

GAPS IN PUBLIC HEALTH INDICATORS AND DATA IN ONTARIO

Prepared by the Association of Public Health Epidemiologists in Ontario (APHEO) Core Indicators Work Group in Collaboration with Public Health Ontario (PHO)

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Introduction:

The primary purpose of this document is to highlight the gaps in available data which affect the ability to create meaningful public health indicators. In addition it identifies areas where data may exist but no indicators have been defined. These gaps were identified based on a comparison of the Core Indicators for Public Health in Ontario (Core Indicators) (1) and the expectations outlined in the following components of the [Ontario Public Health Standards](#) (OPHS):

- Foundational Standard , Population Health Assessment Requirements and Surveillance requirements
- assessment and surveillance program requirements

In addition, selected Ontario Ministry of Health and Long-Term Care (MOHLTC) Guidance Documents (i.e., Child Health and Reproductive Health Guidance documents) were used to provide more detailed descriptions and potential indicators for more general assessment and surveillance requirements (e.g., growth and development, preparation for parenting)(2,3). Also, indicator and data gaps identified in the Public Health Ontario publication [Measuring the Health of Infants, Children and Youth for Public Health in Ontario report](#) and [appendices](#) were incorporated into the document where appropriate (4,5).

Two types of gaps are included in this document:

1. Indicator gaps due to a lack of developed Core Indicators to support an OPHS outcome or requirement.
An indicator may be:
 - i. in development - currently under development
 - ii. under consideration - priority for development in the near future
 - iii. not developed - not currently under consideration for development due to other priorities
2. Data gaps due to lack of data sources or limitations in the existing data sources (e.g., data not available for the majority of public health units).

A secondary purpose of this report is to support efforts to access existing datasets or the collection of new data that will help address indicator gaps. Efforts could include:

- Association of Public Health Epidemiologists in Ontario (APHEO) developing an access strategy that can be used for various datasets and across different organizations/agencies
- APHEO and Public Health Ontario (PHO) working with other public health agencies, government or associations (e.g., Ontario Public Health Association (OPHA); Association of Local Public Health Associations (alPHa); Council of Ontario Medical Officers of Health (COMOH)) to develop or enhance province-wide data collection systems
- Those responsible for assessment and surveillance who are employed in public health units raising awareness with their boards of health/regional councils about the need to access existing data sets or create new data sets

Section 1 of this report discusses gaps by topic, organized by OPHS program standard. Section 2 describes some common data sources and their limitations.

This work is an update of a document of the same name originally released on August 28, 2012 and includes newly developed Core Indicators and newly identified indicator and data gaps since that time. Updates are summarized in

a table at the end of the document. It is recognized that data access is constantly evolving. The reader is encouraged to regularly explore possible updates.

Section 1: Indicator and Data Gaps by OPHS Program Standard - Requirements for Population Health Assessment and Surveillance

1. Chronic Diseases and Injuries Program Standards

1.1 Chronic Disease Prevention:

1. Healthy Eating

Currently, *Vegetable and Fruit Consumption* and *Food Insecurity*, are available for use to meet this requirement. Canadian Community Health Survey (CCHS) data are available for the population 12 years of age and older. Statistics Canada is developing the Canadian Health Survey on Children and Youth (CHSCY) that is anticipated to provide information about the population one to 17 years of age. The 12 to 17 age group will remain in the CCHS.

Indicator Gaps:

Indicators Not Developed:

- meals eaten in home versus out of home
 - data available through the Rapid Risk Factor Surveillance System (RRFSS) nutrition module
- reading food labels
 - data available to some public health units through RRFSS “Food Labels” module
- sugar sweetened beverages
 - data available to some public health units through three RRFSS modules: “Consumption”; “In the Home” and “Attitudes”
- menu nutrition labelling
 - data available to some public health units through “Menu Labelling” RRFSS module

Indicators in Development or Under Consideration:

- Outlet density (fast food outlets, convenience stores, grocery stores)

Data Gaps:

Currently, no data are available for intake of dietary fibre, fat, dairy products or fast foods or for accessibility to healthy foods.

- food skills
 - i.e., knowledge, planning, conceptualizing food, mechanical techniques and food preparation
- healthy eating information for children 11 years and under

2. Healthy Weights

Currently, *Adult Body Mass Index (BMI)* and *Adolescent BMI* Core Indicators are available to meet this requirement. CCHS data are available for the population 12 years of age and older. Statistics Canada is developing the Canadian Health Survey on Children and Youth (CHSCY) that is anticipated to provide information about the population one to 17 years of age. The 12 to 17 age group will remain in the CCHS.

Indicator Gaps:*Indicators Not Developed:*

- waist circumference
 - data available to some public health units through RRFSS (18+ population)

Data Gaps:

- no weight information for children 11 years and under
- sample from CCHS not large enough to examine adolescent BMI in some public health units
- BMI measure developed based on a predominately Caucasian population and therefore there may be limitations to its use in a more ethnically diverse population

3. Comprehensive Tobacco Control

The following Core Indicators fall under this requirement: *Smoking Status; Smoke-free Homes; Non-smoker Second-hand Smoke Exposure; Smoking Cessation; Smoking During Pregnancy and Minors' Access to Tobacco*. Limitations associated with the *Minors' Access to Tobacco* are noted within the indicator comments of this APHEO Core Indicator (6). An optional CCHS module and a RRFSS module cover this topic.

Indicator Gaps:*Indicators Not Developed:*

- age of initiation
 - data available through CCHS (age at which respondent smoked first whole cigarette and age respondent started smoking daily)
- alternative tobacco products
 - cigar, pipe smoking, snuff and chewing tobacco use
 - data available through optional CCHS module (sample size may be too small for analyses at the health unit level)
 - water pipe use and water pipe attitudes available to some public health units through RRFSS
 - electronic cigarette use as a tobacco cessation aid available to some public health units through RRFSS "Tobacco Cessation" module
 - electronic cigarette use RRFSS module in development
- youth initiation rates (incidence)
 - data available through CCHS
- tobacco retail density
 - data available through inspection databases
- youth tobacco cessation desire
 - proportion of youth that want to stop their use of tobacco (recommended indicator of youth tobacco use by Youth Excel) (7)
 - data available through CCHS optional content; sample may be too small for youth
- second hand smoke exposure for people who live in multiunit dwellings
 - data available to some public health units through the optional RRFSS module: *Smoking in multi-unit dwellings*

Data Gaps:

- contraband tobacco
- social exposure to tobacco use
- physical access to tobacco
- prevalence of use and risk factors for priority populations including young adults, low-income pregnant women, blue collar workers, Aboriginal population

The following are recommended by Youth Excel as indicators of youth tobacco use (7):

- proportion of youth who have never had a puff of a cigarette
 - data available to some public health units through the Ontario Student Drug Use and Health Survey (OSDUHS)
 - public health units must buy extra sample in order to use OSDUHS
- youth susceptibility to cigarette experimentation
 - proportion of youth who have never had a puff of a cigarette who are susceptible to cigarette smoking
- youth tobacco use (excluding cigarettes)

4. Physical Activity

The current Core Indicators aligning with this requirement include: *Leisure Time Physical Activity; Screen Time; and Population Density*. CCHS data are available for the population 12 years and older. Beginning in 2017, the CCHS will be available for the population 18 years of age and older. Statistics Canada is developing the Canadian Health Survey on Children and Youth (CHSCY) that will provide information about the population one to 17 years of age. The 12 to 17 age group will remain in the CCHS.

