

HEALTH SURVEILLANCE INDICATORS: VULNERABILITY IN EARLY CHILD DEVELOPMENT



Public Health Relevance

Healthy development in early childhood provides the building blocks for positive emotional, social and physical health and well-being. Children who are vulnerable in early development are more likely to have poor future educational outcomes, and are at increased risk for a number of health problems such as obesity, heart disease and mental health issues. Understanding how children are doing helps public health service providers and policy makers to make informed decisions about how services and policies can best support children and families.

Vulnerability in early child development is measured using the Early Development Instrument (EDI). The EDI is a population-based tool that assesses Kindergarten students in five domains: Physical Health and Well-Being; Social Competence; Emotional Maturity; Language and Cognitive Development; and Communication Skills and General Knowledge. The EDI measures vulnerability, or the inability to meet age-appropriate developmental expectations, in each of the five domains. The focus of this report is on overall vulnerability, which is a measure of children who are vulnerable on at least two of the five domains previously mentioned. These children are struggling in two or more areas of development. They represent the children and families in greatest need of support.

Highlights

1. In Toronto, the percent of children who are vulnerable significantly decreased in 2015, compared to previous years.
2. The percent of children who are vulnerable on two or more domains in Toronto is similar to the percent for all of Ontario.
3. Rates of vulnerability in early child development vary across Toronto.
4. Children who are male, English or French Language Learners and those living in low-income neighbourhoods are significantly more likely to be vulnerable.

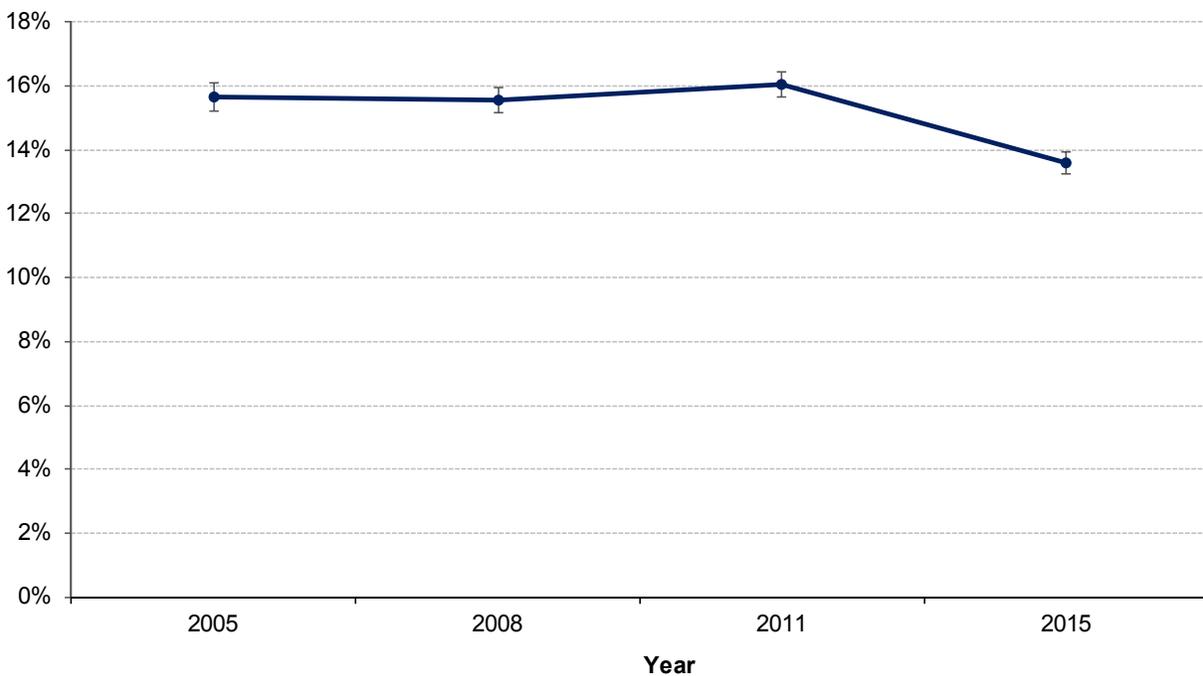
Trends Over Time

In Toronto, the percent of children who are vulnerable significantly decreased in 2015, compared to previous years.

