\) In addition, Figure 3.2 shows that long-term immigrants (immigrated 11 years ago or more) are more likely than recent immigrants (immigrated 10 years ago or less) to be overweight and obese.\(^8\) Such differences are of concern due to the large number of immigrants coming to reside in the region of Peel. Although the prevalence of overweight and obesity is lower when immigrants arrive to Canada, it is likely to rise as time passes as a result of acculturation to the western lifestyle (e.g., less physical activity and poorer diets).\(^15\)

**Obesity and Health Outcomes**

Although individuals who are obese can also be healthy, there is an increase in the number of obese people in a population who are experiencing disease and poor health. Extensive research has identified many health risks and medical complications associated with obesity. Obesity increases the risk of many chronic diseases and conditions, including type 2 diabetes, cardiovascular disease, some types of cancer, respiratory dysfunction and osteoarthritis.\(^8\) It is estimated that among adults, aged 20 to 64 years, the proportion of all deaths attributable to overweight and obesity increased from 5.1 per cent in 1985 to 9.3 per cent in 2000.\(^8\)

Among Ontario residents, there is a close relationship between BMI and diabetes and heart disease. Figure 3.3 shows the significant increase in the prevalence of diabetes with rising BMI, as well as, a doubling in heart disease prevalence as BMI increases.\(^8\)

The proportion of Peel’s population with hypertension more than quadruples when comparing across BMI categories (underweight/normal weight: 8.2 per cent; overweight: 19.7 per cent; obese: 34.9 per cent).\(^8\)

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**Figure 3.2**

*Overweight and Obesity by Immigrant Status, Ontario, 2007/2008*

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<tr>
<th>Immigrant Status</th>
<th>Per cent of population aged 18 years and older</th>
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<tr>
<td>Recent Immigrant</td>
<td>6.9 (Overweight: 27.7, Obese: 34.7)</td>
</tr>
<tr>
<td>Long-term Immigrant</td>
<td>15.0 (Overweight: 36.9, Obese: 34.7)</td>
</tr>
<tr>
<td>Non-Immigrant</td>
<td>19.3 (Overweight: 36.9, Obese: 34.7)</td>
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Note: Excludes pregnant women

Of particular concern is the relationship between obesity and diabetes. The prevalence of diabetes, which is largely influenced by increasing rates of obesity, is high and is expected to continue rising in the region of Peel. Currently it is estimated that one in 10 adults living in Peel region have been diagnosed with diabetes; and without intervention, this is projected to rise to an estimated one in six by 2025.16

Overweight and obesity have direct and indirect impacts on the burden of disease. The Canadian Institute for Health Information (CIHI) and the Public Health Agency of Canada (PHAC) recently reported that the annual economic burden of obesity in Canada is estimated to range from $4.6 to $7.1 billion.8 Therefore, not only do overweight and obesity impact morbidity and mortality of Peel residents and Canadians, but also threaten the sustainability of the Canadian health care system.
Creating Supportive Environments for Healthy Living in Peel

**Ongoing Monitoring and Surveillance**

Peel Public Health will continue to analyze data from the Canadian Health Measures Survey, the Canadian Community Health Survey and other relevant data sources in order to identify population level trends in overweight/obesity and other health-related behaviours (e.g., physical activity, fruit and vegetable consumption). In addition, a Region of Peel Obesity Health Status Report is currently underway and will provide more recent information and data on the magnitude of the problem related to overweight and obesity.

**Analyzing the Epidemic of Obesity**

*Why has an Obesity Epidemic Occurred?*

At its most simplistic, “a person’s weight is determined by the energy they take in (the food they eat) and the energy they put out (how active they are).”18 Overweight and obesity develop “over a period of time, [where] energy intake exceeds energy expenditure.”19 A relatively small amount of daily excess energy intake, on average, over a long period of time results in obesity. In fact, an excess energy balance of just 30 kcal/day is sufficient to generate the increase in average adult bodyweight observed over the past 30 years.20 Modelling in this and other countries has found that the increases in daily energy intake alone could account for the observed increases in rates of obesity.21

The elimination of the small amount of excess energy intake can prevent further weight gain. However, actual weight loss is more challenging. As weight accumulates, energy is consumed to maintain the new weight. In order to lose weight, one needs to reduce the energy intake to stop gaining weight and address the “maintenance energy gap,” which requires negative energy balances in the hundreds of kilocalories per day.17 Understandably, “it is much easier for people, and populations, to gain weight than to lose it.”22 The relative effort to achieve a 150 kcal negative energy balance is shown in the text box. The larger question is why has a positive energy balance been experienced across communities and countries?

---

**Energy Balance – nine-year old boy weighing 30 kg**

To achieve a 150 kcal negative energy balance, either:

- Replace 1.9 hours of sitting with 1.9 hours of walking; or,
- Replace one can of a sugar-sweetened drink with water.


---

**Why Does a Chronic Positive Energy Balance Exist Through Increasing Proportions of the Population?**

*The increasing rates of obesity are the result of a normal response by normal people to an abnormal environment.*23

Posing the question of why a chronic positive energy balance exists for so many people exposes the multi-dimensional nature of the situation. Overall, there are three broad categories of factors that are important to understand in order to develop an informed response: biology/physiology; behaviours; and, the social and physical environment.

**Biology/Physiology**

Since the trends of increasing obesity in recent decades reflect a very short time period of human existence, a fundamental change in human biology cannot explain what has occurred. Nevertheless, our biology is at the
heart of the challenge. “Human metabolism is the product of nearly four million years of natural selection, the majority of which occurred in an environment that demanded vigorous physical activity, provided access to a nutritious, but low-energy diet, and was characterized by cycles of feast and famine.”23 Accordingly, our physiology is geared to accumulate and preserve weight.25 In fact, recent evidence indicates that following diet-induced weight loss, compensatory hormonal changes encouraging weight regain persist for at least 12 months after initial weight reduction.26

“Food is a fundamental biological necessity and the body has evolved to make sure that its needs are met. The hunger drive is powerful and compels humans to search out food. By contrast, there is limited sensitivity to abundance. The feelings of having had enough (satiety cues) are weak and easily overridden by external factors, such as the sight of food or how it tastes... This asymmetry of appetite begins to explain why it is so easy to put weight on and so difficult to take it off.”19 The difficulty of widespread voluntary caloric restriction is evidenced by the people of Okinawa who were unique in historically practicing an approach to eating in which they would eat until they were 80 per cent full. Their caloric restriction is believed to be an important contributor to their marked longevity.27 However, considerable social change since the 1950s has resulted in dietary change with increases in BMI and disappearance of the Okinawan mortality advantage, except in older cohorts.27

Biological processes also have inter-generational effects. For example, excess maternal weight gain during pregnancy can lead, not only to post-partum weight retention in the mother leading to her obesity, but can lead to the child being born pre-term or larger than normal.28 In the longer term, excess maternal weight gain during pregnancy increases the child’s risk of obesity.29

Behaviours

The extent of change in dietary intake and physical activity, required at a population level, to generate an obesity epidemic are not large. While trends in increasing caloric intake have been described,30 long-term trends of total physical activity are not available. Nevertheless, there is widespread agreement that there have been “systematic reductions in energy expenditure as a consequence of fewer manual jobs, increases in car ownership, and the rise of labour-saving devices for use at home and work.”19 Among children, reductions in walking and cycling to school, less outdoor unsupervised play, and increased “screen time” have been identified as trends reducing physical activity.31 Furthermore, some screen time activities, such as watching TV, also increase the risk of increasing caloric intake.32
Social and Physical Environment

Major and fundamental changes have occurred in how people lead their lives. In general, physical activity has been engineered out of the environment in the past few decades. Examples of this include:

- Decrease in and disincentives for the need to walk
- Decline of manual occupations
- Perceived safety concerns for children, leading to reduced opportunities for outdoor play
- More home appliances
- Design of neighbourhoods to support the use of cars.19

Eating behaviours have also undergone changes in recent decades. Examples include:

- Ready availability of inexpensive, energy-dense, nutrient-poor foods
- Increased frequency of eating out
- Aggressive marketing of less healthy foods, beginning in early childhood.19

Further lifestyle changes have occurred with time allocated to work and commuting. The resulting time-pressed lives leave little time for physical activity, discourage food preparation and reduce sleep duration.33

The latter is of concern due to associations of reduced sleep duration with obesity, which may be due to increased energy intake with chronic sleep restriction.34

The Net Result

Obesogenic Environment

The sum of the influences that the surroundings, opportunities or conditions of life have on promoting obesity in individuals and populations.


The fundamental problem is that due to a variety of physiological, behavioural and environmental influences, obesity outcomes are the “result of a normal response by normal people to an abnormal environment.”23 Our once useful survival traits to consume and preserve weight are now counterproductive in the current obesogenic environment.34 Essentially, our biology is “out of kilter with society.”25 Overall, “it is now well accepted that the causal pathways driving the increases in obesity prevalence involve societal and environmental changes laid onto the underlying, but relatively stable genetic, and behavioural susceptibility of individuals.”35

The societal changes that were implemented were intended to improve our productivity and quality of life. With hindsight, considering the massive changes that have occurred in society in recent decades and the nature of the underlying biology of humans, it would have been surprising if an obesity epidemic had not occurred. Analysis prepared for the Organization for Economic Co-operation and Development (OECD) summarizes that “the circumstances in which people have been leading their lives over the past 20 to 30 years, including physical, social and economic environments, have exerted powerful influences on their overall caloric intake, on the composition of their diets, and on the frequency and intensity of physical activity at work, at home and during leisure time.”36
Figure 3.4 adds these “causes of the causes” and recognizes the importance of our obesogenic environment in driving unhealthy eating, sedentary behaviours and physical inactivity. While these behaviours are ultimately conducted by individuals, these behaviours do not occur in isolation of the social and physical environments where we live, grow, work, play and go to school. These environments have undergone considerable change in recent decades and there is widespread consensus that these are the underlying, primary causes of the causes responsible for the population-wide appearance of adverse behaviours, adverse risk conditions and adverse health outcomes.

**Figure 3.4**
Causes through Conditions and Outcomes

- **Unsupportive Environmental Factors – “Underlying Causes”**
  - Busy, overscheduled lives, sedentary jobs and poor work-life balance
  - Abundant, cheap and convenient food that is high in calories and low in nutrients
  - Excessive marketing and promotion of less healthy foods
  - Reliance on television, computers, mobile devices, media and other forms of sedentary entertainment
  - Dependence on technology and labour-saving devices
  - Lack of places to be active and less time for unstructured play
  - Communities designed for cars rather than walking, biking or playing*

- **Adverse Behaviours “Immediate Causes”**
  - Physical Inactivity
  - Unhealthy Eating

- **Adverse Risk Conditions**
  - High Blood Pressure
  - Obesity
  - High Blood Cholesterol

- **Adverse Health Outcomes**
  - Cardiovascular Diseases
  - Cancers (breast & colon)
  - Kidney Diseases
  - Diabetes (type 2)

*Source: Growing up healthy discussion framework for a childhood obesity prevention strategy Nova Scotia, 2011.*
Won’t the Health Care System Cure this Problem?

Individuals who are overweight/obese, and particularly those experiencing adverse health effects, need to receive appropriate health care services. However, as highlighted by the earlier discussion of “The Public Health Way,” expecting this approach to solve the problem is unrealistic. First, treating obesity and its adverse health outcomes does nothing to prevent more and more people from developing obesity and a range of chronic diseases because the causes of unhealthy eating, physical inactivity and sedentary behaviours remain untouched. Second, it is extremely challenging to initiate and sustain behaviour change when the surrounding social and physical environments are compelling unhealthy living. “Supporting and encouraging people to respond more healthily to that abnormal situation is important, but the range of options within which people make their choices is skewed in favour of weight gain rather than weight loss.”

Considering our biology and the current state of social and physical environments, losing weight and sustaining that weight loss is an extremely challenging proposition. Existing research indicates that intensive behavioural interventions involving 12 to 26 sessions in a year have been associated with a six per cent loss of baseline weight. These modest short-term reductions in body weight may not be sustained in the long-term; regaining weight is common due to the ongoing challenges from modern living. Even if there was long-term success, having the 25 per cent of the adult population that are obese attend multiple behavioural sessions raises some considerable feasibility issues since health systems everywhere are already struggling to contain costs, even if staff trained to perform these interventions were available. Without prevention and control of the risk factors for obesity now, health systems will be overwhelmed to the breaking point.

As losing weight is such a challenge, a reasonable approach is to act throughout the life cycle (starting with pregnancy and the early years and continuing throughout the school years and adulthood) to create an environment...
that encourages healthy growth. The health care system not only has a complementary role for providing clinical care to those experiencing adverse health impacts, but can support the desired outcomes through its services (e.g., prenatal counselling, breastfeeding supports, monitoring growth and development, etc.).

**Is Obesity the Right Target for Public Health Action?**

Over the course of the past decade, there has been a long series of reports in this and other countries focusing on obesity. Peel Public Health and other public health organizations are increasingly questioning an approach where the focus is to decrease obesity.

**The Difference Between Causes and Outcomes**

As previously described, public health is in the prevention business. This means identifying the causes of adverse health outcomes and addressing them. As shown earlier in Figure 3.4, obesity is an intermediate-type outcome that increases the risk of a variety of chronic diseases. The immediate causes are physical inactivity, sedentary behaviour and unhealthy eating, but the underlying causes are environmental. While outcomes, such as obesity, can provide motivation for priority setting and action, interventions need to tackle the immediate and underlying causes, such as institutional food policies, facilitating physical activity while at school and work, and addressing the design of the built environment.

**Obesity Rates Are Not an Ideal Measure of Success**

Obesity trends have developed over a period of decades and it is likely that reversing these trends will take a similarly long time period. Due to the nature of physiological mechanisms, we are more likely to be successful in preventing obesity than reversing it; given that many people are unable to sustain weight loss and the timelines to alter the underlying social and physical environmental causes. Furthermore, because physical activity and healthy eating have positive health effects independent of their effect on a person’s weight, populations can become healthier due to lifestyle changes and communities more supportive of healthy living, which are precursors to longer term changes in obesity trends. While obesity and other health outcome trends need to be monitored from an impact perspective, attention needs to be focussed on changes to physical activity and fitness levels, sedentary behaviour, and eating behaviours and their causes (e.g., policy change, availability of healthy and affordable foods, physical activity opportunities incorporated into work and school lives, etc.).

**Potential Adverse Impacts of Focussing on Obesity**

Compared with other intermediate outcomes, such as high blood pressure or high cholesterol, obesity is externally visible. Public and media focus tend to be on appearance, rather than health. This ease of identification potentially places overweight/obese individuals at risk for stigmatization, which is pervasive and even argued for as a useful approach to motivate obese persons to adopt healthier behaviours. However, since obesity is an expected normal response by normal people to an abnormal environment, it is both unfair and inappropriate to blame individuals for being obese. Furthermore, stigma is not only an unlikely motivator, it is counter-productive, with studies indicating that it increases the risk for binge eating. An additional concern is that over-attention to weight risks feeding concerns for body image and eating disorders. “Body dissatisfaction is associated with binge eating and other eating disordered behaviours, lower levels of physical activity and increased weight gain over time.”