Indicator Gaps:

Indicators Not Developed:

- International Physical Activity Questionnaire (IPAQ)
 - data available to some public health units through RRFSS (18+ population; available for some public health units)

Data Gaps:

- physical activity or sedentary behaviour information for children 11 years and under
- access to recreational opportunities
 - examine factors such as recreational centre density and accessibility to trails and parks
- ability to walk or bike as mode of transportation

5. Alcohol Use

The Core Indicators that can be used to examine alcohol use are: *Underage Alcohol Drinking; Drinking in Excess of the Low Risk Alcohol Drinking Guidelines; Heavy Drinking Episodes; and Alcohol Attributable Hospitalizations for selected Chronic Disease and Injuries*.

Indicator Gaps:

Indicators Not Developed:

- current drinkers and proportion abstaining from alcohol consumption
 - data available through CCHS

Indicators in Development or Under Consideration:

- outlet density (i.e., alcohol outlet density, bar density)

Data Gaps:

- age of initiation of drinking alcoholic beverages
 - data available to some public health units through OSDUHS
 - public health units must buy extra sample in order to use OSDUHS
- degree of alcohol dependency
- type of drinking
 - social/recreational, experimental, situational and intensive
 - CCHS optional module not chosen for inclusion in the questionnaire since 2001
- exposure to advertisements in the built environment

6. Ultraviolet Radiation Exposure

Currently, *Ultraviolet Radiation (use of sunscreen; sunburn in the past 12 months; avoiding sun during peak times; wearing sunglasses; wearing protective clothing against the sun; using sunscreen)*, can be used to meet this requirement. This indicator evaluates sunburns in the past 12 months as well as sun safety practices. RRFSS is used as the data source and therefore this information is only available for the population 18 years and older and is not available for all public health units. Although there is an optional module, *Sun Safety Behaviours*, available through CCHS, it has never been selected for Ontario.

Indicator Gaps:*Indicators Not Developed:*

- tanning bed use, risk perception and awareness, and policy support
 - data available to some public health units through RRFSS
- heat islands
 - mapping tool from the Clean Air Partnership (8)
- engaging in tan-seeking behaviour (4,5).

Data Gaps:

- no information for children and adolescents
- shade protection
 - shade available in recreational facilities, playground and parks

7. Food Affordability

The Core Indicators currently available: *Cost of a Nutritious Food Basket* and *Food Insecurity*.

Data Gaps:

- *Cost of a Nutritious Food Basket*
 - Does not take into consideration the cost of special diets
- food insecurity
 - data available through the CCHS
 - do not capture some populations most likely to experience food insecurity (e.g., homeless, individuals living on Indian Reserves)

1.2 Prevention of Injury and Substance Misuse:**1. Alcohol and Other Substances**

The Core Indicators currently available are: *Underage Alcohol Drinking; Drinking in Excess of the Low Risk Alcohol Drinking Guidelines; Heavy Drinking Episodes; Drinking and Driving Prevalence;*

Adolescent Drug Use; Alcohol Attributable Hospitalizations for selected Chronic Disease and Injuries; and Alcohol-Related Injury and Mortality from Motor Vehicle Traffic Collisions; Illicit Drug Use.

Data Gaps:

- alcohol-related injuries
 - ICD-10 codes capture unintentional poisoning by alcohol but do not capture injuries which have alcohol as a contributing factor
 - data available through the Ontario Ministry of Transportation (MTO) for injury or death resulting from alcohol-related motor vehicle collisions
- drinking in excess of the Canadian LRDG (9)
 - CCHS does not provide needed data for LRDG number two

2. Falls across the Lifespan

The Core Indicators currently available are: *Injury-Related Mortality; Injury-Related Hospitalization; Injury-Related Emergency Department Visits; Fall-Related Mortality; Fall-Related Hospitalization; and Fall-Related Emergency Department Visits.*

Indicator Gaps:

- none identified at this time

Data Gaps:

- none identified at this time

3. Road and Off-road Safety

The following Core Indicators are currently available: *Drinking and Driving Prevalence; Alcohol-Related Injury and Mortality from Motor Vehicle Traffic Collisions; Motor Vehicle Traffic Collisions Injuries; Injury-Related Mortality; Injury-Related Hospitalization; Injury-Related Emergency Department Visits; Cell Phone Use and Text Messaging While Driving; Seat Belt Use; and Child Car Restraint Use.*

Indicator Gaps:

- none identified at this time

Data Gaps:

- none identified at this time

4. Other Areas

The following Core Indicators are currently available: *Suicide Mortality; Intentional Self-Harm-Related Hospitalization; Suicidal Thoughts and Attempts; Injury-Related Hospitalization; and Injury-Related Mortality, Injury-Related Emergency Department Visits, Neurotrauma-Related Hospitalization; Self-Reported Injury.*

Indicator Gaps:

- none identified *at this time*

Indicators Not Developed

- domestic violence awareness
 - data available to some public health units through RRFSS optional modules: *Violence Against Women; Women Abuse & Routine Universal Comprehensive Screening (RUCS); and Family Violence*

- awareness of childhood injuries
 - data available to some public health units through RRFSS optional module

Data Gaps:

- farm injuries
 - data limited to examining external cause of injury codes (ICD-10 U98 codes) by place of occurrence only (i.e., farm); no information on how the injury occurred is available
- playground safety
 - data limited to emergency department (ED) and hospital records which capture falls from playground equipment; no other external causes of playground injury available
- sports injuries
 - data limited to examining ICD-10 external cause of injury codes for sporting activities and falls (W00-W19), exposure to inanimate mechanical forces (W20-W49), exposure to animate mechanical forces (W50-W64) during sporting activities
 - definition of “sport” may be determined differently by public health units and other agencies
 - may not be known whether injury-causing activity was recreational or employment-related
- attempted suicide
 - self-harm data limited to ED and hospital records which provide no information about intent

2. Family Health Program Standards

2.1 Reproductive Health:

1. Pre-conception Health

It is assumed that this applies to both men and women of reproductive age. The pre-conception period is a time to make decisions about pregnancy and parenting and to achieve a state of optimal health to optimize reproductive health and birth outcomes (3).

Folic Acid Supplementation is the only available indicator that falls under this requirement.

The Ontario Reproductive Health Guidance Document (3) discusses examining the following factors in relation to developing reproductive health, “pre-conception health” communication strategies: alcohol/drug use; awareness of community services; oral health; environmental toxins (including environmental tobacco smoke); family violence; folic acid; history, screening and testing; home environment; nutrition; physical activity; preparation for breastfeeding; reproductive primary care; tobacco; transition of parenthood; and work environment.

Indicator Gaps:

Indicators in Development or Under Consideration:

The following indicators may be used to meet this requirement once they have been developed for a defined population of reproductive age:

- *Adult Body Mass Index*
- *Vegetable and Fruit Consumption*
- *Self-Perceived Life Stress*
- *Heavy Drinking Episodes*
- *Drinking in Excess of the Low Risk Drinking Guidelines*
- *Leisure-Time Physical Activity*
- *Self-Perceived Work Stress*
- *Smoking Status*
- *Smoke-free Homes*
- *Non-Smoker Second-hand Smoke Exposure*
- *Number of Sexual Partners*

Indicators Not Developed:

- number of women in childbearing years who have a family doctor
 - data available through CCHS
 - data available to some public health units through the optional RRFSS content (women that visited a health care provider prior to becoming pregnant in the past 5 years)
- ethnicity of women in childbearing years
 - data available through Census, the voluntary National Household Survey (NHS), CCHS
- number of women in childbearing years
 - data available through the Census
- geographic distribution of women in childbearing years
 - data available through the Census
- sexually transmitted infection (STI) rates (including HIV) among women of childbearing age