Figure 1 shows the percent of children who are vulnerable on two or more domains in Toronto from 2005 to 2015.

The percent of children who are vulnerable remained relatively consistent in the first three cycles of the EDI. In the most recent cycle (2015), the percent of children vulnerable on two or more domains (14.4%) was a significant decrease compared to previous cycles. This indicates a favourable trend for children in Toronto.

Figure 1: Percent of Children Who Are Vulnerable, Kindergarten Students, Toronto, 2005 to 2015.



Error bars (I) represent the 95% confidence intervals.

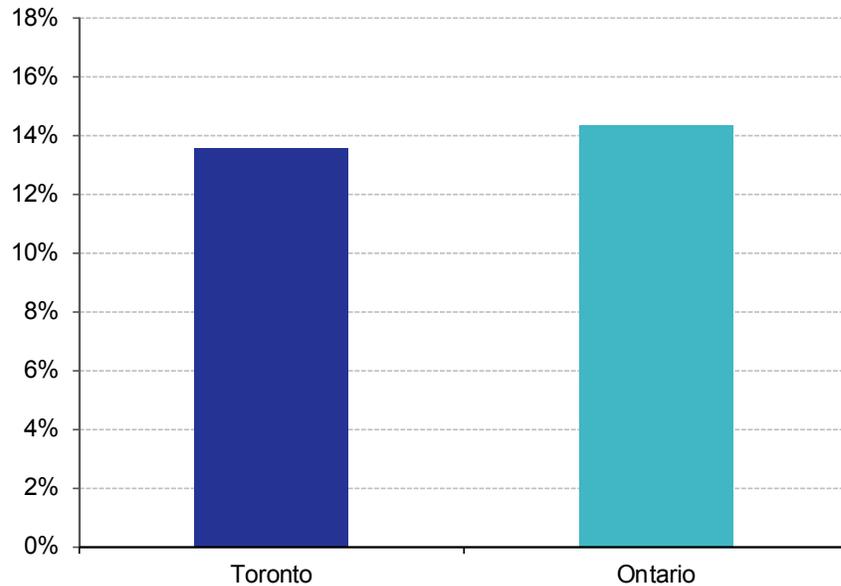
Data Sources: Early Development Instrument, see Data Notes.

Regional Comparisons

The percent of children who are vulnerable on two or more domains in Toronto is similar to the percent for all of Ontario.

Figure 2 shows the percent of children who are vulnerable on two or more domains in Toronto and in Ontario in 2015. In Toronto, 13.6% of children are vulnerable on two or more domains, compared to 14.4% of Ontario children.

Figure 2: Percent of Children Who Are Vulnerable, Kindergarten Students, Toronto and Ontario, 2015.



Data Sources: Early Development Instrument, see Data Notes.

Figure 3 and Table 1 show the percent of children who are vulnerable by domain in Toronto and in Ontario 2015. Children in Toronto are less likely to be vulnerable in Physical Health and Well-Being, Social Competence, and Emotional Maturity, compared to Ontario. Children in Toronto are however, more likely to be vulnerable in Communication Skills and General Knowledge than children in Ontario. There is no difference between Toronto and Ontario in the percent of children who are vulnerable in Language and Cognitive Development.

Figure 3: Percent of Children Who Are Vulnerable by Domain, Kindergarten Students, Toronto and Ontario, 2015.