**Weight ≠ Health**

The focus of public health is ultimately on a healthy population. The reality is that weight is only one aspect of health. Individuals can be healthy yet overweight (see next section), and those at a normal weight can be unhealthy due...
to the presence of other risk factors or genetic differences. For example, elevated health risk occurs for some populations (e.g., South Asians, Southeast Asians, Aboriginals) even when they fall within a healthy BMI range due to factors, such as percentage body fat and body fat distribution. Their physiological predisposition for metabolic syndrome places them at increased risk for obesity, heart disease, diabetes and other health conditions. For this reason, the development of ethnic-specific assessment tools is an area of active research.

The Health Benefits of Physical Activity and Healthy Eating Independent of Obesity

The importance of being active is more than simply the burning of calories. Being fit or active is associated with a reduction in the overall risk of death, and in particular, from cardiovascular disease. A recent summary of 80 studies calculated a six to nine percent reduction in the risk of death for each hour of activity each week for moderate-vigorous and vigorous levels of intensity respectively (see Lower Risks box below). Moderate intensity activities of daily living, walking and physical activity for transportation were associated with a four per cent decrease in mortality for each hour of activity per week.

The health benefits of physical activity exist regardless of BMI. Existing evidence from multiple studies indicates that “the risk for all-cause and cardiovascular mortality is lower in individuals with high BMI and good aerobic fitness, compared with individuals with normal BMI and poor fitness.”

However, as BMI increases, it creates a barrier to physical activity. Among those that are overweight/obese and inactive, “despite the apparent benefits of vigorous exercise, a pragmatic approach may be preferred [with] the initial threshold for beginning physical activity… as low as possible.” There is a dose response between non-vigorous physical activity and a reduction in the overall risk of death, with the largest risk reduction between those that are inactive and those having low levels of activity. Specifically, adults having the recommended minimum levels of activity at that time (i.e., 30 minutes daily of moderate intensity on five days a week) have a 19 per cent lower risk of death than those who are inactive.

The new Canadian Physical Activity Guidelines for adults aged 18 to 64 years now recommend the accumulation of at least 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week, in bouts of 10 minutes or more.

Lower Risks of All Causes of Death with Physical Activity

Vigorous exercise – nine per cent decrease per hour per week
Moderate-vigorous – six per cent decrease per hour per week
Moderate-intensity – four per cent decrease per hour per week


Why being sedentary may be unhealthy, independent of physical activity?

While our understanding still needs to improve, existing research indicates that being sedentary, independent of physical activity levels, has adverse effects on different body systems, including adverse effects on lipoprotein levels and glucose tolerance, reductions in bone mass/density, and changes in blood pressure and vascular function.

An additional consideration is the growing body of evidence that sedentary behaviours are not simply the extreme end of physical inactivity, but may represent a health risk independent of overall level of physical activity. This has implications for those who meet minimum physical activity recommendations, but still have a significant amount of sedentary behaviour.\textsuperscript{32, 48-50} Furthermore, sedentary behaviours, such as TV watching, also appear to be associated with unhealthy eating behaviours while watching TV.\textsuperscript{49} Among those who are quite sedentary, reducing sedentary behaviour may be more achievable/viable as an initial goal for increasing movement and energy expenditure that is achievable with minimal financial or time requirements.

There are also dietary factors independent of obesity (i.e., caloric intake is not the only aspect of healthy eating). Many dietary components are directly linked to cardiovascular and cancer outcomes. These include vegetable and fruit consumption, fibre intake, salt intake and trans-fats.\textsuperscript{6}

### SUMMARY

This section has reviewed why an obesity epidemic has occurred due to societal and environmental changes interacting with biologic and behavioural susceptibilities. It has also described why an approach reliant on individual treatment cannot be expected to work and the need for public health’s focus to be on the immediate and underlying causes driving this epidemic. This is the focus of the next section of this report.

**Determinants of Unhealthy Eating, Physical Inactivity and Sedentary Behaviours – The Causes of the Causes**

The preceding section described the consensus that exists regarding the society-wide changes that have occurred leading to changes in our eating and physical activity behaviours. The purpose of this section is to review in more detail our understanding of these underlying causes in order to inform our strategy development.

The most comprehensive analysis in this area has been conducted in England, where a team of multi-disciplinary researchers (Foresight Committee) developed an obesity system map to capture the underlying causes that ultimately influence individual eating and energy expenditures.\textsuperscript{19} The resulting diagram includes over 100 variables with a multitude of inter-relationships and feedback loops. Figure 3.5 depicts a simplified version of the map and highlights a series of thematic clusters. A full version of the map showing the individual variables is provided in Appendix 2.
Key points from a high level analysis of the Foresight system map includes the following:

1. **Physical activity and eating are highly multi-dimensional behaviours.** Physical activity can occur in a variety of contexts, including transport to destinations (such as school and work), activity at work and school, domestic activities, as well as, in recreation. Similarly, eating has a number of dimensions, including nutritional quality, portion size, food abundance, taste, energy density, convenience and cooking skills.

2. **Physical and social environments influence individual level decisions.** The broader food environment includes influences such as the pricing and composition of foods provided in the marketplace. The family mealtime environment, which influences children’s eating habits, is influenced by perceived lack of time, demand for convenience, de-skilling and TV watching. Physical activity options are influenced by a range of factors from the design of communities and whether it is feasible and safe to walk to work, school or the corner store to whether our workplace is designed to foster movement throughout the day.

3. **Psychological and physiologic factors influence decisions.** These broad categories include factors such as the marketing of foods, stress and time pressures. Also included are our physiological mechanisms regarding appetite control and accumulating energy, as well as, early life factors, such as appropriateness of maternal body composition and the quality and quantity of breastfeeding. A key consideration is that people’s decisions often occur in the context of something called “psychological ambivalence.” This refers to the “psychological conflict between what people want (e.g., fatty, sweet foods) and their desire to be healthy…people know that rich foods are less healthy for them and that moderate exercise is beneficial. But people get positive sensations from eating foods that are laden with calories or excess salt, while, on the other hand, finding the time to exercise is very hard.”

The point is that while eating and physical activity are ultimately conducted at an individual level, the context within which these decisions are made are considerably broader and are currently, generally unsupportive of healthy choices. At the present time, individual behaviour change regarding improvements in physical activity and healthy eating, when they occur, are occurring in spite of the current forces within our society.

The following sub-sections provide additional information regarding our understanding of these health-related behaviours.

**Healthy Eating**

Healthy eating is a complex multi-dimensional behaviour that includes decisions about acquiring, preparing and consuming foods that are influenced by family and social contexts. The term “healthy eating” implies viewing eating from a health perspective. However, in people's lives, the relationship between food choices and diet, nutrition or health knowledge is often weak and insignificant. Food is very important in our lives, and is loaded with meaning – conviviality, hospitality, religion, comfort, class, culture, family, love and so on – but not health. As described later in this chapter, food preferences, eating behaviours and perceptions to healthy eating are strongly influenced by cultural and social norms. Surveys indicate that consumers understand generally what it means to eat healthy and that eating healthy foods are beneficial, but continue to make less healthy food choices. The idea that nutrition knowledge can change behaviour is based upon the faulty assumption that consumers are mindful and involved in their food choices. In reality, consumers do not think very much about their food choices.
Figure 3.5
Foresight’s Obesity System Map Emphasizing Thematic Clusters

A key argument for establishing healthy eating behaviours from the beginning of life is that it is extremely difficult to motivate individuals to change their eating behaviours and sustain those changes in the long-term.54-56 Familial influences are important from a number of perspectives. Parents have their strongest influence in the early years of life through a healthy pregnancy, “the choice of an infant feeding method, the foods they make available and accessible, by direct modelling influences, the extent of media exposure in the home, and by the way they interact with children in the eating context.”57 These parental decisions do not occur in isolation, but within a broader context of familial and social influences (e.g., social barriers to breastfeeding).58

Individual variation in the regulation of energy intake exists as early as the preschool period and these differences are associated with differences in child-feeding practices and children’s adiposity.57 For example, breastfed infants may learn to self-regulate energy intake better than non-breastfed infants.59 In addition, infants provided with opportunities to be active (e.g., tummy time) may encourage greater motor development and physical activity.60, 61

Eating together as a family can facilitate healthy eating among children and youth62 and expose children to food preparation and cooking skills. Anecdotally, a lack of such knowledge and skills has been identified as a gap amongst children, youth and some young adults in Peel.24 Where TV viewing is a normal part of meal routines, children eat fewer fruit and vegetables, and consume more pizza, snack foods and sodas63 compared to children who live in households where TV and eating are separate activities.24 The sedentary behaviour associated with screen time (i.e., TV watching, playing video games and computer use) is associated with increased snacking and less nutritious food choices.64 Food is the most frequently advertised item on children’s TV and predominantly involves sweetened products and fast food.65 Research shows that an association exists between children and youth’s exposure to TV advertising and overweight and obesity.66-68
Portion sizes have been increasing since the first half of the 1980s and have been influenced by a variety of environmental factors, including eating out more frequently.69,70 This increasing trend in portion size has been occurring concurrently with the increase in overweight and obesity.18,69-71 From a business perspective, the cost of food for a restaurant is a relatively minor part of overall expenses, and it is considered good business to serve larger portions with the result that regular restaurant portions are often two or three times a standard serving.70 Research has demonstrated that children’s energy intake increases when larger portions are offered.69

In the past, eating out was an occasional social event by the average person or family. However, today, eating out has become much more frequent to address lifestyle time constraints, a lack of cooking skills, and is often driven by social norms and the desire for convenience.63 Over the past few decades, food establishments, and in particular fast food outlets, have seen unprecedented growth in consumption and locations. In Canada, from 1990 to 2006, restaurant revenues more than doubled, increasing from $16.5-34.4 billion.72 Since then, restaurant revenues grew a further 18 per cent from 2006 to 2011.73 The challenge is that fast food and restaurant meals, compared to home-prepared meals, are typically higher in calories and fat, lower in nutrients and larger in portion size.63,72

Children and youth spend a significant amount of time in school/preschool settings. These environments make important contributions to their eating behaviours. The overall availability and access to food in schools has increased as meal programs, vending machines, cafeterias, school events, tuck shops (i.e., school stores) and food-based fundraisers have become commonplace. The types of food and beverages typically sold in schools and offered in preschools have been high-fat, high-sugar and/or high-sodium and offer minimal nutritional value.74 In Ontario, there has been momentum building to change the school nutrition environment into one that supports healthy eating. This includes school nutrition standards, a revised curriculum and legislation (Healthy Food for Healthy Schools Act). More information is needed regarding the implementation and impacts, anticipated and otherwise, of these various policies and interventions. For the preschool population, there is further attention required to update the Day Nurseries Act (1990). Recommendations should be expanded beyond meeting the minimum recommended food servings from Canada’s Food Guide to assessing the health value of the food and beverages offered.

In summary, the overall trend is that of a food system that favours cheap, energy-dense food and a consumer culture that responds well to marketing and advertising and which operates with a more is better mentality.75,76 Fast food outlets cater to the demand for time-saving food preparation, provide palatable and cheap foods, and are attractive to children and youth.70,72 Time pressures and loss of food preparation skills are reducing the preparation of food prepared and consumed within family contexts, which make important contributions to establishing healthy eating in children and youth.
Physical Activity

Physical activity is similarly a complex, multi-dimensional behaviour. While sometimes equated with leisure time exercise, there are many different types of opportunities for physical activity through the course of a typical day. These include:

- Transport activity (to school, work, shopping, etc.)
- Occupational activity (at work or school)
- Domestic activity (at home)
- Recreational activity (discretionary/voluntary).

The reason why physical activity frequently centres on recreational activity is that as a society we have essentially engineered physical activity out of the rest of our lives. There is a dominance of motorized transport and sedentary employment with a depreciation of labour. A reliance on labour-saving devices exists at home and at work.

A focus predominantly or solely on recreational sources of activity positions activity against multiple competing demands. It frames activity as an extra versus something that should be intrinsic to people’s daily lives. A key reason for incorporating physical activity into the regular activities of people’s days is related to our over-scheduled lives. Analysis of hypothetical daily routines for children (see Table 3.1) indicates that physical activity guidelines can be met, but only at the expense of a number of daily activities such as homework, TV and household chores.

**Table 3.1**

<table>
<thead>
<tr>
<th>Start time</th>
<th>End time</th>
<th>Activity</th>
<th>Duration</th>
<th>Cumulative time</th>
<th>Moderate phys-act</th>
<th>Vigorous phys-act</th>
</tr>
</thead>
<tbody>
<tr>
<td>0700</td>
<td>0730</td>
<td>Wake up, bathroom, get dressed</td>
<td>30</td>
<td>30</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0730</td>
<td>0800</td>
<td>Travel to daycare</td>
<td>30</td>
<td>60</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0800</td>
<td>0900</td>
<td>At daycare</td>
<td>60</td>
<td>120</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0900</td>
<td>0915</td>
<td>Walk or bus from daycare to school</td>
<td>15</td>
<td>135</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>0915</td>
<td>1545</td>
<td>At school</td>
<td>390</td>
<td>525</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>1545</td>
<td>1600</td>
<td>Walk or bus from school to daycare</td>
<td>15</td>
<td>540</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>1600</td>
<td>1730</td>
<td>At daycare</td>
<td>90</td>
<td>630</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>1730</td>
<td>1800</td>
<td>Travel home</td>
<td>30</td>
<td>660</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1800</td>
<td>1815</td>
<td>Play indoors</td>
<td>15</td>
<td>675</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1815</td>
<td>1845</td>
<td>Eat dinner</td>
<td>30</td>
<td>705</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1845</td>
<td>1915</td>
<td>Travel and prepare for extracurricular activity</td>
<td>30</td>
<td>735</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1915</td>
<td>2000</td>
<td>Time for extracurricular activity</td>
<td>45</td>
<td>780</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>2000</td>
<td>2020</td>
<td>Travel from extracurricular activity</td>
<td>20</td>
<td>800</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2020</td>
<td>2100</td>
<td>Prepare for bed</td>
<td>40</td>
<td>840</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2100</td>
<td>0700</td>
<td>Sleep</td>
<td>600</td>
<td>1440</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Total**                                                                                   75       25

Teens are relatively less time-stressed and potentially less dependent on parents for transportation and supervision. Nevertheless, for children of all ages, building more physical activity into schools is a key strategy to meet physical activity targets. Furthermore, the relationship between physical activity and improved learning provides schools with a mission-centred rationale for doing so.77

Table 3.2 provides a hypothetical routine for adults with young children. It indicates major challenges with achieving limited physical activity and still no time for major tasks (such as helping with children’s homework, parent’s own take-home work and meal preparation) and very little time for household chores. In addition, the physical activity that is indicated assumes the parent’s involvement in vigorous physical activity while their child is in an organized activity in the evening, and that moderate activity occurs at work and travelling home.