- data available through the *Integrated Public Health Information System (iPHIS)*
- alcohol consumption among women of childbearing age
 - data available through CCHS, and to some public health units through RRFSS
- oral health
 - data available through CCHS, and to some public health units through RRFSS
- maternal health conditions
 - data available through the Better Outcomes Registry and Network (BORN) Information System
- family violence
 - data available through the Better Outcomes Registry and Network (BORN) Information System

Data Gaps:

- use of fertility treatments among women of childbearing age
 - Data available through CCHS “Infertility Module” included in the Rapid Response in 2009-2010; data not available at the health unit level
 - Deliveries in which artificial reproductive technology was used available through the BORN Information System and the Discharge Abstract Database (DAD); will not take all women of childbearing age into consideration
- multi-vitamin intake (including folic acid) among women of childbearing age
- alcohol/drug use
- awareness of community services
- environmental toxins (including environmental tobacco smoke)
- history, screening, testing
- home environment
- nutrition
- physical activity
- preparation for breastfeeding
- primary care provider of pregnant women (obstetrician, family doctor, midwife, nurse practitioner)
- tobacco
- transition of parenthood
- work environment

2. Healthy Pregnancies

These requirements are assumed to apply to pregnant women only. Currently, the following Core Indicators can be used to meet this requirement: *Smoking during Pregnancy* and *Folic Acid Supplementation*.

The Ontario Reproductive Health Guidance Document (3) discusses examining the following factors in relation to developing reproductive health, “healthy pregnancies” communication strategies: alcohol/drug use; awareness of community services; oral health; environmental toxins (including environmental tobacco smoke); family violence; folic acid; history, screening and testing; home environment; nutrition; physical activity; preparation for breastfeeding; reproductive primary care; awareness of signs and symptoms of preterm labour; tobacco; transition of parenthood; and work environment.

Indicator Gaps:*Indicators in Development or Under Consideration:*

- maternal obesity
- gestational weight gain
 - data available through the BORN Information System
- alcohol use during pregnancy
- illicit drug use during pregnancy
 - data available through the BORN Information System, Healthy Baby Healthy Children-Integrated Services for Children Information System (HBHC-ISCIS)
- maternal mental health
 - data available through the BORN Information System, NACRS

Indicators Not Developed:

The Ontario Reproductive Health Guidance Document (3) discusses examining the following factors, which are available through the BORN Information System:

- gestational diabetes incidence
- prenatal class attendance
- hepatitis B prevalence and STI rates (including HIV) in pregnant women
- environmental toxins (including environmental tobacco smoke)
- family violence
- mother's education
- family violence (variable "Woman Abuse" available by request)
- primary care provider

Information about access to primary care is available through HBHC-ISCIS:

- no primary care provider during pregnancy
- no prenatal care before sixth month
- no OHIP number

Information about home environment is available through HBHC-ISCIS:

- need newcomer support
- concerns about money
- involvement with CAS
- single parent family
- client/partner with disability

Data Gaps:

- awareness of community services
- oral health
- history, screening, testing
- home environment
- nutrition
- physical activity
- preparation for breastfeeding
- awareness of signs and symptoms of preterm labour
- transition of parenthood
- work environment
- perinatal mood disorder

3. Reproductive Health Outcomes

These outcomes are related to the health of the baby and the mother post-partum. Currently available Core Indicators include: *Crude Birth Rate; Fertility Rates; Total Fertility Rate; Pregnancy Rate; Age of Parent at Infant's Birth; Birth Weights; Preterm Birth Rate; Multiple Birth Rate; Congenital Infections; Perinatal Mortality and Stillbirth Rates; Neonatal and Infant Mortality Rates; Congenital Anomalies.*

Indicator Gaps:

Indicators Not Developed:

The Ontario Reproductive Health Guidance Document (3) discusses examining the following factors:

- caesarean section rate
 - data available through the BORN Information System, Discharge Abstract Database (DAD - a secondary data source)
- epidural rates
 - data available through the BORN Information System, DAD
- assisted delivery rates (forceps/vacuum)
 - data available through the BORN Information System, DAD
- incidence of pre-eclampsia and eclampsia
 - data available through the BORN Information System, DAD
- incidence of placenta previa or abruption
 - data available through the BORN Information System, DAD
- maternal mental health concerns
 - data available through the BORN Information System, HBHC-ISCIS

4. Preparation for Parenting

A definition of “preparation for parenting” is required to determine what factors could be examined to meet this requirement. The Reproductive Health Guidance Document (3) suggests examining the following factors in relation to developing reproductive health, “preparation for parenting” communication strategies: alcohol/drug use; awareness of community services; environmental toxins (including environmental tobacco smoke); family violence; home environment; nutrition; physical activity; preparation for breastfeeding; tobacco; transition of parenthood; and work environment.

Currently, *Folic Acid Supplementation* can be used to meet this requirement.

Indicator Gaps:

Indicators in Development or Under Consideration:

- intention to breastfeed
 - data available through the BORN Information System

Indicators Not Developed:

- prenatal class attendance
 - data available through the BORN Information System, and to some public health units through RRFSS

Data Gaps:

- alcohol/drug use
- awareness of community services
- environmental toxins (including environmental tobacco smoke)
- family violence
- home environment
- nutrition
- physical activity
- preparation for breastfeeding
- tobacco
- transition of parenthood
- work environment

2.2. Child Health:

A child is defined as anyone less than 18 years of age.

1. Positive Parenting

Positive parenting is defined as positive/warm and consistent parenting interactions with the child (e.g., parents frequently talk, play, praise, laugh and do special things together with their children, have clear and consistent expectations and use non-punitive consequences with regard to child behaviour) (2).

Currently, no Core Indicators meet this requirement or are in development to meet this requirement.

Indicator Gaps:

Indicators Not Developed:

- awareness and use of parenting programs
 - data available to some public health units through optional RRFSS content
 - data may also be available for senior kindergarten (SK) students through the Kindergarten Parent Survey (KPS) for selected school boards in Ontario
- child discipline campaign
 - data available to some public health units through optional RRFSS content
- perceptions about the prevalence of family violence in the community
 - data available to some public health units through optional RRFSS content
- parenting consistency/positive parenting
 - data available to some public health units through optional RRFSS content
- parenting type
 - data available to some public health units through optional RRFSS modules: *Parenting Style; Parenting Consistency/Positive Parenting*
- parenting time with child
 - data may be available for SK students through the KPS for selected school boards in Ontario

Data Gaps:

- type of discipline
- parental alcohol or drug addiction (4,5).
- parental mental health (4,5).

2. Breastfeeding

The Core Indicator *Breastfeeding Initiation and Duration* can be used to meet this requirement.

Indicator Gaps:

Indicators in Development or Under Consideration:

- intention to breastfeed
 - data available through the BORN Information System
- breastfeeding exclusivity at discharge from hospital
 - data available through the BORN Information System

Indicators Not Developed:

- attitudes towards breastfeeding

- data available to some public health units through optional RRFSS module “Attitudes towards breastfeeding”

Data Gaps:

- breastfeeding exclusivity
 - data available through CCHS; sample available not large enough to obtain reliable estimates
 - exclusive breastfeeding, at time of hospital discharge only, available through BORN Information System
- supplementation rates (4,5).

3. Healthy Family Dynamics

The following Core Indicators fall under this requirement: *Single Parent Families; Pregnancy Rate (teen); Underage Alcohol Drinking; and Illicit Drug Use (adolescent)*.

To examine family dynamics, the Child Health Guidance Document (2) suggests assessing the following topics/subjects listed as either an indicator gap or a data gap.

