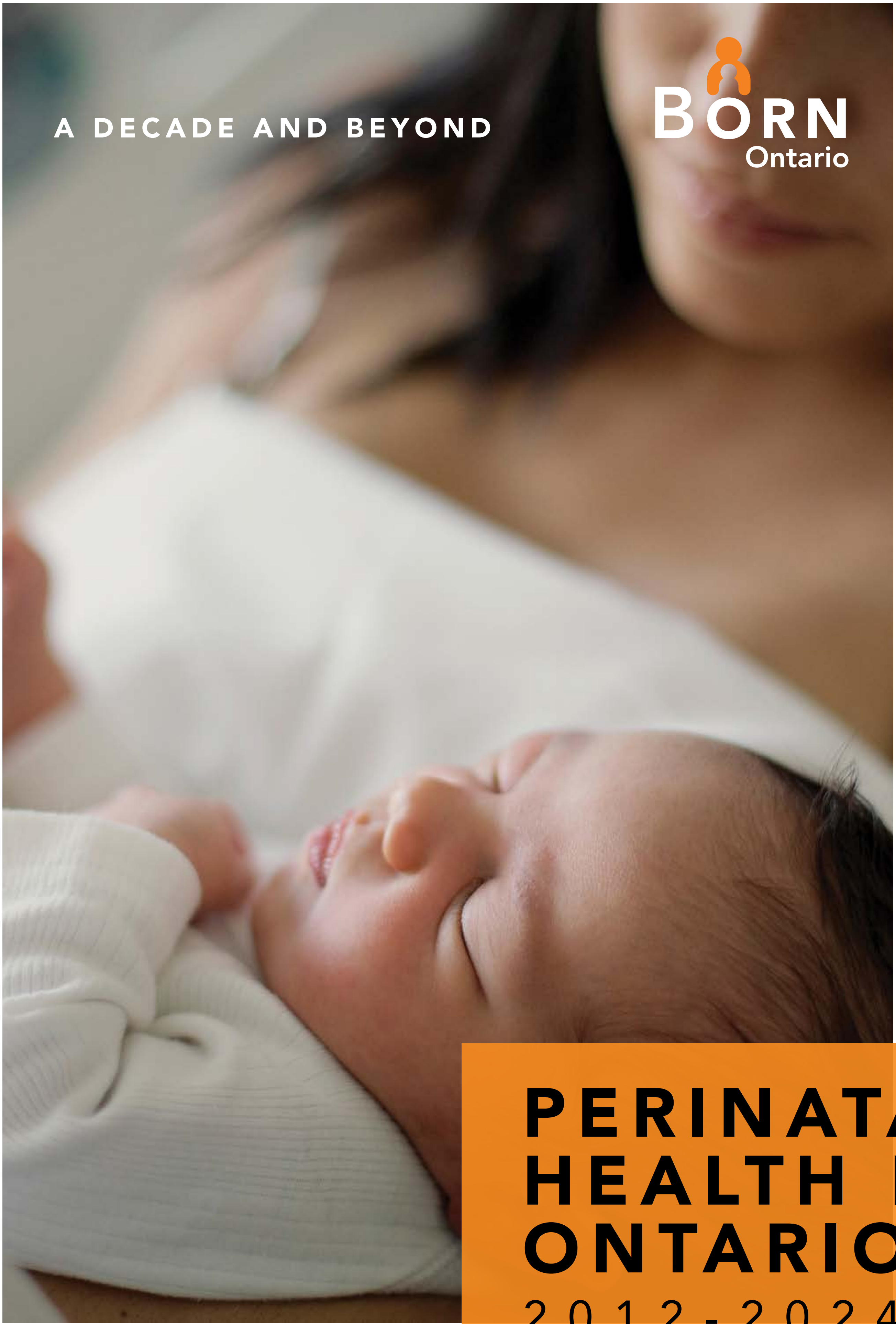
A DECADE AND BEYOND

BORN Ontario



PERINATAL HEALTH IN ONTARIO

2012-2024

User Acknowledgement

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BORN developed this resource with the goal of supporting improved care outcomes.

We encourage care providers to review and discuss the information with their colleagues and consider the findings while providing care to their patients. Individuals receiving care are also invited to use this resource as a tool to engage in informed conversations with their care providers.

Data Acknowledgement

The goal of this report is to support and facilitate improved perinatal health care outcomes by providing insights related to patient risk factors, pregnancy complications, screening practices, treatments and interventions, levels and modes of care, care providers, and other relevant aspects of the perinatal care journey. BORN Ontario also strives to better understand how our data can be used to inform health system partners on the intersection between social determinants of health, indigeneity, and perinatal and child health outcomes. This report includes data that may or may not support reflections on indigeneity and health equity. We cannot conclusively or accurately identify the extent to which BORN data reflect indigeneity and equity-deserving groups. This pursuit is ongoing, and we appreciate your support and ideas related to enabling our efforts in pursuit of more equitable outcomes and programming.

Land Acknowledgement

BORN Ontario acknowledges that the land on which we gather and the living environment from which our data are collected is the traditional territory of the Haudenosaunee and Anishinaabe, the original peoples of Turtle Island. These territories are covered by traditional and shared agreements including the Two Row Wampum, the Dish Wampum, the Nanfan Treaty of 1701, and Haldimand Proclamation of 1784. BORN Ontario recognizes that geography is not universally agreed upon and acknowledges the importance of ongoing land claims and negotiations.

Suggested citation

BORN Ontario. A Decade and Beyond: Perinatal Health in Ontario Report 2012–2024. Ottawa, Ontario; 2025.

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Alicia St Hill
Executive Director, BORN Ontario

MESSAGE FROM THE EXECUTIVE DIRECTOR

BORN Ontario plays a vital role in advancing maternal and child health. This report highlights key trends and outcomes from the past twelve years. The findings tell an evolving story of pregnancy, birth, and newborn care in our province.

The trends are striking: births to individuals aged 35 and older have risen, mental health concerns during pregnancy have nearly doubled, early exclusive breastfeeding rates are declining, and the reporting of cannabis use in pregnancy has tripled since legalization. At the same time, we've seen improvements in early prenatal care access and newborn temperature management at NICU admission, increased care provided by midwives, a growing use of assisted reproductive technologies, and most recently an impressive adoption of new universal infant RSV prevention at birth.

These shifts reflect changes in our population and in the systems – within and outside of traditional healthcare models that support them. They challenge us to ask: Are we meeting the needs of today's pregnant women, individuals, and families? And more importantly, how can we do better?

One trend that demands our attention is the steady rise in C-section births (see Figure 3.2.5) affecting both first-time and repeat parents. Understanding these patterns is essential to ensuring that birthing options remain safe, evidence-informed, and person-centred.

This report is a call to action. Whether you are a clinician, policymaker, researcher, or advocate, the insights within these pages are tools — tools to drive curiosity, quality improvement, to plan and innovate, and to champion high quality equitable care and outcomes. Let this data spark conversations, inform decisions, fuel research questions, re-evaluate care models, and inspire bold steps toward better outcomes for all.

At BORN Ontario, we are committed to being more than a registry of aggregated data that fuels rich research, reflections, and analysis. We are evolving as a collaborative and responsive leader in facilitating care through digital health innovation, harnessing the power of protected, high-quality data and insights. From leveraging AI to improve screening and surveillance approaches to enabling real-time insights for frontline clinicians and care teams, smarter, safer, and more responsive care. Our leadership in advocating for, co-designing, and developing a digital Ontario Perinatal Record platform is anchored in this commitment to empower individuals, families, and clinicians with a connected digital backbone that fuels safer efficient care, greater engagement, and more informed decision making.

The "N" in BORN stands for network and we could not do this work without the dedication and expertise of our partners - clinicians, data contributors, government partners, system leaders, and BORN advisory committee members who contribute to the richness, relevance, and reliability of the data we steward. Your commitment fuels the system-wide value of registries, like BORN and ensures that our collective efforts translate into meaningful change.

Together, let's use this report not just to reflect — but to act. The future of perinatal health in Ontario depends on it.

Alicia St Hill
Executive Director, BORN Ontario

BORN A Decade and Beyond

Records from over **140,000 births** across Ontario **annually**

All hospitals with birthing units, all NICUs, midwifery practice groups, fertility clinics, and many laboratories **contribute**

Nearly **3,000 record entries** submitted **each day**

From 2012 to 2024: How pregnancy and childbirth has changed

Maternal Health

Increased maternal age and pre-existing conditions are associated with increased risks

23% of mothers were aged 35+, up from 18%

70% of births in 2023/24 were to individuals ≥ 30 yrs

50% decrease in **tobacco smoking use**. Cannabis use up to 3.6%, up from 1.3% prior to legalization

Pre-existing health issues rose from **17% to 25.6%** of pregnancies

3% of all births were conceived by IVF, up from 0.9%.

>21% living with obesity

22% reported **mental health issues** in pregnancy

Birth & Postpartum

Only about 50% people deliver after spontaneous labour (down from 63%). Induction and C-sections rates are rising

33% of births were Cesarean deliveries, up from 27%

5x increase of births with syphilis exposure

5% of births involved 3rd or 4th degree lacerations

Postpartum readmissions rose slightly to 1.7% from 1.6%; (Postpartum) ICU transfers reached **0.18%**

>80% used pharmacologic pain relief; epidural was most common

~70% **Successful VBAC** for eligible & attempted

29% from Northern Ontario travel ≥100 km for birth

Infant Health

The decline in neonatal deaths reflects improved care and medical advances.

8.5% or 11,881 babies were preterm (<37wks) in 2023/24

11.1 days Average NICU stay; For infants born **25-31 weeks, it was 54.2 days**

18% of babies <28wks GA were born in hospitals below recommended care level — an improvement from the high of 31%.

69% of infants received infant **RSV immunization** after launch of universal program in 2024/25

8% of newborns lacked a primary care provider in 2023/24

78% of newborns admitted to NICU with normal body temperature

>91% initiated breastfeeding, but exclusive rates at discharge declined to 43% from 58.5%.

INTRODUCTION & REPORT OVERVIEW

BORN Ontario is pleased to present this *A Decade and Beyond: Perinatal Health in Ontario Report 2012-2024*, examining perinatal care over the past 12 years. Over time, Ontario has experienced considerable change, but we have attempted to put historical and current context to the outcomes we examined. While there is definitely some good news, there are also some concerning trends. BORN works in partnership with many individuals and organizations in perinatal care across Ontario and where discrepancies and areas for improvement exist, we have the opportunity as a collective community to work on improvements. You will find examples of resources and improvement strategies mentioned throughout this report.

As the Prescribed Maternal-Child Registry in Ontario under Ontario's privacy legislation, BORN collects data to facilitate and improve care. Under that mandate, we have very specific purposes to fulfill. This report meets the following BORN purposes:

- Identify situations where appropriate care has not been received
- Facilitate continuous improvement
- Determine where outcomes are clinically or statistically discrepant
- Enable health-care providers to compare their outcomes and performance
- Identify areas where best-practice evidence needs implementation
- Provide information to help planning bodies like the Ministry of Health, Ontario Health or Public Health

CONTEXT

Ontario is a geographically vast province with almost 40% of Canada's population. Over 90% of the population resides in the southern part of the province. Birth volumes vary by year, but there are usually between 140,000 to 144,000 births. Additionally, there are up to 20% more pregnancies that we haven't been able to include to-date due to early pregnancy loss. Often early losses occur outside of a healthcare setting and as a result there is limited data; we miss an important opportunity to improve care for so many individuals.

To help with context, we looked back at the perinatal care setting from 12 years ago and compared it to present day. According to the BORN Annual Report from 2012, there were 103 hospitals and 84 midwifery practice groups submitting data and just over 5000 registered users in the BORN

Information System (BIS). Care was directed and managed by 14 local health integrated networks (LHINs). We were integrated with the provincial laboratory for newborn screening and the labs for prenatal screening from the beginning. As fertility centres were integrated into the BIS, the first year saw 16 centres contributing data.

In 2023-2024, there are 88 hospitals providing labour and birth services, 52 neonatal intensive care units (NICU) and special care nurseries (SCN) (44 in level 2 hospitals and 8 in Level 3), 92 midwifery practice groups and three independent birthing centres. There are now 19 fertility clinics contributing data. Health care is managed within six health regions of Ontario Health. Our data contributors have also expanded as we have the cytogenetic laboratories. Changes have also occurred within the public health landscape over this 12-year period. Ontario has gone from 36 to 34 public health units due to amalgamations of service areas. As well, over this reporting period, definitions about maternal and newborn hospitals levels of care (LOC) were redefined slightly and BORN adjusts our system to ensure accurate ascertainment when changes occur.

METHODS

Indicators for this report were chosen by BORN's Scientific Manager in consultation with BORN's Executive Committee, the Data Analysis Research & Reporting Team, BORN Project Advisors, the Data Request & Research Coordinators with insight from the Health Equity Advisory Group, the Maternal Newborn Outcomes Committee (MNOC), Midwifery Advisory Committee (MAC), internal and external subject matter experts (SME) as well as provincial partners. The data was extracted from the BORN Information System (BIS). When we needed further information to enhance the analysis and interpretation we used other sources of data available to BORN, but not directly from the BIS. We linked the BIS records to Canadian Institute for Health Information (CIHI) Discharge Abstracts for information that the BIS does not routinely capture (intensive care units admissions, readmissions to hospital). The Ontario Marginalization Index (ON-MARG) provides 4 area-based measures reflecting social and economic marginalization mapped to postal codes. For postal code data we used the address of the pregnant individual at the time of birth, with linked census geography and geographical coordinates using the Postal Code Conversion File Plus (PCCF+), version 8A1 (Statistics Canada, 2022).

The report uses descriptive statistics to present trends and outcomes.

DATA LIMITATIONS

The BORN Information System (BIS) was new in 2012. For that reason, ascertainment and reporting bias may be responsible for changing rates we observed in some indicators over time. Although BORN provides training to those entering data and on-line help and resources are available, new systems take time to implement and for people entering data to be fully versed in all aspects of the system. Similarly, when data is extracted from hospital EMR systems and sent to BORN, extensive mapping has to occur to ensure the data elements in each system are correct. While BORN has a series of verification and validation exercises with all data received, it is possible that estimates may be impacted by incomplete data mapping where information is captured in EMR notes and not discrete data fields.

There is only a small amount of information presented by race other than what was derived at the neighbouhood level from the census or amalgamated racial groups collected by Prenatal Screening Ontario. As only about 70% of individuals in Ontario undergo prenatal screening, we are missing 30% of information on this important variable, thus these conclusions about the impact of race on outcomes needs to be interpreted with caution. BORN is actively working on improving the collection of race and ethnicity data as we recognize the importance of presenting an equity lens on the interpretation of perinatal results. BORN's Health Equity Advisory Group is consulting with partners across the province about the safe collection, use and sharing of this important data and ensuring appropriate protections are in place to prevent unintended harm.

Comments on the report and suggestions for reporting in the future are welcome. Please send these to: Scientific Manager at BORN, Alysha Dingwall-Harvey, science@bornontario.ca.

Finally, we thank the team at BORN responsible for producing the report, the subject matter experts (SME), and the reviewers who provided important context and edits.

This report could not have been produced without significant effort from Dr. Rong (Rita) Luo, Liam Bruce, Sierra Killam, Nahantara Lafleur, Dr. Ann Sprague, Dr. Sandra Dunn, Dr. Katherine Muldoon, Dr. Gillian Alton, and Alysha Dingwall-Harvey. We appreciate the broader support from a larger team, including: Dr. Kara Bellai-Dussault, Janet Brownlee, Annabel Cope, Danna Hull, Tammy Kuepfer, Dr. Andrea Lanes, Catherine Lombardo, Lynn Meng, Ammu Menon, Dana-Marie Radke, Dr. Michaela Smith, Dr. Eszter Torok, Anne Trinneer, Alicia St. Hill, and Dr. Mark Walker.

1.0 PERINATAL OVERVIEW

In 2023/2024, Ontario recorded 144,068 live and stillbirths, with birth volumes remaining relatively stable over the past decade. OH West consistently sees the highest number of births, while OH North West has the fewest. Monitoring birth volumes is essential for planning health resources, education, and community services, and for understanding population growth or decline.

INTRODUCTION

The vast majority of births — over 90% — occur among individuals living in urban settings, a trend that has held steady over time. In contrast, approximately 10% of births take place in rural areas, where access to care often involves long travel distances (Smylie, 2021). Ensuring adequate services in these communities remains a challenge, requiring collaborative care models and support from urban providers (*Northern Policy Institute, 2024*).

There were over 4,000 out-of-hospital births in Ontario in 2023/2024, with most occurring at home under the care of midwives. Midwives are trained to manage both routine and emergency situations and coordinate transfers to hospital when necessary. Birth choices and access to care are shaped by geography, provider availability, and individual preferences, highlighting the importance of flexible and responsive care models (*Campbell et al., 2019*). Socioeconomic and educational factors also influence birth patterns. In 2023/2024, 21% of births occurred in the lowest income quintile neighborhoods, down from 24% in 2012/2013, while the highest income quintile has consistently remained at 16%. Similarly, the volume of births in neighborhoods with the lowest levels of postsecondary education have declined slightly, suggesting shifts in the distribution of pregnancies across social and economic contexts.

Demographic trends continue to shape perinatal care needs. Nearly 70% of births in 2023/2024 were to individuals aged 30 or older, up from 57% in 2012/2013. The proportion of births to individuals aged 35 and older has also increased, from 18% to 23%. Additionally, the mean maternal age of first time individuals giving birth, or nulliparous, has raised from 28 years to 30 years. Shifting demographic patterns, including changes in the age distribution of individuals giving birth, are important to consider, as they may be associated with increased rates of pregnancy complications, fertility challenges, and genetic risks (*Aoyama et al., 2019*). Recognizing these trends helps inform safe and equitable care planning (Statistics Canada, 2024).

Gestational age trends show that over 90% of live births occur at full term (≥37 weeks), a rate that has remained consistent. However, stillbirths are increasingly concentrated in the preterm period, particularly under 28 weeks. These patterns may reflect increased interventions aimed at preventing fetal death, but also raise important questions about balancing maternal risks with fetal outcomes (*Murphy-Kaulbeck et al., 2025*). As Ontario's population and care needs evolve, ongoing surveillance of perinatal indicators remains critical — not only for guiding policy and clinical practice, but for ensuring that every pregnancy and birth is supported with compassion, safety, and equity (*Murphy et al., 2021*).

1.1 PERINATAL OVERVIEW

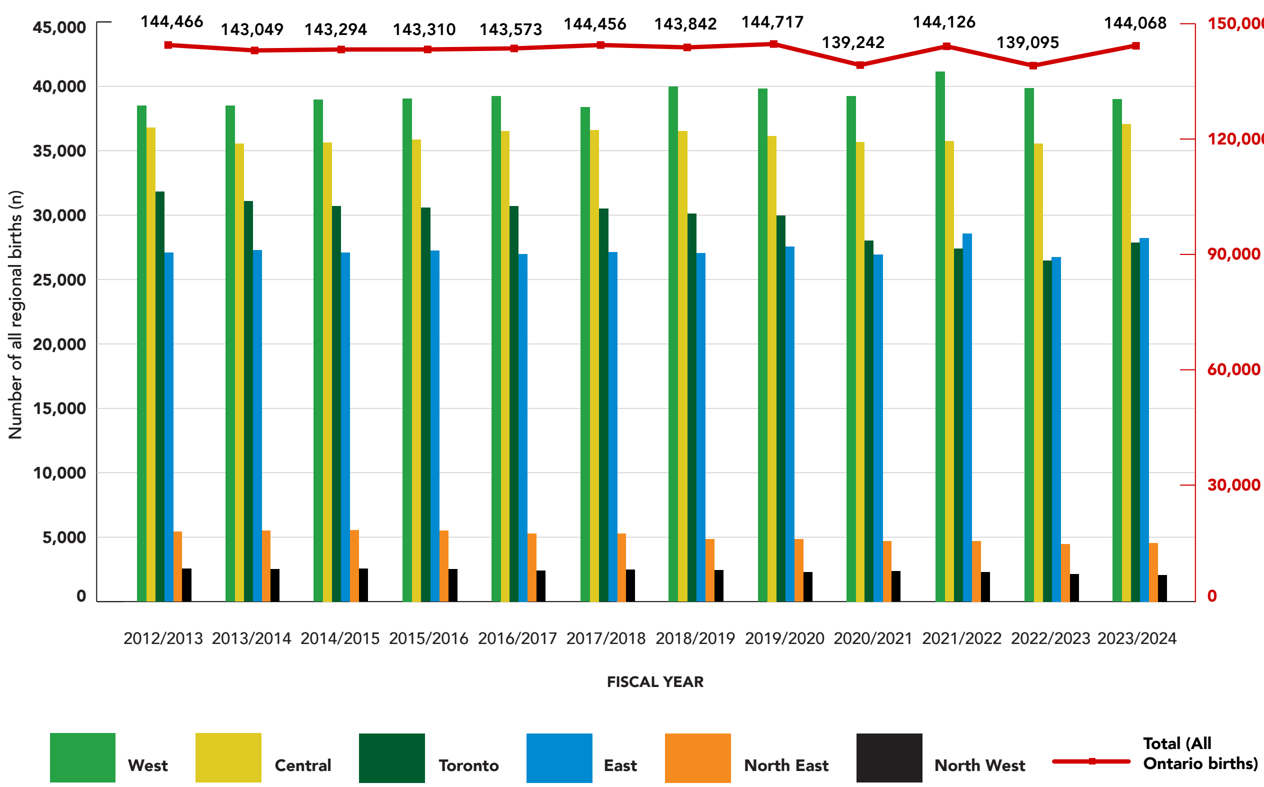
FIGURE 1.1.1

Birth volumes, Ontario, 2012/2013 to 2023/2024 by Ontario Health region of residence and fiscal year

Summary of Figure 1.1.1

- In 2023/2024 there were 144,068 live and stillbirths in Ontario. Birth volumes, provincially and by Ontario Health (OH) region, have remained relatively stable over the past decade
- This graph is stratified by OH region, which shows the largest birth volumes occur in the West region and the fewest in the North West.
- Monitoring birth volumes is important to plan for health resource allocation, and population needs (e.g. schools or children's services) and understand population growth or declines.

To view an alternate to this graph see **Table 1.1.1** in Appendix A for a table option of data points.



Numerator: Births in each region of residence.
Denominator: All live and stillbirths in Ontario.

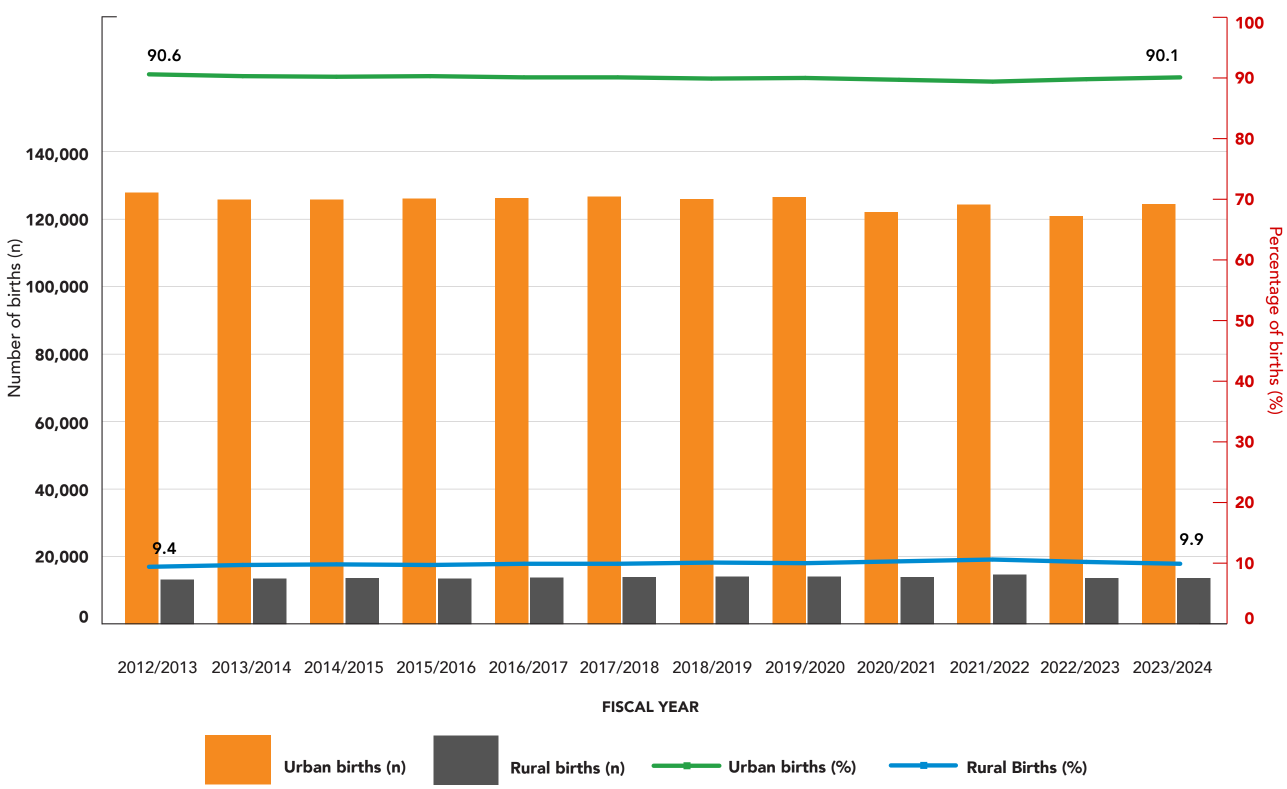
FIGURE 1.1.2

Birth volume by population density, Ontario, 2012/2013 to 2023/2024 by urban/rural residence and fiscal year

Summary of Figure 1.1.2

- Over 90% of births in Ontario occur in urban settings, which has been consistent over the decade and ranges between 121,000 and 128,000.
- Approximately 10% of births in Ontario occur in rural areas (13,000-15,000 per year). Pregnant individuals may be required to travel long distances to access prenatal and birthing services.
- Ensuring adequacy of services for pregnant women and individuals in rural and remote areas can be challenging. Hospital closures and lengthy travel times for pregnancy and birthing services have made birth close to home difficult in rural and remote areas. Interprofessional and collaborative care models are needed to maintain care in these areas with support from urban colleagues.