<table>
<thead>
<tr>
<th>Start time</th>
<th>End time</th>
<th>Activity</th>
<th>Duration</th>
<th>Cumulative time</th>
<th>Moderate phys-act</th>
<th>Vigorous phys-act</th>
</tr>
</thead>
<tbody>
<tr>
<td>0700</td>
<td>0730</td>
<td>Wake up, bathroom, get dressed, get kids dressed</td>
<td>30</td>
<td>30</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0730</td>
<td>0830</td>
<td>Travel to work</td>
<td>60</td>
<td>90</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0830</td>
<td>1700</td>
<td>At work</td>
<td>510</td>
<td>600</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>1700</td>
<td>1800</td>
<td>Travel home</td>
<td>60</td>
<td>660</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>1800</td>
<td>1830</td>
<td>Eat dinner</td>
<td>30</td>
<td>690</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1830</td>
<td>1900</td>
<td>Travel to child’s organized physical activity</td>
<td>30</td>
<td>720</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1900</td>
<td>2000</td>
<td>Child’s organized physical activity</td>
<td>60</td>
<td>780</td>
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<tr>
<td>2000</td>
<td>2030</td>
<td>Travel from physical activity</td>
<td>30</td>
<td>810</td>
<td>0</td>
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</tr>
<tr>
<td>2030</td>
<td>2100</td>
<td>Put child to bed</td>
<td>30</td>
<td>840</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2100</td>
<td>2200</td>
<td>Laundry, housecleaning, prep for next day</td>
<td>60</td>
<td>900</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2200</td>
<td>2300</td>
<td>Television, computer, prep for bed</td>
<td>60</td>
<td>960</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2300</td>
<td>0700</td>
<td>Sleep</td>
<td>480</td>
<td>1440</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>45</td>
<td>60</td>
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</table>

For young children, safety is a key factor that has decreased the opportunities to be physically active. Due to the time constraints of parents, there is limited opportunity for children to experience unattended physical activity. Parents are reported to have a higher perception of risk of physical injury and of the dangers of children being abducted from public play spaces.

Similar to the preceding description of healthy eating, knowledge related to health and physical activity is not associated with physical activity.78-80 Despite decades of exposure to messaging exhorting physical activity, 85 per cent of Canadian adults and 93 per cent of Canadian children and youth do not achieve the minimum level of physical activity necessary to ensure long-term good health and well-being.81 Yet, simple environment-based interventions to make activity fun or interesting can be associated with significant increases in activity (see Piano Key Staircase box above).

Self-confidence to be physically active is one of the most consistently identified correlates of physical activity in adults.82-84 The degree of physical education and level of functional fitness are both important determinants of physical activity, while conversely, being overweight or obese is a consistently negative influence on physical activity. In order to be physically active, children and youth need to develop a range of physical skills. In early years (birth to six years of age), this involves developing agility, balance, co-ordination and speed. These are then followed in subsequent years with mastering fundamental movement skills in a variety of environments (i.e., land, water, air, ice and snow) and then fundamental sport skills. This development of physical literacy is to support the skills, attitudes and knowledge to be physically active throughout life.85, 86

Among adults, in addition to the need for self-confidence and physical literacy, other barriers to physical activity include fatigue, ill health, lack of energy and self-consciousness about appearance.82 Social support and having a companion for physical activity are strongly associated with a variety of types of activities. Similar to healthy eating, parental modelling and learned activity patterns in early childhood are important determinants of physical activity.19 In adults, past exercise behaviour is a consistent predictor of current activity status.82, 83

A wide variety of characteristics of the environment are associated with physical activity.82, 87 The Foresight Committee’s analysis highlights the importance of the walkability of the living environment, opportunity for non-motorized transport, access to opportunities for physical exercise (including cost), and the safety of walking and transport environments.19 More detailed guidance has been developed by the U.K. National Institute for Health and Clinical Excellence (NICE) to promote and create environments to encourage and support physical activity (see Recommendations next page).88
Creating Supportive Environments for Healthy Living in Peel

As previously noted, there is a growing body of evidence suggesting that, independent of physical activity levels, sedentary behaviours are associated with an increased risk of cardio-metabolic disease, all-cause mortality, and a variety of physiological and psychological problems. This has implications for active and non-active children and youth, as well as, adults who increasingly utilize sedentary modes of transport and are employed in sedentary jobs.

Economic and Social Factors

Populations are not homogeneous. A variety of economic and social factors will limit individual ability to obtain optimal health. For example, low-income Canadians are considered to be nutritionally vulnerable.\(^9\) In Peel, 11 per cent of people in private households (126,660 people) lived with low income after tax in 2005.\(^8\) Observed links between obesity and low income may be related to dietary energy density and energy cost\(^9\) since refined grains, added sugars and added fats are among the lowest cost sources of dietary energy.\(^9\) Analysis from the

**Recommendations to Promote and Create Built or Natural Environments that Encourage and Support Physical Activity**

**Strategies, policies, and plans**
1. Strategies, policies and plans should involve local communities and experts at all stages of development. Planning applications should prioritise people to be physically active and include an assessment in advance of the impact of development proposals on physical activity.

**Transport**
2. Transportation users (including pedestrians and cyclists) should be given priority when developing and maintaining roads. Some methods include re-allocate space for physical activity, restrict motor use, introduce road-user fees, traffic calming and plans for safe routes to school.
3. Plan and provide a comprehensive network of routes for walking/cycling.

**Public Open Spaces**
4. Public spaces should be accessible by walking/cycling and be well maintained.

**Buildings**
5. Schools, hospitals, universities, workplaces and other new public buildings should be designed to link with walking and cycling routes. Where possible, additional walking/cycling infrastructure should be built to improve existing routes.
6. During building design or refurbishment, staircases should be positioned for people to easily access and use them, include adequate signage and incorporate welcoming/attractive design elements.

**Schools**
7. School playgrounds should be designed to encourage varied, active play.
8. Primary schools should create areas (e.g., using coloured paint) to promote individual and group playground games, such as hopscotch.
U.S. indicates that from 1985 through 2000, the relative pricing of food items has shown the sharpest increase for fruit and vegetables, while sugar-based beverages have shown the greatest decrease in prices. Statistics Canada tracks food prices of certain types of food items in Canada from 1995 to 2012. Analysis of that data shows a similar trend to that of the U.S. While the price of soft drinks and fruit flavoured crystals increased by 22 per cent over that time period, the price of vegetables and fruit increased by more than double (53 per cent) and fluid milk by more than three times (76 per cent) (see Appendix Three).

Food prices and their relative trends are a dimension of affordability, which influences food choices. Such choices may also be influenced by the social and economic context. An eight-year study of Canadian children found that children living in Canada’s poorest neighbourhoods gained more weight than those living in middle income neighbourhoods, even after controlling for family income. Neighbourhood-level factors include the proportion of fast-food outlets, which tend to be higher in Peel’s lower income areas. Existing research also indicates that economic factors influence access to physical activity. This includes direct impacts due to entry fees and equipment costs, but also indirect costs, such as transportation. Furthermore, the literature indicates that access to safe, neighbourhood recreational opportunities can be reduced in lower income areas.

Food preferences, eating behaviours and perceptions to healthy eating are strongly influenced by cultural and social norms. Food and eating act as mechanisms for expressing and sharing ethnic identity, cultural values and beliefs, kinship among families and communities, wealth and social status, and celebrating life events. Culture determines how food is traditionally prepared, the frequency and time of eating, and ideal body types and foods that are associated with good and bad health.

Research demonstrates that acculturation to a Western lifestyle has predominantly negative effects on an immigrant’s food, nutrition and dietary habits. For example, some traditional South Asian diets are high in grains, vegetables and fruit, and low in meat and meat alternatives. However, as South Asians adapt to the obesogenic and urbanized environment of the Western world, there is an increase in the prevalence of obesity, insulin resistance and type 2 diabetes. Important differences may also exist among population groups regarding perceptions of the value of physical activity. For example, some cultural/ethnic groups may associate physical activity with manual labour of lower social status and some groups have distinct expectations related to social status for males and females.

Weight can also be perceived differently in various cultures. Some parents feel pressure for their baby to be a certain size and weight, and they can alter feeding habits in attempts to increase the weight of their baby. Furthermore, these weight perceptions can be influenced by misinformed health care providers, having a potentially detrimental effect on a child’s weight trajectory. For example, an incorrect diagnosis of underweight or the prescription of formula feeding or early introduction of solids can impact a child’s eating habits.

Summary

Healthy eating and physical activity are complex, multi-dimensional behaviours with a broad range of underlying causes – physical, social, physiologic and psychological. While awareness of the health impacts of behaviours tends not to be associated with behaviour levels, life stages or family and social contexts, competing demands for time, as well as, cultural and economic factors, are important contributors to behaviours. Reflecting this complex reality, the next chapter addresses the needed conceptual shift to promote healthy eating, physical activity and healthy living in Peel.
Overview

Preceding chapters have described the nature of public health, provided an assessment of the magnitude of the problem posed by unhealthy eating, physical inactivity and sedentary behaviours, and summarized our understanding regarding their determinants. This chapter considers the limitations of existing approaches and outlines the shift in Peel Public Health’s thinking regarding our strategy for supporting healthy living in Peel.

Limitations of Existing Approaches and the Needed Shift in Focus

Over time, our understanding of the obesity epidemic has evolved from one solely focused on individual choices (i.e., whether people choose to eat healthy and be active) to one that is inclusive of the physical and social environmental contexts that can either facilitate or hinder health-promoting behaviours. A focus on eating food for the benefit of its individual elements (i.e., nutrients, high fibre, etc.) and on planned, structured and high intensity activity to burn calories have characterized public health efforts in the past. Eating and movement are natural human behaviours that can be enjoyed through everyday life experiences. However, our historical approaches have tended to emphasize weight loss as the main motivator for healthy lifestyle behaviours, with the potential to devalue the significance of healthy eating and movement for overall health and wellness independent of weight loss.

Nutritionism, which is the science of food and a focus on the single elements of food, has led the public astray from the basic principles of healthy eating. Despite increased efforts to educate the public about nutrition and healthy
Creating Supportive Environments for Healthy Living in Peel

eating, eating behaviours have not improved and the prevalence of obesity continues to climb.\textsuperscript{107} While reflecting reductionist educational approaches, nutritionism is also a product of commercial interests, which has led to the mass marketing of food for its individual elements and nutrients (e.g., omega-3 enriched eggs, orange juice fortified with calcium), as well as a plethora of heavily promoted ‘health products’ with unproven benefits. Justifiably, the general public and the media are confused about the validity of health claims related to particular nutrients.

Eating well is intrinsically pleasurable, supports excellent health and is a highly social activity that contributes to mental well-being. What’s more, food preparation, cooking, eating and sharing is a core feature of cultural identity – the value and meaning of food within a cultural context is of great significance. The simple act of preparing and cooking a meal, and subsequently sharing it with family and friends can be both pleasurable and beneficial to health. As noted earlier, shared family meals are associated with increased healthy eating behaviours and reduced overweight and obesity among children and youth.\textsuperscript{62} Unfortunately the concept of shared family meals now appears to be more of an unrealistic ideal (whether perceived or actual) than a daily social norm, as it was previously.\textsuperscript{63}

A considerable focus in the field of physical activity has been about structured, higher intensity activities with prescriptions for minimum activity levels. There is a well-established scientific basis for these recommendations. However, they have not resonated with substantial proportions of the public. Carving out specific time to be physically active while remaining sedentary the remainder of waking hours is problematic. In time-pressured lives, it is highly challenging for many to find that extra 30 minutes per day to meet activity prescriptions. Less emphasis has been placed on the activities of daily life (e.g., household chores, walking or cycling to school or work) that can be enjoyed and considered as contributing to optimal health. Furthermore, recent research indicates that being sedentary has adverse health effects, even if an individual is active during other parts of their day since the biological mechanisms are different.\textsuperscript{3,108-110}

Addressing sedentary behaviours needs to be incorporated into our messaging and programming.

Active living not only benefits overall health, but is enjoyable in and of itself. For example:

- A grandfather who walks his grandson to school will reap the health benefits of active transportation, but will also gain from having spent time with his family.
- An employee who enjoys small bouts of activity throughout their workday (e.g., a walk outside at lunch or during a meeting, taking the office stairs) can gain health benefits of moderate physical activity that can be accumulated throughout the day. Frequent breaks from being sedentary also provide benefit.
- An hour spent gardening provides moderate physical activity, but also the intrinsic pleasure of being outside and doing something enjoyable.
- Playing pick-up basketball in the driveway or chasing a child in a game of tag provides physical activity, but also provides important family time together.

In a technologically-advanced culture where fad diets, weight loss centres and health clubs for structured physical activity are promoted, it is no surprise that the enjoyment and satisfaction that come from eating flavourful, healthy food and from healthy movement have been largely forgotten. Daily barriers, such as time pressures, limited knowledge about food and food selection, and low levels of food skills among the population, further complicate the once straightforward behaviours of eating well and being active. The notion of eating and moving in a structured and prescribed manner is
unrealistic for many individuals and likely does not resonate with the majority of the population.

There is a need to shift from a focus on nutritionism and structured activity for the purpose of weight loss to one that recognizes the wide range of health benefits (i.e., physical, mental, social) that healthy eating and activities of daily life can offer. While utilizing some of the general principles of healthy eating (e.g., limiting sugar, salt, trans and saturated fat intake, reduced soft drink consumption, adequate fruit and vegetable consumption), the approach can change from single nutrients in food to a focus on food in its entirety and the benefits of a well balanced diet consumed in moderate portions.

A reliance on educational approaches is supported by neither theory nor experience. What’s essential is that supports are in place for the population to adopt and maintain healthy behaviours on a daily basis and in a variety of settings. For example, environments should be designed in a way that neighbourhoods support pedestrians (e.g., through appropriate density and street connectivity) and food options are accessible, affordable and appealing.

Realistically, public health’s only hope for tackling the obesity epidemic is to invest in policies and programs that create supportive environments for healthy eating and active living. Until then, the current obesogenic environment will continue to undermine all other efforts. An individual may have the best intentions to eat healthy and be active, yet their efforts can be undermined in an environment where: i) healthy choices are not available or very difficult to make (e.g., too expensive), and/or ii) unhealthy choices are the default, easy options. Unfortunately, both of these scenarios accurately describe the obesogenic environments in which Peel residents currently live, work and play.

Overall, Peel Public Health’s approach will shift the focus from: i) nutritionism and single nutrient focussed nutrition to the enjoyment of eating healthy food, and ii) from structured physical activity alone to the inclusion of unstructured and utilitarian movements of daily life. In doing so, Peel Public Health will support the Peel population to develop a healthy relationship with both food and activity in order to achieve and maintain optimal health.

Our shift in approach is summarized in the following declaration:

- Whereas the obesity epidemic has been decades in the making and will likely take a generation or more to successfully address;
- And whereas most people are unsuccessful in the long term in their individual weight loss attempts due to the biological drives to acquire and preserve energy, and our current obesogenic environment;
- And whereas people can reduce the risk of chronic disease by increasing physical activity, reducing sedentary behaviour, and eating healthier, independent of weight loss;
- And whereas there are potential adverse impacts of overly focussing on weight versus health;
- Peel Public Health will therefore shift its focus from obesity and healthy weights to creating environments that support healthy living.
Moving Forward – Opportunities and Challenges

Lifestyle Change

This section reflects to a considerable degree the Foresight Committee’s evidence review regarding lifestyle change.54

A common finding for many health-related behaviours is that knowledge is necessary, but insufficient to foster behaviour change. Knowledge about healthy eating and physical activity does not correlate well with behaviour. The reality is that providing information is only one element of successful behaviour change; tackling motivation, skills and environmental influences are also crucial.51 For example, someone may know that unhealthy eating is a risk factor for ill health, but that person is not necessarily persuaded that s/he is eating an unhealthy diet. The person may not know how to prepare healthy meals or may have limited opportunities to purchase healthy meals while out of the home. Furthermore, the basis of non-healthy behaviours may have nothing to do with consciously held health intentions (e.g., eating fast food because it is readily available). Similarly, a person need not be persuaded about the health benefits of a behaviour choice if that choice is the easier option (e.g., the intrinsic fun of using a staircase made out of piano keys).