Indicator Gaps:

Indicators Not Developed:

- awareness and perceptions of family violence
 - data available to some public health units through optional RRFSS module: *Family Violence*
- domestic violence awareness
 - data available to some public health units through RRFSS optional modules: *Violence Against Women; Women Abuse & RUCS; and Family Violence*
- awareness of post-partum mood disorder
 - data available to some public health units through optional RRFSS module: *Post-partum Mood Disorders (PPMD)*
- child relationships
 - data available to some public health units through optional RRFSS modules: *Child/Youth Sexual Education I – Children; Sexual Education II – Youth* which assess parent-child sexual health communication

Data Gaps:

- substance misuse among children and teenagers
 - includes alcohol consumption, illicit drug use, prescription drug use, tobacco use
 - prescription drug use (teen) may be available to select public health units through OSDUHS
- public health units must buy extra sample in order to use OSDUHS child abuse
- shaken baby syndrome/abusive head trauma
- family connectedness
- family functioning
- child custody
- family violence (4,5).
- parental employment/housing (4,5).
- attachment to parents (4,5).
- child and parent engagement in schools (4,5).

4. Healthy Eating, Healthy Weights and Physical Activity

Currently, several Core Indicators can be used to meet this requirement for children 12 to 18 years of age, including *Vegetable and Fruit Consumption*; *Adolescent Body Mass Index*; *Leisure-Time Physical Activity*; and *Screen Time*. This information may be available to some public health units.

Indicator Gaps:

Indicators Not Developed:

- physical activity (SK students)
 - data may be available for SK students through the KPS for selected school boards in Ontario
- screen time (SK students)
 - data may be available for SK students through the KPS for selected school boards in Ontario
- healthy weights (BMI) (SK students)
 - data may be available for SK students through the KPS for selected school boards in Ontario
- healthy eating (SK students)
 - data may be available for SK students through the KPS for selected school boards in Ontario in the areas of:
 - vegetable and fruit consumption
 - milk product consumption
 - fast food consumption
 - sweetened drink consumption

Data Gaps:

- limited data sources available for information about healthy eating, healthy weights and physical activity in children under the age of 12 years old at the local or provincial level
- OSDUHS may be used by some public health units as a data source for children in grades 7-12 (e.g., for sleep duration)
- potential to use the NutriSTEP Tool data collection system to generate information on nutrition status of preschoolers (10)
- potential to use electronic medical records for childhood healthy weight surveillance (11)

5. Growth and Development

Currently, no Core Indicators have been developed or are under development to meet this requirement. The Early Development Instrument (EDI) could be used to assess school readiness for public health units with data access. EDI data are only available for children of senior kindergarten (SK) age in Ontario at this time. Medical Services data could be explored to assess the 18-month well baby visit.

The Child Health Guidance Document (2) describes this requirement as including motor, language, social, emotional, cognitive skills and abilities. It suggests examining injury prevention; fetal alcohol spectrum disorder (FASD); vision; speech and language; hearing; and education.

Indicator Gaps:

Indicators Not Developed:

- motor, language, social, emotional cognitive skills and abilities
 - data available through EDI
- readiness to learn among SK students

- data available through EDI
- physical health and well-being; social competence; emotional maturity; language and cognitive development; communication; and general knowledge
 - data available through EDI
- vulnerability and multiple challenge index
 - data available through EDI
- education
 - data available through Education Quality and Accessibility Office (EQAO) (12)
- well baby visit (18 months)
 - data potentially available through Medical Services Visits (OHIP)
 - a pilot project is underway to explore integrating Enhanced 18 month well baby visit data into the BORN Information System(11)
- access to a physician
 - data available through CCHS module: *Contacts with Health Professionals*

Data Gaps:

- growth and development data for children 0-4 years of age (i.e., younger than senior kindergarten-aged children)
- developmental milestones
- injury prevention
- Fetal Alcohol Spectrum Disorder (FASD)
- vision and hearing
- visits to MD and dentist not available for children under 12

Oral Health

Currently, the following Core Indicators can be used to meet this requirement: *Caries-free Children; Children with Dental Treatment Needs; Fluorosis Index; deft/DMFT Index and Early Childhood Tooth Decay*. These indicators are outdated and review/update is pending.

Indicator Gaps:

- none identified at this time

Data Gaps:

- population-level oral health status data for youth
- oral health status data are available through Oral Health Information Support System (OHISS) for junior kindergarten, senior kindergarten and grade two children enrolled in publicly funded schools in Ontario, however OHISS screening summary report contains optional fields and the data required for the calculation of the Core Indicators may not be collected by all public health units.

3. Infectious Disease Program Standards

3.1. Infectious Diseases Prevention and Control:

1. Infectious Diseases of Public Health Importance (Morbidity, Mortality and Associated Risk Factors)

The following Core Indicators can be used to meet this requirement: *Infectious Disease Incidence; Infectious Disease Mortality; Pelvic Inflammatory Disease Morbidity; Rabies; Influenza Vaccination; Adult Pneumococcal Vaccination; Influenza and Pneumococcal Vaccination Rates among Long-term Care Facility Residents; and Influenza Vaccination Rates among Staff at Long-term Care Facilities and Hospitals.*

Indicator Gaps:

Indicators Not Developed:

- infectious disease risk factor indicators
 - iPHIS risk factor data collected by individual public health units (please see “Section 2” below for an account of iPHIS data limitations)
- real-time emergency department visit data for syndromic surveillance available for majority of hospitals from Acute Care Enhance Surveillance (ACES) system.
- health care-associated infections (HAIs)
 - patient safety indicator data available from the MOHLTC and provided to public health units through Public Health Ontario for *Clostridium difficile* infection (CDI); methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia, and vancomycin-resistant enterococci (VRE) bacteremia
 - Only CDI cases associated with outbreaks in hospitals are reportable in iPHIS

Data Gaps:

- no data available for diseases of public health importance that are currently not reportable
- emerging trends
 - no consistent source of school absenteeism or other syndromic surveillance data

2. Infection Prevention and Control Practices of Inspected Premises

The following Core Indicators fall under this requirement: *Influenza and Pneumococcal Vaccination Rates among Long-term Care Facility Residents; and Influenza Vaccination Rates among Staff at Long-term Care Facilities and Hospitals.*

Data Gaps:

- no system in place to collect other infection prevention and control practices across public health units

3.2. Rabies Prevention and Control:

1. Rabies

The *Rabies* Core Indicator can be used to meet this requirement.

Data Gaps:

- none identified at this time

3.3. Tuberculosis Prevention and Control:

1. Tuberculosis

The *Infectious Disease Mortality* and *Infectious Disease Incidence* Core Indicators can be used to meet this requirement.

Indicator Gaps:

- none identified at this time

Data Gaps:

- none identified at this time

3.4. Sexual Health, Sexually Transmitted Infections, and Blood-borne Infections (including HIV):

1. Sexually Transmitted Infections (STI) and Associated Risk Factors

The following Core Indicators can be used to meet this requirement: *Infectious Disease Incidence*; *Infectious Disease Mortality*; *Pelvic Inflammatory Disease Morbidity*; *Cancer Incidence (Cervical)*; *Cancer Mortality (Cervical)*; *Number of Sexual Partners*; *Condom Use the Last Time Among Those at Risk for STIs*; *Youth Sexual Activity*; and *Age of Sexual Debut*.

iPHIS has risk factor data collected by individual public health units. Please see “Section 2” below for an account of iPHIS data limitations.

Indicator Gaps:

Indicators Not Developed:

- prevalence of HIV/AIDS

Data Gaps:

- frequency of condom use among those at risk for STIs – formerly available from the CCHS

2. Blood-borne Infections and Associated Risk Factors

The following Core Indicators can be used to meet this requirement: *Infectious Disease Incidence* and *Infectious Disease Mortality*.

iPHIS has risk factor data collected by individual public health units. Please see “Section 2” below for an account of iPHIS data limitations.