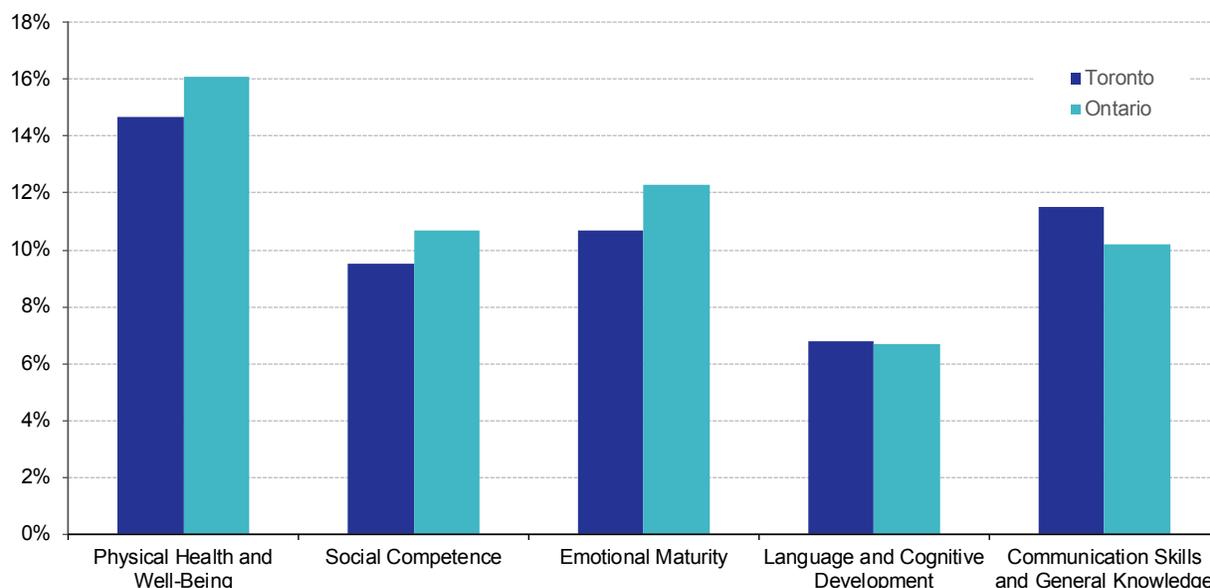


Table 1: Percent of Children Who Are Vulnerable by Domain, Kindergarten Students, Toronto and Ontario, 2015.

	Physical Health and Well-Being	Social Competence	Emotional Maturity	Language and Cognitive Development	Communication Skills and General Knowledge
Toronto	14.7%	9.5%	10.7%	6.8%	11.5%
Ontario	16.1%	10.7%	12.3%	6.7%	10.2%

Toronto Neighbourhood Comparisons

Rates of vulnerability in early child development vary across Toronto.

Table 2 shows the percent of children who are vulnerable on two or more domains for Toronto Public Health's Child Health and Development Service Delivery Areas.

When compared to Toronto as a whole, significantly lower rates are found in the:

- Southeast area.

Significantly higher rates are found in the:

- Northwest area.

Table 2: Percent of Children Who Are Vulnerable by Service Delivery Area*, Toronto, 2015

Service Delivery Area	Vulnerability
West	13.0%
Northwest	16.8% ^H
Southwest	12.6%
Northeast	12.6%
Southeast	11.8% ^L
East	14.4%
Toronto	13.6%

^H Significantly higher than the Toronto total indicating a less favourable result for that area.