To view an alternate to this graph see **Table 1.1.2** in Appendix A for a table option of data points.



Numerator: Births in each population density.
Denominator: All live and stillbirths among Ontario residents.

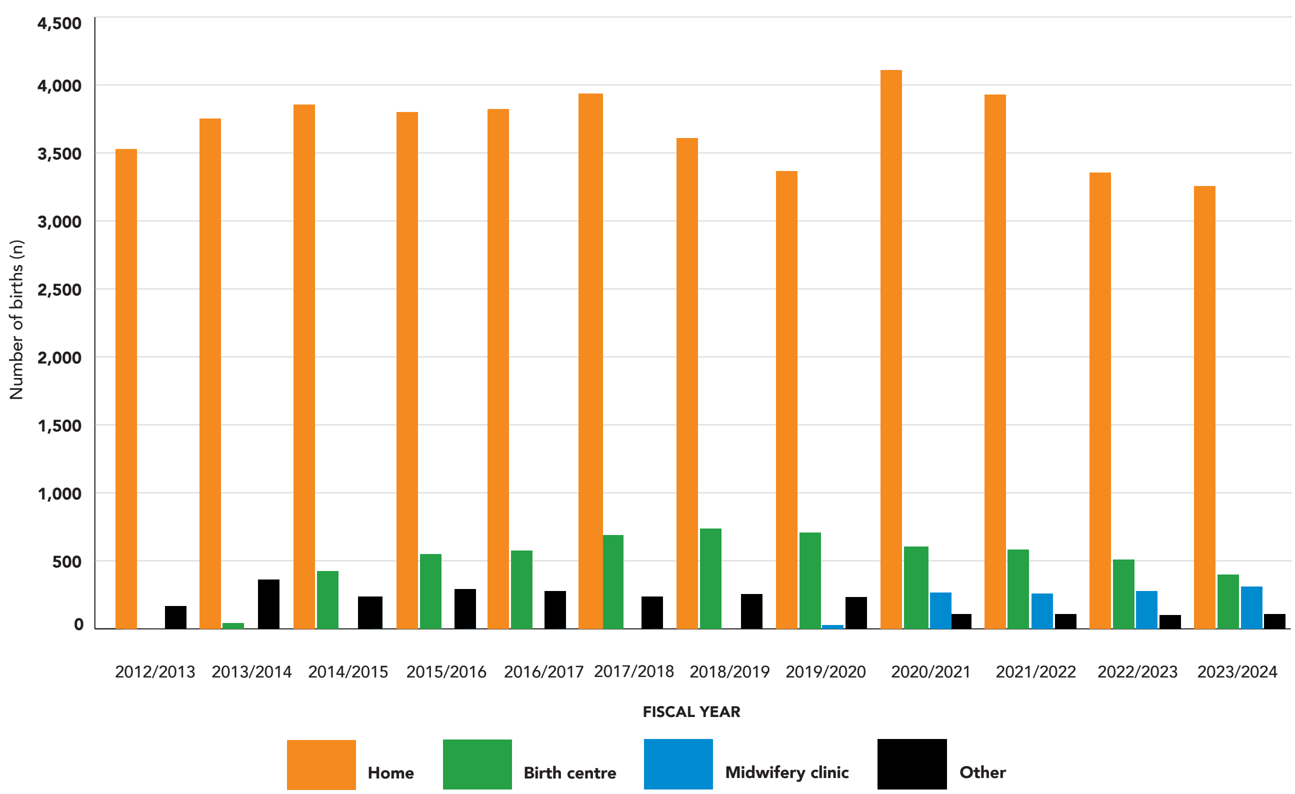
FIGURE 1.1.3

Out-of-hospital birth volumes, Ontario, 2012/2013 to 2023/2024 by birth location and fiscal year

Summary of Figure 1.1.3

- Approximately 3% of births in Ontario occur outside of hospital, which has varied over the decade and ranges between 3,700 and 5,000 births per year.
- The vast majority of these out-of-hospital births occur at home and range from about 3,200 to 4,000 births per year.
- The majority of out-of-hospital births are under the care of registered midwives. Within a registered midwife's scope of practice, healthy low-risk individuals according to the College of Midwives of Ontario can choose place of birth as home, hospital, birth centre or midwifery clinic. Midwives are trained and equipped to provide regular and emergency care and also use hospitals and emergency services when transfer is required.

To view an alternate to this graph see **Table 1.1.3** in Appendix A for a table option of data points.



Numerator: Births in each birth location.

Denominator: All out of hospital live and stillbirths that occurred in Ontario.

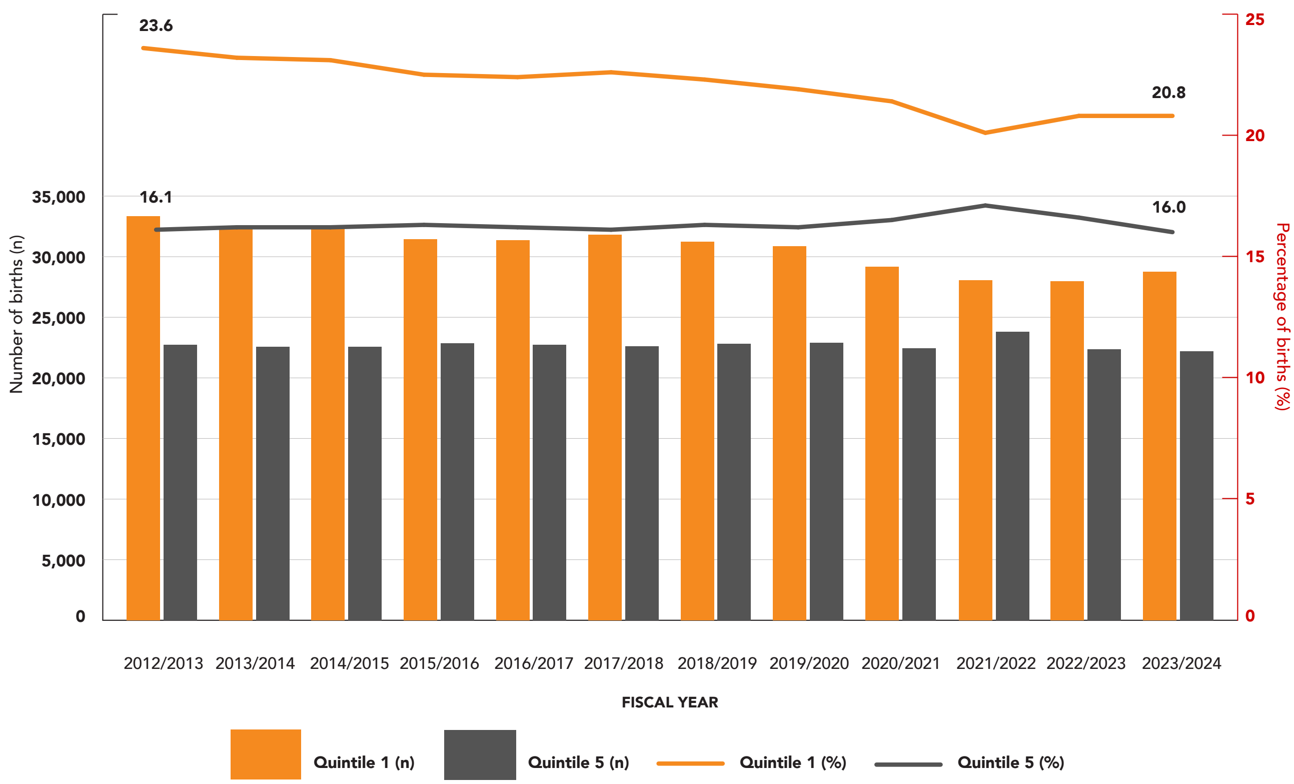
FIGURE 1.1.4

Birth volumes by neighbourhood income, Ontario, 2012/2013 to 2023/2024 by median income quintiles 1 (lowest) and 5 (highest) and fiscal year

Summary of Figure 1.1.4

- Approximately 16% of pregnant women and individuals who gave birth reside in the highest median income quintile neighbourhood, which has been consistent over the decade *(gray line)* and represents 28,000 – 33,000 births per year.
- In 2023/2024, approximately 21% of births occur in residences in the lowest median income quintile neighbourhood, which has decreased over the decade from approximately 24% *(orange line)*.
- This indicates a shift in the distribution of pregnancies, with a slight decrease in the proportion of births in the lowest income neighborhoods over time.

To view an alternate to this graph see **Table** 1.1.4 in Appendix A for a table option of data points.



Numerator: Births in income quintiles 1 and 5**.**
Denominator: All live and stillbirths among Ontario residents.

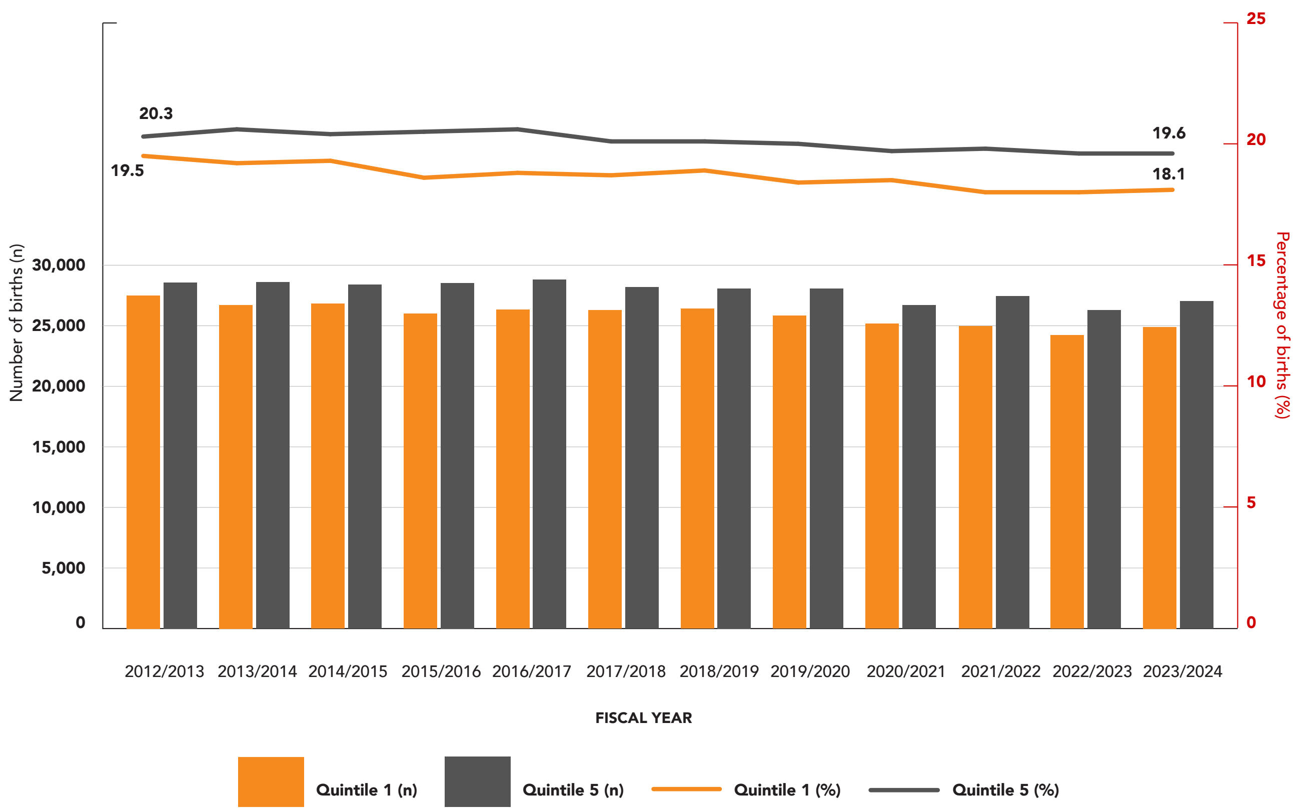
FIGURE 1.1.5

Birth volumes by neighbourhood education, Ontario, 2012/2013 to 2023/2024 by quintiles 1 (lowest) and 5 (highest) and fiscal year

Summary of Figure 1.1.5

- Approximately 20% of pregnant women and individuals who gave birth reside in a neighbourhood with the highest percentage of individuals with a postsecondary certificate, degree, or diploma. This proportion has been consistent over the decade and represents 26,000 – 29,000 births per year.
- In 2023/2024, approximately 18% of births occur in a neighbourhood with the lowest percentage of individuals with a postsecondary certificate, degree or diploma. This proportion has decreased slightly over the decade from approximately 20%.
- This indicates a shift in the distribution of pregnancies, with a slight decrease in the proportion of births in the lowest education neighborhoods over time.

To view an alternate to this graph see Table 1.1.5 in Appendix A for a table option of data points.



Numerator: Births in education quintiles 1 and 5.

Denominator: All live and stillbirths among Ontario residents.

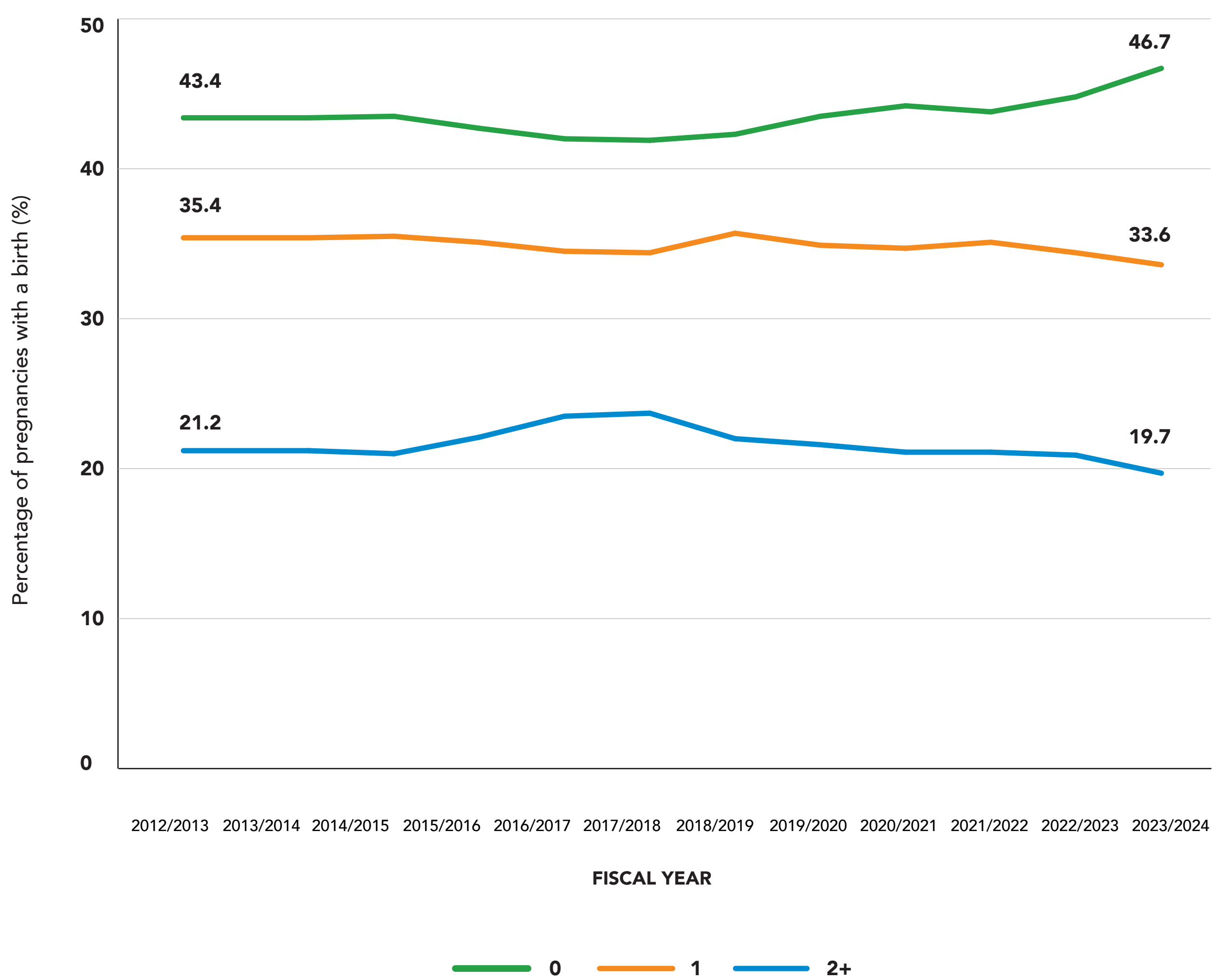
FIGURE 1.1.6

Distribution of parity, Ontario, 2012/2013 to 2023/2024

Summary of Figure 1.1.6

- In 2023/2024, 46.7% of pregnant women and individuals who gave birth were nulliparous, 33.6% were primiparous and 19.7% were multiparous.
- The proportion of people having two or more births has declined from 21.2% to 19.7% over the past 10 years.
- Understanding family size norms and fertility patterns is important at the population level to predict future population growth and resource implications.

To view an alternate to this graph see **Table 1.1.6** in Appendix A for a table option of data points.



Numerator: Pregnancies in each parity group.
Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

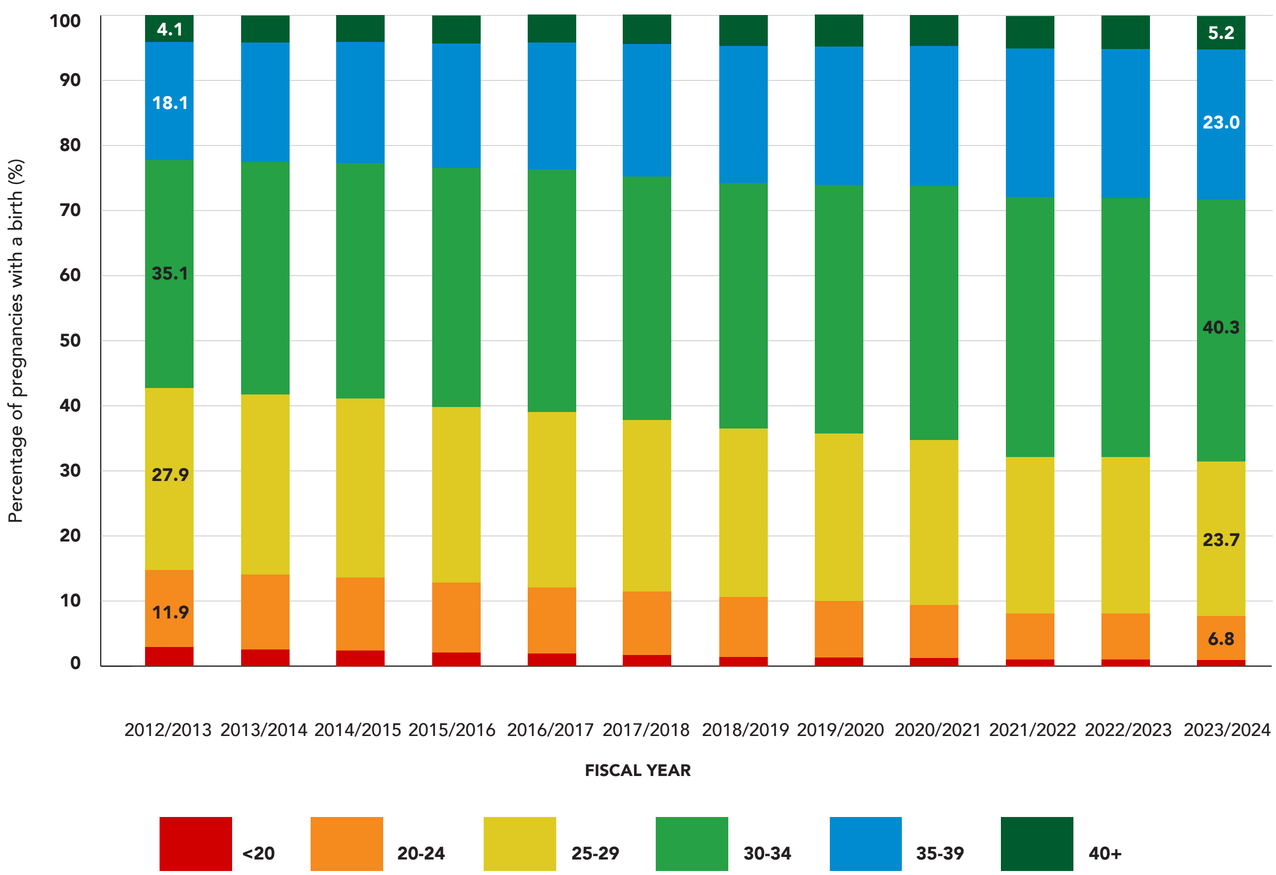
FIGURE 1.1.7

Distribution of maternal age at birth, Ontario, 2012/2013 to 2023/2024

Summary of Figure 1.1.7

- In 2023/2024, nearly 70% of pregnant women and individuals were 30 years of age or older when they gave birth compared to only 57% ten years ago.
- In the last decade there has been an increase in the proportion of pregnant individuals age 35 years and older from 18.1% in 2012/2013 to 23% in 2023/2024.
- As the age of pregnant and birthing individuals increases, so do rates of complications. Specifically, the increasing proportion of pregnant individuals over the age of 35 is associated with increased risk of pregnancy complications, fertility challenges, and increased risk of certain fetal genetic conditions.

To view an alternate to this graph see Table 1.1.7 in Appendix A for a table option of data points.



Numerator: Births in each maternal/pregnant individual age category.
Denominator: All pregnancies with a live or stillbirth in hospital that occurred in Ontario.

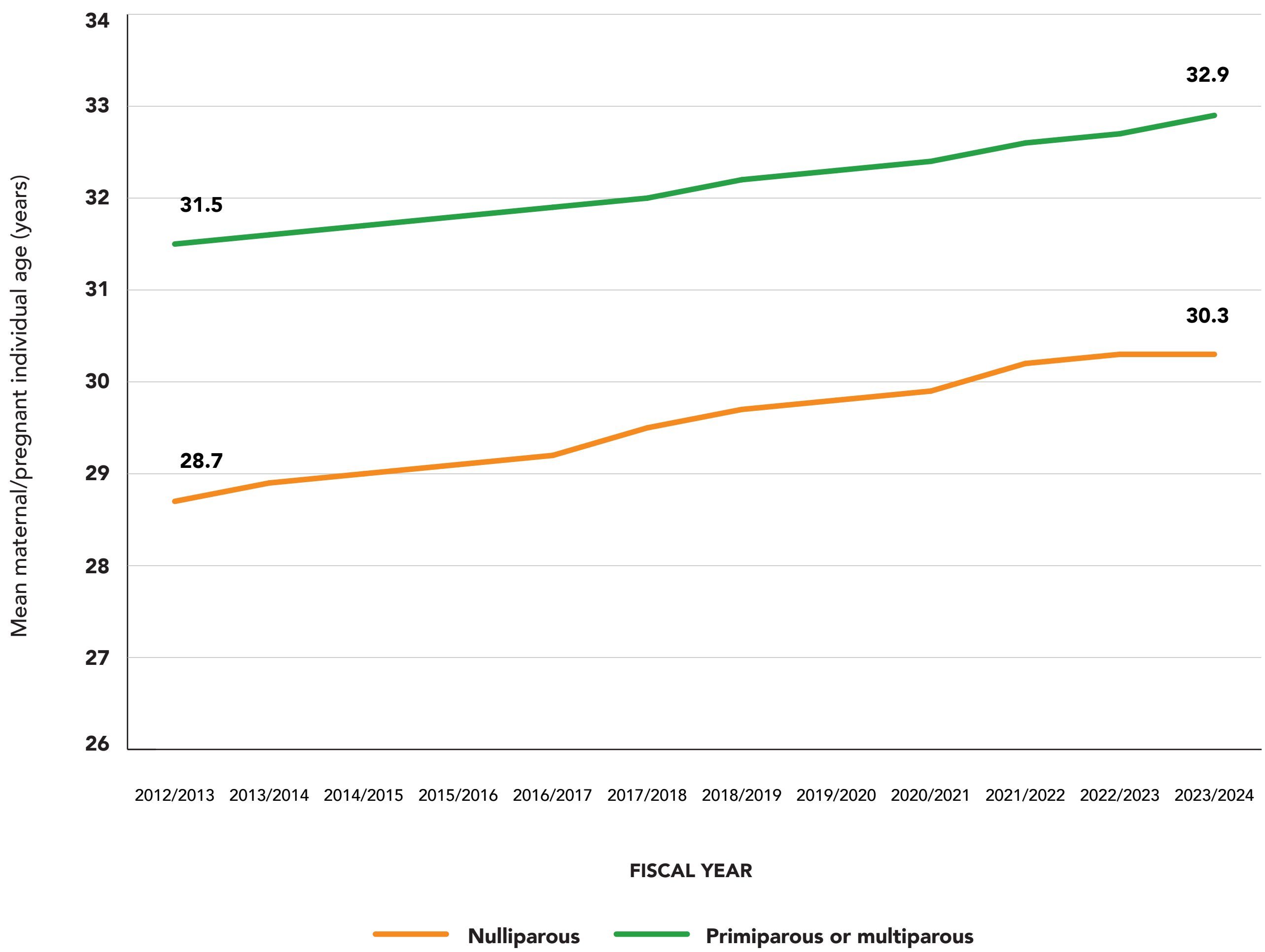
FIGURE 1.1.8

Mean maternal/pregnant individual age at birth (years), Ontario, 2012/2013 to 2023/2024 by parity and fiscal year

Summary of Figure 1.1.8

- In 2023/2024, the mean maternal/pregnant individual age at birth was 30.3 years for nulliparous individuals and 32.9 years for primiparous or multiparous individuals.
- The mean age at the time of birth has increased over the past decade by 1.6 years in nulliparous individuals and 1.4 years in parous individuals.
- As with the previous graph on maternal/pregnant individual age at birth, increasing age regardless of parity increases the risk of pregnancy and birth complications and will drive rates of intervention.