Indicator Gaps:

Indicators Not Developed:

- prevalence of Hepatitis B

3. Reproductive Outcomes

Currently, the following Core Indicators can be used to meet this requirement: *Congenital Infections* and *Pelvic Inflammatory Disease Morbidity*.

Data Gaps:

- infertility

4. Distribution of Harm Reduction Materials/Equipment

Currently, no Core Indicators meet this requirement and no Core Indicators are in development to meet this requirement.

Data Gaps:

- distribution/availability of harm reduction materials and equipment

3.5. Vaccine Preventable Diseases:

1. Child Immunization Status

Currently, one Core Indicator, *Childhood Vaccination Coverage*, can be used to address this requirement. This indicator is outdated and review/update is pending.

Data Gaps:

- childhood vaccination coverage is missing a data source for infants and for children who are not school aged (4,5). Children who are home-schooled and those who do not attend school may not be captured
- vaccination coverage should reflect the proportion of children who have received the appropriate number of immunizations for their age to be considered up-to-date. Traditionally, IRIS reports and forecaster-generated Panorama compliance reports provide estimates of the proportion of students who are not yet overdue for their next immunization, which differs from up-to-date coverage.

2. Board of Health Clinic Immunizations

Currently, no Core Indicators have been developed or in development to meet this requirement.

Data Gaps:

- no systematic collection of immunization clinic data

3. Other Indicators Supporting this Standard

The following Core Indicators fall under this category: *Influenza and Pneumococcal Vaccination Rates Among Long-term Care Facility Residents; Influenza Vaccination Rates among Staff at Long-term Care Facilities and Hospitals; Vaccine Wastage; Adverse Events Following Immunization; Influenza Vaccination; and Adult Pneumococcal Vaccination.*

4. Environmental Health Program Standards

4.1. Food Safety:

1. Suspected and Confirmed Food-borne Illnesses

Currently, the following Core Indicators fall under this requirement: *Infectious Disease Incidence* and *Infectious Disease Mortality*.

Indicator Gaps:

Indicators Not Developed:

- food handling practices
 - data available to some public health units through optional RRFSS module: *Food Safety in the Home - Time/Temperature Food Handling Behaviours*
- food safety
 - data available to some public health units through optional RRFSS module: *Food Safety in the Home - Awareness, Behaviour and Communication*

4.2. Safe Water:

1. Drinking Water Illnesses

Currently, the following Core Indicators fall under this requirement: *Infectious Disease Incidence*; *Infectious Disease Mortality*; *Municipal Drinking Water Quality*; *Private Well Water Testing*; and *Water Advisories*.

Data Gaps:

- none identified at this time

2. Beach Water Illnesses

Currently, the following Core Indicators fall under this requirement: *Infectious Disease Incidence*; *Infectious Disease Mortality*; and *Posted Bathing Beaches*.

Data Gaps:

- none identified at this time

4.3. Health Hazard Prevention and Management:

1. Community Environmental Health Status

Currently, the *Air Quality* Core Indicator falls under this requirement:

Indicator Gaps:

Indicators Not Developed:

- extreme weather
 - data available through Environment Canada

- climate change and air quality
 - optional RRFSS modules—available to some public health units—assess public knowledge of issues related to climate change, air quality and health as well as beliefs about individual and government responsibility in affecting change:
 - *Knowledge of Climate Change and the Causes of Climate Change*
 - *Impact of Climate Change on the Local Community*
 - *Impact of Poor Air Quality on Health*
 - *Built Environment*
 - *Saving Energy at Home*
 - *Home Temperature Settings*
 - *Public Transit*
 - *Motorized Vehicles and Climate Change*
 - *Active Transportation*
 - *Outdoor Air Quality – Awareness & Beliefs*
 - *Radon*
 - *Pesticides – Health & Environment*
 - *Children's Health & Environment - Outdoor & Indoor Air Quality, Awareness and Concern about Exposure to Toxic Chemicals*

Data Gaps:

- indoor air quality
- exposure to radiation

5. Emergency Preparedness Program Standards

5.1. Public Health Emergency Preparedness Standard:

1. Public Health Emergency Preparedness

Currently, no Emergency Preparedness Core Indicators exist and none have been identified for development.

Data Gaps:

- none identified at this time

Section 2: Common Data Sources and their Limitations

Features of common data sources, including their limitations are highlighted below. For further details about these and other data sources, please refer to APHEO [Core Indicators Resources](#) webpages and to the cited documents.

1. Better Outcomes Registry and Network (BORN) Information System (13,14)

- Ontario’s Better Outcomes Registry & Network (BORN) was established in 2009 (13,14).
- Previously the Ontario Perinatal Surveillance System.
- Comprised of five founding members:
 - i. Prenatal Screening Ontario (fetal and congenital anomalies)
 - ii. Fetal Alert Network (FAN)
 - iii. Ontario Midwifery Program (OMP)
 - iv. Niday Perinatal and Neonatal Intensive Care Unit (NICU)/Special Care Nursery (SCN) Database
 - v. Newborn Screening Ontario
- As of April 1, 2012, birthing hospitals and midwifery practices in Ontario contribute data to the BORN system.
- BORN database is set up to have information entered by encounters across the continuum of maternal, newborn and perinatal care.
- Reporting system within the BORN database is comprised of three components: clinical dashboards, standard reports and analytical reports:
 - i. Clinical dashboards display outcomes for key performance indicators from maternal-newborn, NICU and SCN, prenatal screening, prenatal screening follow-up, newborn screening and newborn screening follow-up care settings.
 - ii. Standard reports are tools to assist clinical programs and practice groups to examine their performance, outcomes and utilization, and also to assist with planning. These reports are meant to be generated from the system on a regular basis (monthly, quarterly or annually) and will have drill down capability when further information is required, as well as display comparator values.
 - iii. Analytic reports are available for those who want to have the ability to perform custom queries of the BORN data. Specific analysis “Cubes” are available for maternal newborn health, pregnancy and birth, prenatal and newborn screening, as well as for public health and midwifery practices. Users having access to these cubes will have the ability to manipulate data to answer specific questions.

- Access to the BORN reporting system is based on status as a health information custodian and various levels of access can be given based on an individual's clearance to see personal health information.

Limitations:

- All Ontario hospitals with maternal-newborn services contribute data to the BORN Information System. However, the small numbers of births that take place each year in hospitals with no obstetrical services are not captured by the database.
- Data capture was complete in most regions from 2005 onwards, and capture of all Ontario births was attained in November 2009; therefore examination of long-term trends is not possible at a provincial level or for all health unit areas.
- Data are available in the BORN Information System as of April 2012 with no historic data. Some variables that were in the Niday Perinatal Database changed with the new system and will not be comparable with historic data.
- A data quality assessment of the BORN Information system found that, for Ontario overall, number of births were over 90% complete in BORN after a lag time of six month and over 99% complete by 15 months. Time to completion varied by public health unit (15).
- Aboriginal populations are under-represented in BORN. BORN suppresses data records with postal codes where the majority of the population live on reserves (15).

2. **Canadian Community Health Survey (CCHS) (16)**

- National survey conducted by Statistics Canada.
- Cross-sectional design, self-report.
- Data collected in 2001, 2003, 2005, 2007 and annually afterwards (17).
 - i. Data collected January-December
- Three types of content components (16): common, optional and rapid response
 - i. Common content is collected from all survey respondents in all provinces and territories, unless otherwise specified.
 - Annual common content modules are collected every year and remain relatively unchanged over several years.
 - One and two-year common content questions are related to a specific topic and are and rotate every two or four years.