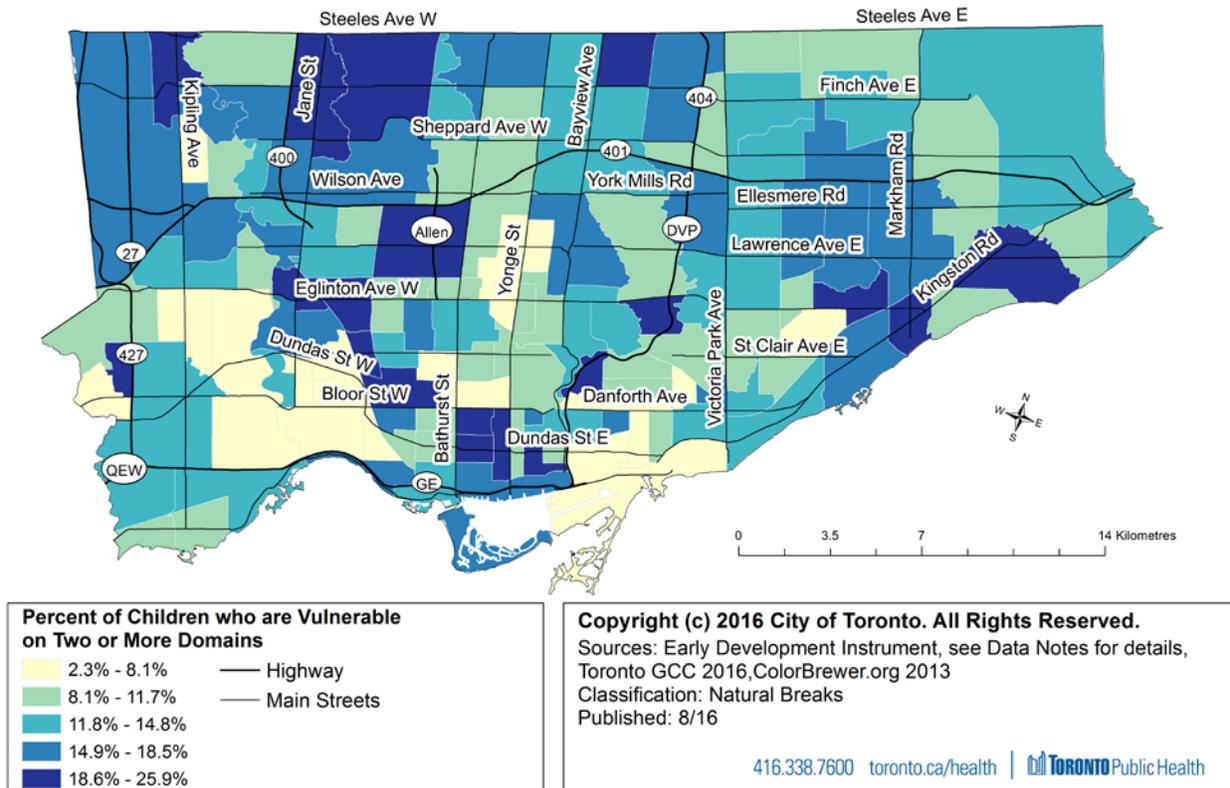
^L Significantly lower than the Toronto total indicating a more favourable result for that area.

* Toronto Public Health's Service Delivery Areas for Child Health and Development

Data Sources: Early Development Instrument, see Data Notes.

Map 1 shows the percent of children who are vulnerable on two or more domains by Toronto neighbourhoods. The percent of children who are vulnerable on two or more domains ranged from 2.3% to 25.9%.

Map 1: Percent of Children Who Are Vulnerable by Neighbourhood, Kindergarten Students, Toronto, 2015.



Clusters of neighbourhoods with significantly lower rates of children who are vulnerable are found to the east, west and north of the downtown core. Neighbourhoods with significantly lower rates of vulnerability include:

- Annex
- Banbury-Don Mills
- Danforth
- Edenbridge-Humber Valley
- Greenwood-Coxwell
- Henry Farm
- High Park North
- High Park-Swansea
- Ionview
- Junction
- Kennedy Park
- Kingsway South
- Lawrence Park North
- Lawrence Park South
- Markland Wood
- Playter Estates-Danforth
- Princess-Rosethorn
- Rexdale-Kipling
- Roncesvalles
- Runnymede-Bloor West Village
- South Riverdale
- Stonegate-Queensway
- The Beaches
- Woodbine-Lumsden
- Wychwood
- Yonge-Eglinton

Neighbourhoods with significantly higher rates of vulnerability are scattered across the city and include:

- Bayview Woods-Steeles
- Black Creek
- Broadview North
- Dovercourt-Wallace Emerson-Junction
- Eglinton East
- Englemount-Lawrence
- Flemingdon Park
- Glenfield-Jane Heights
- Kensington-Chinatown
- Mount Dennis
- Mount Olive-Silverstone-Jamestown
- Scarborough Village
- West Hill
- Weston-Pellam Park
- York University Heights

Socio-demographics

Children who were male, English or French Language Learners and those living in low-income neighbourhoods are significantly more likely to be vulnerable.

Table 3 shows the percent of children who are vulnerable on two or more domains by sex. Male children are significantly more likely than female children to be vulnerable on one or more domains. Male children were also twice as likely as female to be vulnerable on two or more domains.

Table 3: Percent of Children Who Are Vulnerable by Sex, Kindergarten Students, Toronto, 2015.

Sex	Vulnerability
Male	18.0% H
Female	9.1% L

H Significantly higher than the other sex indicating a less favourable result for this group.

L Significantly lower than the other sex indicating a more favourable result for this group.

Data Sources: Early Development Instrument, see Data Notes.

Table 4 shows the percent of children who are vulnerable on two or more domains by English or French Language Learner (EFLL) status. English or French Language Learners are twice as likely as non-EFLL children to be vulnerable.

Table 4: Percent of Children Who Are Vulnerable by EFLL Status, Kindergarten Students, Toronto, 2015.

Status	Vulnerability
EFLL	27.9% H
Non-EFLL	11.9% L

H Significantly higher than the other status indicating a less favourable result for this group.

L Significantly lower than the other status indicating a more favourable result for this group.

Data Sources: Early Development Instrument, see Data Notes.

Table 5 below shows the percent of children who are vulnerable on two or more domains by income quintile. Quintile 1 includes areas in Toronto with the highest percent of people living below the low income measure (LIM). Quintile 5 includes areas in Toronto with the lowest percent of people living below the LIM.

Rates of vulnerability in lower income quintiles (1, 2, 3 and 4) were all significantly higher than the highest income quintile (5).

Table 5: Percent of Children Who Are Vulnerable by Income Quintile, Kindergarten Students, Toronto, 2015.

Income Level	Vulnerability
Quintile 1 (Lower income)	17.3% H
Quintile 2	14.5% H
Quintile 3	15.4% H
Quintile 4	12.0% H
Quintile 5 (Higher income)	8.1%

H Significantly higher than Quintile 5, the higher income group, indicating a health inequality and a less favourable result for that group.

Data Sources: Early Development Instrument and Income Quintiles, see Data Notes.

Data Notes

Notes

- The Early Development Instrument (EDI) is a population-based tool that measures vulnerability in early childhood development. The EDI is a 103-item questionnaire completed by kindergarten teachers that measures a child's ability to meet age-appropriate developmental expectations. The EDI is used to monitor healthy childhood development over time and to assess areas where children and families may benefit from additional supports and services.
- The EDI is a valid and reliable measure of early development created by the Offord Centre for Child Studies at McMaster University. For more information about the validity and reliability of this tool, please visit the Offord Centre's [website](#).
- The EDI includes all children in Ontario publicly funded schools. It does not include children who attend privately funded schools. Children who were unable to be linked to provincial records, were in class for less than one month or were missing information for more than one domain (approximately 3.6% in 2015) were excluded from this analysis. Children with special needs (approximately 3.4% in 2015) were also not included because the developmental expectations for this group of children are not the same as for the general population.
- Significant differences were estimated using overlapping confidence intervals. Confidence intervals were calculated using a Poisson approximation of the binomial distribution. Although this method is conservative ($\alpha \sim < 0.01$) and most appropriate when comparing mutually exclusive groups, it was chosen as an objective means of making conclusions on population-based data. Multiple comparisons performed in the analysis were not taken into consideration when choosing the level of significance to test.
- Significant differences were not used for Figures 2 and 3 and Table 1 due to the limited information about the count of Ontario children available to Toronto Public Health.
- For comparisons of smaller geographic areas, any child who could not be linked to a valid Toronto postal code was excluded from the total.
- Neighbourhoods identified as having significantly higher or lower rates than Toronto as a whole do not necessarily represent all such neighbourhoods. Cut-offs are arbitrary.