To view an alternate to this graph see **Table 1.1.8** in Appendix A for a table option of data points.



Numerator: Mean age at birth in each parity group.

Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

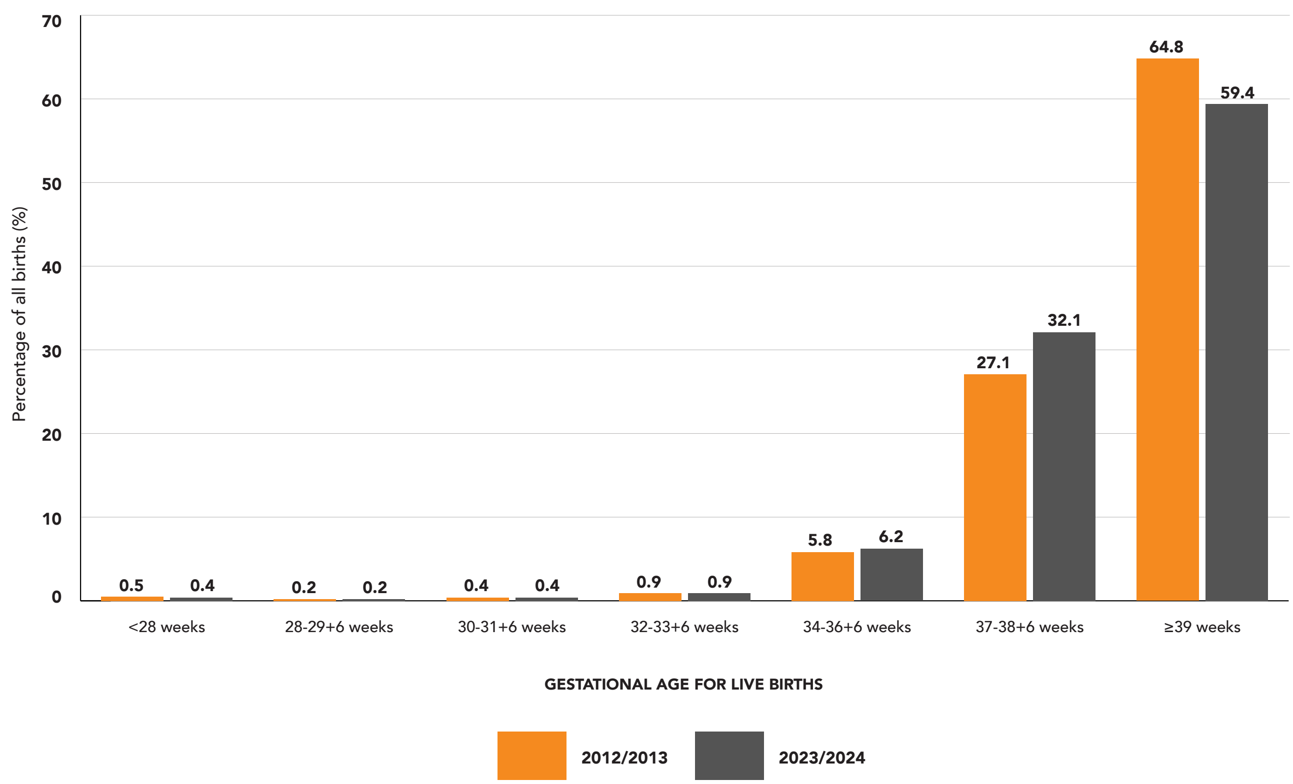
FIGURE 1.1.9A

Distribution of gestational age among live births, Ontario, 2012/2013 compared to 2023/2024

Summary of Figures 1.1.9A & 1.1.9B

- In 2023/2024, over 90% of live births occurred at term (≥ 37 weeks gestation). The rate of live births at < 34 weeks gestation has been fairly stable. There has been an increase in births between 34 and 35+6 weeks (late preterm) and 37 and 38+6 weeks (early term).
- In 2023/2024, 75.3% of stillbirths occurred preterm (<37 weeks gestation) with the largest proportion in the <28 weeks category. In this preterm stillbirth group the rate has increased slightly with 71.7% of stillbirths occurring in the preterm period in 2012/2013 to 75.3% in 2023/2024, particularly in the <32 weeks gestation group. Stillbirth at ≥ 39 weeks has decreased over time. Further information on fetal mortality is presented in Section 4.
- Increasing birth rates in the late preterm and early term periods, alongside a reduction in late term birth, suggest higher rates of intervention to bring about the birth, but decreasing rates of stillbirth in the same gestational age groups may be secondary to the effectiveness in preventing fetal death. The risks and balances of harm to pregnant individuals with increased intervention needs to be balanced with fetal outcomes at different gestational ages.

To view an alternate to this graph see **Table 1.1.9A** in Appendix A for a table option of data points.

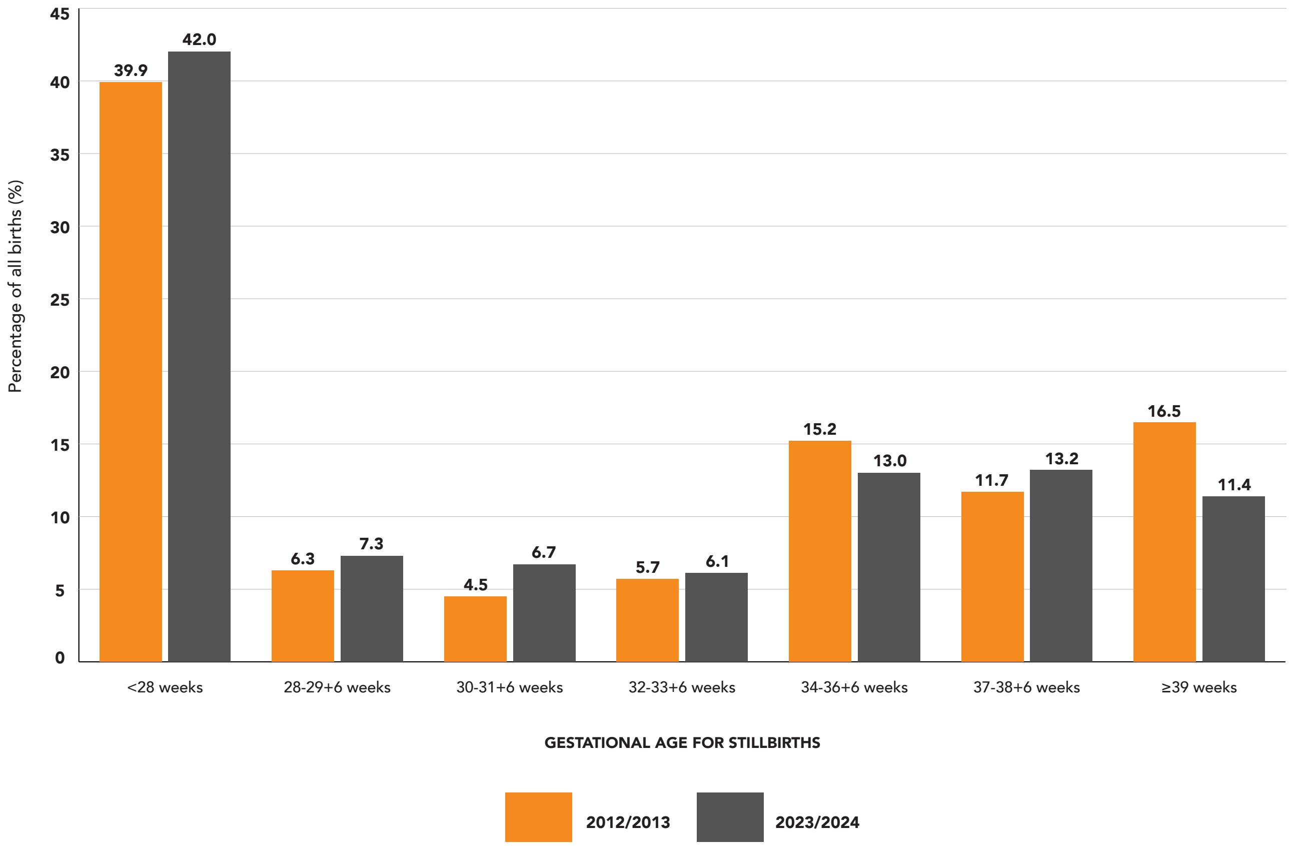


Numerator: Births in each gestational age category.
Denominator: All live births in Ontario.

FIGURE 1.1.9B

Distribution of gestational age among stillbirths, Ontario, 2012/2013 compared to 2023/2024

To view an alternate to this graph see **Table 1.1.9B** in Appendix A for a table option of data points.



Numerator: Births in each gestational age**.**

Denominator: All pregnancies resulting in a stillbirth that occurred in Ontario.

2.0 MATERNAL/ PREGNANT INDIVIDUAL HEALTH

Maternal health during pregnancy is a critical determinant of outcomes for both the pregnant individual and the infant. In Ontario and across Canada, emerging trends in gestational conditions such as abnormal weight gain, hypertensive disorders, diabetes, and mental health challenges are reshaping the landscape of perinatal care. These conditions not only influence immediate birth outcomes but also carry long-term implications for maternal recovery and child development.

INTRODUCTION

Understanding the prevalence and impact of maternal health issues is essential for informing clinical practice, guiding public health interventions, and shaping equitable healthcare policies. The following section outlines key maternal health indicators, highlighting their significance and the need for targeted strategies to improve outcomes across diverse populations.

Gestational weight gain (GWG) outside recommended ranges is a growing concern in Canada. Nearly half of pregnant individuals exceed Health Canada's guidelines, with 49.4% gaining above and 17.6% below the recommended range (*Lang et al., 2022*). Excess GWG is particularly common among those with overweight or obese pre-pregnancy BMI and is associated with increased risks of cesarean delivery, preterm birth, and large-for-gestational-age infants (*Lang et al., 2022*). These outcomes have implications for maternal recovery and infant health, emphasizing the need for tailored prenatal counseling and early intervention strategies.

Rates of gestational hypertension have increased in Canada, rising from 3.9% to 5.1% between 2012 and 2021 (*Jairam et al., 2023*). This condition contributes to elevated risks of cesarean delivery, acute renal failure, and long-term cardiovascular disease (Ryan et al., 2020). Although early recognition and improved management have led to reductions in severe outcomes such as preterm birth and intrauterine fetal death, the overall rise in hypertensive disorders of pregnancy highlights the importance of ongoing surveillance and preventive strategies.

Preeclampsia, a severe form of gestational hypertension, has increased in prevalence from 1.6% to 2.6% over the past decade in Canada (*Jairam et al., 2023*). It remains a leading contributor to severe maternal morbidity, including risks of renal failure, ICU admission, and long-term cardiovascular complications (*Ryan et al., 2020*). Advances in blood pressure monitoring and prophylactic use of low-dose aspirin have helped reduce some adverse outcomes, but the condition still poses significant risks to maternal and fetal health.

The prevalence of gestational diabetes mellitus (GDM) in Canada has surged by over 150% since 2005, with the highest increases observed among younger individuals aged 15 – 19 (*Miao et al., 2022*). GDM is associated with elevated risks of hypertension, cesarean delivery, macrosomia, and congenital anomalies (*Luke & Brown, 2007*). Long-term studies in Ontario show that children exposed to maternal diabetes in utero face increased risks of ADHD, autism spectrum disorder, and cardiometabolic conditions (*Miao et al., 2023*), underscoring the importance of early screening, glycemic control, and postpartum follow-up.

There has been an overall rise in mental health issues among expecting and new mothers, including depression, anxiety, and postpartum depression (PPD). These conditions can significantly affect infant mental health, as parents who are suffering may struggle to read their baby's cues which has implications for parent-infant attachment and increases the risk of adverse maternal-newborn outcomes (*Glover, 2014; Shaw-Churchill & Phillips, 2023*). Increased assessment and willingness to self-report mental health challenges have led to more diagnoses, highlighting the need for better-equipped healthcare systems to facilitate screening and address these issues effectively (*Lang et al., 2022; Shaw-Churchill & Phillips, 2023*).

Substance use remains a concern, with a proportion of the population self-medicating without knowing the risks. While smoking rates have declined and alcohol prevalence has remained stable, cannabis use has increased following its legalization (*Corsi et al., 2020; S. Luke et al., 2022*). This rise is attributed to greater legal availability and increased reporting (*Corsi et al., 2020*). Misconceptions about the benign nature of cannabis and the perception that personal choice is without consequences have implications for infant development and long-term effects. Prenatal cannabis use increases the likelihood of preterm birth, low birth weight, small-for-gestational age and major congenital anomalies with prenatally exposed female infants showing evidence of increased susceptibility. Additional measures are needed to inform the public and providers of the risks of cannabis exposure in pregnancy (*S. Luke et al., 2022*). Studies show that healthcare providers often feel unprepared to counsel patients on cannabis use, indicating a need for capacity building to provide adequate care (*Corsi et al., 2020*).

There are inequities in prenatal screening based on geographic location within Ontario. Non-invasive prenatal testing (NIPT) has significantly improved the sensitivity and specificity of screening, helping individuals make informed decisions (*Hayeems et al., 2015*). However, lacking a first-trimester visit can impact the ability to access prenatal screening, emphasizing the need for equitable healthcare access across the province (*Hayeems et al., 2015*).

Pregnancy complications, both maternal and fetal, are increasing. There has been a slight increase in maternal transfers to ICU, which, although small in numbers, has significant resource implications, is stressful for the patient and family, and causes separation of the mother-infant dyad affecting early infant attachment and feeding (*Ryan et al., 2020*). The length of stay in hospitals is decreasing, pointing to a need for robust community resources and post-hospital support. Babies with congenital anomalies that depend on medical interventions will require comprehensive support at home, highlighting the importance of an integrated model of care (*Ryan et al., 2020*). Postpartum readmission rates are increasing, which is related to shorter hospital stays after birth. Pregnancy-related deaths tend to occur soon after delivery, with 30-40 maternal deaths per year, a figure that has remained consistent over the years (*Jairam et al., 2023*).

Cultural competence in healthcare is essential to ensure that diverse populations receive appropriate, equitable and respectful care. Ontario's multicultural population requires healthcare providers to be trained in cultural sensitivity and to offer services that meet the unique needs of different communities (*PCMCH, 2021*). The lack of investment in an Indigenous cultural safety strategy for non-Indigenous healthcare providers results in fear of mistreatment and distrust in healthcare professionals, leading to delayed healthcare seeking (*PCMCH, 2021*).

Integration of services is also a concern, as fragmented care can lead to gaps in treatment and support. Coordinated care models that integrate pregnancy care, pediatric and children's health care, and, mental health services can improve outcomes for mothers and infants (*Gulbransen et al., 2024*). The COVID-19 pandemic has underscored the need for such integration, as virtual pregnancy care has shown both benefits and disadvantages. While virtual care offers workflow efficiencies and patient convenience, it can impair patient-provider rapport (*Shaw-Churchill & Phillips, 2023*).

Addressing these issues requires a comprehensive approach that includes policy changes, increased funding, and community engagement to ensure equitable and effective perinatal care across Ontario. The Provincial Council for Maternal and Child Health (PCMCH) has identified key gaps within the prenatal care system, emphasizing the need for a multisectoral strategy to address health inequities and close the equity gap (*PCMCH, 2021*).

In conclusion, perinatal care in Ontario faces several key challenges, including access to care, mental health support, cultural competence, and service integration. Monitoring trends in birth volumes, pregnancy risks, complications, and outcomes are essential for planning health resource allocation and understanding population needs. A comprehensive approach involving policy changes, increased funding, and community engagement is necessary to address these issues and ensure equitable and effective perinatal care across Ontario.

2.1 PREGNANCY RISKS

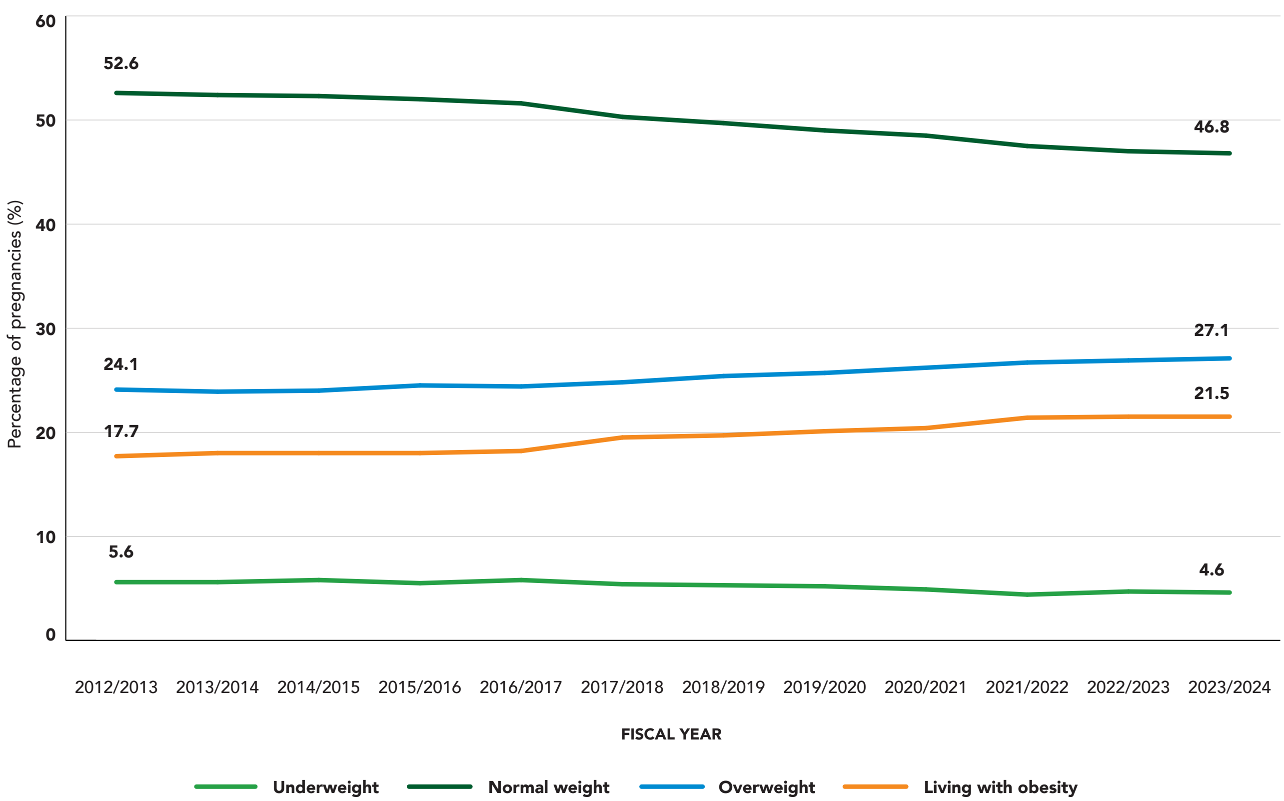
FIGURE 2.1.1

Distribution of pre-pregnancy BMI, Ontario, 2012/2013 to 2023/2024 by weight category and fiscal year

Summary of Figure 2.1.1

- In 2023/24, 27.1% of pregnant individuals were overweight and 21.5% living with obesity, continuing a steady rise since 2017/18.
- This reflects a steady decline in the proportion of pregnant individuals with a normal pre-pregnancy BMI (18.5–24.9 kg/m²).
- Rising pre-pregnancy BMI—particularly obesity—increases maternal and newborn complications and has long-term cardiovascular implications. This emphasizes the importance of public health interventions aimed at promoting healthy weight management before and during pregnancy.

To view an alternate to this graph see **Table 2.1.1** in Appendix A for a table option of data points.



Numerator: Pregnancies in each BMI category.

Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

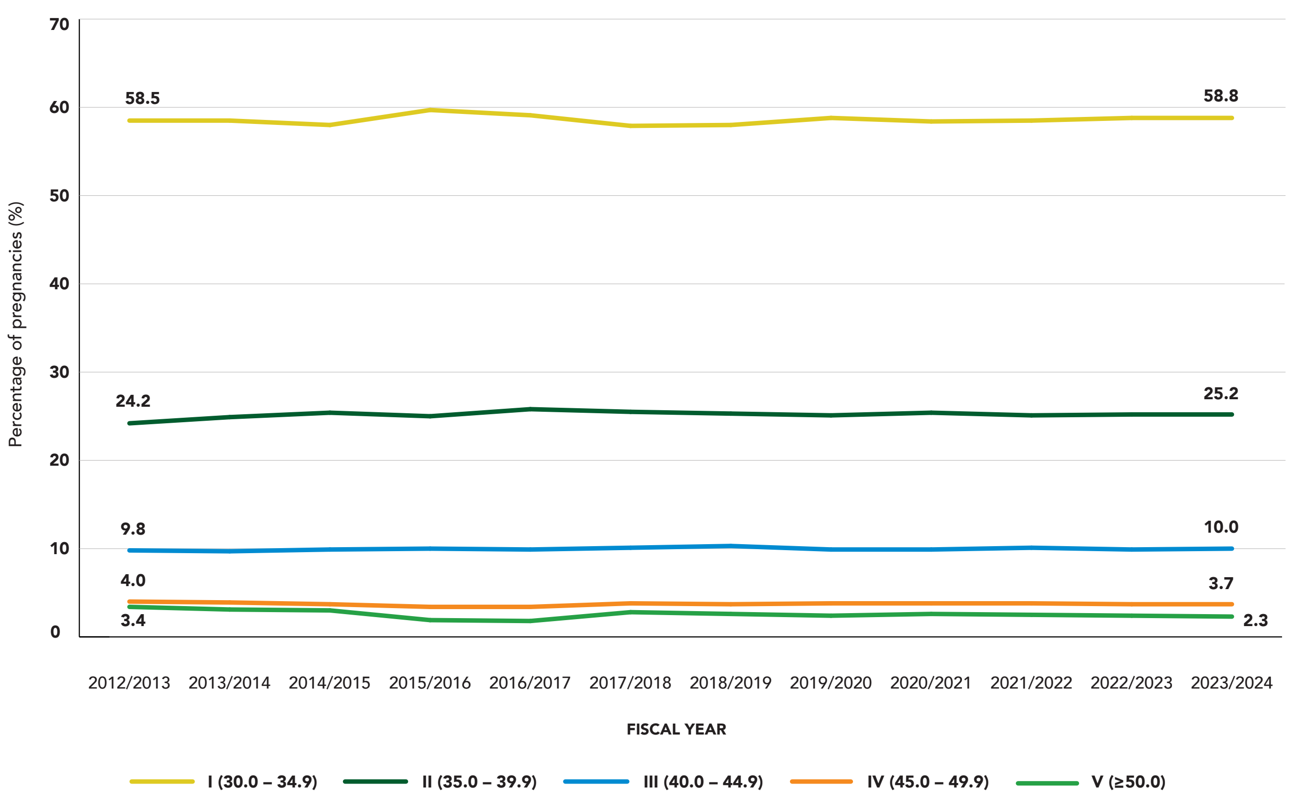
FIGURE 2.1.2

Distribution of pre-pregnancy obesity Class among individuals living with obesity, Ontario, 2012/2013 to 2023/2024

Summary of Figure 2.1.2

- Among the population of pregnant individuals with pre-pregnancy obesity, the distribution of BMI categories has remained stable. In 2023/2024, the most common was Class I (58.8%), II (25.2%), and III (10.0%).
- While the overall prevalence of pre-pregnancy obesity has been increasing among pregnant individuals, the stability in the distribution of obesity classes suggests that the severity has not changed.
- This relative lack of change in prevalence among the obesity categories suggests that weight management is a complex issue. At the population level there is still work to be done to ensure individuals contemplating pregnancy understand the issues associated with obesity and the relationship with maternal and newborn outcomes.

To view an alternate to this graph see **Table 2.1.2** in Appendix A for a table option of data points.



Numerator: Pregnancies in each obesity class.
Denominator: All pregnancies resulting in a live or stillbirth in Ontario among people living with obesity (BMI ≥30 kg/m^2).