Physical activity and healthy eating are complex, multi-dimensional behaviours. However, to have impact, messages for a specific behaviour need to be very focussed. For example, the message to “eat five portions of fruit and vegetables per day” is much more specific than one that states “eat healthier.” Furthermore, messages to influence behaviour change need to be based on psychological theory and evidence combined with pre-testing, since people may behave differently than expected in any given context. While somewhat counter-intuitive, best practice recommendations are to avoid overreliance on survey and focus group data, since these methods reveal what people think would work and not what actually does work. People’s stated attitudes do not necessarily align with their implicit attitudes. Furthermore, some aspects of eating and activity are habitual in nature so that these behaviours do not arise from conscious choices, but rather become automatic.

The challenge for both physical activity and healthy eating is that there needs to be repeated and persistent performance such that the new behaviour becomes normalized. Interventions need to consider both the challenges with getting started (i.e., initiating action to change), as well as, staying on track and avoiding/dealing with getting derailed. Reflecting the nature of underlying causes, behavioural decisions do not occur in isolation of the social context and physical environment. “Individual responsibility can have its full effect only in a society where governments, private interests, and other sectors work together to support individuals making healthy choices.”111

The implication is that interventions need to directly encourage behaviour change (e.g., social marketing messages), as well as, incorporate upstream approaches that alter the social context and environments (e.g., visible attractive staircases, healthy school meals, etc.).
Considering the strength of individuals’ behaviour patterns, existing evidence suggests taking advantage of life stage changes when people may be more amenable to consider changes in habitual behaviours. Key life stages include birth of a child, a new job or major reorganization of the workplace. At these times, individuals may be more susceptible to new information as they find new ways to behave and solve problems.

Overall, the best available evidence suggests the following:

- People cannot attain lifestyle change without the motivational, cognitive and emotional resources to drive change and an environment that facilitates it.
- Public campaigns might benefit from an interactional, open-ended style, rather than merely telling people what they should do and how to do it. Campaigns should encourage more reflection on the part of individuals. For example, a question posed to participants prompts them to come up with their own answer regarding attitudes, implementation intentions and values.
- It is clear that failures to change the environment will inevitably result in cues for older, habitual behaviours to reassert themselves.

**Magnitude of the Challenge**

The Foresight obesity system map depicted earlier in Figure 3.5 includes more than a hundred factors influencing eating and activity behaviours. Analysis of this type is powerful in capturing the complexity of the challenge, but risks overwhelming decision-makers and prompting them to conclude that effective action is impossible. However, the challenge is complex and simplistic responses are not going to get the job done. If it were easy, it would have been solved already. The complexity of the system map with its large number of variables and their inter-relationships has some important overall implications.

First, no single solution exists and no single intervention is likely to produce a very high impact. While the potential cumulative effect of multiple variables is strong, the impact of any one variable is relatively weak. The implication is that intervention in just one area will likely have limited impact on desired behaviour outcomes. Furthermore, the extent of inter-relationships and feedback loops means that intervention in just one area may precipitate compensatory changes elsewhere. For example, increased activity alone might stimulate compensation in metabolic pathways or psychological traits allowing an energy-dense snack as a reward. Predicting how a complex, adaptive system will react to an intervention(s) is not completely possible, so impacts need to be monitored.

The underlying causes within our social and physical environments became established over a period of decades. In response, a long-term, broad and diversified approach is required. According to an Organisation for Economic Co-operation and Development (OECD) report,

Tackling major risk factors for health or chronic diseases linked to behaviours that are highly prevalent in a population requires more than a single preventive intervention, however effective and broadly based it may be. Turning the tide of diseases that have assumed epidemic proportions during the course of the 20th century requires fundamental changes in the social norms that regulate individual and collective behaviours. Such changes will only be triggered by wide ranging prevention strategies addressing multiple determinants of health.

Our planning is guided by the following conceptual model (Figure 4.1) in which health-promoting policies will help create health-supporting physical and social environments that will then support healthier behaviours and its impact on a healthier population.
The Need for Action and the State of Current Knowledge

Chapter 3 described the current burden of illness due to unhealthy eating, physical inactivity and sedentary behaviours, and the projections for future ill health if population-wide change does not occur. There is also extensive consensus regarding the many societal changes that have been occurring in recent decades and their adverse effects on health. The obesity system map (Figure 3.5) and other models provide a comprehensive portrayal of our understanding of the complex, causal web of a multitude of factors driving adverse health behaviours. We also know that there is little if any likelihood that the many societal drivers of unhealthy behaviours will self-correct. This rather large problem is not going to go away or get better on its own.

There is evidence that obesity rates for some groups in some countries have begun to stabilize so that it is unclear whether this represents a true upper limit or a plateau before increasing again. Regardless, overweight and obesity rates remain high with significant long-term health implications. At this point in time, we know considerably more about immediate and underlying causes of ill health than about the effectiveness of strategies for population prevention. While “it is clear that remedies will need to involve policies and programmes that change the relevant societal and environmental drivers in a direction that promotes healthy population weights, the ways to do this are not straightforward. The processes influencing food intake and physical activity are fundamental, complex and dynamic.” As described by the United States Institute of Medicine, several factors complicate the task of identifying effective interventions:

- **Complexity in the causal sequences:** there are multiple factors acting simultaneously, including numerous mediating and enabling factors with multiple positive and negative feedback loops
- **Scientific uncertainty:** this is associated with many of the linkages among variables where the nature of relationships can vary across different social contexts and whose assessment may be constrained by current methods and ethical limitations
- **Differences in values:** individuals and groups differ in the benefits and costs they attach to each of the causes, potential solutions, intended outcomes and unintended consequences
- **Differences in tolerances of uncertainty:** individuals and groups differ in how much uncertainty they are willing to tolerate before acting to address a problem.

As noted by the UK Foresight Committee, this “current lack of evidence for success is not surprising since any such undertaking would require several years of evaluation.” It is also evidence that is unlikely to be routinely generated by researchers. “The need for large-scale research studies involving teams
with diverse skills over long periods of time is unlikely to be met by existing funding mechanisms or data-gathering processes.”19 The Institute of Medicine’s deliberations indicated that “given the methodological challenges, as well as, the complexities in linkages between different elements and in their environments, certain interventions may prove effective even though their mechanisms for success are not known… Absence of experimental evidence does not indicate a lack of causation or ineffectiveness of a preventive intervention.”63

The challenge is that “evidence-based public health action is … often inhibited by a mismatch between the magnitude and importance of a public health problem, and the adequacy of evidence on potential interventions to address the problem.”115 Paralysis can be created by not doing anything until it is clear what works, yet what works will not be clear until something is done. The result can be a perpetual stream of reports describing the problem and its determinants without actually doing anything to address the problem. It is important to recall that when faced with a similar scenario in the early days of tobacco control, the response was action and to learn by doing. “Initial tobacco interventions were not evidence-based, but represented sound judgement at the time.”111

The United States’ Centre for Disease Control and Prevention describes a continuum of evidence of effectiveness of interventions116 (see Figure 4.2).

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**Figure 4.2**

*Continuum of Best Available Research Evidence*

![Continuum of evidence](image)

Much of the existing literature is in the “promising direction” and “emerging” categories. For example, the development of school and workplace travel plans has been proposed as a mechanism to reduce car use and increase the use of active transport options, such as walking and cycling. Results of initial studies have been mixed to-date, such that a recent Cochrane review indicated that while there is insufficient evidence to determine whether organizational travel plans are effective for improving health or changing travel mode, although they have considerable potential to influence community health outcomes depending upon the environmental context in which they are introduced. This issue of context is extremely important. It is not merely the what of an intervention, but the how, who, when and where that are highly relevant. The Cochrane review’s authors indicated that implementation should be conducted in the context of a well-designed research project. Currently, several schools within Peel region are participating in a pilot project assessing the impact of travel plans (see Metrolinx box below).

The implication though is that “there is an obligation to accumulate appropriate evidence not only to justify a course of action, but to assess whether it has made a difference.” In other words, we will need to learn while doing. The Institute of Medicine’s perspective is consistent with the UK Foresight Committee’s advice to government:

Given the pressing need to tackle obesity, it is likely that interventions to prevent obesity will have to take place when the evidence is neither complete nor perfect. Instead, the evidence base needs to develop alongside the delivery of novel interventions, informed by the available evidence and strengthened by expert advice. This approach establishes a virtuous circle of policy development, implementation and evaluation. Importantly, it builds practical experience and allows interventions to be refined over time. However, it also requires willingness to accept the risk that some interventions may fail or need to be refined and enhanced as their effects become better understood.

In considering potential interventions and while awaiting more definitive evidence, it is highly unlikely that efforts to ensure that people have access to healthy, competitively priced food, safe play areas, and enhancing walkability or reducing car use would have detrimental effects on the health of the public.

Considering the magnitude of the problem and the severity of adverse health outcomes, the Institute of Medicine concluded that “actions should be based on the best available evidence – as opposed to waiting for the best possible evidence… [P]reventive actions should be taken even if there is as-yet-incomplete scientific evidence on the interventions to address specific causes and correlates of obesity.”

Metrolinx – Stepping It Up
This pilot project led by Metrolinx, in partnership with the Region of Peel and other partners, focuses on identifying the possibilities for enhancing and encouraging the use of active and sustainable travel options, such as walking, cycling and carpooling, for students and staff.

Creating Supportive Environments for Healthy Living in Peel

Learning from Previous Public Health Success – Tobacco Control and Policy Change

Public health’s experience addressing other complex, community-wide challenges can be highly informative. Public health’s efforts with tobacco control started at a time when smoking was highly normalized throughout society. The majority of adults smoked and essentially did so everywhere. It was not initially clear how to denormalize a behaviour that was widespread and that had strong industry support. While increasing awareness of the adverse health impacts of tobacco use was the approach initially utilized, a key lesson was that tobacco control efforts needed to include altering the physical and social environments that influenced tobacco use, including pricing, marketing, and restrictions on where smoking could occur. Our experience over time is that comprehensive tobacco control programs need to include a series of program components that have been shown to be effective in reducing tobacco use (see Comprehensive Tobacco Control box below). These program components are typically delivered in an integrated manner and “it is difficult, if not impossible, to tease out the relative impact of specific program components within these compressive real-life campaigns.”

The lessons from the tobacco control experience are highly pertinent and their success was “linked to the application and implementation of a broad range of policies.” However, the intent and types of policies are not entirely transferrable to the challenge of encouraging physical activity and healthy eating. As shown in Table 4.1 (below) the challenge is more complex since the intent of public health efforts for tobacco control is essentially zero use, whereas physical activity and healthy eating are desired behaviours that need to occur daily.

Comprehensive Tobacco Control Program Components

- **State and community interventions:**
  
  Supporting and implementing programs and policies to influence societal organizations, systems and networks that encourage and support individuals to make behaviour choices consistent with tobacco-free norms; durable change occurs through shifts in the social environment, initially or ultimately, at the grassroots level across local communities

- **Health communication interventions:**
  
  Deliver strategic, culturally appropriate and high-impact messages in sustained and adequately funded campaigns integrated into overall tobacco program effort

- **Cessation interventions:**
  
  All patients seen in health care are screened for tobacco use and receive counselling; quitlines

- **Surveillance and evaluation:**
  
  Monitoring tobacco-related attitudes, behaviours, and health outcomes at regular intervals; assessing implementation and outcomes of programs, increase efficiency and impact over, time and demonstrate accountability

- **Administration and management:**
  
  Sufficient capacity enables programs to plan strategic efforts, provide strong leadership and foster collaboration.

Source: Centers for Disease Control and Prevention (CDC). Best practices for comprehensive tobacco control programs-2007. Atlanta: CDC, 2007. [Reproduced with permission from CDC, United States.]
Creating supportive physical and social environments to support healthy living is predominantly about policies – the formal and informal rules by which our societies are designed and work. Improvements to the built environment need to consider transportation systems, urban design and land use patterns. For example, environments can be established or modified in which cycling, walking and the use of public transit make physical activity easy, accessible and affordable. Built environments that make unstructured and utilitarian movement the default options for activity will help to shift the social norms and perceptions relating to what physical activity should be. Regarding healthy eating, we can aim to have food environments where even the least healthy option supports a well-balanced, suitably portioned meal and makes healthy eating easy, accessible and inexpensive.
DEVELOPING A FRAMEWORK FOR ACTION

Moving Forward – Principles to Guide Action

The preceding chapters have provided a convergence towards the need for public health’s focus on creating supportive environments for healthy living. This has included:

- “The Public Health Way,” with its focus on prevention applied to the health of populations by addressing the causes of illness and premature death, as well as, inequalities in health;
- The magnitude and widespread nature of the burden of ill health due to unhealthy eating, physical inactivity and sedentary behaviours;
- The limits of depending on individual-level interventions for a problem that is community-wide and that do not address the underlying drivers or causes of ill health;
- The need to use the best available evidence; and,
- The experience with tobacco control where awareness-raising was insufficient, and interventions to alter the physical and social environments were required.

While preparing this report, we encountered a seemingly endless cycle of health status reports and comprehensive sets of recommendations that have been published over the past decade. Clearly, it is time to start to take concerted action. Our intent is to make the healthier choice the easier choice for people across our region.
Based on our understanding of the underlying causes of eating and physical activity behaviours in populations, and the requirements for achieving and sustaining behaviour change within populations, the following principles have been identified to guide our actions:

• An environment must be actively established and maintained that supports and facilitates healthy choices.
• Individuals need to be encouraged and supported to desire, seek and make different choices with respect to physical activity and eating. It is important to recognize that people make decisions as part of families and groups, and that individual behaviour is cued by the behaviours of others, including organizational behaviours and other wider influences.
• The multiplicity and overlap of the causes of less healthy eating, physical inactivity and sedentary behaviour argues against a dependence on fragmented solutions to address these issues. Focusing too heavily on one cause, or on one population group, is unlikely to be successful in bringing about the scale of change required.

• A comprehensive strategy will need to incorporate a range of policies that must act in at least three dimensions:
  - Change is needed across the many domains of underlying causes of behaviours and the cues for behaviours relating to food, physical activity, sedentary behaviour, and physiological and psychosocial factors.
  - To change a single cause/behaviour, may need to have action at multiple levels (i.e., individual, local, regional, provincial, national, and global). While only the first three are within the potential direct sphere of action for Peel Public Health, part of our strategy needs to advocate for change at broader levels.
  - Different interventions targeting the same process of behaviour change will be needed across the life course (e.g., sedentary behaviour in early childhood, school age, young adults, older adults).
• The impact of individual interventions or initiatives in isolation is likely to be small, even if the overall impact of a combination of responses could be significant. Therefore, to create an overall impact, the strategy will need to maximize the impact of individual interventions and initiatives through the co-ordination of a sustained multi-sectoral approach.
This chapter outlines our thinking about how Peel Public Health will put these principles into action applying our capacities in the most appropriate manner to have the greatest impact. The predominant focus of our efforts going forward is on policy change to create supportive environments for healthy living. The primary mandate of public health is prevention in the true sense of the word. The provision of treatment interventions, while important, is the responsibility of the health care system. Our mandate is complementary, but different. This means we will not attempt to apply our resources to provide individual-level counselling or conducting weight loss seminars or classes. Not only do programs of this nature already exist, but considering the magnitude of the challenge, this type of approach is not going to alter the causes of our obesogenic society. In moving forward, we harnessed the analysis and recommendations of major expert groups and discussed potential priorities with our own expert advisory panel.