Definitions

95% Confidence Interval is the range within which the true value lies, 19 times out of 20.

Communication Skills and General Knowledge: One of five domains in the EDI that measures skills to communicate needs and wants in socially appropriate ways, symbolic use of language, storytelling, and age-appropriate knowledge about the life and world around.

Domain: The EDI measures early development on five domains. Each domain represents a broad area of child development. See Physical Health & Well-Being, Social Competence, Emotional Maturity, Language & Cognitive Development and Communication Skills & General Knowledge for a definition of each domain.

Emotional Maturity: One of five domains in the EDI that measures ability to think before acting, a balance between too fearful and too impulsive, an ability to deal with feelings at the age-appropriate level, and empathetic response to other people's feelings.

English or French Language Learners (EFLL) refers to children who are identified by the school board as being enrolled in an English Language Learning or French as a Second Language program. It does not refer to Anglophone children who are enrolled in a French Immersion program.

Income Quintiles: Five groups, each containing approximately 20% of the population, were created by ranking Toronto's census tracts based on the percent of residents living below the Statistics Canada after-tax Low Income Measure (LIM). Quintile 1 includes the census tracts with the highest percent of people living below the LIM and is therefore the lowest income quintile. Quintile 5 includes the census tracts with the lowest percent of people living below the LIM, making it the highest income quintile. LIM is an income level set at 50% of the median income in Canada in a given year, adjusted for household size.

Language and Cognitive Development: One of five EDI domains that measures reading awareness, age-appropriate reading and writing skills, age-appropriate numeracy skills, ability to understand similarities and differences, and ability to recite back specific pieces of information from memory.

Physical Health and Well-Being: One of five EDI domains that measures gross and fine motor skills (e.g., holding a pencil, running on the playground, motor coordination), adequate energy levels for classroom activities, independence in looking after own needs, and daily living skills).

Social Competence: One of five EDI domains that measures curiosity about the world, eagerness to try new experiences, knowledge of standards of acceptable public behaviour, ability to control own behaviour, appropriate respect for adult authority, cooperation with others, following rules, and ability to play and work with other children.

Sex defines people based on their biological characteristics, whereas gender is a socially constructed concept. From a social determinants of health perspective, certain health conditions can be associated with gender, and from a biological perspective, health conditions can be associated with sex. Although reporting based on both concepts would be preferable, the data source used here only collects information on sex, and not gender.

Vulnerable refers to children who score below the vulnerability cut-off points. The cut-off points are fixed values determined based on the lowest 10% of children in each domain in the first Ontario cycle of the EDI (2004/2005).

Vulnerability refers to the percent of children who are vulnerable on two or more of the five EDI domains. This measure of vulnerability allows for results from the five domains to be combined to give a sense of overall vulnerability across domains. Children who are vulnerable on two or more domains are struggling in at least two areas of development. They represent those in greatest need of supports and services.

Sources

Early Development Instrument: Offord Centre for Child Studies, McMasters University, 2004/2005 to 2014/2015. Used in:

- Figures 1, 2 and 3
- Tables 1, 2, 3, 4 and 5
- Map 1.

Income Quintiles: Income Estimates for Census Families and Individuals (T1 Family File), Table F-18, Statistics Canada, 2013. Used in:

- Table 5.

Health Surveillance Indicator: Vulnerability in Early Child Development

Category: Child Health

Prepared: December, 2016

This indicator report is part of a series that informs the ongoing assessment of Toronto's health status. For a full list of the indicators, please go to: www.toronto.ca/health.