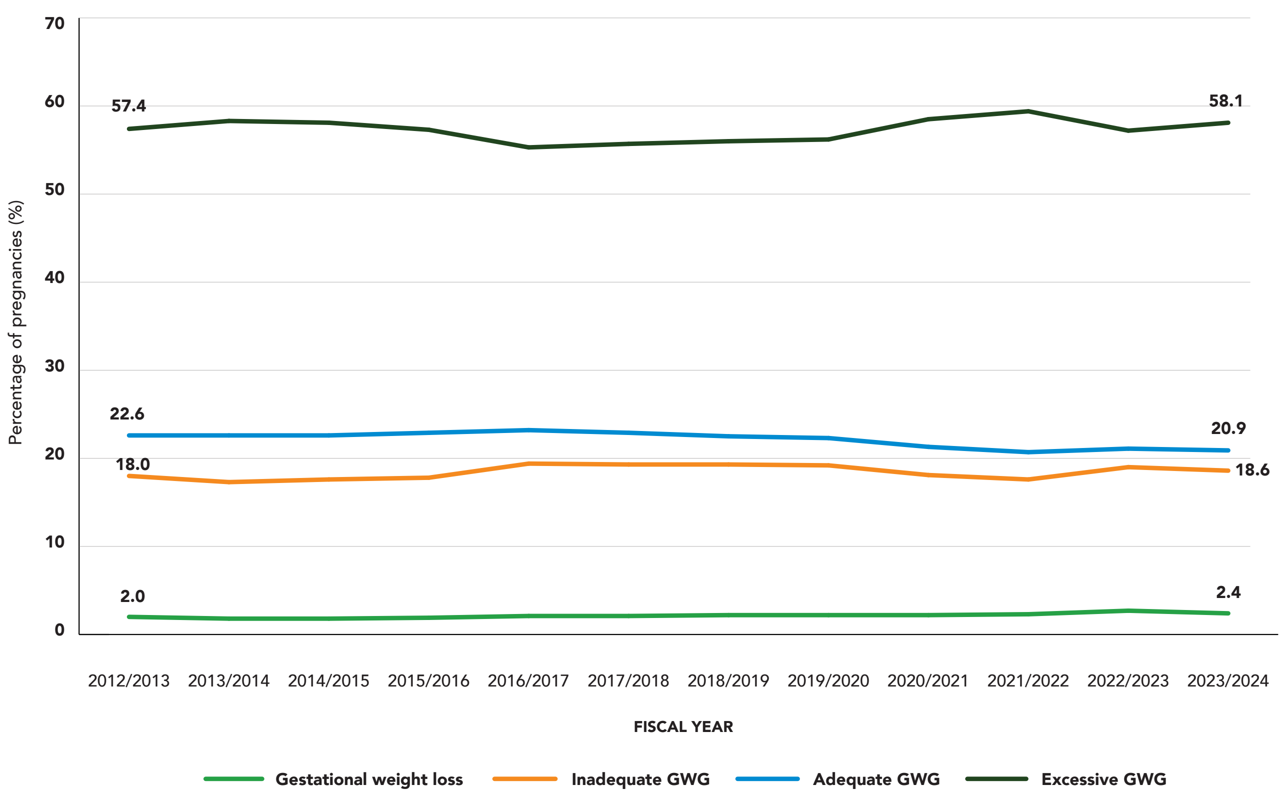
FIGURE 2.1.3

Distribution of gestational weight gain and loss categories among pregnancies with singleton deliveries, Ontario, 2012/2013 to 2023/2024 by category and fiscal year

Summary of Figure 2.1.3

- Healthy gestational weight gain (GWG) supports optimal fetal growth and development, reducing risks. For those with a normal pre-pregnancy BMI, 11.5–16.0 kg is recommended. GWG guidelines vary: underweight individuals should gain more, while those overweight or living with obesity should gain less.
- In 2023/2024, 58.1% of pregnant individuals with singleton deliveries had excessive gestational weight gain. This has been stable over time. It is concerning that the majority of pregnant individuals have excessive GWG and only 21% have adequate gestational weight gain.
- Excessive GWG raises risks of gestational diabetes, hypertension, preterm birth, cesarean delivery, and postpartum weight retention, increasing the odds of entering a subsequent pregnancy at a higher BMI. Tailored prevention — considering access to healthy food, physical activity, and eating-related stressors — may help improve outcomes.

To view an alternate to this graph see **Table 2.1.3** in Appendix A for a table option of data points.



Numerator: Pregnancies in each gestational weight gain category.
Denominator: All singleton pregnancies resulting in a live or stillbirth that occurred in Ontario.

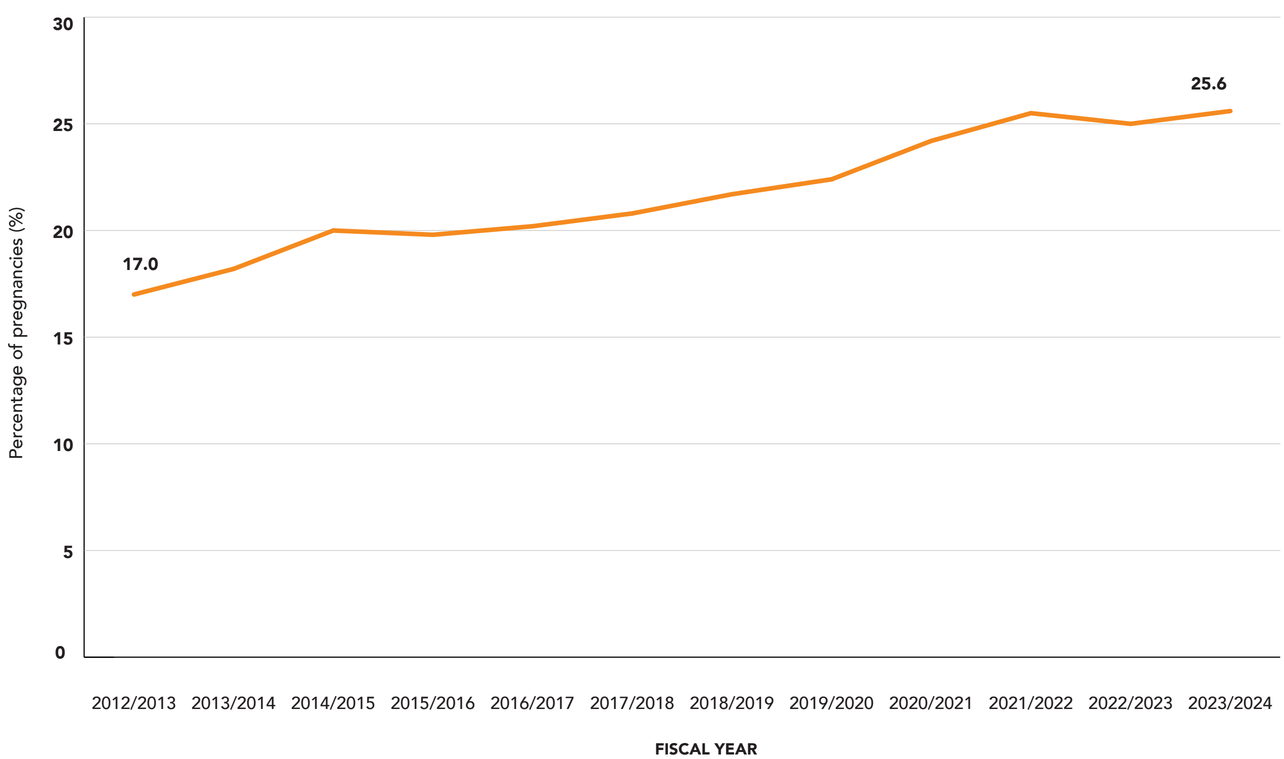
FIGURE 2.1.4

Prevalence of any pre-existing health condition in pregnant women and individuals, Ontario, 2012/2013 to 2023/2024

Summary of Figure 2.1.4

- The management of pre-existing health conditions is a critical component of perinatal health and can help reduce both fetal and maternal/pregnant individual adverse outcomes.
- The prevalence of pre-existing health conditions in pregnancy has been increasing over time, from 17.0% in 2012/2013 to 25.6% in 2023/2024. This is a concerning trend.
- The growing prevalence highlights the importance of interdisciplinary care to provide additional support and monitoring to individuals with pre-existing health conditions in the preconception, prenatal and postpartum period.
- Pre-existing health conditions are defined in **Appendix A**.

To view an alternate to this graph see **Table 2.1.4** in Appendix A for a table option of data points.



Numerator: Pregnancies with a pre-existing health condition in pregnancy.
Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

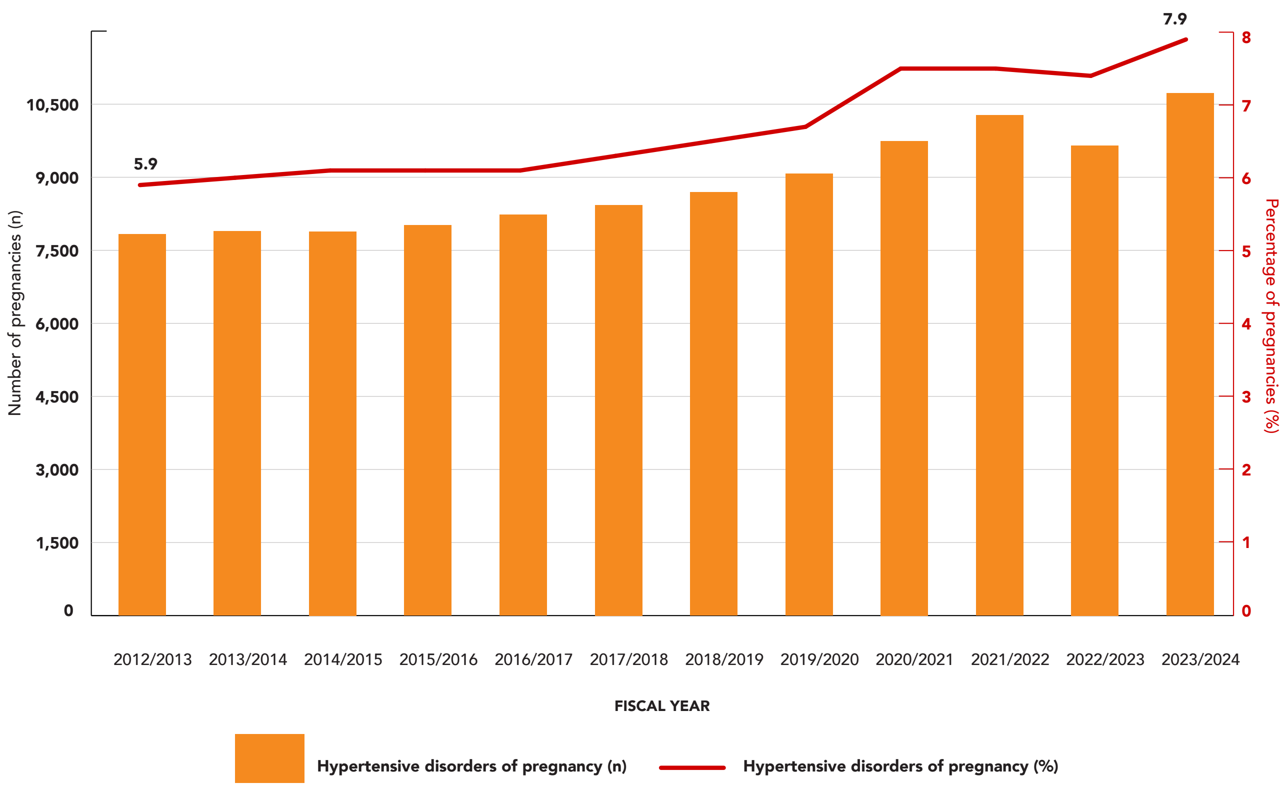
FIGURE 2.1.5

Prevalence of hypertensive disorders of pregnancy, Ontario, 2012/2013 to 2023/2024

Summary of Figure 2.1.5

- The prevalence of hypertensive disorders during pregnancy has increased from 5.9% in 2012/2013 to 7.9% in 2023/2024. This may be associated with the rising prevalence of obesity, increasing maternal/pregnant individual age at conception, and/or improved detection through advances in prenatal care.
- In 2023/2024 there were 10,726 individuals with either pre-existing chronic hypertension, gestational hypertension, preeclampsia, eclampsia or unspecified hypertension.
- The data highlights the need for targeted prevention strategies, early detection, and effective management to mitigate the impact of these disorders and improve perinatal outcomes.

To view an alternate to this graph see Table 2.1.5 in Appendix A for a table option of data points.



Numerator: Pregnancies with any form of hypertension.

Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

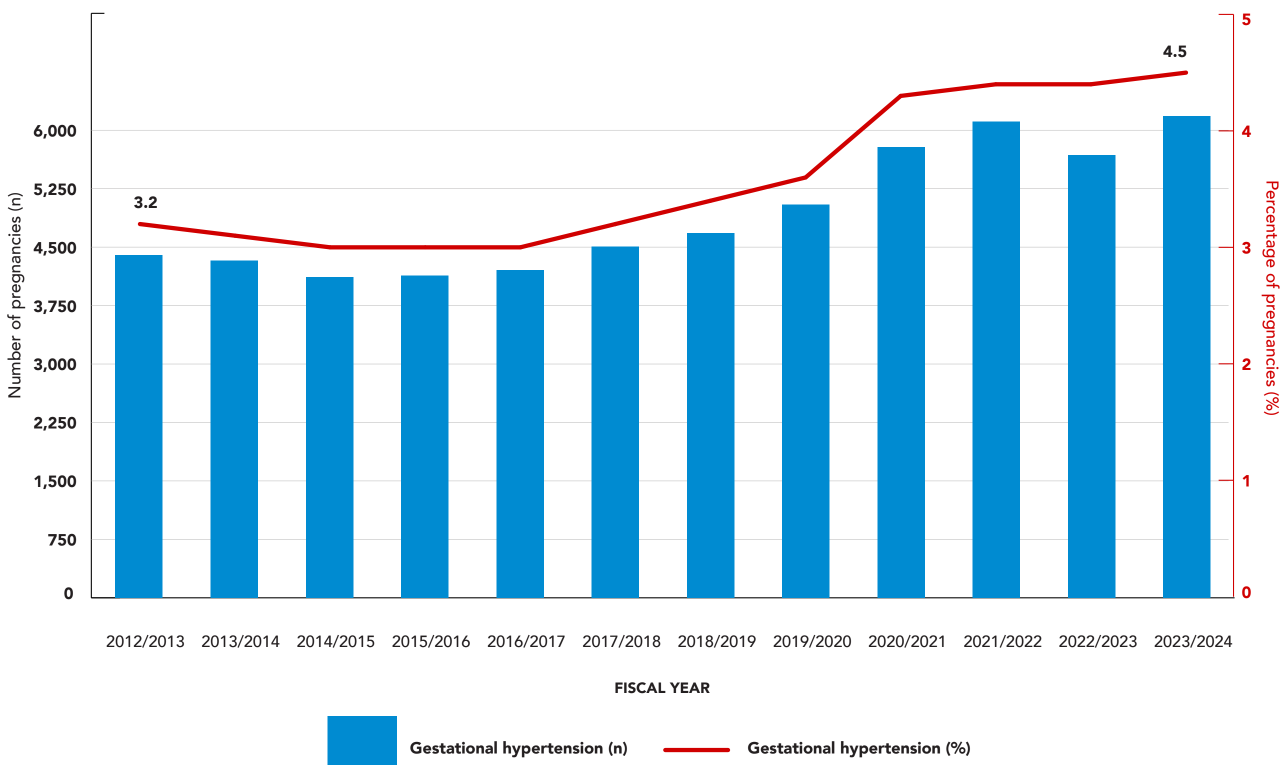
FIGURE 2.1.6

Prevalence of gestational hypertension, Ontario, 2012/2013 to 2023/2024

Summary of Figure 2.1.6

- Gestational hypertension develops after 20 weeks of pregnancy among individuals who previously had normal blood pressure. It requires close monitoring as it can progress to preeclampsia or lead to complications such as preterm birth and placental complications.
- The prevalence of gestational hypertension has risen from 3.2% in 2012/2013 (4,401 cases) to 4.5% in 2023/2024 (6,184 cases), showing a steady increase over time.
- This concerning trend indicates a need for heightened awareness, early detection, and effective management during pregnancy.

To view an alternate to this graph see **Table 2.1.6** in Appendix A for a table option of data points.



Numerator: Pregnancies with gestational hypertension.
Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

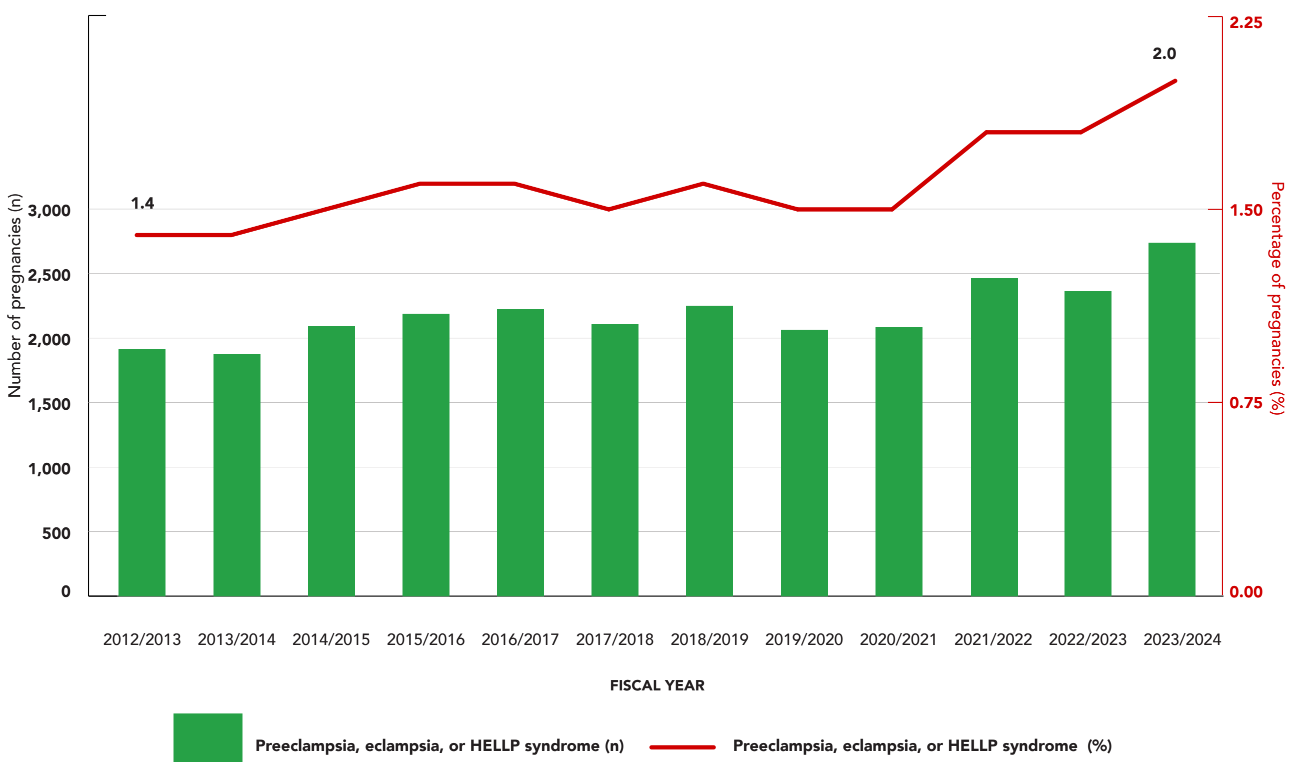
FIGURE 2.1.7

Prevalence of preeclampsia, eclampsia or HELLP syndrome, Ontario, 2012/2013 to 2023/2024

Summary of Figure 2.1.7

- Preeclampsia is characterized by high blood pressure and proteinuria. It typically develops after 20 weeks of pregnancy and can lead to serious maternal/pregnant individual and infant health risks. Eclampsia is a severe progression of preeclampsia characterized by seizures. HELLP syndrome is a severe form of preeclampsia involving hemolysis, elevated liver enzymes, and low platelet count. HELLP syndrome is a severe and life-threatening condition for both the mother/pregnant individual and the infant.
- The combined prevalence of these conditions has been increasing overtime, with 1.4% (1,912) in 2012/2013 to 2.0% (2,741) in 2023/2024.
- Regular perinatal care is critical for this population and a relatively simple intervention of daily low-dose aspirin (81mg) may reduce the risk of developing preeclampsia. There is longer-term risk of hypertension and its associated sequelae later in adult life and these individuals require regular blood pressure lifestyle assessments.

To view an alternate to this graph see Table 2.1.7 in Appendix A for a table option of data points.



Numerator: Pregnancies with preeclampsia, superimposed preeclampsia on pre-existing hypertension, eclampsia or HELLP syndrome.
Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

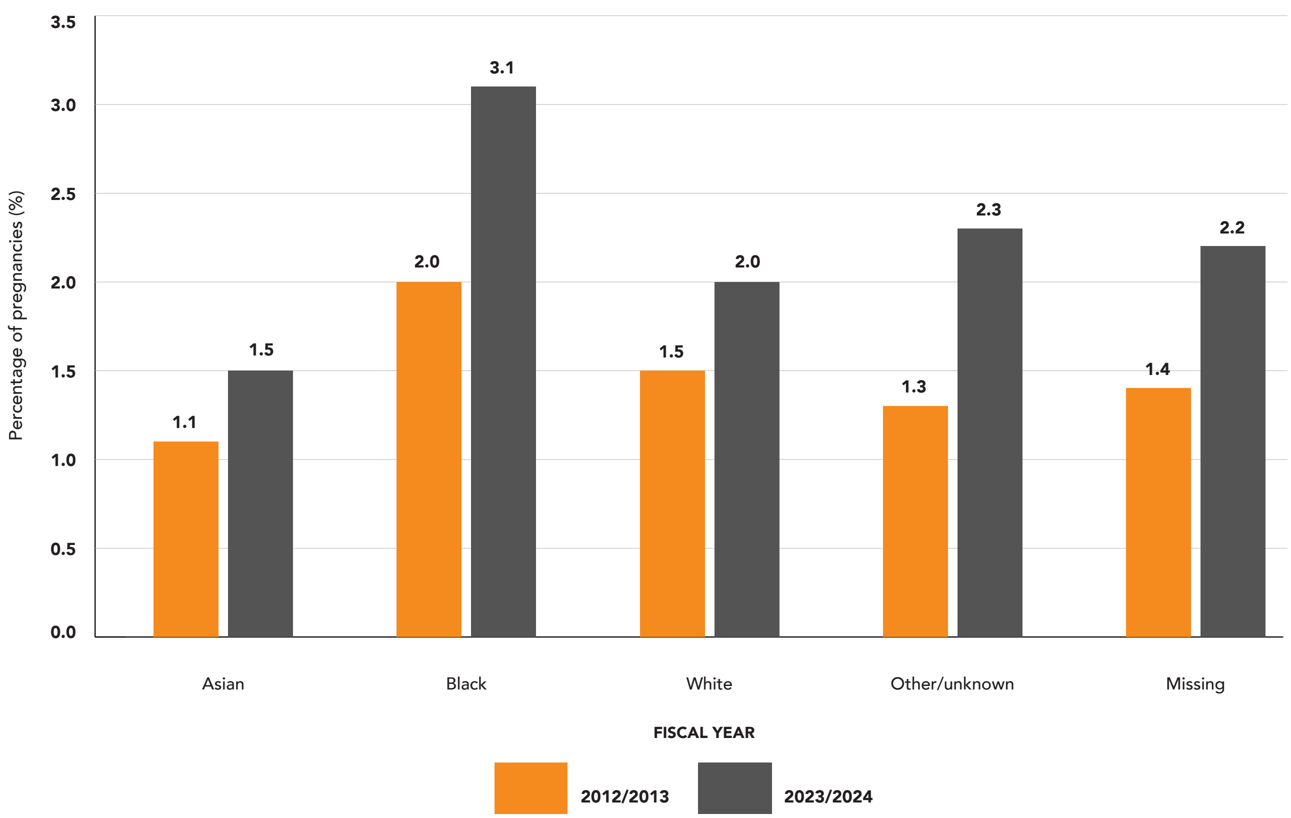
FIGURE 2.1.8

Prevalence of preeclampsia, eclampsia or HELLP syndrome, Ontario, 2012/2013 compared to 2023/2024 by maternal/pregnant individual race and fiscal year

Summary of Figure 2.1.8

- Preeclampsia/Eclampsia/HELLP syndrome is rising across all pregnant populations. In 2023/2024, prevalence was 3.1% among Black individuals, 2% among White, and 1.5% among Asian individuals.
- The Black perinatal population had both the highest prevalence (3.1%) and the largest increase over time (1%), compared to 0.5% increases in White and Asian groups.
- Research suggests Black individuals may face higher risk, with these conditions linked to endothelial dysfunction, arterial stiffness, and increased cardiovascular disease risk. This underscores the need for increased awareness, targeted prevention, screening, and deeper understanding of contributing disparities.

To view an alternate to this graph see Table 2.1.8 in Appendix A for a table option of data points.