Learning from Others
In recent years, a series of high profile projects have been conducted by a variety of expert groups to identify recommendations for action to prevent obesity. Despite their titles, the predominant, if not sole, focus of these reports is on establishing supportive environments for healthy eating and physical activity. These projects, listed in the text box, have been conducted on a scale beyond the scope possible for a single public health organization, such as Peel Public Health, utilizing multi-disciplinary expertise, literature reviews, analysis, modeling, etc. This body of work represents at least a starting point to informing Peel Public Health’s actions. The recommendations from England’s national strategy were also included, since it is the first national strategy to comprehensively address supportive environments for healthy eating and physical activity, and it provides a level of detail more targeted at local action.119

Consistent with the advice of the United States Institute of Medicine and Foresight Committee, the expert groups utilized a mix of evidence and expert opinion to develop their recommendations. In some instances this was done by consensus, while in others, formal prioritization processes were utilized to identify, based on expert opinion, the best evidence-informed areas for intervention. Examination of the more than 100 recommendations emanating from these reports identified seven major clusters of action that predominantly reflect different settings (see Figure 5.1). Within each cluster, recommendations were further grouped into themes. Some duplication of themes is included where items mapped to more than one cluster. A more detailed listing of the specific recommendations by cluster is provided in Appendix 4. The importance of these clusters is that they represent potential opportunities for action for Peel Public Health.
Analysis of Potential Options

Once the preliminary analysis of existing recommendations was completed, advice was sought from this project’s own expert panel about the clustering and which items Peel Public Health should consider pursuing. Three main areas of feedback were received. The first was that considering the comprehensive set of drivers influencing on healthy eating and physical activity, and the fact that the various reports’ recommendations had been the subject of prioritization processes, ideally action should occur in all of these areas. The second area of feedback was that while no items were felt to be inappropriate, the expert panel did note that some areas for action that should be under consideration might not be sufficiently captured. These included targeting of particular sub-populations at higher risk, such as the large South Asian population of Peel region, as well as, the importance of the food industry.

Recognizing the magnitude of the challenge and the finite set of available resources, the expert panel’s third suggestion was that a feasibility analysis might help prioritize potential areas for action that were most relevant for Peel Public Health. The following criteria were applied to 15 clusters or sub-groups of recommendations:
• **Sphere of influence**: extent to which public health can directly influence target population or setting, or if not, the extent to which there are a limited number of intermediaries that themselves have direct influence on target population or setting

• **Extent of current action**: the opportunity to build on existing activity

• **Resource requirements**: the magnitude of resources required to tackle a recommendation

• **Reach**: the extent of the population that will be accessed by the intervention.

Application of the criteria provided an initial ranking of the clusters and groupings that was a useful starting point for further discussion and analysis. See Appendix 5 for further details on the approach.

Overall, leveraging the many existing recommendations for public health action, combined with the feasibility analysis and expert input, facilitated the prioritizing of areas for Peel Public Health’s initial focus, which are:

- Preschools
- Schools
- Workplaces
- Built Environment

Two additional higher-ranked items (i.e., breastfeeding policies and strengthening existing child development programs) are not listed above, but are components of a parallel Peel Public Health strategic priority, Nurturing the Next Generation. That strategic priority is focussed on the first year of life and will need to integrate with the Creating Supportive Environments for Healthy Living Strategy, particularly regarding the overlap regarding early childhood and the role of families. An additional set of ongoing cross-cutting supportive elements for all the components are needed including: a focus on achieving policy change at multiple levels of government; achieving health equity and inclusion for diversity with particular attention to the South Asian population; ongoing use of social marketing to address social norms; and the ongoing application of surveillance, evaluation, research and evidence-informed decision making to inform our actions.

The next section describes these components in more detail.

**Developing a Comprehensive Portfolio of Component Approaches**

The preceding section describes the identification of the key components for our strategy. This section will describe each of these components in more detail. We will be developing more detailed action plans for each of the components.

**Priority Settings**

**Preschool**

The preschool years represent an important time to promote the establishment of an environment that encourages healthy growth and development. Environments or settings typically include home, child care, community and school. In addition to healthy eating and physical activity, role modelling and parent/caregiver engagement can have a major influence on the health practices of a child. The work in this initiative that addresses the early years will integrate with a related Peel Public Health strategic priority, Nurturing the Next Generation, which is focussed on the first year of life.

As described earlier regarding the state of current knowledge overall, the extent of existing evidence for public health interventions that have a significant effect on the prevention of obesity in children from birth to six years is limited. However, all of the reviews and guidelines reviewed as part of an internal rapid evidence review identified the early years as a key time for shaping lifelong attitudes and behaviours. The rapid review indicated that overall, the following principal conclusions related to successful interventions in the prevention of childhood obesity:
1. Sustained physical activity/limited sedentary activity is fundamental.
   a. Integrate more regular physical activity into daily routines in preschool/childcare settings (e.g., implement policy in child-care centres).
   b. Promote limited screen time (i.e., television watching, playing video or computer games) to no more than one hour a day for children 2-4 years of age, and two hours a day for children and youth aged 5-17 years of age to encourage more activity and less food consumption, and to limit exposure to food advertising (e.g., social marketing encouraging less screen time). Screen time is not recommended for children under 2 years of age.
   c. Encourage active play at home and preschool/childcare.
   d. Promote being active as a family.

2. Healthy eating for children is fundamental.
   a. Promote breastfeeding until at least six months of age.
   b. Encourage children to eat regular, healthy meals, including breakfast, in a pleasant, sociable environment with the parents and caregivers, and without distractions (such as watching television).

3. Cultural sensitivity and awareness of the impact of socioeconomic status are necessary.

4. Active engagement of parents/care providers is essential in reinforcing and role modelling the messages to children about healthy eating and active living.
   a. Promote food skills to parents and child care staff, including cooks and caterers (e.g., food preparation, cooking skills, and food choices).

5. Any program to prevent obesity in preschool, childcare or family settings should incorporate a range of components (rather than focusing on parental education alone), such as:
   a. Healthy eating – interactive cookery demonstrations, videos and group discussions on practical issues, such as meal planning and shopping for food and drink.
   b. Physical activity – interactive demonstrations, videos and group discussions on practical issues, such as ideas for activities, opportunities for active play, safety and local facilities.

The findings of Peel Public Health's rapid review coincide with the main conclusions of the Institute of Medicine’s 2011 consensus report, Early Childhood Obesity Prevention Policies. The Institute of Medicine report recommended that steps should be taken by child-care centres, preschools, physician offices and through other programs to help shape children’s healthy weight related behaviours. The behaviours cited included limiting television and other media use, encouraging more time for children to engage in physically active play, with the additional behaviour cited being the promotion of healthy sleep practices.

Initial opportunities for action include ensuring Peel Public Health’s existing early childhood focussed programs are modified to be inclusive of the key attributes identified in the evidence review. In addition, a policy review framework is being developed and utilized to determine policy options for childcare settings.
Creating Supportive Environments for Healthy Living in Peel

Schools

Schools “have a vital role in ensuring that children have access to healthy food and sufficient opportunities for physical activity during the school day.”

The school environment provides the potential to:

- Increase opportunities for daily physical activity
- Physical education to build basic skills and fitness
- Reduce sedentary behaviours during the school day
- Active transportation to and from school
- After-school programming that includes healthy eating and physical activity
- Food support programs (e.g., breakfast programs)
- Availability of healthy foods in schools
- Development of food knowledge and skills.

A school-based approach builds on the longstanding relationship between schools and school boards and public health. It also builds on the momentum of existing interventions, such as the number of school food policies introduced in recent years, as well as, school travel plans currently being piloted in a number of Peel schools. While there are a large number of schools in the region (326 primary and 50 secondary schools), the presence of two main school boards provides a key intermediary to facilitate joint planning and implementation. Additional reasons for the attractiveness of working with the school system is the opportunity to take a comprehensive approach with all of the relevant behaviours, the potential to link to other areas of interest, such as academic performance, and the well-grounded interest of communities to take action to optimize the current and future health of their children.

In general, “reviews of interventions in school settings suggest that a whole school approach (meal services, vending, class teaching, physical education, out-of-school activities) is more likely to be successful than one targeting individual children.” A recent Cochrane review found strong evidence to support beneficial effects of child obesity prevention programs on BMI, particularly for programs targeted to children aged six to 12 years that included a broad range of program components:
• school curriculum that includes healthy eating, physical activity and body image
• increased sessions for physical activity and the development of fundamental movement skills throughout the school week
• improvements in nutritional quality of the food supply in schools
• environments and cultural practices that support children eating healthier foods and being active throughout each day
• support for teachers and other staff to implement health promotion strategies and activities (e.g., professional development, capacity building activities)
• parent support and home activities that encourage children to be more active, eat more nutritious foods and spend less time in screen-based activities.122

As noted by the review’s authors, the challenge is identifying how effective intervention components can be embedded within education and health systems to achieve long-term sustainable impacts.122 Models for doing so exist. For example, one model pursues approaches across six action zones within schools: school environment; scheduled physical activity; classroom action; family and community; extra-curricular; and, school spirit.123

Careful consideration needs to be given to specific, individual interventions that collectively comprise a whole school strategy. For example, healthier foods and beverages include, but are not limited to, foods and beverages with low energy density and low calorie, sugar, fat and sodium content.101 Healthier food and beverage choices need to be both available and affordable for persons to consume them and is a particular concern for lower-income consumers.95 Multi-component interventions with European school children are associated with increased consumption of fruit and vegetables.124 The availability of fruit and vegetables is associated with their increased consumption95, 125, 126 and the converse is also true. The availability of less healthy foods in schools is inversely associated with fruit and vegetable consumption and is positively associated with fat intake among students.127 Restricting access and increasing the price of unhealthy food options is a complementary approach within a comprehensive plan for better nutrition.95

The impact of introducing school food policies on student eating behaviours in Ontario and many other jurisdictions has not been extensively studied. A greater understanding of the positive and any unintended impacts is needed. Several sources recommend improving students’ food preparation skills4,119 since traditional dissemination of these skills from one generation to the next are being interrupted by societal trends to eating prepared foods and eating out. How best to address food preparation skills on a whole school basis is something we will need to pursue.
An earlier section outlined the limits on available time for children (and their parents) to participate in physical activity outside of school hours. Since children spend much of their day in school, it is important that much of their recommended daily physical activity (see Activity box below) be achieved in these settings. Multiple approaches will likely need to be deployed to ensure feasibility and to take advantage of the evidence that there are cumulative benefits of short periods of activity over the course of the day. A range of potential approaches include: increase the number of children walking to and from school; increase regularly scheduled physical education time; increase the amount of physical activity within physical education time; increase movement during regular classes; and, increase extracurricular activities during and outside school hours.

School-based physical education increases students’ level of physical activity and improves physical fitness.\textsuperscript{128, 129} There is no evidence that time spent in physical education classes harms academic performance,\textsuperscript{128} with some evidence that it is positively associated with academic performance in children.\textsuperscript{77} Non-competitive, extracurricular activities, such as games and dance classes, that are open to all students are complementary to existing competitive sports and have been demonstrated to increase children’s level of physical activity and improve other obesity-related outcomes.\textsuperscript{95} An Ontario Ministry of Education memorandum requires elementary students to have a minimum of 20 minutes of sustained moderate to various physical activity (MVPA) each school day during instructional time.\textsuperscript{4} However, an assessment of over 1,000 children in 16 Toronto schools found that fewer than half of the children were provided with daily physical activity every day and none engaged in sustained MVPA for a minimum of 20 minutes.\textsuperscript{130} More information is required about the process and result of this policy to optimize its impact.

How children get to and from school is dependent upon factors in the built environment. Modelling from the U.S. indicates that the combination of school location and built environment quality would produce a 13 per cent increase in non-motorized travel to school.\textsuperscript{131} Even among students that need to be bussed, the drop-off location does not need to be within immediate vicinity to the school nor the pick-up time immediately after classes are completed, in order to allow time for extracurricular activities. School-specific transportation plans are an important approach to examine feasibility and safety concerns associated with these types of approaches and need to be tailored to the local context. While much of the focus to date has been on the development of school transportation plans, our focus going forward will be on supporting their implementation.

### Activity and Sedentary Behaviour Guidelines for Early Years, Children and Youth

\textbf{Infants (less than 1 years of age) should be active several times a day, particularly through interactive floor play. Toddlers and preschoolers should accumulate 180 minutes.}

\textbf{At least 60 minutes of moderate to vigorous intensity physical activity daily is recommended for children and youth. And more physical activity provides greater benefits.}

\textbf{Limit recreational screen time to no more than two hours per day for children and youth. Limit to one hour a day for toddlers and preschoolers aged 2-4, and no screen time is recommended for infants under 2 years of age.}

\textbf{Limit sedentary (motorized) transport, extended sitting and time spent indoors throughout the day.}

Considering the importance of policy change, and the large number of schools within Peel region, it is critical for Peel Public Health to engage and work with school board staff to identify the best approaches for creating healthier school environments. Providing support for change within individual schools will also be important with public health staff working with principals, school staff, students and parents. Piloting initiatives within individual schools will occur with an eye towards the scalability of any approaches on a region-wide basis. While the school environment component of our overall supportive environment portfolio is intended to be the largest single component, our focus needs to be on supporting a region-wide approach.

Workplaces and Agencies

While children spend a considerable portion of their day at school, most adults spend a longer portion of their day at work. There is a multitude of ways in which a workplace can create a supportive environment for healthy living. This includes: its location (e.g., proximity to walking/cycling paths); its design (e.g., visibility and ease of use of staircases); presence of on-site facilities (e.g., shower, bicycle parking, fitness equipment); as well as, the availability of healthy food choices in the cafeteria and vending machines. Furthermore, work design influences sedentary behaviour and policies regarding the food choices offered at hosted meetings.

There are several important differences between workplaces and schools. First, behaviour change among adults is considerably more difficult than in children. Second, while there are a limited number of intermediaries for schools through school boards, no such intermediary exists for workplaces. This poses a major feasibility issue considering the multitude of workplaces (approximately 88,000) across a region as large as Peel. Nevertheless, there is longstanding and increasing evidence for the effectiveness of workplace-based interventions. This includes interventions such as prompts to encourage use of stairs and enhanced access to places for physical activity with informational outreach which are associated with increases in physical activity. Comprehensive approaches, including combinations of informational strategies, behavioural strategies, and policy and environmental approaches to improve access to healthy foods and provide opportunities to be physically active, are associated with reductions in staff body weights. Interventions that reduce the price of healthier, low-fat snacks in vending machines in work settings have been demonstrated to increase purchasing of healthier snacks. Intervention studies are also underway that evaluate the impact of limiting portion size, combined with other strategies to prevent obesity in workplaces. There is a clear business case for employers to pursue employee wellness programs, including lowering costs, and increasing productivity and morale.