- ii. Optional content may vary by health region and province, may vary annually and is reviewed every two years.
 - Starting in 2005 the same optional content has been selected for each health region in Ontario in a cycle).
 - iii. Rapid response content may be added as required when national estimates on an emerging issue are required.
 - It can be included in the survey in each two month collection period (17,18).
- The CCHS uses three sampling frames to select the sample of households: 40.5% of the sample of households are selected from an area frame, 58.5% are selected from a list frame of telephone numbers and the remaining 1% are selected from a Random Digit Dialing (RDD) sampling frame (17).
- The CCHS questionnaire is administered using computer-assisted interviewing (CAI). Up until 2012, sample units selected from the area frame were interviewed using the Computer-Assisted Personal Interviewing (CAPI) method while units selected from the Random Digit Dialing (RDD) and telephone list frames are interviewed using the Computer-Assisted Telephone Interviewing (CATI) method. Starting in 2013, a specific number of cases selected from the area frame were also interviewed using CATI (CATI dwelling) (17).
- The CCHS covers approximately 98% of the Canadian population aged 12 and over. In 2014 the sampling frame covered 92% of private households in the Yukon, 96% in the Northwest Territories and 92% in Nunavut (17).
- In Ontario, 2013, the combined response rate for the area and telephone frames was 65.8% (16).
- A CCHS Redesign Project is underway that includes a review of the sampling methodology, adoption of a new sample frame, modernization of the content and review of the target population. Another component of the redesign project focuses on development of a new Internet collection method. Timeline for introduction of the redesigned CCHS is to be determined.
- Statistics Canada is developing the Canadian Health Survey on Children and Youth (CHSCY) to provide information about the population one to 17 years of age. The start date of the proposed CHSCY is to be determined and the survey will likely be conducted every three years. The survey will provide provincial estimates, with an optional extra sample buy in available to health regions (i.e., public health units). The 12 to 17 age group will remain in the CCHS.

Limitations:

- Excludes:
 - i. Those living on Indian Reserves; Crown Land; Canadian Forces bases/full-time members of the Canadian Forces
 - ii. Children under the age of 12
 - iii. Institutional residents
 - iv. Residents of certain remote regions
- Sample size too small in some health regions to analyze data at the health unit level.
- Based on self-reported information, therefore may be subject to biases, such as recall bias or social desirability bias, or result in high non-response.
- Telephone-based survey may exclude certain populations.
- The survey is conducted only in English or French.
- Cross-sectional design therefore cannot determine causal order.

3. **Census of Canada and National Household Survey (NHS) (19,20)**

- The census is conducted every five years by Statistics Canada. The most recent census year was 2011.
- 100% of the population completes the short form of the census with information on:
 - i. Age
 - ii. Sex
 - iii. Marital status
 - iv. Mother tongue
 - v. Relationship to person “x” (18,19)
- Prior to the 2011 census, 20% of the Canadian population (or one in five) were mandated to complete the long form of the census which collected detailed social and economic data about:
 - i. Aboriginal peoples
 - ii. commuting to work
 - iii. education, training and learning
 - iv. employment and unemployment
 - v. ethnic diversity and immigration
 - vi. families, households and housing
 - vii. globalization and the labour market
 - viii. income, pensions, spending and wealth

- ix. industries
- x. labour
- xi. languages
- xii. occupations
- xiii. population and demography
- xiv. population estimates and projections
- xv. unpaid work
- xvi. vital statistics

- In 2011, information previously collected by the mandatory long-form census questionnaire was collected as part of the new voluntary National Household Survey (NHS), distributed to one in three Canadian households. There is a commitment to reinstate the mandatory long-form census questionnaire in 2016.

Limitations:

- The NHS is voluntary and may be subject to bias and a higher non-response rate than the mandatory census long-form.

4. **Discharge Abstract Database (DAD)** (21)

- An administrative database maintained by the Canadian Institute for Health Information (CIHI).
- Data are collected from acute care facilities by CIHI and made available in Ontario through the MOHLTC IntelliHEALTH Ontario data portal.
- Contains hospital separation records. A separation occurs anytime a patient leaves a hospital due to death, discharge or transfer to another facility. Since April 1 2001, most responsible diagnosis during an admission and external causes of injury have been coded using the International Classification of Diseases, Tenth Revision, Canada (ICD-10-CA)). Prior to March 31 2001, the Ninth Revision of the International Classification of Diseases (ICD-9) was the source of these codes. Comparison of trends for specific causes of hospitalization from 2001 onward with earlier rates must therefore be interpreted with caution.

Limitations:

- Hospitalization data only provides a crude measure of prevalence of a disease or injury event, as a person may not be hospitalized, or may be hospitalized several times for the same disease or injury event.
- A person may be hospitalized for more than one occurrence of the same disease or injury classification or discharged for more than one hospital for the same disease or injury event in a given time period. Therefore, hospitalization data cannot be used to measure the incidence of a specific injury.
- Hospitalization data are reported at time of patient separation from the hospital and may not be timely.

5. **Early Developmental Instrument (EDI)** (22-24)

- A teacher-completed instrument designed to measure a child's developmental health in five general domains: physical health and well-being; social knowledge and competence; emotional maturity; language and cognitive development; and general knowledge and communication skills (22).
- Across Canada, the EDI targets children enrolled in kindergarten in publicly funded English and Francophone school boards.
- Drs. Dan Offord and Magdalena Janus from the Offord Centre for Child Studies (OCCS) developed the EDI. OCCS facilitates the data collection with provincial partners, local coordinators (i.e., data analysis coordinators (DACs) in Ontario) and school boards, manages the training and implementation, cleans and scores the data and produces reports at the provincial, school boards and community/neighbourhood levels.

- Historically in Ontario, the EDI funding, policy and operations were the responsibility of the Ministry of Children and Youth Services and was completed in three year waves. The EDI was implemented in senior kindergarten classes.
- In Ontario in 2013–14, the responsibility for the EDI transferred to the Early Years Division of the Ministry of Education.
- Starting in 2014–15 in Ontario, data were collected province-wide in a single year, for each kindergarten student who will be starting grade one the following year. This allows for point-in-time EDI results comparisons across the province. The EDI will still occur in three year waves, with one year for data collection, one year for planning and one year for knowledge mobilization.
- Four cycles of EDI data have been collected in Ontario since the school year ending in 2004 (i.e., 2004–2006, 2007–2009, and 2010–2012 three-year waves; and 2015 province-wide).

Limitations:

- Targets kindergarten-aged children only.
- Private schools have not yet participated.

6. **Health care-associated infections data**

- All hospitals in Ontario are required to publicly report on patient safety indicators, including the following health care-associated infections (HAIs): *Clostridium difficile* infection (CDI), bloodstream infections caused by methicillin-resistant *Staphylococcus aureus* (MRSA) and bloodstream infections caused by vancomycin-resistant enterococcus (VRE). Most public reporting of patient safety indicator data is done through the Health Quality Ontario (HQO) website.
- CDI has been reported on a monthly basis since September 2008. Both MRSA and VRE have been reported on a quarterly basis since December 2008.
- Public health units receive a data extract from the MOHLTC’s Hospital Self Reporting Initiative (SRI) database provided by Public Health Ontario that includes counts and rates of health care-associated CDI, and MRSA and VRE bacteremias. Currently this information is shared through an Excel file. It is anticipated that the information will soon be available through an on-line tool.

Limitation(s)

- Includes only aggregate cases of CDI/MRSA /VRE associated with the reporting facility and publically reported by hospitals in Ontario.
- Does not include case-level information on demographics, risk factors, morbidity or mortality.
- Data are reported at infrequent intervals (i.e., once a month or quarterly) limiting the timeliness of public health response.