Numerator: Pregnancies with preeclampsia, superimposed preeclampsia on pre-existing hypertension, eclampsia or HELLP syndrome in each racial group for the approximately 70% of individuals who had aneuploidy screening where race information is collected.
Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

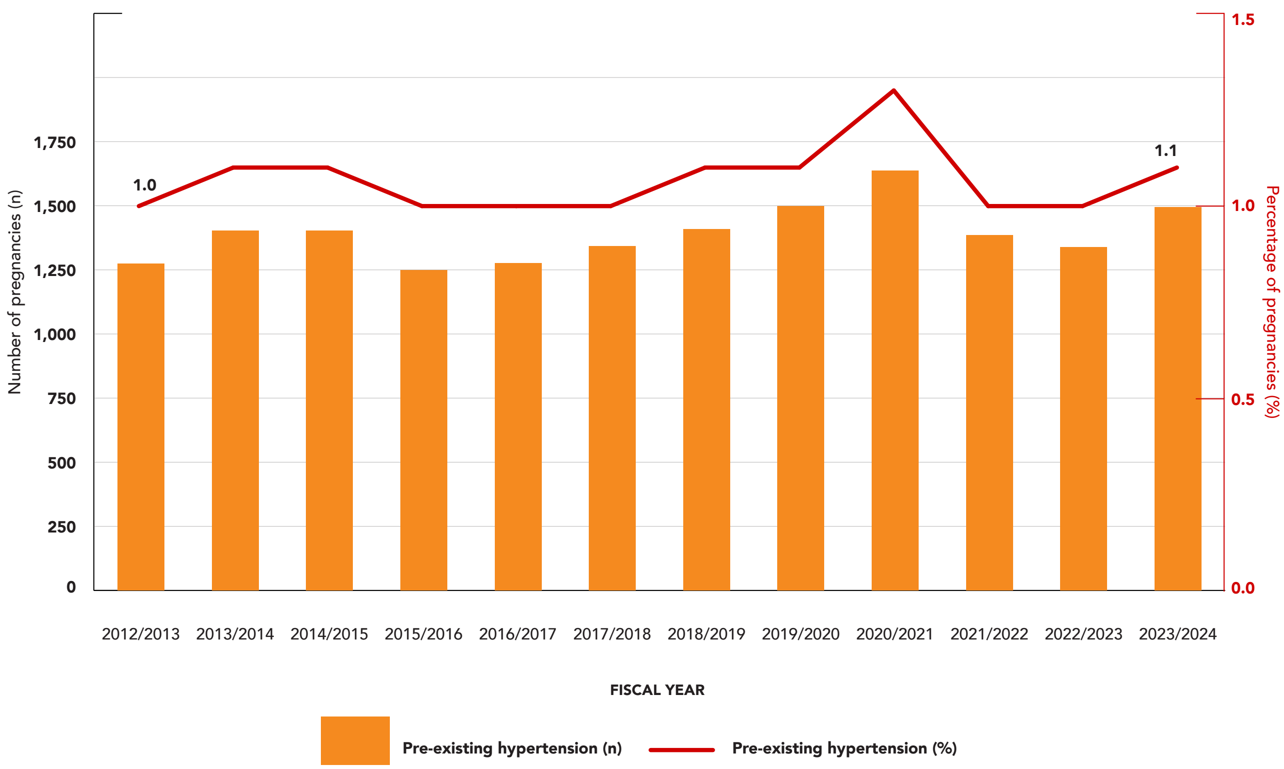
FIGURE 2.1.9

Prevalence of pre-existing hypertension in pregnancy, Ontario, 2012/2013 to 2023/2024

Summary of Figure 2.1.9

- Since 2012/2013, the prevalence of pre-existing hypertension among the pregnant population has remained approximately 1%. In 2023/2024, there were 1,495 cases.
- Pre-existing hypertension is a risk factor for preeclampsia, placental complications, fetal growth restriction, and preterm birth.
- Regular prenatal care is essential for managing pre-existing hypertension, enabling blood pressure monitoring, antihypertensive medication adjustments, fetal surveillance, and early detection of preeclampsia.

To view an alternate to this graph see Table 2.1.9 in Appendix A for a table option of data points.



Numerator: Pregnancies with pre-existing hypertension or superimposed preeclampsia on pre-existing hypertension.
Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

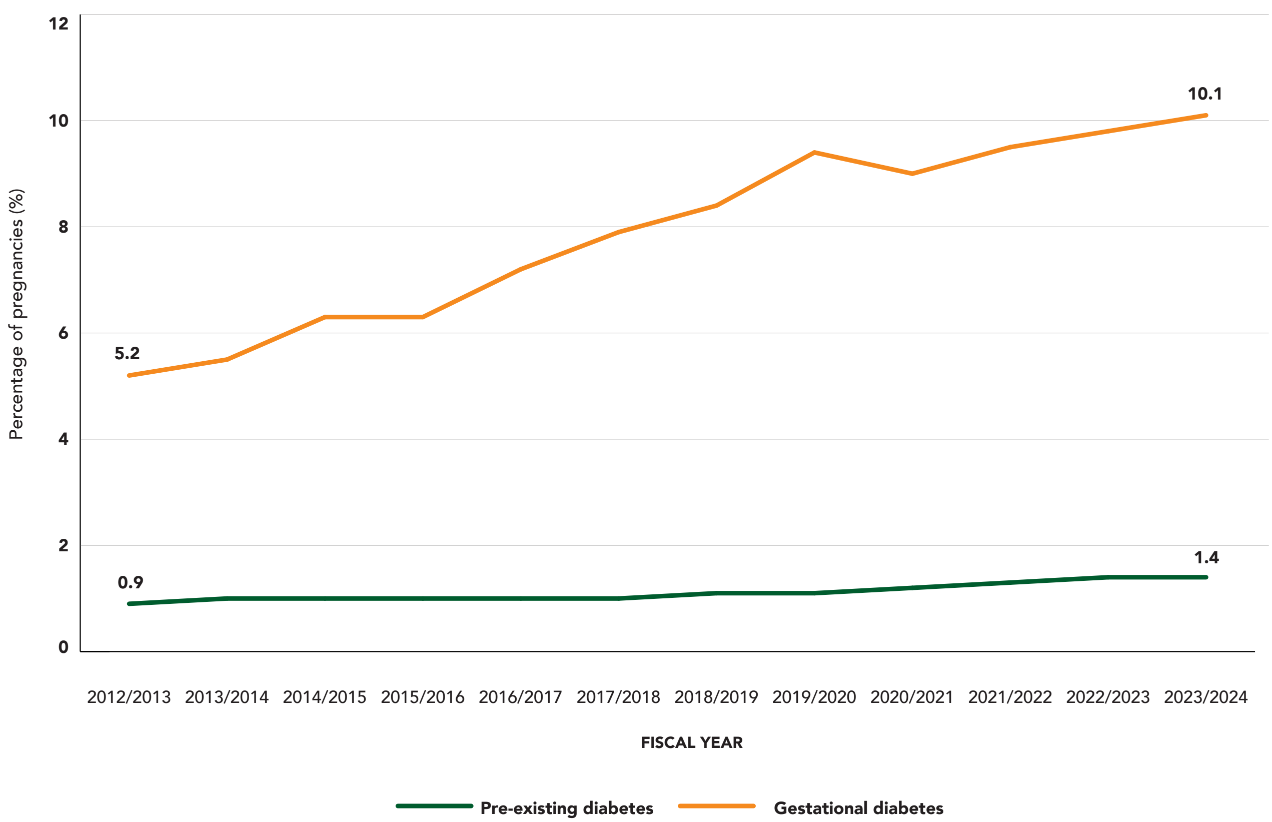
FIGURE 2.1.10

Prevalence of diabetes mellitus in pregnancy, Ontario, 2012/2013 to 2023/2024 by diabetes type and fiscal year

Summary of Figure 2.1.10

- Over time, the prevalence of gestational diabetes increased from 5.2% to 10.1% and the prevalence of pre-existing diabetes increased from 0.9% to 1.4%.
- Diabetes poses risks for macrosomia which can increase the risk of birth injuries including shoulder dystocia, preterm birth, higher risk of cesarean delivery, or stillbirth.
- As the prevalence of diabetes continues to grow, these findings emphasize the importance of early detection, before and during pregnancy. Health administrators and planners will need to consider increased resources for diabetes-associated care and services.

To view an alternate to this graph see **Table 2.1.10** in Appendix A for a table option of data points.



Numerator: Pregnancies with each type of diabetes mellitus.
Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

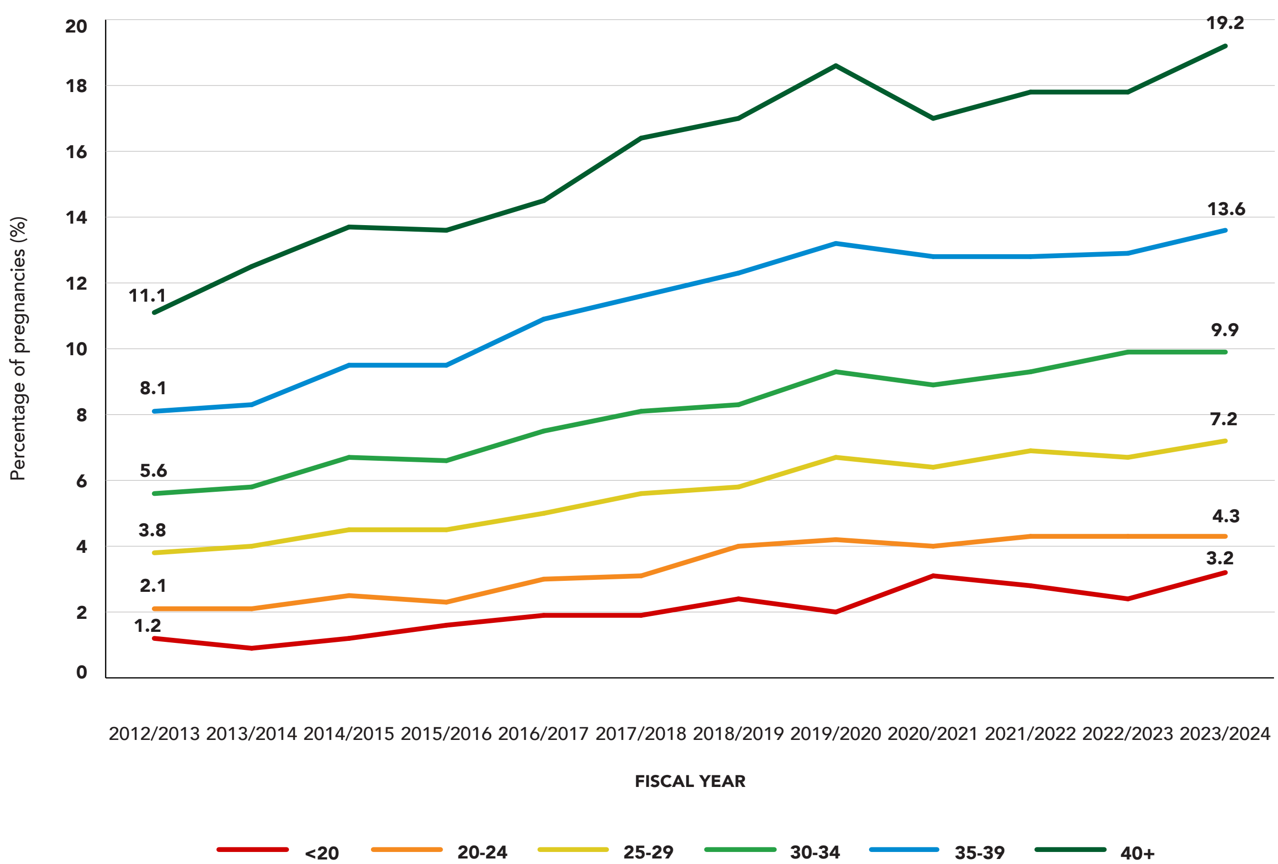
FIGURE 2.1.11

Prevalence of gestational diabetes mellitus, Ontario, 2012/2013 to 2023/2024 by maternal/pregnant individual age group (years) and fiscal year

Summary of Figure 2.1.11

- The prevalence of gestational diabetes has increased across every age group. It follows an age gradient where the lowest prevalence is in those under 20 years and the highest in those 40 years and older.
- In 2023/2024, the highest prevalence, at 19.2%, was seen in those 40 years and above. This group also had the greatest increase since 2012/2013, when the prevalence was 11.1%.
- This indicates that gestational diabetes is a growing perinatal health concern, emphasizing the need for awareness, prevention strategies, and tailored care, across all age groups, especially as maternal/pregnant individual age at conception continues to increase. Individuals with gestational diabetes have a greater risk of developing Type 2 diabetes later in adult life and prevention and monitoring can start in the pregnancy and postpartum period.

To view an alternate to this graph see **Table 2.1.11** in Appendix A for a table option of data points.



Numerator: Pregnancies with gestational diabetes in each age group.
Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

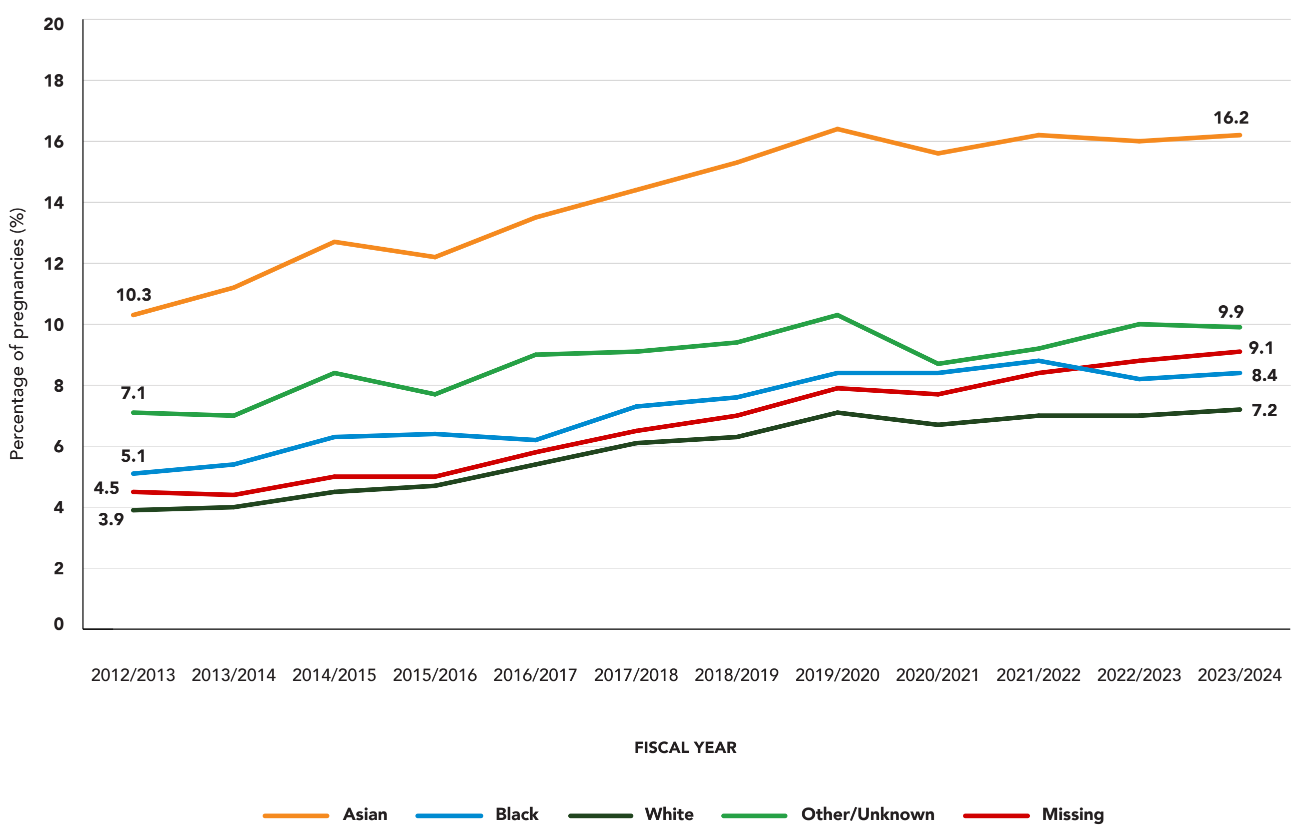
FIGURE 2.1.12A

Prevalence of gestational diabetes mellitus, Ontario, 2012/2013 to 2023/2024 by maternal/pregnant individual race and fiscal year

Summary of Figure 2.1.12A

- The prevalence of gestational diabetes is rising across all racial groups. In 2023/2024, it affected 16.2% of the Asian perinatal population, 8.4% of the Black perinatal population and 7.2% of the White perinatal population. Type II diabetes is also increasing over time, affecting 1.5% of the Asian perinatal population, 1.5% of the Black population, and 0.5% of the White perinatal population in 2023/2024.
- Some research shows that the Asian population may have a higher predisposition to insulin resistance. This underscores the need for preventive measures, comprehensive screening, and monitoring strategies for this population, as well as increased understanding of the underlying factors contributing to the observed differences.

To view an alternate to this graph see **Table 2.1.12A** in Appendix A for a table option of data points.



Numerator: Pregnancies in each racial group with gestational diabetes.
Denominator: Pregnancies resulting in a live or stillbirth that occurred in Ontario, by racial group for the approximately 70% of individuals who had aneuploidy screening where race information is collected..

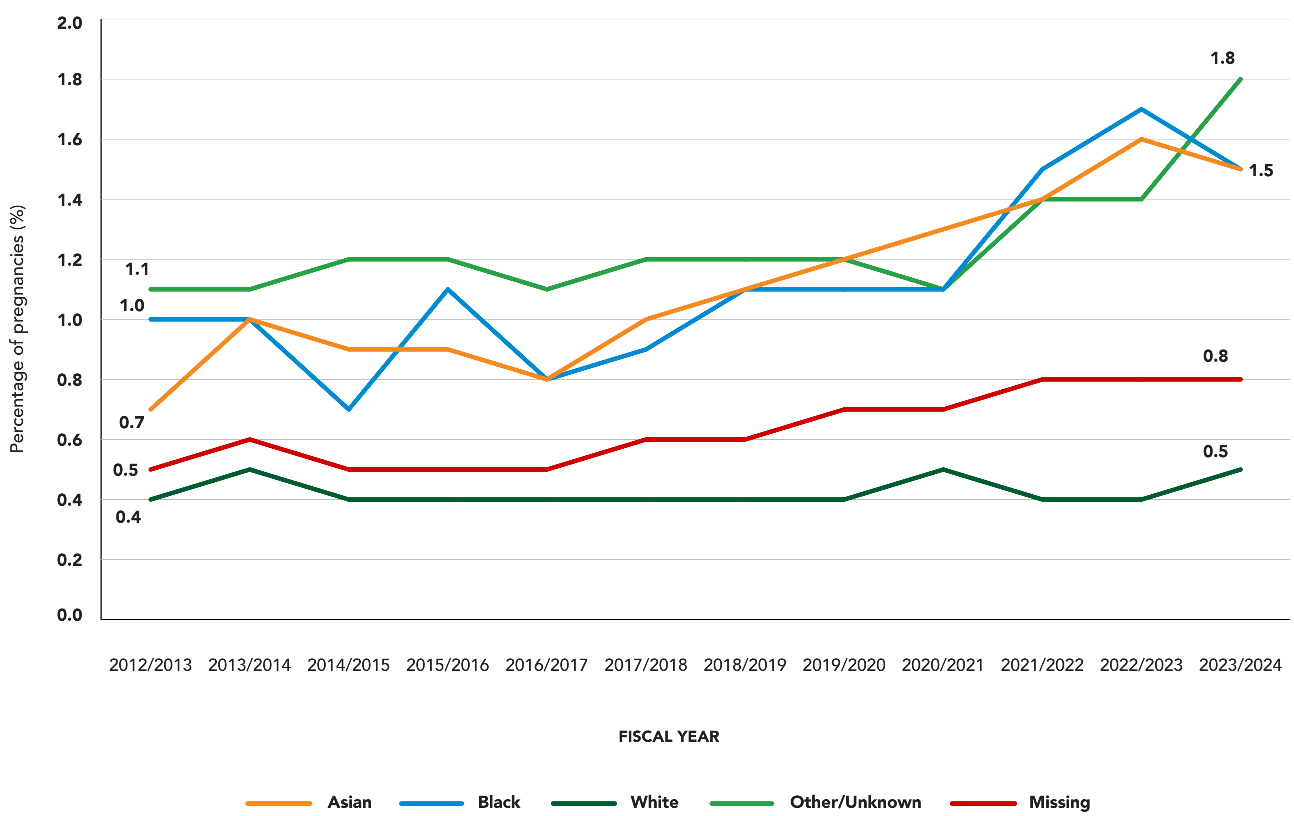
FIGURE 2.1.12B

Prevalence of type II diabetes mellitus in pregnancy, Ontario, 2012/2013 to 2023/2024 by maternal/pregnant individual race and fiscal year

Summary of Figure 2.1.12B

- Racial and/or racialized differences were observed in the distribution of gestational diabetes and type II diabetes.
- Race and ethnicity data in the BORN Information System are collected only from those individuals who have prenatal aneuploidy screening (~70% of the population) and do not adequately identify subpopulations in racial groups. They are collected by self-report or by health care providers and are prone to measurement bias. Please interpret with caution.

To view an alternate to this graph see **Table 2.1.12B** in Appendix A for a table option of data points.



Numerator: Pregnancies in each racial group with type II diabetes mellitus.
Denominator: Pregnancies resulting in a live or stillbirth that occurred in Ontario, by racial group.

2.2 MENTAL HEALTH AND SUBSTANCE USE

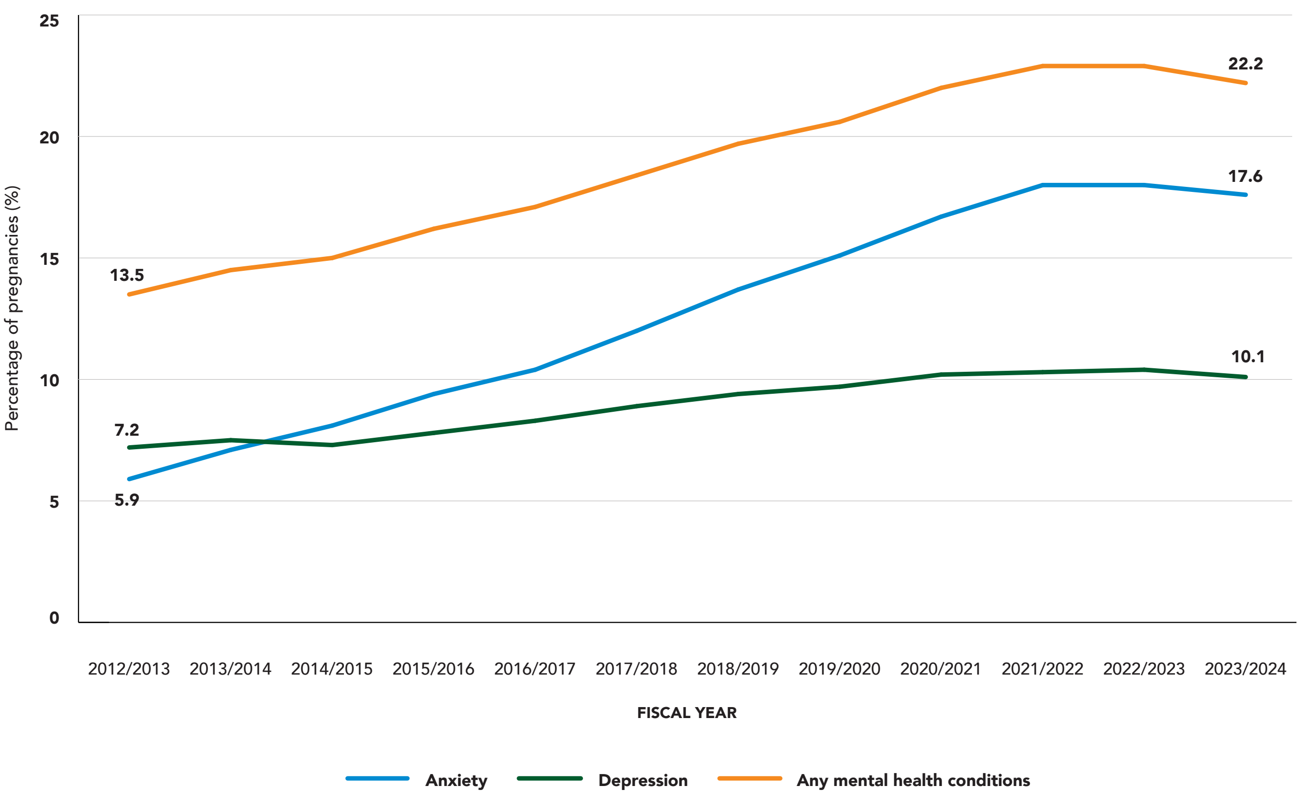
FIGURE 2.2.1

Prevalence of pregnant women and individuals with mental health concerns, Ontario, 2012/2013 to 2023/2024

Summary of Figure 2.2.1

- In 2023/2024, 22.2% of pregnant individuals reported having a mental health concern during pregnancy, with the most frequently reported mental health concerns being anxiety (17.6%) and depression (10.1%).
- There has been a large increase in reported mental health concerns during pregnancy over the past decade, particularly in anxiety.
- This data underscores the need for comprehensive mental health care during pregnancy to support mothers, pregnant people and their children. Key strategies include regular screening during prenatal visits, provider education, integration of mental health with obstetric care, equitable access to support, and tailored interventions.

To view an alternate to this graph see Table 2.2.1 in Appendix A for a table option of data points.