A starting point is to address health-supporting work environments within Region of Peel worksites to apply interventions and thereby, lead by example. This builds on Peel Public Health’s efforts in recent years to influence food policy choices within buildings where public health staff are located. Achieving change has been challenging to date. Our intent is to increase our efforts to influence our immediate environment working with key leaders and through key decision-making processes to seek policy change to increase health supportive environments for staff. We will subsequently leverage that experience for the benefit of other workplaces in Peel. Where we have a direct sphere of influence, such as food served at public health-related meetings, we will take immediate action to ensure foods meet our healthy nutrition policy. We will also highlight leading healthy workplace practices across Peel.
A number of non-governmental agencies provide services to the public and are potentially important intermediaries for reaching priority populations. As such, Peel Public Health will seek engagement with these agencies as part of our comprehensive portfolio of approaches.

**Built Environment**

While well intentioned, as a society we have engineered, to a considerable degree, physical activity out of our day-to-day lives. Existing evidence points to a large number of influences on people's physical activity. Increasing access to places for physical activity, when combined with informational outreach, can be effective in increasing physical activity. Accessibility depends on a number of factors, such as proximity to homes or schools, cost, hours of operation and ease of access.

Populations with higher levels of active transportation have lower rates of obesity. Improving walking and bicycling infrastructure is an important element of the built environment and has been demonstrated to be associated with physical activity in adults and children. However, with Peel's low population density, destinations such as school, work or shopping, and thus the potential contribution of paths to active transport is limited. Paths can be used for recreational activities, but the time to do so needs to be squeezed into people's already busy lives.

For several years, Peel Public Health has been actively involved in a number of initiatives to increase our understanding of the issue and to promote public health action on influencing the built environment. Collaborating with the Centre for Research on Inner City Health at St. Michael's Hospital, and McMaster University, a Peel Healthy Development Index has been developed that identifies seven elements of the built environment that are known to be associated with health (see box at top). Peel Public Health has also been active in developing a built environment assessment tool and additional background work.

With much of Peel's infrastructure already established, opportunities for intervention are somewhat limited. Nevertheless, new subdivisions continue to be built and infill projects also occur. These present opportunities to apply existing recommendations for creating more health-supporting environments, including their walkability, cyclability, and mixed-use zoning. Peel Public Health needs to be in a position to take advantage of opportunities associated with new development and any natural experiments that might occur. Consistent with the U.K.'s National Institute for Health and Clinical Excellence (NICE) recommendations, ensuring interdepartmental planning and health impact assessments of new development are potential areas for future action. Additional areas for attention include working with stakeholders regarding existing policies, such as bylaws that restrict activity in open spaces and policies preventing bicycles on school property. Opportunities to address built environment food policies include food availability in recreation centres, as well as, Drive-Thru policies. These complement the food policies already addressed earlier in school and regional workplace settings.

Health is one of many considerations in urban planning and development. Nevertheless, major changes in the built environment can influence the obesity system map in several
locations and in a sustainable manner.\textsuperscript{19} Opportunities to align with broader efforts, such as reducing energy consumption, pollution, traffic congestion and injury rates, may assist in achieving sufficient momentum for change.\textsuperscript{19}

Peel Public Health will develop its capacity to work with the Region’s Planning Department and other key partners, including lower-tier municipalities, school boards, developers and the population at large, since public demand is an important driver of developers’ plans. Planning requirements are often set at higher levels of government; therefore, working with other healthy built environment proponents to advocate for more health-supporting policies would also be linked to this component. Because of the pervasiveness of built environment issues, there are multiple potential synergies with the work of other components, such as child-care centres, schools and workplaces (active transportation plans), as well as working with the South Asian population.

Cross-Cutting Elements
Achieving Policy Change

In the various priority settings described above, most of the policies that Peel Public Health will be seeking to influence are local or regional in nature. School board (region-wide) and individual school (local) policies are examples. However, there are also many important types of policies that influence social and physical environments at the community level that are within the direct sphere of influence of provincial and national governmental levels. For example, regulations regarding food nutrition labelling, food environment in child care settings, advertising of food to children and regulations of trans-fats and sodium content in foods are based at these levels. Many restaurant and grocery chain stores are national in scope, so efforts to encourage food choices, presentation, menu labelling and portion size would need to be pursued at that level. Local built environment policies, such as school policies and transportation standards, are also influenced outside the region.

Peel Public Health is not alone in its interest in influencing policies at provincial and federal levels. Key partners include other Ontario public health units, the province’s Chief Medical Officer of Health, and provincial and federal public health associations. Opportunities for broader advocacy will be sought within the scope of individual components, as well as, the number of provincial and national initiatives that Peel Public Health is involved with. Furthermore, reviews of existing legislation, such as the Day Nurseries Act, will provide opportunities to encourage revisions that support healthy living.

Achieving Health Equity and Inclusion for Diversity

As described in the earlier chapter on “The Public Health Way,” public health approaches typically need to balance universal and targeted approaches. The latter are particularly important since universal
public health approaches, while powerful, can miss some population sub-groups because of language, literacy, culture, income or other reasons. Guidance from the U.K.’s National Institute for Health and Clinical Excellence (NICE) notes that actions to improve the health of the population overall may widen health inequalities between different groups, necessitating consideration of efforts targeting higher risk groups.143 It is well established that “migration from developing countries to affluent, Westernised countries is associated with an increased risk of chronic disease, especially obesity, diabetes and chronic heart disease.”144 For example, South Asians, who represent a major proportion of immigrants to our region, have a predisposition towards metabolic syndrome, which puts them at increased risk for cardiovascular disease and diabetes.145

Existing studies indicate that culturally tailored and facilitated interventions that encompass multiple strategies among immigrants to developed countries had the greatest effects on health behaviours and blood sugar control.144 In addition, the success of interventions can depend on identifying local key players and champions, and take target groups’ needs, including cultural sensitivities, into account from the start of the intervention.143

Discussions with our expert panel highlighted the potential synergies of working with the South Asian population and other program components (e.g., preschool, school, workplace, built environment and social marketing). In addition, there are a number of ongoing projects with South Asian populations occurring in multiple cities across Canada that provides a potential network of contacts and advice. The strong sense of community and family, as well as, existing health professionals within the community, provide an opportunity for collaboration to address needs in a culturally appropriate manner. In addition to establishing collaborative relationships with respected leaders, a considerably greater understanding of socio-cultural issues is required in order to develop an action plan for this portfolio component.

Addressing Social Norms through Social Marketing

Cutting across all of the components is the need to use a comprehensive social marketing campaign to inform, influence attitudes and facilitate behaviour change. A range of messaging will be required to address well-ingrained attitudes and social-cultural norms.

Social Marketing Steps

Continuous, iterative process comprised of:

- Initial planning
- Formative research
- Strategy development
- Program development and pretesting of material and nonmaterial interventions
- Implementation
- Monitoring and evaluation


Social marketing is not simply a promotion or communication activity, but rather employs a conceptual framework that includes “exchange theory, audience segmentation, competition, ‘the marketing mix,’ consumer orientation, and continuous monitoring.”146 As described in an earlier section on the challenges of behaviour change, fundamental to any social marketing initiative is a research component. There needs to be an understanding of the target audience’s wants and needs to guide planning of the interventions, as well as, evaluating and monitoring the interventions to gauge the audiences’ responses to all aspects of the intervention.146 The social marketing plan needs to empower, inspire and motivate change.
Creating Supportive Environments for Healthy Living in Peel

Historical efforts on nutritionism and publicizing evidence-based guidelines for eating and physical activity have been insufficient to address societal trends. “Evidence from research on social marketing suggests that it is unlikely that the type of public information campaigns that urge people to avoid certain foods and to exercise more frequently will be enough to adequately address the problem of obesity. Interventions that go beyond information campaigns to simultaneously inform, shift motivation and provide the necessary skills are more likely to lead to behaviour change.”19 As noted in the evidence review prepared for the Foresight Committee, public campaigns might benefit from an interactional, open-ended style; rather than merely telling people what they should do and how to do it, campaigns should encourage more reflection on the part of individuals.51

It is our intent to employ pragmatic messages and tools to help initiate and sustain action. For example, this may include electronic reminders and applications to assist meal planning, generating a shopping list and providing meal preparation podcast demonstrations to support healthy eating. We will also need to address common myths about time and cost requirements to cook family meals.

From a planning perspective, a number of inter-related issues will need to be considered. These include the sequencing or phasing of messages, as well as, their tailoring to specific behaviours, target groups and settings. Peel Public Health will seek professional social marketing expertise to pursue this portfolio component.

Surveillance, Evaluation, Research and Evidence-Informed Decision Making

A comprehensive approach to creating supportive environments for healthy living must have a system of surveillance and evaluation to accomplish several tasks. First, as highlighted in an early chapter of this report, this component contributes to understanding the extent of the problem, its determinants and its distribution across the population. It is an iterative and ongoing need to understand these characteristics over time and, as interventions begin to be implemented, have impact.

The second major contribution is in monitoring and documenting the short-term, intermediate, and long-term intervention outcomes in the population to inform program and policy direction, as well as, ensure accountability.118 Behavioural and health outcomes are long-term in nature. In order to
assess whether we are having impact in a timely fashion, we will need to track measures that are shorter-term in nature, such as changes in attitudes, changes in supportive policies and whether the implementation of those policies has had the intended impact. As with any continuous improvement initiative, we will need to constantly ask ourselves whether to continue, adapt or discontinue our efforts for particular interventions.147 Standard practice typically dictates that about 10 per cent of annual program funds be allocated for surveillance and evaluation.118 However, the extent of monitoring and evaluation for this initiative will be greater than for well-established, longstanding initiatives. We are currently much better able to describe causes than we are the interventions that will be effective at a population level. Even interventions shown to work elsewhere may not necessarily work exactly the same way in Peel, due to differing social and physical contexts. The complexity of the obesity system map, with its many inter-connections and feedback loops, also means that predicting outcomes is more probabilistic than certain. The net result is that Peel Public Health recognizes and intends to address the need to learn as we do and to document impacts for our and others’ benefit. We intend to augment our existing epidemiologic and evaluative capacity with a range of additional research supports and expertise, including seeking grant funds, hosting graduate student practicum/thesis placements and partnering with academic researchers.

Peel Public Health is committed to evidence-informed decision making and will continue to access and assess the best available evidence (both published and grey literatures) related to the various components of the strategy. Our rapid review process will inform the refinement and enhancement of programs and policies implemented within the strategy.

As a cross-cutting element, these activities need to be integrated with the intervention components from the planning stage of each of the component action plans. Individual components will need to consider the best available evidence, as well as, needs for baseline data and ongoing data needs for short- and longer-term indicators. Needs for more in-depth evaluations (e.g., organizational nutrition food policies) and research will also need to be identified.

**Putting It All Together**

The development of our comprehensive approach to create supportive environments is underpinned by “The Public Health Way,” our understanding of the issues and the aforementioned principles for action. The action plans for each of the components will form a portfolio of actions to create supportive environments for healthy living in Peel region. Overall, our actions will represent a continuum of information, skill development and policy change (see Figure 5.2).

The overall strategic approach to creating supportive environments for healthy living to prevent obesity and many chronic diseases involves the systematic application of a comprehensive set of approaches to a set of priority settings and populations. This comprehensiveness is critical. For example, the social marketing component is important to raise awareness, influence public opinion and the resetting of social norms, but needs to coexist with parallel environmental interventions to support and facilitate behaviour change.19 All of the activities ultimately are intended to support healthy eating and physical activity and address sedentary behaviours. Appendix 6 provides a more detailed diagram showing the multiple dimensions of the strategy to aid planning of interventions.
Best practice recommendations indicate that the comprehensiveness of a portfolio of actions should be assessed. This check on our portfolio’s comprehensiveness at this point in our planning is summarized in Table 5.1. It will be repeated once the component action plans are fully developed.
### Table 5.1
Assessing the Comprehensiveness of the Supportive Environment Portfolio

<table>
<thead>
<tr>
<th>Does the strategy...</th>
<th>Current Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contain interventions that act at different levels with varying, but cumulative degrees of impact (amplifiers, enablers, focused initiatives)?</td>
<td>Predominantly focused, but include enablers (increasing knowledge and education; raising awareness in school officials, parents and employers of productivity benefits of healthy lifestyles in children and workers) and amplifiers (advocating for control of advertising high fat, salt and sugar foods) Significant synergies between components; for example, school environment component aligns with broader social marketing messaging; advocacy regarding food marketing to children; planning of new schools incorporates safe cycling and walkability (built environment); and reinforcement with South Asian population interventions</td>
</tr>
<tr>
<td>Influence a broad set of system levers (physiological/psychosocial/food related factors and the physical activity environment)?</td>
<td>Intended to be built into each of the major components (i.e., preschools, schools, workplaces, built environment and working with South Asian population)</td>
</tr>
<tr>
<td>Obtain a balance between population-level measures and targeted measures?</td>
<td>Population-level measures (social marketing, school children, preschool children), as well as, targeted (Region workplaces and working with South Asian population)</td>
</tr>
<tr>
<td>Act at multiple levels, from the national to the local to the individual?</td>
<td>Individual (social marketing); sub-population (preschool and school children, Regional staff, South Asian population); provincial/national (advocacy efforts since not within direct sphere of influence)</td>
</tr>
<tr>
<td>Take time into account (e.g., life course and generational effects)?</td>
<td>Early child experiences addressed additionally in other public health programs; childhood addressed in school component; adults in workplace program; South Asian and social marketing components to facilitate synergies (e.g., cooking as family, activity together, etc.)</td>
</tr>
<tr>
<td>Have interim targets and measures, as well as, long-term health goals?</td>
<td>To be built into component action plans</td>
</tr>
<tr>
<td>Actively seek alignment with other policy agendas, recognizing synergies and conflicts?</td>
<td>Will seek opportunities with relevant societal concerns (e.g., climate change, school success, school bullying, workplace productivity)</td>
</tr>
<tr>
<td>Engage a broad range of stakeholders?</td>
<td>Key aspect of development and subsequent implementation of component action plans</td>
</tr>
<tr>
<td>Consider the balance between cost-effectiveness and achievability?</td>
<td>Contributed to identification of selected components and relative allocation of resources; will further influence component action plans</td>
</tr>
<tr>
<td>Consider the impact on and implications for health inequalities?</td>
<td>Issues of access to healthy foods and physical activity to be built into multiple components; also subject of ongoing surveillance and evaluation</td>
</tr>
</tbody>
</table>

Table 5.1 continues...
Table 5.1 continued

<table>
<thead>
<tr>
<th>Is the strategy supported by...</th>
<th>Current Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>An ongoing strategy development process underpinned by expert analysis, data-gathering processes and a robust evaluation framework?</td>
<td>Process to date has involved review of scientific literature and engagement with external experts; explicit component for ongoing surveillance and evaluation with seeking of partnerships with relevant academic researchers</td>
</tr>
<tr>
<td>Suitable government management structures to enable clear leadership, strategy formulation and co-ordination for action across government (all levels) and with other key stakeholders?</td>
<td>Will be seeking partnership with key decision-makers and advocacy at other levels of governments</td>
</tr>
<tr>
<td>Underpinning risk analysis (for management of unexpected consequences)?</td>
<td>Ongoing evaluation will seek detection of unexpected effects</td>
</tr>
<tr>
<td>Sufficient resources to enable a scaled-up response?</td>
<td>Initial set of resources made available to begin with intent to augment them as required</td>
</tr>
</tbody>
</table>


Action Plan Development

For each portfolio component, we will develop a multi-year action plan with associated objectives, actions and measures. Early engagement with relevant champions and key players will be critical. We anticipate conducting an environmental scan for each component comprised of the following:

- Identify existing recommendations, guidelines, and existing evidence (e.g., systematic reviews)
- Identify existing initiatives/pilots in Peel and other opportunities
- Environmental analysis with key informants and focus groups to identify physical, economic, policy and sociocultural barriers and opportunities
- Analyze to prioritize and sequence actions
- Ensure SMART (Specific, Measurable, Attainable, Relevant, Timely) objectives
- Identify associated capacity building that is required to be able to optimally pursue the desired policy change: leadership; workforce development; partnerships/relationships; organizational development; resources. For example, we will need to complement existing expertise within Peel Public Health with expertise in social marketing, culinary skills, community development and evaluation.