7. **Healthy Babies Healthy Children/Integrated Services for Children Information System (HBHC-ISCIS) (25,26)**

- The Integrated Services for Children Information System (ISCIS) is a multi-tier case management system designed to enable Ontario public health units to effectively administer the Healthy Babies Healthy Children (HBHC) program, a voluntary prevention and early intervention initiative that promotes healthy child development (25).
- HBHC data are entered into ISCIS by public health unit staff (25).
- Only those births for which the parents' consent to further follow-up as part of the HBHC program can be entered into ISCIS. Births for which consent was not obtained are excluded (25).
- A pilot project with BORN and the Ministry of Children and Youth Services (MCYS) is currently underway to explore transmitting BORN Information System (BIS) data to populate ISCIS directly (11).

Limitations

- Participation in HBHC is voluntary. ISCIS has incomplete coverage of the total number of births in a given geographical area. Coverage rates will vary by health unit (25).
- Permission to access the HBHC-ISCIS data for assessment and surveillance purposes varies by public health units according to individual data governance policies.

8. **Integrated Public Health Information System (iPHIS) (27)**

- The information system used for reporting case information on all reportable communicable diseases for provincial and national surveillance.
- Started in 2005.
- Each public health unit is responsible for collecting case information on reportable communicable diseases occurring within their boundaries and entering information into iPHIS. Each public health unit is able to access their own data.
- Public Health Ontario extracts data from iPHIS and makes reports available by public health unit through their Infectious Disease Query on-line tool.

Limitations:

- For many diseases reported numbers are an underestimate of the population's actual burden of disease.
- Comparisons between public health units can be problematic due to inconsistencies in data entry. Also, some cases may be counted in more than one health unit.

- Some case definitions changed in 2009 therefore caution should be used when examining trends (18).
- Although risk factor data are collected in iPHIS, completeness of both collection and entry of risk factor data from cases can vary significantly across public health units. Provincial guidelines for risk factor data collection and entry are available (27).

9. **Kindergarten-Parent Survey (28)**

- Parent-completed companion survey to the EDI which provides additional contextual information.
- Used in Ontario only.
- Developed to meet the need for more information on family characteristics and experiences of children before entering kindergarten. Can be customized to meet the needs of the specific community.
- Consists of seven sections: child health and development; child care; pre-kindergarten experiences; kindergarten; you and your child; your neighbourhood/community; and background information.
- Targets children enrolled in senior kindergarten in publicly-funded English and Francophone school boards.
- KPS questionnaires were distributed at the same time that the EDI was completed for children in most communities. It was originally implemented as pilot projects in some communities and more broadly administered in 2010. Some communities had their own parent questionnaire and did not participate in KPS data collection. The KPS was not implemented in 2015.
- Parents returned questionnaires to the Offord Centre where data were scanned, cleaned and scored.

Limitations:

- Based on self-reported information, therefore may be subject to biases, such as recall bias or social desirability bias, or result in high non-response.
- Completion of the KPS is voluntary. Survey response rate varies among school boards/regions and averages about 50% across communities.
- Private schools have not yet participated.
- Excludes children enrolled in private schools.

10. **National Ambulatory Care Reporting System (NACRS)**⁽²⁹⁾

- An administrative database maintained by the Canadian Institute for Health Information (CIHI).
- Data are collected by CIHI from hospital-based and community-based ambulatory care facilities and made available in Ontario through the MOHLTC IntelliHEALTH Ontario data portal.
- Ambulatory care visits are a source of morbidity information available from the 2001/2002 fiscal (2002 calendar) year onward, and include emergency visits as well as other hospital-based outpatient clinics.
- One "Main Problem", representing the patient's primary problem or diagnosis during the ambulatory visit, and up to nine other problems are coded according to the International Classification of Diseases, Tenth Revision, Canada (ICD-10-CA).

Limitations:

- A person may be admitted to the emergency department (ED) for more than one occurrence of the same disease or injury classification or discharged from more than one ED for the same disease or injury event in a given time period. Therefore, NACRS cannot be used to measure the incidence of a specific injury.

11. **Ontario Student Drug Use and Health Survey (OSDUHS)** ⁽³⁰⁻³²⁾

- Administered by the Centre for Addiction and Mental Health (CAMH).
- Targets students enrolled in Ontario's public and Catholic regular school systems .
- Samples youth in grades seven through twelve.
- Since 1977, sample design has divided Ontario into four regional strata based on the following boundaries (32):
 - i. City of Toronto
 - ii. Northern Ontario (Parry Sound District, Nipissing District and areas farther north)
 - iii. Western Ontario (Peel District, Dufferin County and areas farther west)
 - iv. Eastern Ontario (Simcoe county, York County and areas farther east)
- Public health units must buy extra sample in order to use OSDUHS. This optional extra sample buy-in available to public health units starting in 2009.
- Surveys students every two years.

Limitations:

- Excludes private school students, students that have dropped out, those institutionalized for correctional or health reasons, those on First Nations reserves, military bases, and in the far North regions of Ontario (these exclusions account for 7% of Ontario students) (31,32).
- Self-report therefore actual population rates are likely underestimated due to underreporting and recall bias.
- Cross-sectional therefore cannot determine causal order.
- Does not survey same students each cycle therefore can't evaluate developmental patterns or changes over time.
- Sample too small to determine rates at local level for most public health units.

12. **Oral Health Information Support System (OHISS)**

- The Oral Health Information Support system (OHISS) is a production system used by public health units to support service tracking, program reporting and payment processing for oral health programs and initiatives provided through the MOHLTC, such as Healthy Smiles Ontario.
- OHISS includes oral health screening data for children in JK, SK and grade two at publicly-funded schools in Ontario, as mandated by OPHS (33). Depending on the screening intensity of a school—which is determined based on the grade two screening results—additional grades may have to be screened and included in OHISS (34). Individual public health units may also elect to screen additional grades or students from private schools and include this data in OHISS.
- Dental hygienists conduct oral health screens and data are entered into OHISS.
- The OHISS screening summary report includes the number of screening results with findings of urgent dental care, non-urgent dental care, preventive oral health services only or who have no dental care needs, as well as the total number of screening results. Aggregated data by health unit, planning area, school board, facility, grade and age within the health unit, are available to authorized individuals in that health unit.

Limitations

- Some fields in the screening summary report are not mandatory, resulting in incomplete data capture. For example, decay is a mandatory field, however missing/extracted and filled are optional and subject to individual public health unit data collection protocols. Fluorosis and gingivitis are also optional fields.
- Methods of collecting data may vary across public health units. Collection of individual record-level data is possible through OHISS mobile application. Data can also be entered into OHISS aggregated by classroom. Some data fields are not available when entering aggregated data (e.g., decayed/missing/filled (DMFT)). Results may not be comparable across public health units.

- Information is available from OHISS in aggregate form and can only be extracted from OHISS through summary reports. It is not possible to access and analyze record-level data.

13. **Panorama (formerly Immunization Records Information System (IRIS))**

- Panorama is a web-based information system designed to manage immunization information, vaccine inventory, and cases and outbreaks of communicable diseases.
- Panorama replaced IRIS in all public health units through staggered implementation between 2014 and 2016; the analytic reporting tool PEAR is anticipated to launch in the spring of 2016.