Numerator: Pregnancies with maternal/pregnant individual mental health concern including anxiety and depression.
Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

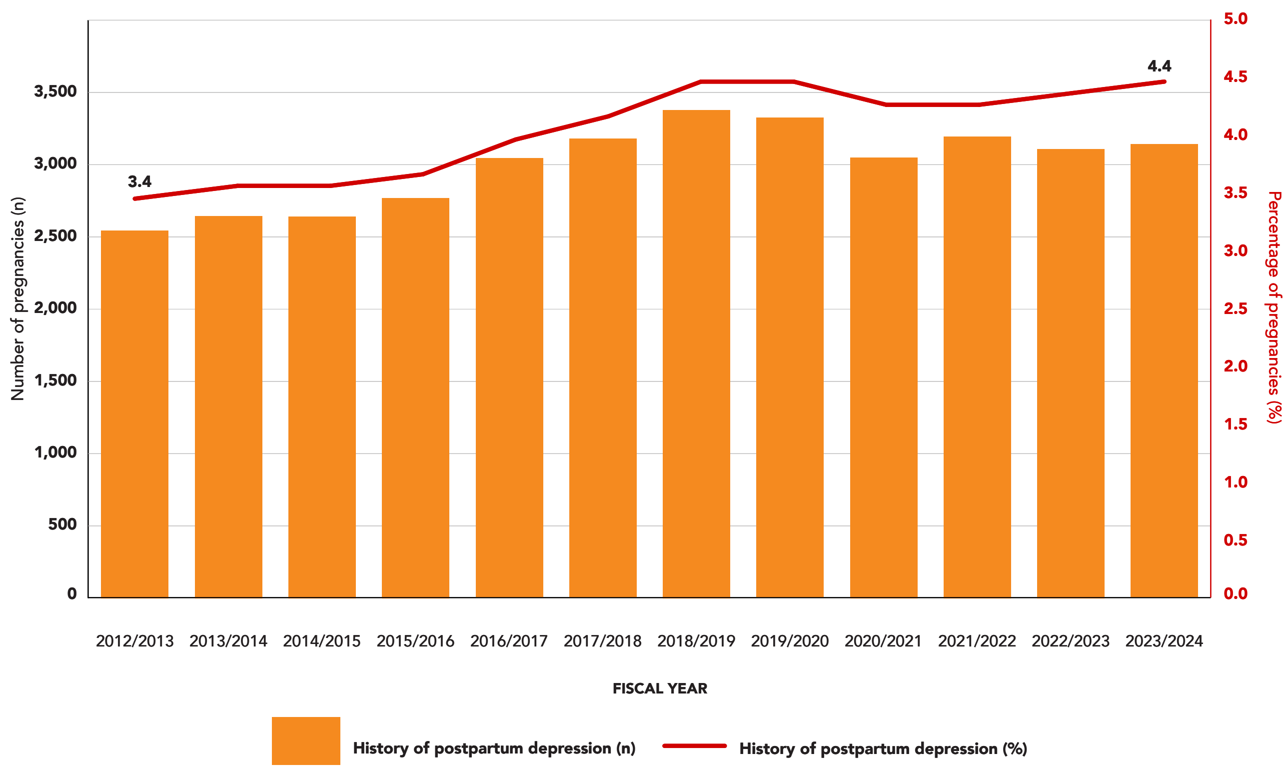
FIGURE 2.2.2

Prevalence of postpartum depression history among pregnant women and individuals with at least one previous birth, Ontario, 2012/2013 to 2023/2024

Summary of Figure 2.2.2

- Approximately 3-4% of pregnant individuals reported a history of postpartum depression (PPD), representing 2,500 – 3,400 individuals per year over the reporting period.
- The prevalence of a history of PPD has increased over the reporting period from 3.4% in 2012/2013 to 4.4% in 2023/2024.
- The increasing prevalence of PPD history among pregnant individuals has significant implications for outcomes. Addressing this issue is a priority to improve the well-being of pregnant individuals, newborns and their families. This requires enhanced screening, early diagnosis, specialized training for healthcare professionals to recognize and manage postpartum depression effectively, integrated care models, development of robust support systems and ensuring equitable access to mental health services for all pregnant individuals.

To view an alternate to this graph see **Table 2.2.2** in Appendix A for a table option of data points.



Numerator: Pregnancy with a maternal/pregnant individual history of postpartum depression.
Denominator: All pregnancies with at least one previous birth resulting in live or stillbirth that occurred in Ontario.

FIGURE 2.2.3

Prevalence of pregnant women and individuals reporting smoking in pregnancy, Ontario, 2012/2013 to 2023/2024

Summary of Figure 2.2.3

- In 2023/2024, 6,780 pregnant women and individuals reported smoking during their pregnancy.
- The prevalence of reported smoking during pregnancy has dropped considerably over the past decade from 11.2% in 2012/2013 to 5% in 2023/2024.
- Although smoking during pregnancy has decreased by more than 50% in the past decade, smoking during pregnancy is still a major issue with increased risk of complications to pregnant individuals and the fetus/newborn (i.e., placental abruption, placenta previa, abnormal bleeding, low birth weight, preterm birth, congenital anomalies, and respiratory problems, and sudden infant death in infancy). Enhanced screening during prenatal care, equitable access to counselling services, smoking cessation and support programs, and public awareness campaigns to raise awareness about the risks of smoking during pregnancy are important.

To view an alternate to this graph see **Table 2.2.3** in Appendix A for a table option of data points.

Numerator: Pregnancies with reported smoking.
Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

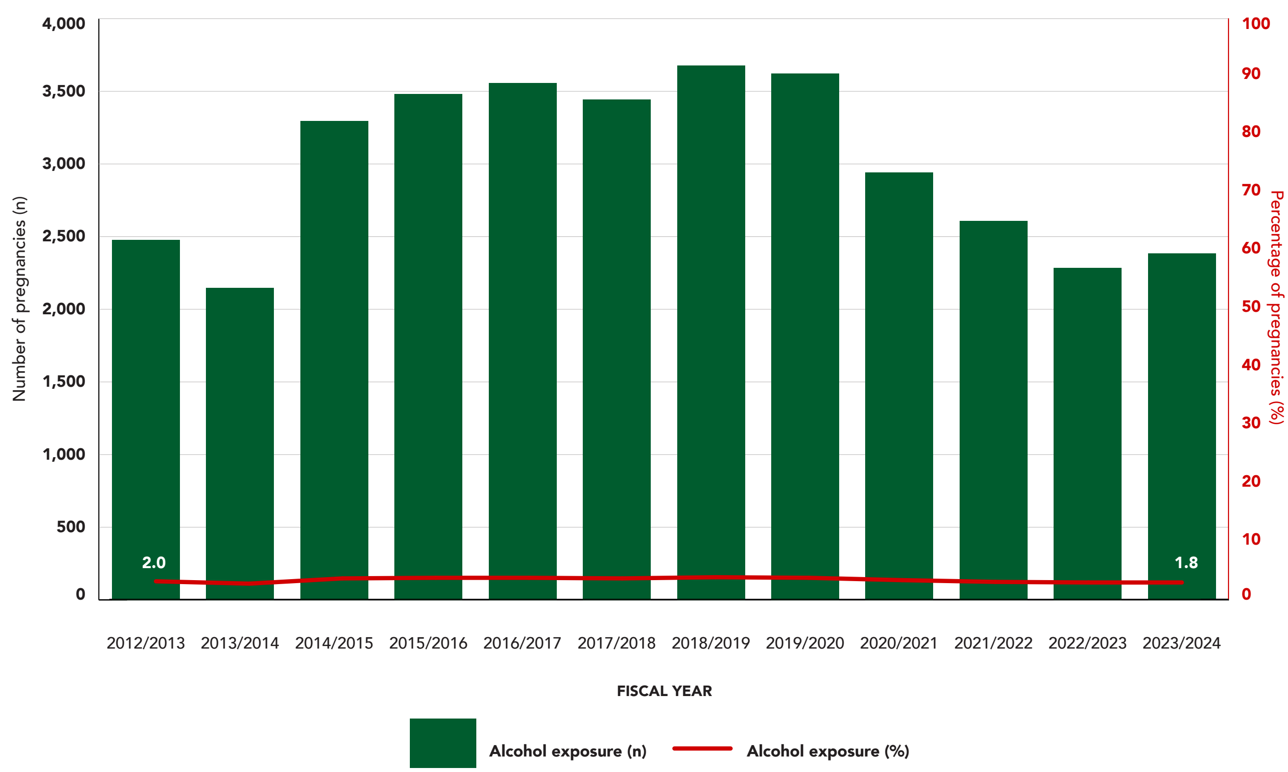
FIGURE 2.2.4

Prevalence of alcohol exposure in pregnancy, Ontario, 2012/2013 to 2023/2024

Summary of Figure 2.2.4

- Approximately 2% of pregnant women and individuals reported alcohol consumption during pregnancy representing 2,100 – 3,700 individuals per year over the reporting period.
- The prevalence of any alcohol exposure during pregnancy has remained stable over time.
- Alcohol exposure during pregnancy poses significant risks to both the pregnant individual and the fetus/newborn (i.e., fetal alcohol spectrum disorders with behavioural intellectual, and physical disabilities; abnormal facial features; growth restriction, low birth weight, cognitive and behaviour issues; birth defects, preterm birth and stillbirth; miscarriage; placental abruption and placenta previa). Enhanced screening and equitable access to counselling and support services are needed.

To view an alternate to this graph see **Table 2.2.4** in Appendix A for a table option of data points.



Numerator: Pregnancies with alcohol exposure.
Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

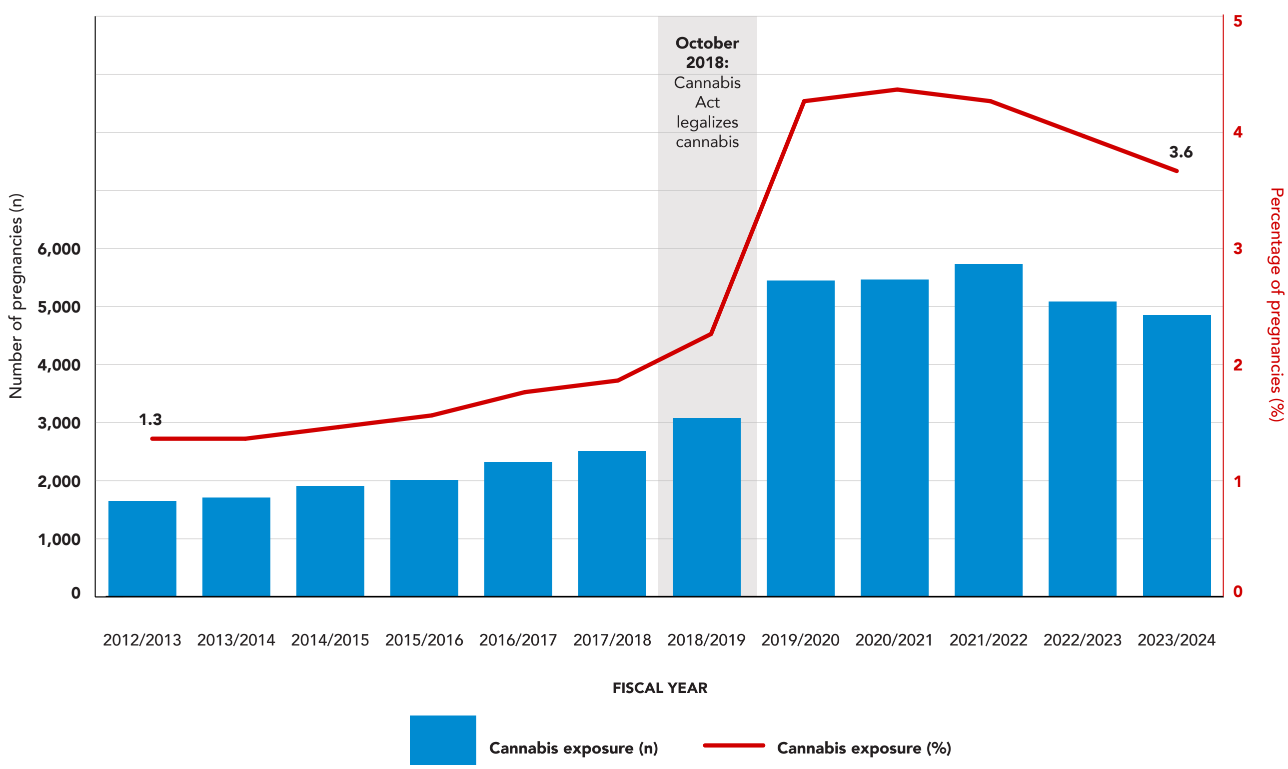
FIGURE 2.2.5

Prevalence of cannabis exposure in pregnancy, Ontario, 2012/2013 to 2023/2024

Summary of Figure 2.2.5

- Each year, 1-4% (1,700 – 6,000 pregnant individuals) use cannabis during pregnancy. Prevalence remained under 2% until legalization in October 2018, after which it doubled to ~4%.
- As a result of Canada's cannabis legalization, BORN changed the way it collected the data, in addition, reduced stigma may have contributed to increased reporting post-legalization.
- Cannabis exposure during pregnancy poses risks to both the pregnant individual and the fetus, including fetal growth restriction, low birth weight, cognitive issues, birth defects, preterm birth, placental problems, and stillbirth. Routine screening, access to cessation support, and public/provider education are key to improving health outcomes.
- For further information on cannabis use, see 2.2.8 in Appendix A.

To view an alternate to this graph see Table 2.2.5 in Appendix A for a table option of data points.



Numerator: Pregnancies with cannabis exposure.

Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

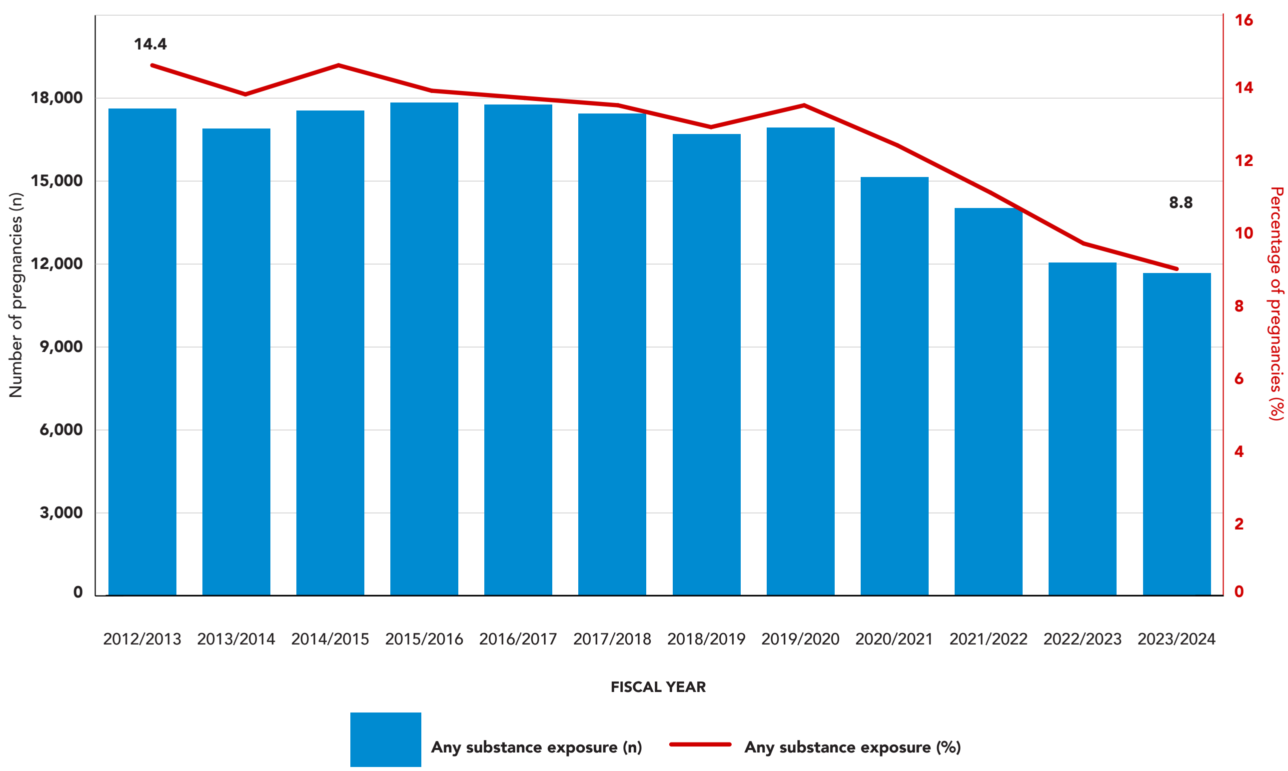
FIGURE 2.2.6

Prevalence of substance exposure in pregnancy, Ontario, 2012/2013 to 2023/2024

Summary of Figure 2.2.6

- Approximately 9 – 14% of pregnant women and individuals reported any substance exposure during pregnancy, representing 12,000 – 18,000 individuals per year. The prevalence of any substance use has seen a consistent decline, likely driven by the decline in smoking, over the decade to 8.8% in 2023/2024.
- The health risks associated with substance exposure during pregnancy include placental complications and abnormal bleeding, fetal growth restriction, low birth weight, developmental problems, birth defects, preterm birth, and abnormal brain development leading to cognitive and behavioural issues. Addressing this issue requires integrated care that includes enhanced screening during prenatal care, equitable access to counselling, support services and substance use treatment programs, and public awareness campaigns to raise awareness about the risk of substance use exposure during pregnancy.

To view an alternate to this graph see Table 2.2.6 in Appendix A for a table option of data points.



Numerator: Pregnancies with any substance exposure including cannabis, alcohol, smoking, opioids, cocaine, gas/glue/hallucinogens/amphetamines, and other.
Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

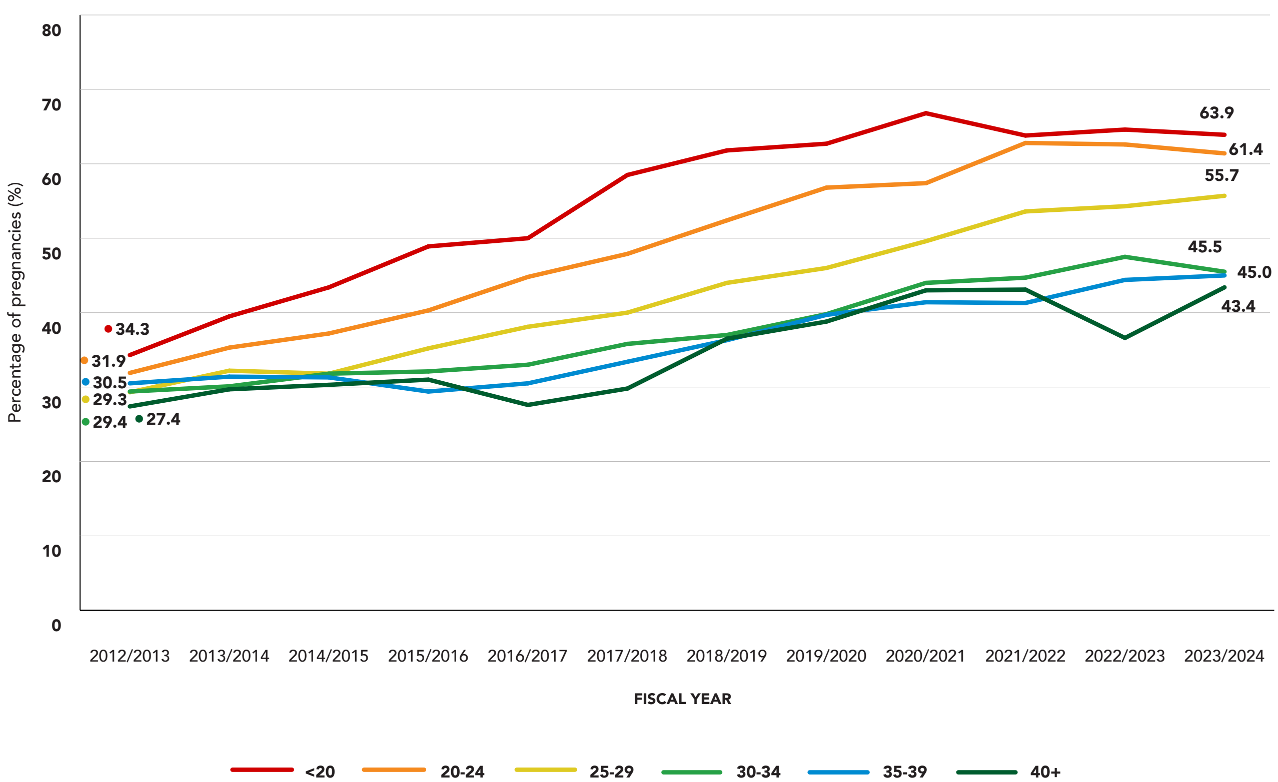
FIGURE 2.2.7

Prevalence of pregnant women and individuals with mental health concerns among individuals using substances, Ontario, 2012/2013 to 2023/2024 by maternal/pregnant individual age group (years) and fiscal year

Summary of Figure 2.2.7

- In 2023/2024, the prevalence of reported mental health conditions among individuals using substances ranged from 43.4 – 63.9% across all age groups with a higher prevalence in pregnant women and individuals less than 30 years of age.
- Mental health conditions among individuals using substances have steadily increased across all age groups, with the largest rise in those under 20 — from 34.3% in 2012/2013 to 63.9% in 2023/2024.
- Routine screening for substance use and mental health during prenatal care is essential for early risk identification. Integrated treatment and support throughout pregnancy, birth, and postpartum — backed by funding and equitable access —is critical.

To view an alternate to this graph see Table 2.2.7 in Appendix A for a table option of data points.



Numerator: Pregnancies with any mental health concerns including addiction, anxiety, bipolar disorder, depression, history of postpartum depression, schizophrenia, and other.
Denominator: All pregnancies resulting in a live or stillbirth, of individuals using substances, that occurred in Ontario.

2.3 PRENATAL SCREENING

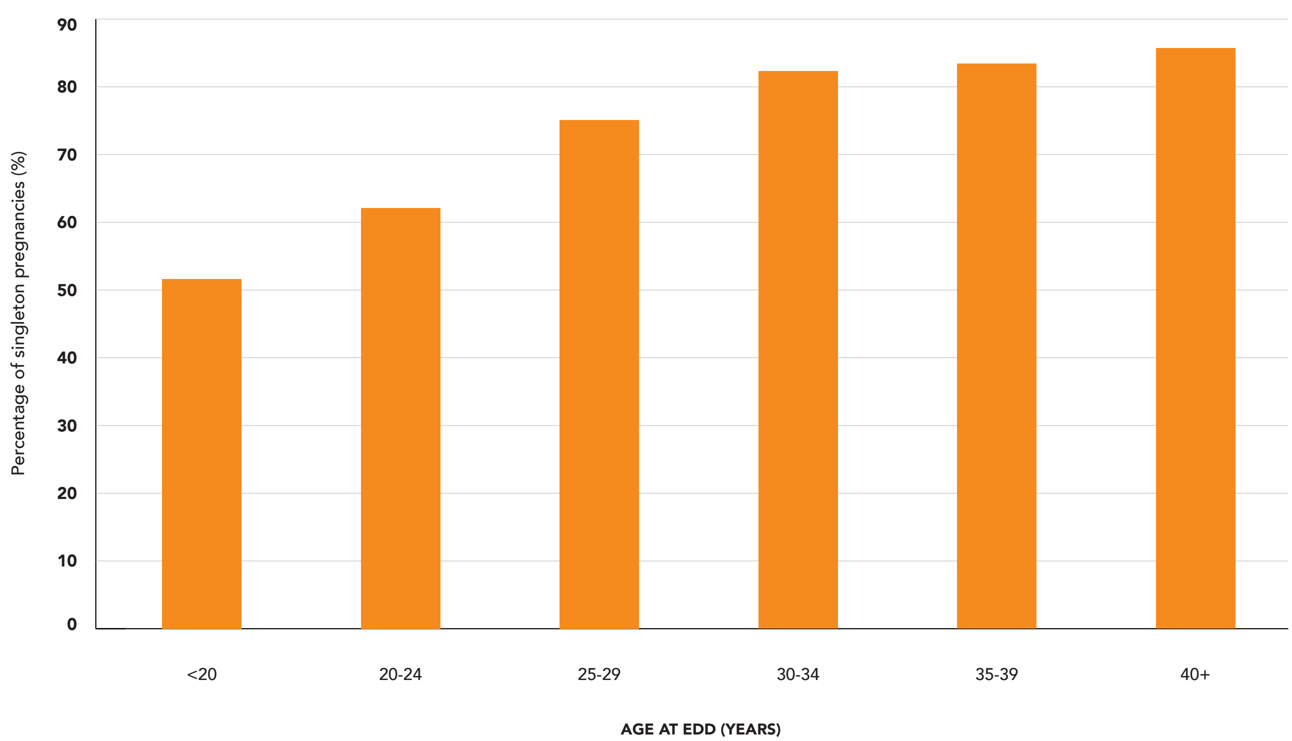
FIGURE 2.3.1A

Overall uptake of prenatal screening for singleton pregnancies, Ontario, 2020/2021 to 2022/2023 by age at Estimated Date of Delivery (EDD) of pregnant individual (years)

Summary of Figures 2.3.1A & 2.3.1B

- Prenatal screening uptake (OHIP-funded and self-paid) for singleton pregnancies in Ontario ranged from 51.6–85.7% across all age groups between 2020/2021 and 2022/2023, with higher uptake among older individuals.
- Screening type varies by age: Multiple Marker Screening (MMS) is most common under 40; those 40+ are eligible for OHIP-funded NIPT, with many opting for NIPT alone (42.9%) or combined with MMS (37.2%) due to increased risk of trisomies 21, 18, and 13, though some selected MMS alone (19.8%).
- Those 40+ years at EDD who choose to have screening should be offered OHIP-funded NIPT instead of MMS, unless the NIPT result is uninformative. All pregnant individuals should be offered screening, regardless of age, and supported in making informed choices about what's right for them.

To view an alternate to this graph see Table 2.3.1A in Appendix A for a table option of data points.