Plan development will need to be iterative in order to identify and reinforce synergies among different components. Recognizing the magnitude of the challenge and the size of Peel, we will seek alignment with existing initiatives and opportunities to multiply the impact of our efforts. Our staff will be our ambassadors modelling the commitment to personal, family and organizational change. Whether it be engaging in walking meetings or ensuring that all food served at meetings meets a healthy food policy or using our own e-tools to plan, prepare and serve healthy meals to our families, we intend to lead and learn by personal example.
CONCLUSION

This report outlines the strategic direction for Peel Public Health to create supportive environments for healthy living where the healthy choice is the easy, default choice for both food and activity. While obesity and adverse health outcomes are the motivation for our work, the focus of our attention will be on addressing the upstream drivers or causes of unhealthy eating, physical inactivity and sedentary behaviours. Eating and movement are natural human activities, but they need to be re-normalized within our society.

The challenge is large and the expected timelines long. Based on the best available evidence and expert advice, our starting point is a portfolio of comprehensive, mutually reinforcing components that address a variety of settings: preschools; schools; workplaces; and the built environment. These initiatives will be supported by cross-cutting initiatives, including: achieving policy change at all levels of government; a social marketing campaign; and ongoing surveillance, evaluation, research and use of the best available evidence.

Furthermore, because of its relative size and higher than average risk, we intend to focus on diversity and inclusion by working closely with the region’s diverse populations, particularly the South Asian population, to reduce health disparities. Our next steps will be to engage relevant partners to develop multi-year action plans for each of the portfolio components.

Now is the time for action and we look forward to learning as we move forward working with our many partners to create more supportive environments for health for the people of Peel.
APPENDIX ONE

ADDITIONAL DETAIL ON THE CAUSAL LINKS BETWEEN SELECTED MODIFIABLE RISK FACTORS AND CHRONIC DISEASES

Figure 3.1 in the main body of this report focuses illustrates the relationship of physical inactivity and unhealthy eating with a selected group of intermediate outcomes and chronic diseases. Table A provides a more detailed summary, including a broader range of risk factors and chronic diseases from a recent report from Cancer Care Ontario and Public Health Ontario.⁴
## Table A
### Causal Links Between Selected Modifiable Risk Factors and Chronic Diseases

<table>
<thead>
<tr>
<th>Select specific diseases</th>
<th>Tobacco Use</th>
<th>Alcohol</th>
<th>Physical Inactivity</th>
<th>Unhealthy Eating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Current smoker</td>
<td>Second-hand smoke</td>
<td>Smokeless</td>
<td>Alcohol consumption</td>
</tr>
<tr>
<td>Cancer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast</td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>Lung</td>
<td>↑</td>
<td>↑</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colon &amp; rectum</td>
<td>↑</td>
<td>↑</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leukemia</td>
<td>↑</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bladder</td>
<td>↑</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body of uterus</td>
<td>↓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kidney</td>
<td>↑</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral cavity, pharynx</td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>Cardiovascular disease</td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>IHD</td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>Stroke</td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>Asthma</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COPD</td>
<td>↑</td>
<td>↑</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chronic respiratory disease</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td>↑</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 2 diabetes</td>
<td>↑</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: IHD = ischemic heart disease; COPD = chronic obstructive pulmonary disease; ↑ = convincing increased risk; ↑ = probable increased risk; ↓ = convincing decreased risk; ↓ = probable decreased risk; ⬇️ = convincing J- or U-shaped risk; ⬇️ = probable J- or U-shaped risk.

Note: Table A was assembled using expert evaluations performed by the World Health Organization, International Agency for Research on Cancer, United States Surgeon General and World Cancer Research Fund. This table includes only a selection of risk factors and the most common diseases associated with these risk factors. Directional arrows were included if the strength of evidence for the causal association between the risk factor and disease was rated as ‘probable’ or stronger by the expert panel. Unhealthy eating indicators were evaluated by the World Health Organization for cardiovascular disease as a whole; a distinction was not made between IHD and stroke.

Source: Cancer Care Ontario (CCO) and Public Health Ontario (PHO). Taking action to prevent chronic disease: recommendations for a healthier Ontario. Toronto: Queen’s Printer for Ontario, 2012. [Reproduced with permission from CCO and PHO, Ontario, Canada.]
Figure A provides Foresight’s full obesity system map with outlining of thematic clusters. The variables are represented by boxes and the positive and negative relationships among them represented by solid and dotted lines, respectively.
Creating Supportive Environments for Healthy Living in Peel

Figure A
Foresight Obesity System Map

## CALCULATION OF CHANGES IN FOOD PRICES OVER TIME

### Table B
Food Prices of Selected Foods and Their Change from January 1995 to January 2012

<table>
<thead>
<tr>
<th>Grouping &amp; Commodity</th>
<th>Jan. '95</th>
<th>Jan. '12</th>
<th>% change</th>
<th>Group Change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid Milk</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homogenized milk, 1 litre</td>
<td>1.34</td>
<td>2.38</td>
<td>78%</td>
<td></td>
</tr>
<tr>
<td>Partly skimmed milk, 1 litre</td>
<td>1.30</td>
<td>2.28</td>
<td>75%</td>
<td></td>
</tr>
<tr>
<td>Apples, 1 kilogram</td>
<td>2.08</td>
<td>3.40</td>
<td>63%</td>
<td></td>
</tr>
<tr>
<td>Bananas, 1 kilogram</td>
<td>1.37</td>
<td>1.72</td>
<td>26%</td>
<td></td>
</tr>
<tr>
<td>Grapefruits, 1 kilogram</td>
<td>1.31</td>
<td>2.58</td>
<td>97%</td>
<td></td>
</tr>
<tr>
<td>Oranges, 1 kilogram</td>
<td>1.55</td>
<td>2.65</td>
<td>71%</td>
<td></td>
</tr>
<tr>
<td>Carrots, 1 kilogram</td>
<td>1.18</td>
<td>1.63</td>
<td>38%</td>
<td></td>
</tr>
<tr>
<td>Celery, 1 kilogram</td>
<td>2.63</td>
<td>2.58</td>
<td>-2%</td>
<td></td>
</tr>
<tr>
<td>Mushrooms, 1 kilogram</td>
<td>5.62</td>
<td>7.99</td>
<td>42%</td>
<td></td>
</tr>
<tr>
<td>Onions, 1 kilogram</td>
<td>1.04</td>
<td>1.48</td>
<td>42%</td>
<td></td>
</tr>
<tr>
<td>Potatoes, 4.54 kilograms</td>
<td>2.70</td>
<td>5.41</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Soft Drinks &amp; Fruit Flavoured</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruit flavoured crystals, 2.25 litres</td>
<td>1.29</td>
<td>1.45</td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td>Soft drinks, cola type, 2 litres</td>
<td>1.39</td>
<td>1.85</td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td>Soft drinks, lemon-lime type, 2 litres</td>
<td>1.50</td>
<td>1.81</td>
<td>21%</td>
<td></td>
</tr>
</tbody>
</table>

Source: Statistics Canada. CANSIM Table 326-012. Note: not adjusted for inflation.
IDENTIFYING THEMES WITHIN EXISTING RECOMMENDATIONS

As described in the main body of the report, recommendations from a variety of major reports were analyzed to identify common themes. Table C summarizes the focus, process and output for each report.
### Table C
Summary of Major Reports Utilized in Analysis

<table>
<thead>
<tr>
<th>Group</th>
<th>Focus</th>
<th>Process</th>
<th>Output</th>
</tr>
</thead>
</table>
| Foresight - 2007<sup>19</sup> | Policy responses likely having greatest impact on future levels of obesity | • Utilized obesity system map and political/societal scenarios  
• From initial set of 56 possible policy interventions, 17 were chosen exemplifying range and depth of interventions that might be needed  
• Experts and stakeholders ranked the impact of the interventions by their effectiveness and achievability for each scenario | • Five top policy responses having greatest average impact on levels of obesity across the scenarios |
| IOM – 2005<sup>13</sup> | Prevention-focussed action plan to decrease the prevalence of obesity in children and youth | • 19-member committee developed guidelines for integrated use of available evidence to inform population-based obesity prevention interventions and on which to base recommendations  
• Perspective that actions should be based on best available evidence as opposed to waiting for best possible evidence | • Ten recommendations addressing different sectors  
• Nine immediate steps relevant to local government, schools and other intermediaries |
| NICE – 2008<sup>88</sup> | Public health guidance on the promotion and creation of physical environments that support increased levels of physical activity | • Program Development Group considered reviews of evidence, economic appraisal, stakeholder comments and the results of fieldwork  
• Recommendations drafted through informal consensus based on strength of evidence of effectiveness, effect size and potential impact on population health and/or reducing health inequalities, cost effectiveness, balance of risk and benefits, ease of implementation and anticipated extent of change in practice that would be required | • Seven recommendations identifying what action should be taken and by whom  
• Appendix links evidence statement to recommendations |

Table C continues ...
### Table C continued

<table>
<thead>
<tr>
<th>Group</th>
<th>Focus</th>
<th>Process</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDC – 2009</td>
<td>Identify and recommend a series of strategies and associated measure-</td>
<td>• 179 strategies identified in literature review</td>
<td>• Twenty-six strategies included</td>
</tr>
<tr>
<td></td>
<td>ments that communities and local governments can use to plan</td>
<td>• Expert Panel prioritized 47 strategies as most promising</td>
<td>• Summary of available evidence in support of</td>
</tr>
<tr>
<td></td>
<td>and monitor policy-level changes for obesity prevention</td>
<td>• Project team reduced this to 22 policy and</td>
<td>strategy provided</td>
</tr>
<tr>
<td></td>
<td></td>
<td>environmental-level strategies with highest priority for preventing</td>
<td>• Potential measurements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>obesity a community level</td>
<td>that communities can use</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Three additional strategies added to be consistent</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>with CDC’s Nutrition and Physical Activity Program to</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prevent Obesity</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• One strategy added on</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>basis of expert opinion</td>
<td></td>
</tr>
<tr>
<td>IOM – 2011</td>
<td>Make recommendations on early childhood prevention policies with a</td>
<td>• Considered direct and indirect evidence regarding likely impact of</td>
<td>• Eighteen recommendations, although one applicable to local</td>
</tr>
<tr>
<td></td>
<td>focus on nutrition physical activity and sedentary behaviour</td>
<td>a given policy on reducing childhood obesity, as well as</td>
<td>action</td>
</tr>
<tr>
<td></td>
<td></td>
<td>evidence pertaining to the potential for unintended adverse</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>effects</td>
<td></td>
</tr>
<tr>
<td>England –</td>
<td>Cross-government national strategy for healthy weight, healthy</td>
<td>• Utilized findings from Foresight report</td>
<td>• Series of recommendations addressing five main</td>
</tr>
<tr>
<td>2008</td>
<td>lives</td>
<td>• Intent to publish an annual assessment of progress in</td>
<td>policy areas: promote</td>
</tr>
<tr>
<td></td>
<td></td>
<td>halting and then turning around rise in excess weight</td>
<td>children’s health; promote</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>healthy food; build</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>physical activity into our</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>lives; support health</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>at work and provide incentives more widely to</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>promote health; and</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>provide effective</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>treatment and support</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>when people become</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>overweight or obese</td>
</tr>
</tbody>
</table>

Table D shows the grouping of recommendations by theme. For space considerations, the wording of lengthy recommendations has been truncated. Source reports should be reviewed before citing specific recommendations.
### Table D
### Grouping of Recommendations from Selected Major Reports

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Sub-Cluster</th>
<th>Recommendations</th>
</tr>
</thead>
</table>
| **Built Environment**        | Planning and Priority Setting| • Planning policies prioritize need for people to be physically active as part of their daily life (NICE, England)  
• Assess plans in advance for health impact assessment (NICE, England)  
• Expand and promote opportunities for physical activity through changes to ordinances, capital improvement and other planning practices (IOM 2005)  
• Community and its built environment should promote physical activity for children (IOM 2011)  
• Zone for mixed-use development (CDC 2009)  
• Invest in training for planners, architects and designers on health implications of local plans (England)  
• Develop and promote a toolkit in ways in which planning policy and powers can be applied to promote physical activity (England)  
• Encourage local planning authorities to support the vision of a more physically active society (England) |
|                              | Walking and Cycling          | • Increase walkability and cyclability of built environment (Foresight)  
• Enhance infrastructure supporting bicycling and walking (CDC 2009)  
• Give walking and cyclists priority when developing or maintaining streets or roads (NICE)  
• Plan comprehensive network of routes for walking and cycling (convenient, safe, attractive access to key destinations – home, school, workplaces, other public facilities) (NICE)  
• Link buildings to walking/cycle network (NICE)  
• Promote walking to and from work (England)  
• Support locating schools within easy walking distance of residential areas (CDC 2009)  
• Improve access to public transport (CDC 2009) |
|                              | Safety                       | • Enhance traffic safety where persons are or could be (CDC 2009)  
• Enhance personal safety where persons are or could be physically active (CDC 2009) |
|                              | Building Design              | • Staircases are designed and positioned to encourage use with clear signposting and attractive to use (NICE)  
• Ensure local facilities and services are easily accessible on foot, by bicycle and by other modes of transport involving physical activity (NICE) |

Table D continues...
# Table D continued

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Sub-Cluster</th>
<th>Recommendations</th>
</tr>
</thead>
</table>
| **Built Environment**    | Open Spaces                  | • Ensure public open spaces and public paths can be reached on foot, by bicycle and using other modes of transport involving physical activity; they should also be accessible by public transport (NICE)  
• Ensure public open spaces and public paths are maintained to a high standard; they should be safe, attractive and welcoming to everyone (NICE) |
|                          | Community Infrastructure     | • Improve access to outdoor recreational facilities (CDC 2009)  
• Build and deliver world class sports infrastructure (England)                                                                                   |
|                          | Healthy Eating in Public Venues | • Control availability of obesogenic food and drink (Foresight)  
• Increase availability of healthier food and beverage choices in public service venues (CDC 2009)  
• Discourage consumption of sugar-sweetened beverages (CDC 2009)  
• Institute smaller portion size options in public service venues (CDC 2009)  
• Restrict availability of less healthy foods and beverages in public service venues (CDC 2009)  
• Improve affordability of healthier foods and beverage choices in public service venues (CDC 2009)  
• Manage proliferation of fast food outlets in proximity to schools and parks (England) |
| **Schools**              | Whole School Policies       | • Help all schools to reach Healthy School standards (England)  
• Provide a consistent environment that is conducive to healthful eating behaviours and regular physical activity (IOM 2005)  
• Develop, implement and evaluate innovative pilot programs for both staffing and teaching about wellness, healthful eating and physical activity (IOM 2005)  
• Ensure school playgrounds are designed to encourage varied, physically active play (NICE)  
• Primary schools should create areas (for instance, by using different colours) to promote individual and group physical activities such as hopscotch and other games (NICE) |
|                          | Healthy Eating              | • Healthy Schools required to have a whole-school food policy (lunchbox policies; lunchtime management) - England  
• Improve nutritional quality of foods and beverages sold in schools (IOM 2005)  
• Make cooking a compulsory part of the school curriculum (England) |