Limitations:

- Data may not be complete for children under the age of seven, adults over the age of 18 years, or individuals who do not attend school or who are home-schooled.
- Data quality will vary by time period. Data prior to 2014 reflect records primarily captured through IRIS – the limitations of IRIS have previously been documented (35). In addition, many of the fields currently available within Panorama (e.g. grade, lot number) will be missing for records that were previously entered in IRIS.
- Panorama compliance reports are based on forecaster generated outputs which reflect the proportion of students who are not yet overdue for their immunizations. As a result, they may not provide true estimates of immunization coverage, which is intended to reflect the proportion of students who have received the appropriate number of immunizations for their age to be considered up-to-date.
- For health care provider-delivered immunizations, parents and guardians must provide immunization information to local public health unit staff who then enter the information into Panorama. The lack of system integration for the documentation of immunizations delivered by health care providers may result in underestimation of provincial coverage if the information is not supplied to the public health unit.
- Duplicate clients are known to exist in the system as they were created during the migration of IRIS data from public health units. Efforts to manage duplicate records in the system are ongoing.

14. **Rapid Risk Factor Surveillance System (RRFSS) (36)**

- The Rapid Risk Factor Surveillance System (RRFSS) is an on-going telephone survey occurring in various public health units across Ontario. On a monthly basis, a random sample of 100 adults aged 18 years and older is interviewed regarding awareness, knowledge, attitudes and risk behaviours of importance to public health.
- Not all public health units participate in RRFSS.
- Three cycles of data collection each year, typically with 400 surveys completed for each participating health unit per cycle (range 240-600 surveys).

- Typically a 20 (range 12-20) minute telephone interview conducted in English or French by the Institute for Social Research (ISR).
- Different types of content: core content, rotating core content, and optional content; core and rotating core decided by consensus of all RRFSS-participating public health units every two years, for a two-year period.
 - i. Core modules - asked throughout the two year period
 - ii. Rotating core modules - asked for one of the two years; typically include content for which the anticipated rate of change does not warrant yearly monitoring
 - iii. Optional modules - specified by individual public health units
- Provincial sample piloted in 2011 for selected modules.

Limitations:

- The number of participating public health units varies by year.
- Samples the population 18 years or older.
- Based on self-reported information, therefore may be subject to biases, such as recall bias or social desirability bias, or result in high non-response.
- Telephone-based survey may exclude certain populations.
- Survey only administered in English or French.
- Cross-sectional design therefore cannot determine causal order.

15. **Vital Statistics (mortality⁽³⁷⁾, live births⁽³⁸⁾, stillbirths⁽³⁹⁾)**

- The Office of the Registrar General (ORG) in Ontario collects provincial mortality, live birth and stillbirth data and shares this with Statistics Canada for national reporting.
- Statistics Canada provides the Ontario Ministry of Health with edited and standardized datasets, which are made available through the MOHLTC IntelliHEALTH Ontario data portal.

Limitations:

- The Ninth Revision of the International Classification of Diseases (ICD-9) (3) was used to code cause of death from 1979 until 1999 (Note: data is only available in IntelliHEALTH from 1986 onwards). From 2000 onward causes of death were coded using the Tenth Revision of the International Classification of Diseases (ICD-10). Comparison of trends for specific causes of death from 2000 onward with earlier rates must therefore be interpreted with caution (37).

- Co-morbidity contributes uncertainty to classifying the underlying cause of death. Vital Statistics mortality data available through IntelliHEALTH include only the primary, underlying cause of death.
- A number of data quality concerns have been identified for the live birth data, including changes in the source of gestational age data for the period 1990 to 1998 and underreporting of births (38).
- A number of data quality concerns have been identified for the stillbirth data. Stillbirths among births weighing <500g but ≥20 weeks gestation may be more prevalent due to maternal age or country of birth of the women in a jurisdiction. These stillbirths at the low end of birth weight or gestational age may not be consistently classified across jurisdictions in Ontario. The rate of stillbirth may be affected by temporal and regional variations in the definition of stillbirth and birth registration practices, especially for stillbirths and live births at the low end of birth weight or gestational age range (39).
- Data are usually two or three years behind the current year.

Abbreviations

BMI	Body Mass Index [weight (kilograms)/height (metres ²)]
BORN	Better Outcome Registry and Network
CAS	Children’s Aid Society
CCHS	Canadian Community Health Survey
CIHI	Canadian Institute for Health Information
DAD	Discharge Abstract Database
EDI	Early Development Index
ED	Emergency Department
EQAO	Education Quality and Accountability Office
FAN	Fetal Alert Network
FASD	Fetal Alcohol Spectrum Disorder
HAIs	Health care-associated infections
HBHC-ISCIS	Healthy Babies Healthy Children-Integrated Services for Children Information System
IPAQ	International Physical Activity Questionnaire
IRIS	Immunization Records Information System
iPHIS	Integrated Public Health Information System
ISR	Institute for Social Research
KPS	Kindergarten Parent Survey
LRDG	Low-Risk Drinking Guidelines
LTBI	Latent Tuberculosis Infection
MOHLTC	Ministry of Health and Long-Term Care
NARCS	National Ambulatory Care Reporting System
NHS	National Household Survey
NICU	Neonatal Intensive Care Unit

OHISS	Oral Health Information Support System
OHMRS	Ontario Mental Health Reporting System
OMP	Ontario Midwifery Program
OPHS	Ontario Public Health Standards
OSDUHS	Ontario Student Drug Use and Health Survey
RRFSS	Rapid Risk Factor Surveillance System
RUCS	Routine Universal Comprehensive Screen
SCN	Special Care Nursery
SK	Senior Kindergarten
STI	Sexually Transmitted Infection
TB	Tuberculosis
VS	Vital Statistics

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Changes made to the document since original publication

Date	Indicators no longer under development or consideration	Additional indicators under development or consideration	Gaps addressed	Gaps newly identified
July, 2013	<p>Core Indicators created and finalized in 2012/2013:</p> <p>Chronic Disease Prevention: <i>Proximity to Community Focal Point; Land Use Mix; Traffic Calming Measures; Network Characteristics</i></p> <p>Injury Prevention: <i>Injury-Related Emergency Department Visits; Neurotrauma-Related Hospitalization; Cell Phone Use and Text Messaging While Driving; Child Car Restraint Use; Self-Reported Injury; Illicit Drug Use</i></p>	<p>Chronic Disease Prevention: <i>Outlet Density; Traffic Counts; Traffic Speed</i></p> <p>Reproductive Health: <i>Maternal Obesity; Gestational Weight Gain; Maternal Mental Health; Alcohol Use During Pregnancy; Illicit Drug Use During Pregnancy.</i></p> <p>Child Health: <i>Intention to Breastfeed</i></p>	<p>Indicator gap: <i>Incidence of Latent Tuberculosis Infection</i> was added as a specific indicator under tuberculosis in the <i>Infectious Disease Incidence Core Indicator.</i></p>	<p>Oral Health was added to the “Child Health” section of the Family Health program standard</p> <p>Indicator gaps: <i>Well-baby visits (18 month); Access to a physician;</i></p> <p>Data gaps: <i>Parental Employment/housing; Attachment to Parents; Child and Parent engagement in school; Visits to a Physician/Dentist for Children Less Than 12 Years of Age; Childhood Vaccination Coverage for Infants and Children that are not School-aged</i></p>
September, 2015			<p><i>Sodium intake</i> was removed as an indicator gap. The association between sodium intake and cardiovascular disease is complex and may be modified by other dietary factors (40).</p>	

Changes made to the document since original publication

Date	Indicators no longer under development or consideration	Additional indicators under development or consideration	Gaps addressed	Gaps newly identified
			Adverse health outcomes are associated with high and low sodium intakes (40).	
January, 2016				Reproductive Health Indicator gaps: <i>No primary care provider during pregnancy; No prenatal care before sixth month; No OHIP number; Need newcomer support; Concerns about money; Involvement with CAS; Single parent family; Client/partner with disability; Maternal mental health concerns</i>
March, 2016				Infectious Disease Indicator gap: <i>Health care-associated infections</i>