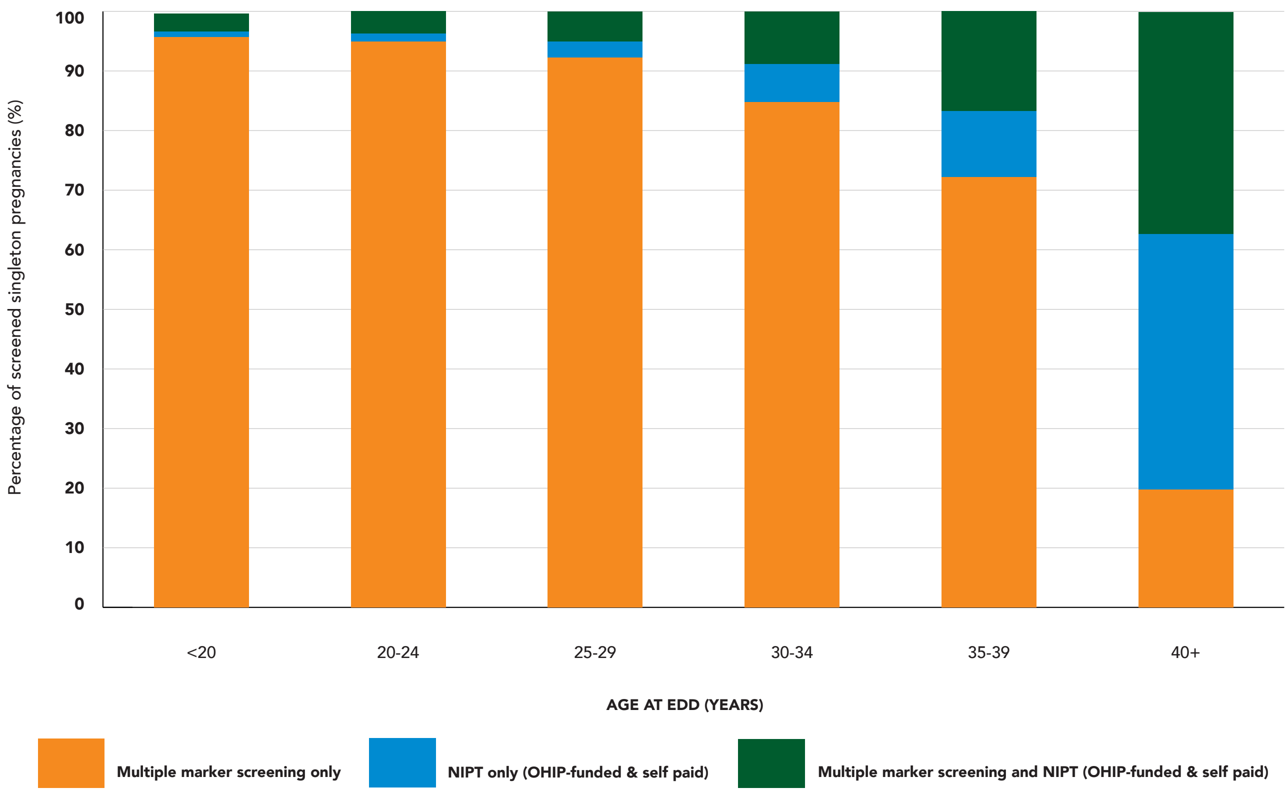


Numerator: Pregnancies with prenatal screening in each age group.
Denominator: Singleton pregnancies among Ontario residents with an EDD between April 1 2020 and March 31 2023.

FIGURE 2.3.1B

Proportion of pregnant individuals receiving prenatal screening, Ontario, 2020/2021 to 2022/2023 by type of screening and age at EDD of pregnant individual (years)

To view an alternate to this graph see **Table 2.3.1B** in Appendix A for a table option of data points.



Numerator: Screened singleton pregnancies in each age group and type of screening.
Denominator: Singleton pregnancies with prenatal screening and EDD between April 1 2020 and March 31 2023.

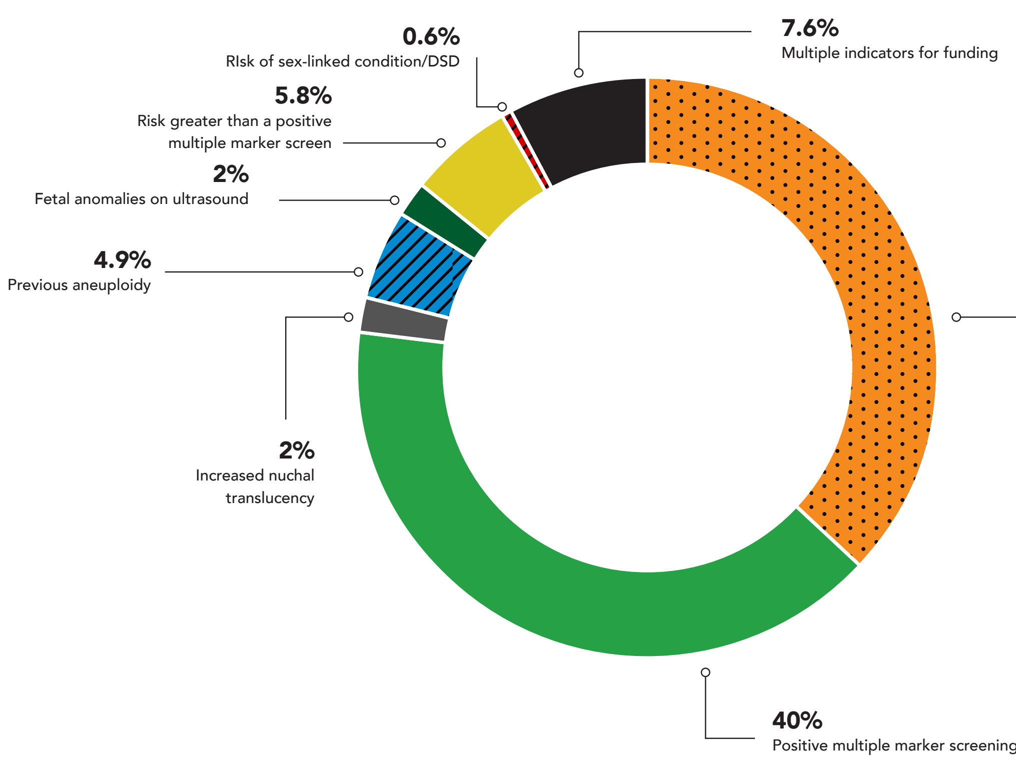
FIGURE 2.3.2

Proportion of OHIP-funded NIPT by clinical funding indicator, Ontario, 2020/2021 to 2022/2023

Summary of Figure 2.3.2

- For singleton pregnancies, the most common reasons for OHIP-funded NIPT in 2020/2021 to 2022/2023 were a positive MMS result (40.0%) and age of the pregnant individual 40 or over (37.1%).
- Some clinical indicators for funding are less commonly ordered, as they represent rarer clinical scenarios, such as an increased nuchal translucency measurement ≥3.5mm which represented 2.0% of all OHIP-funded NIPT. This could also represent patient preferences, where pregnant individuals may choose to have prenatal diagnosis following an increased nuchal translucency measurement, rather than have NIPT. It's important to note that an increased nuchal translucency measurement can be associated with genetic conditions and fetal congenital anomalies not detected by NIPT. A referral to a Genetics / Maternal Fetal Medicine specialist is indicated even if NIPT is ordered.

To view an alternate to this graph see Table 2.3.2 in Appendix A for a table option of data points.



Numerator: Pregnancies with each funding indicator.

Denominator: Singleton pregnancies with OHIP-funded NIPT and EDD between April 1, 2020 and March 31, 2023.

2.3.3

Performance of Multiple Marker Screening (MMS) for singleton pregnancies, Ontario

Summary for Table 2.3.3

- Multiple Marker Screening (MMS), which is available to all pregnant individuals in Ontario, is offered in the form of enhanced First Trimester Screening (eFTS) or Second Trimester Screening (STS). Enhanced First Trimester Screening is the optimal MMS modality when available, as it incorporates a nuchal translucency measurement, and is offered from 11 weeks 2 days to 13 weeks 3 days of pregnancy. If pregnant individuals present later to care or cannot access a nuchal translucency ultrasound, Second Trimester Screening is available from 14 weeks to 20 weeks 6 days of pregnancy.
- Prenatal screening and outcomes data is collected in the **BORN Information System (BIS)**, enabling PSO to assess the performance of prenatal screening for pregnant individuals in Ontario through comparison of screening results to diagnostic cytogenetic (chromosome testing) results and birth outcomes.
- For the detection of trisomy 21, enhanced First Trimester Screening had a comparable performance to Second Trimester Screening, with a sensitivity of 88.23% with a 95% confidence interval of 86.38 to 89.91 and 87.18% with a 95% confidence interval of 77.68 to 93.68 respectively.
- Having Ontario-specific performance is a valuable resource that can help healthcare practitioners provide appropriate counselling and support to pregnant individuals.

To view the table of data points, see **Table 2.3.3** in Appendix A.

2.3.4

Performance of OHIP-funded Non-Invasive Prenatal Testing (NIPT) for singleton pregnancies, Ontario, 2016 to 2023

Summary for Table 2.3.4

- OHIP-funded NIPT is available to pregnant individuals meeting the NIPT funding criteria at the time of blood draw.
- Prenatal screening and outcomes data is collected in the BORN Information System (BIS), enabling PSO to assess the performance of prenatal screening for pregnant individuals in Ontario through comparison of screening results to diagnostic cytogenetic (chromosome testing) results and birth outcomes.
- Ontario-specific data demonstrates that OHIP-funded NIPT is a highly accurate screen, detecting most (but not all) pregnancies with trisomy 21, 18 and 13.
- For pregnancies receiving a high-risk NIPT result, the likelihood for the pregnancy to have the condition (i.e. the positive predictive value) is highest for trisomy 21 (96.32%) and lowest for trisomy 13 (76.74%). All high-risk NIPT results should be confirmed by diagnostic testing prior to irrevocable pregnancy management decisions.
- Providing access to OHIP-funded NIPT reduces the need for invasive diagnostic procedures for pregnant individuals with low-risk NIPT results.

To view the table of data points, see **Table 2.3.4** in Appendix A.

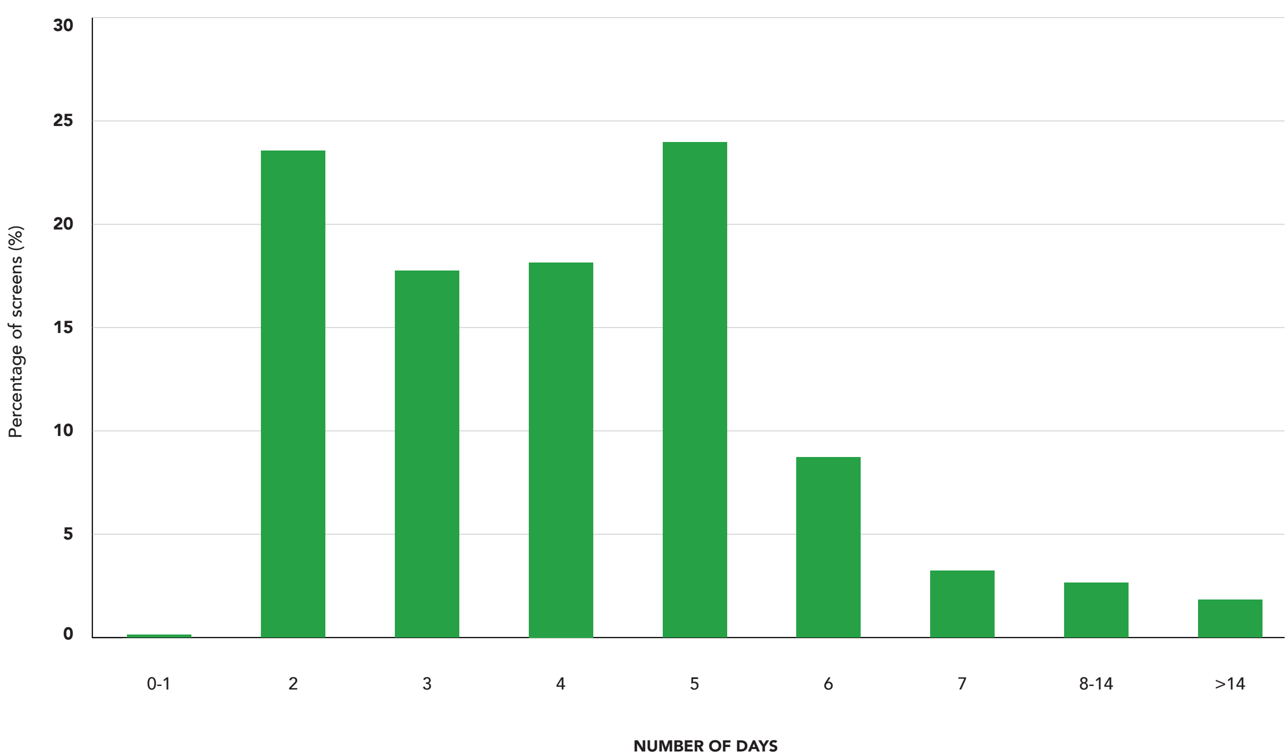
FIGURE 2.3.5A

Turnaround time from sample collection to date of report for Multiple Marker Screening in singleton pregnancies, Ontario, 2020/2021 to 2022/2023

Summary of Figures 2.3.5A & 2.3.5B

- Approximately 95% of MMS testing results are reported to the ordering provider within 7 days of sample collection.
- As expected, NIPT results take slightly longer to complete with approximately 98% of samples reported to the ordering provider within 14 days of sample collection.
- PSO monitors turnaround times for screening results to ensure timely information is provided to pregnant individuals and providers. Knowing the turnaround times can help healthcare providers offer better counselling to pregnant individuals about what to expect and how to manage the waiting period. This can help set realistic expectations and reduce stress during the screening process.

To view an alternate to this graph see **Table 2.3.5A** in Appendix A for a table option of data points.

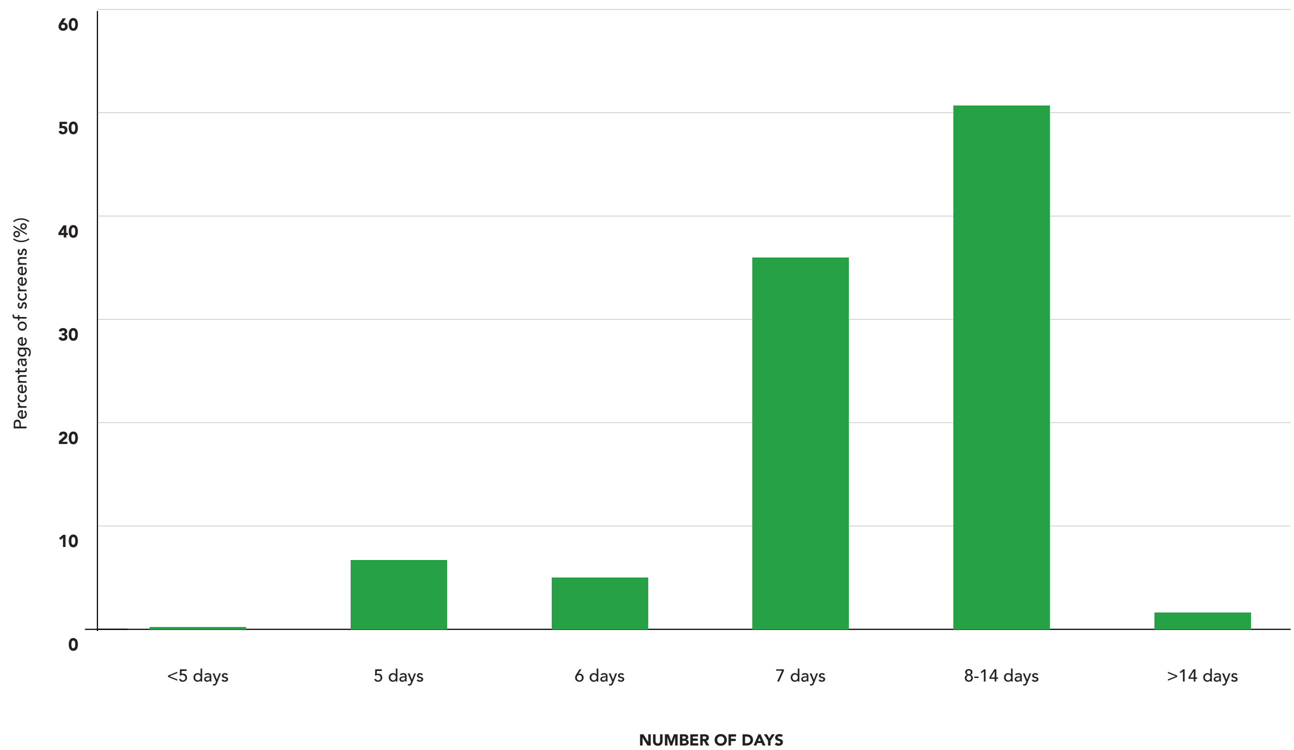


Numerator: Screens returned at each time point.
Denominator: MMS screens at Ontario laboratories for singleton pregnancies with an estimated date of delivery between 1 April 2020 and 31 March 2023.

FIGURE 2.3.5B

Turnaround time from sample collection to date of report for OHIP-funded Non-invasive Prenatal Testing in singleton pregnancies, Ontario, 2020/2021 to 2022/2023

To view an alternate to this graph see **Table 2.3.5B** in Appendix A for a table option of data points.



Numerator: Screens returned at each time point.
Denominator: NIPT screens at Ontario laboratories for singleton pregnancies with an estimated date of delivery between 1 April 2020 and 31 March 2023.

2.4 MATERNAL MORBIDITY AND MORTALITY

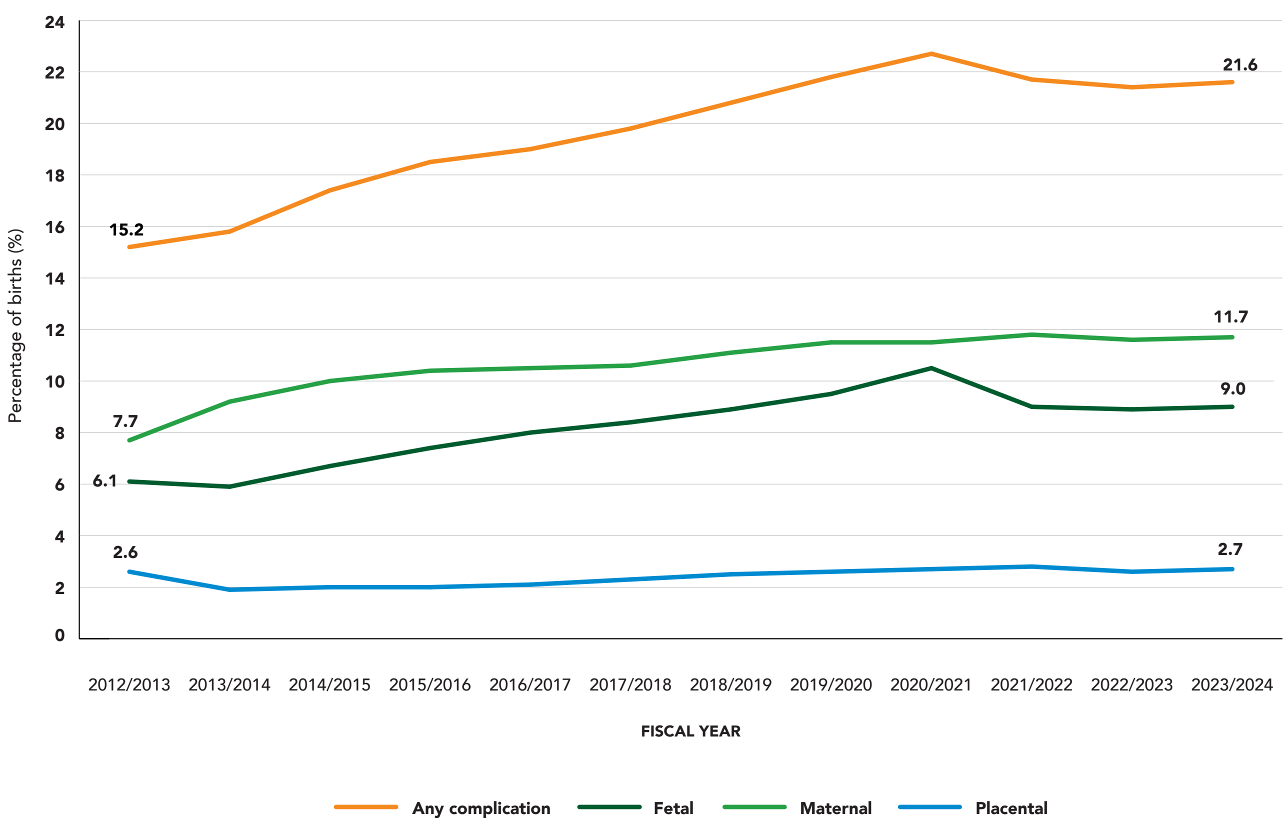
FIGURE 2.4.1

Prevalence of births with a pregnancy complication, excluding hypertension and diabetes, Ontario, 2012/2013 to 2023/2024

Summary of Figure 2.4.1

- The prevalence of pregnancy complications has been rising over time, from 15.2% in 2012/2013 to 21.6% in 2023/2024.
- The prevalence of placental complications has remained steady around 2.6%. However, both maternal and fetal complications have increased equally, with maternal complications rising from 7.7% in 2012/2013 to 11.7% in 2023/2024, and fetal complications increasing from 6.1% to 9.0% during the same period.
- Pregnancy complications require increased use of resources: ultrasound, laboratory, hospital stays, obstetrical/internal medicine/maternal fetal medicine , anesthesiology and neonatal consults. There are many issues for families navigating complex systems and care providers needing to share critical information for decision-making.

To view an alternate to this graph see Table 2.4.1 in Appendix A for a table option of data points.



Numerator: Pregnancies with a complication.

Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

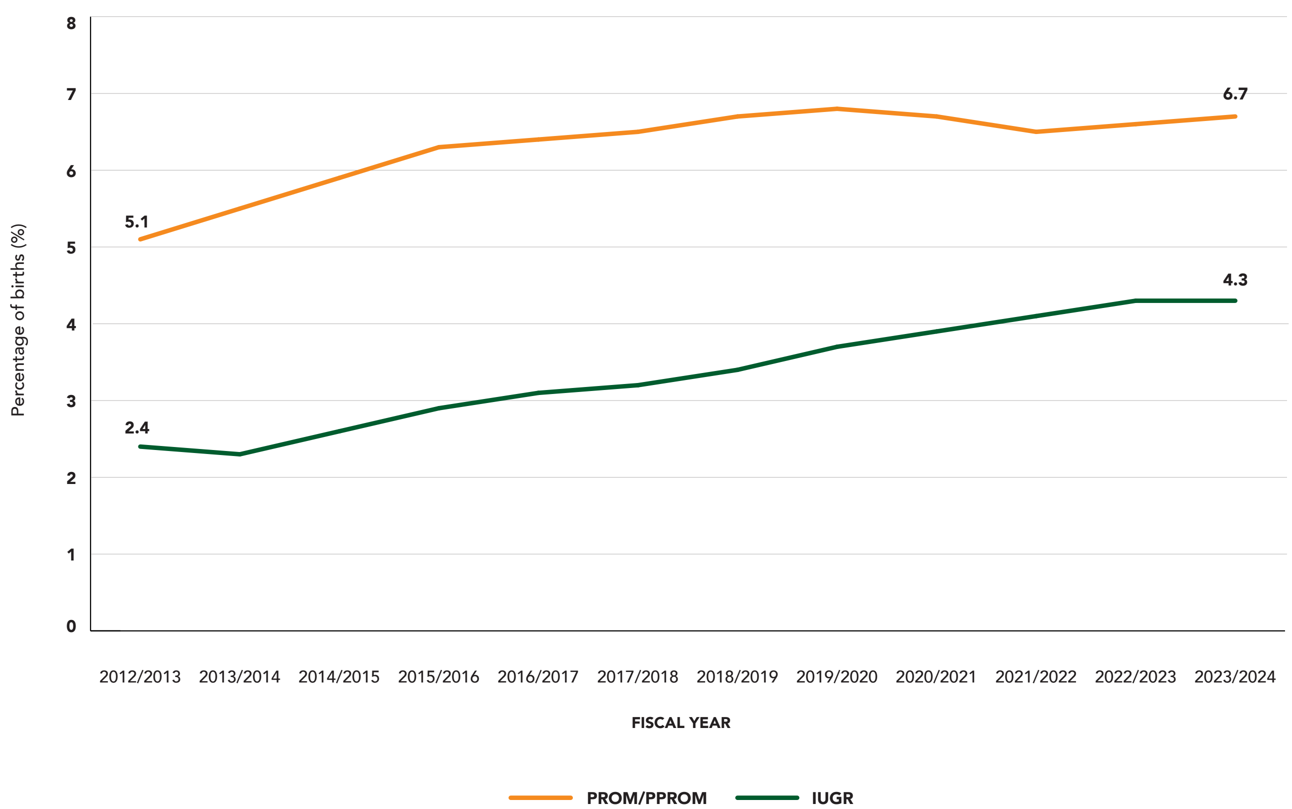
FIGURE 2.4.2

Prevalence of selected complications in pregnancy, Ontario, 2012/2013 to 2023/2024

Summary of Figure 2.4.2

- Prelabour Rupture of Membranes (PROM) refers to the rupture of the amniotic sac before labor begins, with Preterm PROM (or PPROM) specifically occurring before 37 weeks of pregnancy. Intrauterine Growth Restriction (IUGR) is a condition where a fetus grows slower than expected, often weighing below the 10th percentile for its gestational age.
- The prevalence of both PROM/PPROM and IUGR have increased equally, with PROM/PPROM rising from 5.1% in 2012/2013 to 6.7% in 2023/2024, and IUGR increasing from 2.4% to 4.3% during the same period.
- PROM/PPROM can lead to complications such as preterm birth, chorioamnionitis, placental abruption, and umbilical cord problems. Diagnosis prompts decisions about care management (expectant or induction), depending on clinical circumstances and preferences, and guided by clinical practice guidelines. IUGR increases risks like preterm birth, low birth weight, newborn respiratory problems, thermoregulation, and blood sugar issues. Affected pregnancies are closely monitored to assess fetal growth and well-being and provide guidance on optimal timing for delivery.