Table D continues...
### Table D continued

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Sub-Cluster</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools</td>
<td>Sedentary Behaviour</td>
<td>• Implement school-based interventions to reduce children’s screen time (IOM 2005)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Reduce screen time in public service venues (CDC 2009)</td>
</tr>
<tr>
<td></td>
<td>Physical Activity (pre/during/after)</td>
<td>• Require physical education in schools (CDC 2009)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Increase amount of physical activity in physical education programs (CDC 2009)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ensure overweight and obese children increase their participation including tailoring of activities (England)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Increase opportunities for extracurricular physical activity (CDC 2009)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Extended schools – all schools offer extended services on year-round basis from 8 a.m. to 6 p.m. (e.g., breakfast clubs, parenting classes, cookery classes, food co-ops, sports clubs, use of leisure facilities) (England)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Increase opportunities for frequent, more intensive and engaging physical activity during and after school (IOM 2005)</td>
</tr>
<tr>
<td>Childcare</td>
<td>Childcare Settings</td>
<td>• Require providers to provide physical activity throughout the day (IOM 2011)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Requirement to practice responsive feeding (IOM 2011)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Require providers to allow young children to freely move and limit time sitting or standing still (IOM 2011)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Require practices promoting age-appropriate sleep durations (IOM 2011)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Variety of healthy foods and age-appropriate portion sizes with all meals, snacks and beverages served by early childhood programs consistent with Guidelines (IOM 2011)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Limit screen time to &lt;2hrs/day for children aged 2 to 5 yrs. (IOM 2011)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Reduce screen time in public service venues (CDC 2009)</td>
</tr>
<tr>
<td></td>
<td>Training to Staff and Information to Parents</td>
<td>• Should be trained and educated and have the right tools to increase healthy eating (IOM 2005/2011)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Include ways to increase physical activity and decrease sedentary behaviour (IOM 2005/2011)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Include children’s age-appropriate sleep durations (IOM 2011)</td>
</tr>
</tbody>
</table>
### Table D continued

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Sub-Cluster</th>
<th>Recommendations</th>
</tr>
</thead>
</table>
| Homes and Families | Breastfeeding (selected items since subject of separate Peel Public Health strategy) | • Promote and support exclusive breastfeeding for 6 months and continuation to complement foods for 1 year or more (IOM 2011)  
  • Increase support for breastfeeding (CDC 2009)  
  • Make breastfeeding the norm (England) |
| | Home-Based Healthy Lifestyles | • Engage in and promote more healthful dietary intakes and active lifestyles (e.g., increased physical activity, reduced television and other screen time, more healthful dietary behaviours) – IOM 2005  
  • Limit screen time to <2hrs/day for children (IOM 2011)  
  • Counsel parents not to permit screens in children’s bedrooms or other sleeping areas (IOM 2011) |
| | Parent Information | • Routinely receive schoolchildren’s height and weight measurements performed at reception and year 6 (England)  
  • Integrated marketing to inform, support and empower parents to make changes to their children’s diets and levels of physical activity (England)  
  • Social marketing for consistent, practical info on risk factors for obesity and strategies for preventing overweight and obesity (IOM 2011)  
  • Engage in and promote more healthful dietary intakes and active lifestyles (e.g., increased physical activity, reduced television and other screen time, more healthful dietary behaviours) (IOM 2005) |
| Advocacy for Supportive Policies Not in Local Sphere of Influence | Limit Marketing of Unhealthy Foods to Children | • Limit advertisements of less healthy foods and beverages (CDC 2009)  
  • Industry should develop and promote products, opportunities and information that will encourage healthful eating behaviours and regular physical activity (IOM 2005)  
  • Industry should develop and strictly adhere to marketing and advertising guidelines (IOM 2005)  
  • Nutrition and marketing standards for food and beverage products marketed to children (IOM 2011)  
  • Work with industry leaders and other relevant stakeholders to finalize a Healthy Food Code of Good Practice (England)  
  • Review restrictions on promotion to children of foods height in fat, salt and sugar (England) |
| | Entertainment Industry | • Work with entertainment industry to continue to develop tools to allow parents to manage the time that their children spend playing games and online (England) |

Table D continues...
### Table D

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Sub-Cluster</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Partnerships</td>
<td></td>
<td>• Participate in community coalitions or partnerships to address obesity (CDC 2009)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Provide opportunities for healthful eating and physical activity in existing and new community programs, particularly for high risk populations (IOM 2005)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Support partnerships and networks that expand availability and access to healthy foods (IOM 2005)</td>
</tr>
<tr>
<td>Partnerships</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inequities in Food Access</td>
<td></td>
<td>• Improve geographic availability of supermarkets in underserved areas (CDC 2009)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Provide incentives for food retailers to locate in/offer healthier foods/beverage choices in underserved areas (CDC 2009)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Promote access to affordable healthy foods in all neighbourhoods (IOM 2011)</td>
</tr>
<tr>
<td>Local Farms</td>
<td></td>
<td>• Improve availability of mechanisms for purchasing food from farms (CDC 2009)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Provide incentives for production, distribution and procurement of food from local farms (CDC 2009)</td>
</tr>
<tr>
<td>Fitness and Leisure Facilities</td>
<td></td>
<td>• Explore how to boost use of fitness and leisure facilities during off-peak times (e.g., flex-time workers; families) (England)</td>
</tr>
<tr>
<td>Health Care (selected items)</td>
<td></td>
<td>• Measure children’s height and weight and provide to parents (IOM 2005/2011; England)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Identify children/families at risk (IOM 2011; England)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Target health interventions to those at risk (Foresight)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Government website provides personalized advice on diet, activity and how to maintain a healthy weight (England)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Intensive support for at-risk families – identify mothers during prenatal care that are already obese/overweight (England)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Resource pack for general practitioners and nurses to help sedentary adults become active (England)</td>
</tr>
<tr>
<td>Workplaces</td>
<td></td>
<td>• Increase responsibility of organizations for health of employees (Foresight)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pilot how companies can best promote wellness and make healthy workplaces part of their core business model (England)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Walk into health program to encourage walking to and from work (England)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pilot how health care staff can be offered personalized health advice and lifestyle management programs linked to personal assessments (England)</td>
</tr>
<tr>
<td>Building Design</td>
<td>(see Built Environment cluster)</td>
<td></td>
</tr>
<tr>
<td>Healthy Eating Public Service Venues</td>
<td>(see Built Environment cluster)</td>
<td></td>
</tr>
</tbody>
</table>
PRIORITIZATION OF RECOMMENDATIONS FOR PUBLIC HEALTH ACTION

As described in the main body of this report, ideally action would be pursued for all of the recommendations (see Appendix 4) with the additional consideration of the food industry and higher risk sub-populations, such as the large South Asian population of Peel region. Recognizing the magnitude of the challenge and the finite set of available resources, the expert panel suggested that a feasibility analysis might help prioritize potential areas for action that were most relevant/attractive for Peel Public Health.

Based on the discussion with the expert panel and a decision framework from the literature,\textsuperscript{114} the following set of criteria were applied:

- **Sphere of influence**: extent to which public health can directly influence target population or setting, or if not, the extent to which there are a limited number of intermediaries that themselves have direct influence on target population or setting
- **Extent of current action**: the opportunity to build on existing activity
- **Resource requirements**: the magnitude of resources required to tackle a recommendation
- **Reach**: the extent of the population that will be accessed by the intervention

An ordinal scoring system was devised for each of these criteria with equal weighting for each item with lower scores being more favourable (see Table E). For example, the most feasible recommendations would be those in which public health can directly influence the target population or setting, has extensive experience doing so, would require relatively few resources, and would reach the entire target population.
Creating Supportive Environments for Healthy Living in Peel

Considering the large number of recommendations, the criteria were applied to groups of recommendations at either the cluster or theme level. Since many of the recommendations had been subject to prioritization processes, there was an implicit assumption that the recommendations were equally effective.

Table E

Scoring of Feasibility Criteria

<table>
<thead>
<tr>
<th>Scoring</th>
<th>Sphere of Influence/Intermediaries</th>
<th>Extent of Current Action</th>
<th>Resource Requirements (assume 60 FTE total)</th>
<th>Reach</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Direct</td>
<td>Extensive</td>
<td>Small (&lt;5%)</td>
<td>Large</td>
</tr>
<tr>
<td>2</td>
<td>Intermediary – limited number with direct influence (e.g., 1 or 2 school boards)</td>
<td>Some</td>
<td>Significant (20%)</td>
<td>Moderate</td>
</tr>
<tr>
<td>3</td>
<td>Intermediary – multiple with diffuse influence (e.g., multiple licensed daycares; primary care providers)</td>
<td>None/limited</td>
<td>Considerable (33%)</td>
<td>Limited</td>
</tr>
<tr>
<td>4</td>
<td>Higher Scale (e.g., prov/fed)</td>
<td>–</td>
<td>Extensive (50%+)</td>
<td>–</td>
</tr>
</tbody>
</table>

Table F

Application of Feasibility Criteria to Clusters/Groups of Existing Recommendations

<table>
<thead>
<tr>
<th>Cluster/Group</th>
<th>Sphere of Influence</th>
<th>Extent of Current Action</th>
<th>Resource Requirements</th>
<th>Reach</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Built environment</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1.5</td>
<td>7.5</td>
</tr>
<tr>
<td>School food policy and skills</td>
<td>2</td>
<td>1.5</td>
<td>3</td>
<td>1</td>
<td>7.5</td>
</tr>
<tr>
<td>Peel’s own direct service delivery (HBHC)</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Breastfeeding policies</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1.5</td>
<td>8.5</td>
</tr>
<tr>
<td>Info to parents (media)</td>
<td>1</td>
<td>3</td>
<td>3.5</td>
<td>1</td>
<td>8.5</td>
</tr>
<tr>
<td>School PA/SB policies</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Workplaces – Regional</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Food policy – Public service venue</td>
<td>2.5</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>9.5</td>
</tr>
<tr>
<td>Childcare</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2.5</td>
<td>9.5</td>
</tr>
<tr>
<td>Higher risk populations</td>
<td>2.5</td>
<td>2</td>
<td>2.5</td>
<td>2.5</td>
<td>9.5</td>
</tr>
<tr>
<td>Local foods availability</td>
<td>2.5</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>9.5</td>
</tr>
<tr>
<td>Food industry</td>
<td>3.5</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>9.5</td>
</tr>
<tr>
<td>Marketing and food standards</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Workplaces – general</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Health care</td>
<td>3</td>
<td>3</td>
<td>2.5</td>
<td>1.5</td>
<td>10</td>
</tr>
</tbody>
</table>
While the scoring achieved a ranking of items, the actual dispersion among items was quite small and highly susceptible to any scoring change of a single criterion. Scoring of some items was challenging and was addressed through discussion among project team members. Nevertheless, the intent of this type of exercise is not to generate the answer, but to inform discussion and further analysis.

For most items, action is not within public health’s direct sphere of influence. This is not a surprise since most determinants of health are outside public health’s sphere of influence, which reinforces the need for public health to develop strategic partnerships with others. Nevertheless, not all circumstances are the same. For some actions, there exist a limited number of intermediaries that have the target policy setting within their sphere of influence. The two Peel region school boards are an example of this scenario. This contrasts with childcare settings where there is no overall co-ordinating body that has strong levers to direct action within individual facilities. Two of the higher ranked items (i.e., breastfeeding policies and strengthening existing child development programs) are components of a parallel Peel Public Health strategic priority, Nurturing the Next Generation. However, as that strategic priority is focussed on the first year of life, these topics in early childhood are an important component of the Supportive Environment Healthy Living initiative.

The initially highest ranked items were built environment, and school food policy and skills. Initial discussion with our expert advisory group addressed the concern that Peel’s built environment was, to a large extent, already constructed, and did not reflect the higher density, mixed-use planning conducive for active transport. Nevertheless, with new areas under construction, there may be opportunities for intervention. Expert panel feedback regarding school food policy and skills indicated that a whole school approach should be considered, incorporating physical activity and sedentary behaviours into school-based interventions.

Discussion also occurred regarding the potential for workplace-level interventions, since as a significant employer within Peel, the Region has the opportunity to lead by example in establishing health supporting workplaces. Expert panel members also noted a few key facts regarding the South Asian population within Peel region; namely: its relative size, the physiologic reasons members of this group are at higher health risk even with a normal BMI, and the likely need to tailor messages and interventions for this population. They also emphasized the number of current research projects across the country involving South Asian communities that could help inform actions within Peel.

Overall, leveraging the many existing recommendations for public health action, combined with a feasibility analysis and expert input, facilitated the prioritizing of areas for Peel Public Health’s initial focus, which are:

- Preschools
- Schools
- Workplaces and Agencies
- Built Environment.

Working with Peel’s diverse populations, particularly the South Asian population will also be included as a cross-cutting element in the strategy.
MORE DETAILED STRATEGY DIAGRAM

The following figure complements the main strategy diagram shown in Figure 5.2 in the main body of this report. Figure B below, illustrates that the planning of interventions to create supportive environments for health eating, physical activity and sedentary behaviours needs to consider multiple dimensions (i.e., priority populations, settings, approaches and partners/intermediaries). For example, an active transportation initiative to increase physical activity for children going to and from school, would need to consider, at a minimum, the following:

- **Priority population:**
  - school-age children and their families
- **Approaches:**
  - policy development
  - community awareness and education
  - partnership and collaboration
  - research, surveillance and evaluation
- **Target settings:**
  - schools
  - built environments (since may need to make changes to road design)
- **Partners:**
  - School board and school staff
  - Parents
  - Local government.
Creating Supportive Environments for Healthy Living in Peel

Figure B
Multiple Dimensions of Creating Supportive Environments for Healthy Living

Priority Populations:
- Preschool & School-age children (and their families)
- Region of Peel staff
- South Asian population

Approaches:
- Policy development, implementation and monitoring
- Health equity and inclusion
- Research, surveillance, & evaluation
- Community awareness & education (social marketing)
- Community development
- Partnership and collaboration

Healthy Eating
Physical Activity
Sedentary Behaviours

Target Settings:
- Childcare
- Schools
- Workplaces (regional first)
- Built environments

Partners/Intermediaries:
- Childcare organizations and staff
- School boards and school staff
- Parents
- Employers
- Community groups
- Regional and municipal governments
- Provincial and federal governments

Priority Populations:
- Preschool & School-age children (and their families)
- Region of Peel staff
- South Asian population

Approaches:
- Policy development, implementation and monitoring
- Health equity and inclusion
- Research, surveillance, & evaluation
- Community awareness & education (social marketing)
- Community development
- Partnership and collaboration

Healthy Eating
Physical Activity
Sedentary Behaviours

Target Settings:
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Partners/Intermediaries:
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- School boards and school staff
- Parents
- Employers
- Community groups
- Regional and municipal governments
- Provincial and federal governments
REFERENCES


Creating Supportive Environments for Healthy Living in Peel


Creating Supportive Environments for Healthy Living in Peel


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B  Canadian Community Health Survey 2007/2008, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care

C  Student Health Survey 2011, Peel Public Health