To view an alternate to this graph see **Table 2.4.2** in Appendix A for a table option of data points.



Numerator: Pregnancies with PROM/PPROM or IUGR.

Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

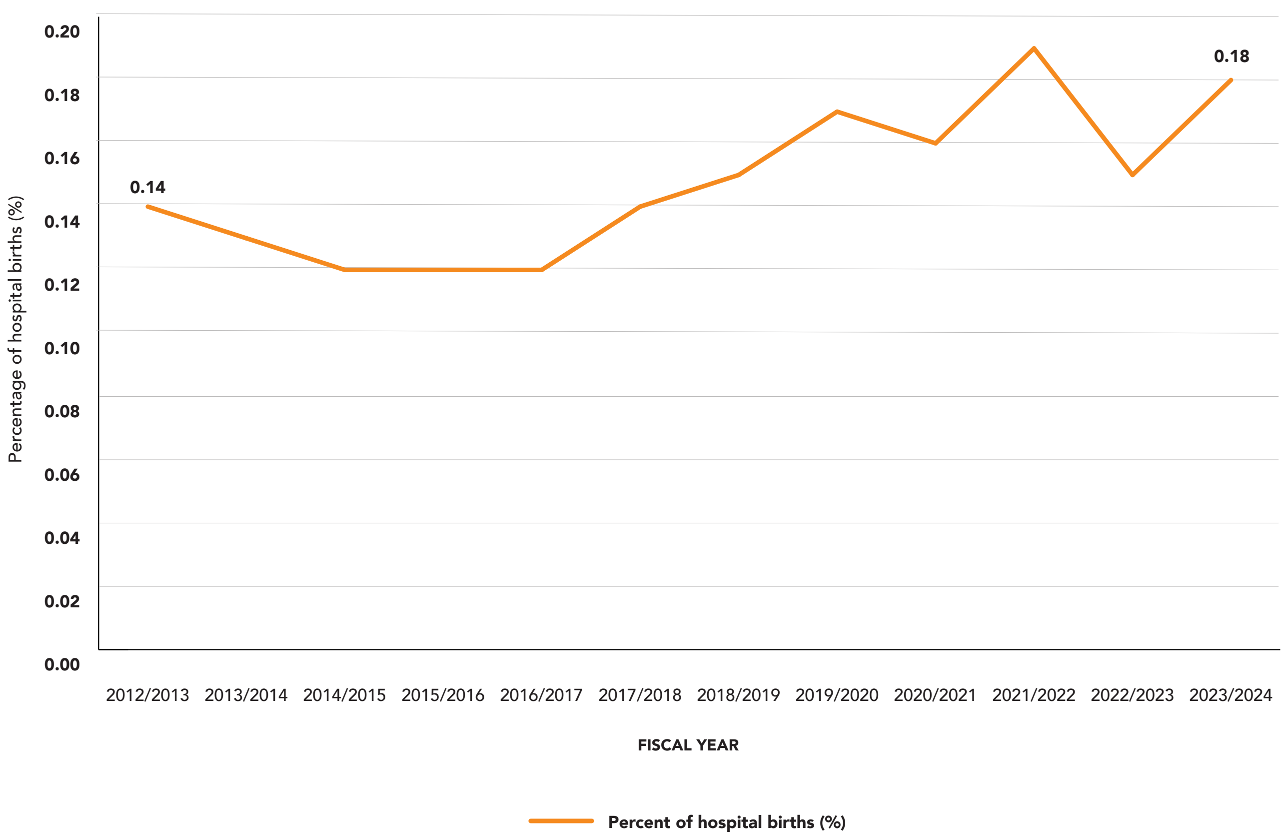
FIGURE 2.4.3

Prevalence of maternal transfer to ICU in labour, birth, or postpartum, Ontario, 2012/2013 to 2023/2024

Summary of Figure 2.4.3

- Maternal transfer to the ICU is a measure of severe maternal morbidity, highlighting critical cases that require intensive care.
- The prevalence of maternal transfers to the Intensive Care Unit has increased from 0.14% in 2012/2013 to 0.18% in 2023/2024.
- Because these numbers are small it is helpful to think about it differently. In 2023/2024, 1.8 per 1000 pregnant individuals had to be transferred to an ICU for a complication. This means that nearly 250 individuals spent time in an ICU environment which is stressful for the individual and family and often leads to separation of the maternal-newborn pair which can influence breastfeeding and early attachment.

To view an alternate to this graph see **Table 2.4.3** in Appendix A for a table option of data points.



Numerator: Pregnant individuals transferred to ICU/CCU in labour/birth or postpartum.
Denominator: All pregnancies resulting in a live or stillbirth that occurred in an Ontario hospital.

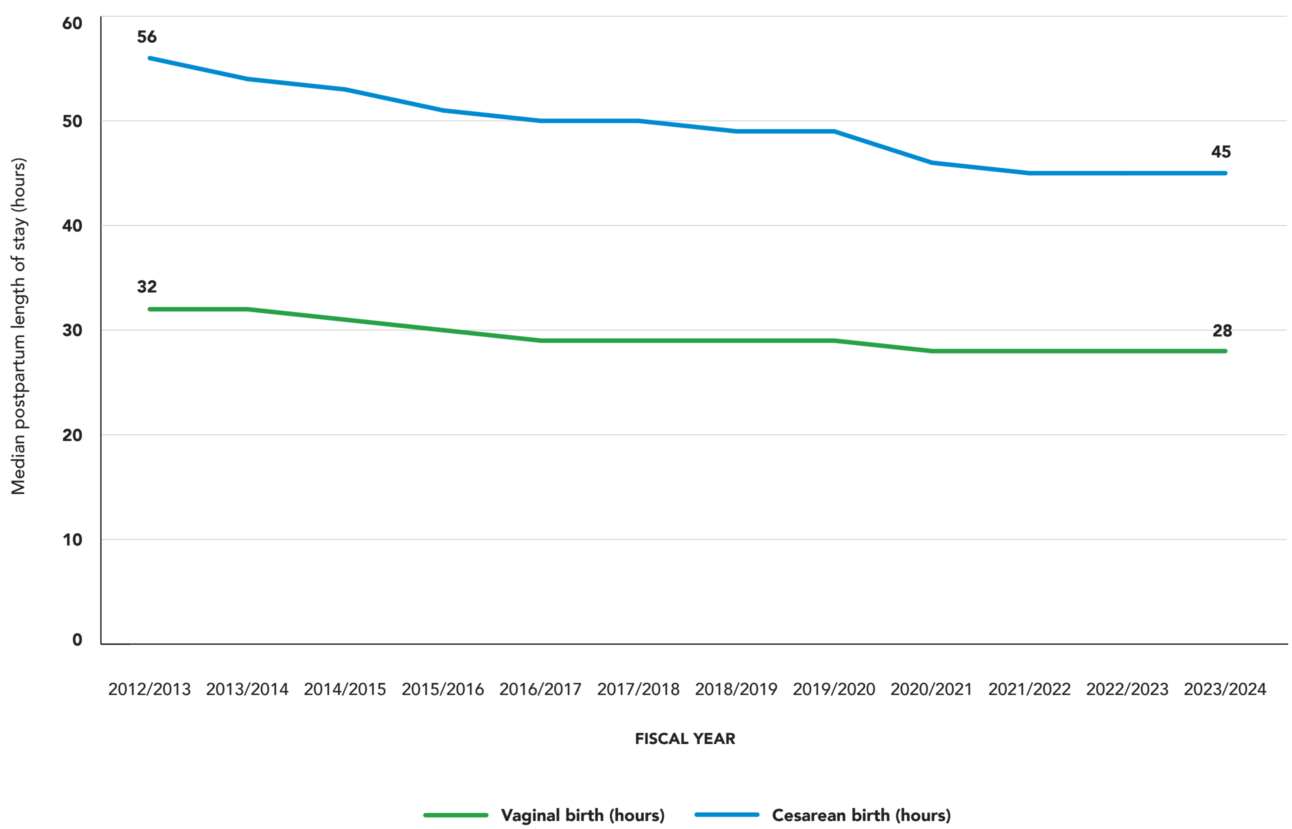
FIGURE 2.4.4

Median maternal postpartum length of hospital stay (hours), Ontario, 2012/2013 to 2023/2024 by birth type and fiscal year

Summary of Figure 2.4.4

- Maternal length of stay following birth is tracked as a quality-of-care indicator and helps to predict the need for hospital resources and the time available for postpartum care and education.
- Median maternal length of stay has decreased over time: vaginal births from 32 to 28 hours, and cesarean births from 56 to 45 hours between 2012/2013 and 2023/2024.
- Coordinated postpartum care is essential beyond discharge, including support for breastfeeding, newborn care, and postpartum mood disorders. Tracking length of stay alongside outcomes like emergency department (ED) visits, readmissions, and breastfeeding rates provides a more complete picture of perinatal system performance.

To view an alternate to this graph see Table 2.4.4 in Appendix A for a table option of data points.



Numerator: Median maternal postpartum length of hospital stay in hours.
Denominator: All pregnancies resulting in a live or stillbirth that occurred in an Ontario hospital with a discharge home documented on the labour/birth or postpartum record.

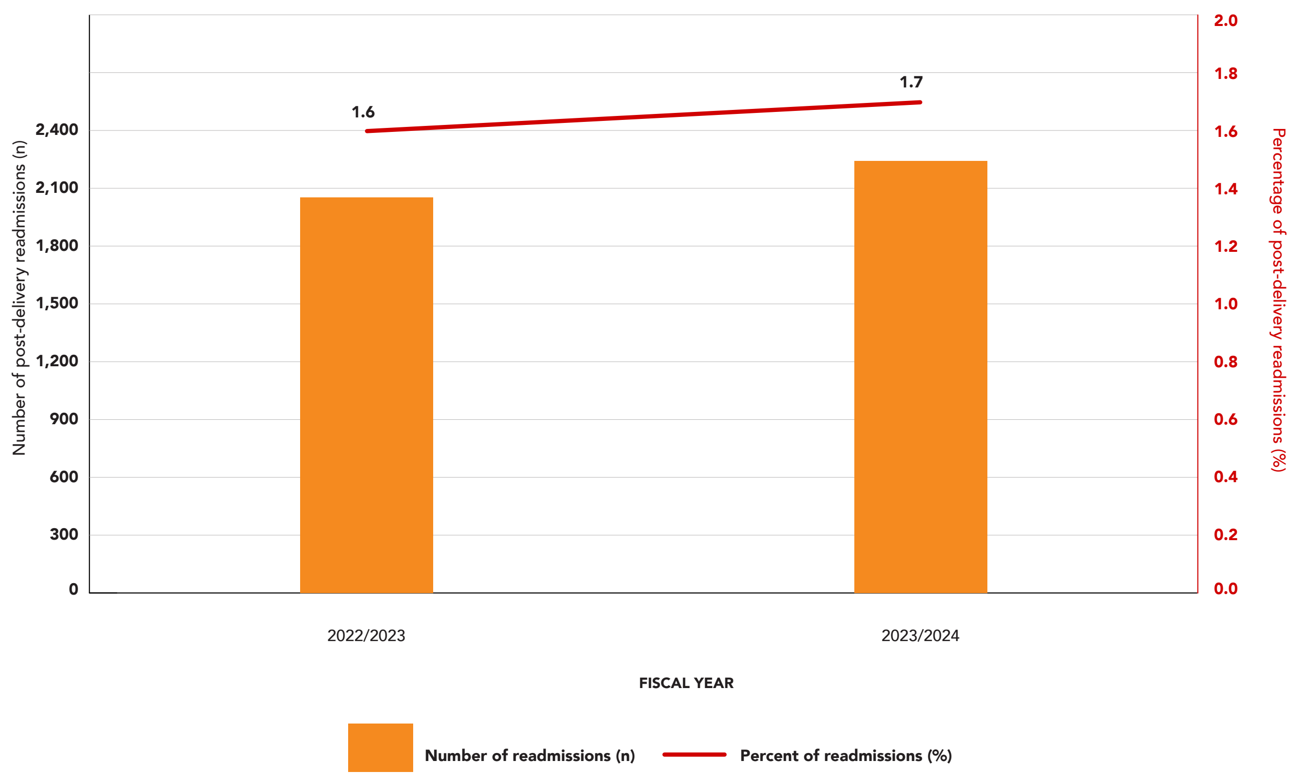
FIGURE 2.4.5A

Prevalence of post-delivery readmission within 42 days of delivery, Ontario, 2022/2023 compared to 2023/2024

Summary of Figures 2.4.5A & 2.4.5B

- The prevalence of post-delivery readmission within 42 days has increased from 1.6% (2,053 readmissions) in 2022/2023 to 1.7% (2,242 admissions) in 2023/2024.
- There has been an increase in volume of readmissions with puerperal infections, postpartum hemorrhage, preeclampsia and hypertension.
- Readmissions for postpartum complications are stressful and disruptive for families and may affect breastfeeding. Tracking rates of readmission in conjunction with length of stay, types of delivery and interventions may help identify areas for improvements in care.

To view an alternate to this graph see **Table 2.4.5A** in Appendix A for a table option of data points.

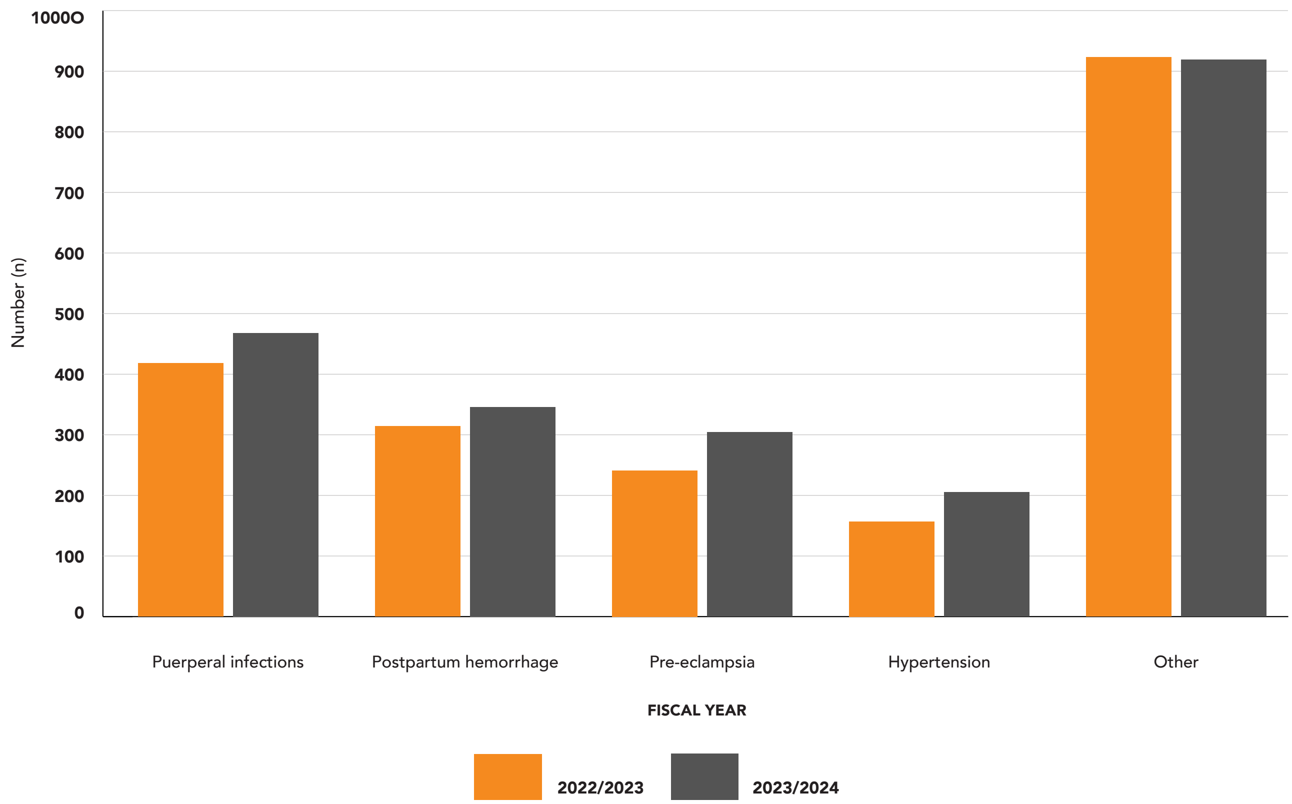


Numerator: Maternal readmission to an acute care hospital within 42 days of delivery.
Denominator: All pregnancies among Ontario residents with a valid Ontario health card number resulting in live or stillbirth in Ontario between 1 April 2023 and 31 March 2024.

FIGURE 2.4.5B

Frequency of primary reason for post-delivery readmissions within 42 days of delivery, Ontario, 2022/2023 compared to 2023/2024

To view an alternate to this graph see **Table 2.4.5B** in Appendix A for a table option of data points.



Numerator: Primary reason for post-delivery readmission.
Denominator: All pregnancies among Ontario residents with a valid Ontario health card number resulting in live or stillbirth in Ontario between 1 April 2023 and 31 March 2024 with maternal readmission to an acute hospital within 42 days of delivery.

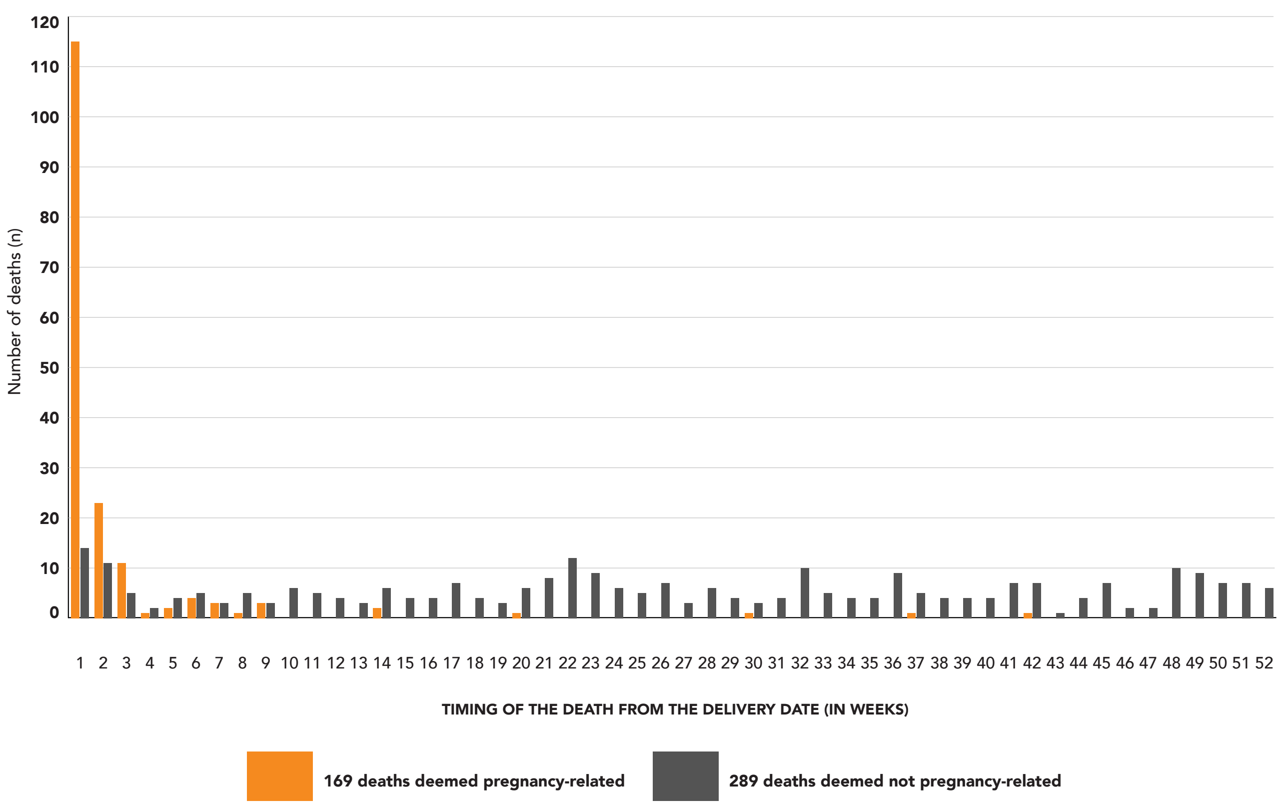
FIGURE 2.4.6

Frequency of maternal death within 365 days of delivery, 2002 to 2022 by number of weeks following the birth

Summary of Figure 2.4.6

- Maternal mortality is a devastating outcome, reflecting not only the loss of a life but also having a profound affect on families, communities, and healthcare providers.
- Between 2002 and 2022, there were 485 maternal deaths within a year of delivery. Among these, 458 could be classified further as pregnancy-related deaths (169) or non-pregnancy-related (289) deaths. Most pregnancy-related deaths occurred within 7 days of delivery. The most common causes of pregnancy-related death included obstetric hemorrhage, infection, preeclampsia and embolism.
- Capturing and sharing maternal death data is a first step in prevention. There is a continued need for vigilance to prevent pregnancy-related hemorrhage and preeclampsia deaths, careful monitoring for signs of infection, and the need for improved documentation of deaths. Because death is at the end of a cascade of obstetric complications, learning from near-miss events is critical to future prevention efforts. For more information see (Sprague, 2024).

To view an alternate to this graph see **Table 2.4.6** in Appendix A for a table option of data points.



Denominator: Pregnancies resulting in a live or stillbirth in an Ontario hospital between 2002 and 2022 followed by a death within 365 days.

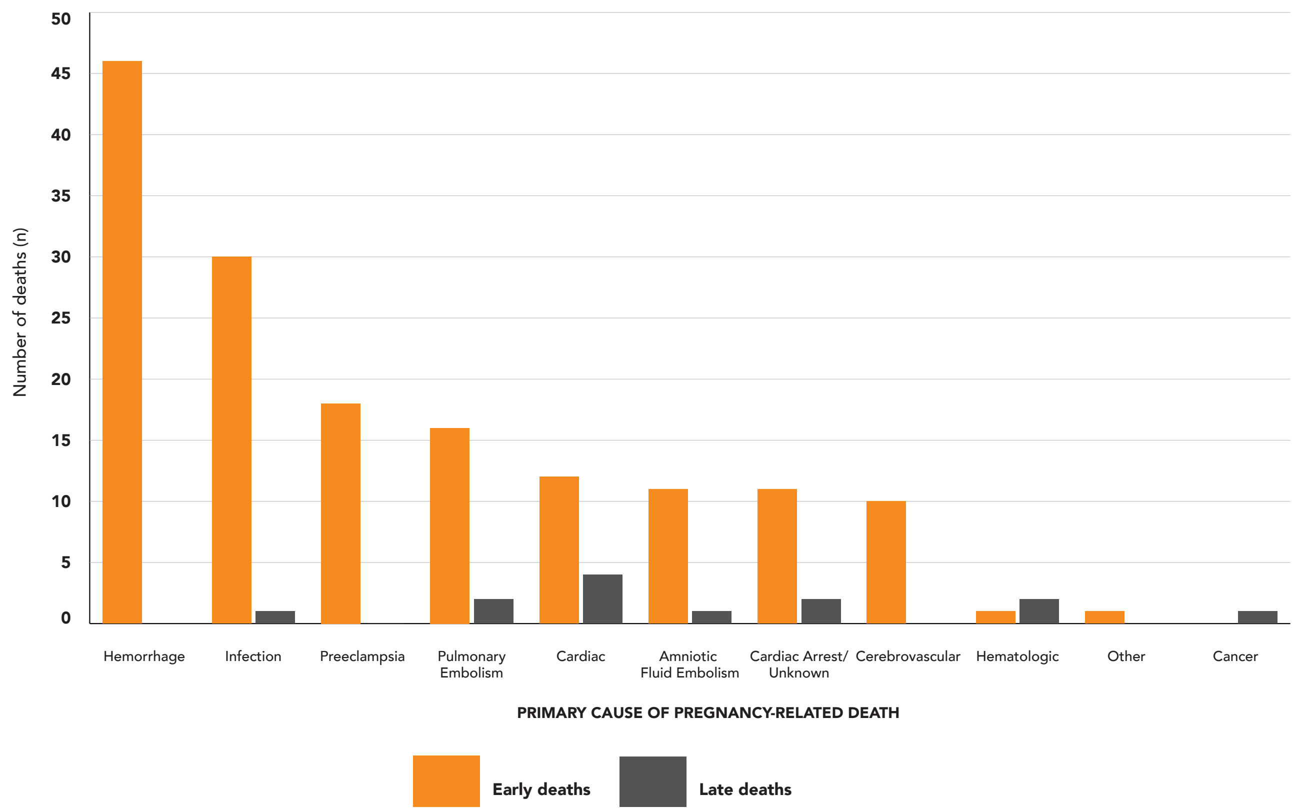
FIGURE 2.4.7A

Prevalence of pregnancy-related deaths, 2002 to 2022 by primary cause and timing of death

Summary of Figures 2.4.7A & 2.4.7B

- Among pregnancy-related deaths occurring ≤42 days, 46 were attributed to post-partum hemorrhage, 30 to infection, 18 to preeclampsia, and 16 to pulmonary embolism.
- Most non-pregnancy related deaths occurred after 42 days. Causes including cancer, cardiac arrest, injury, and infection.

To view an alternate to this graph see **Table 2.4.7A** in Appendix A for a table option of data points.

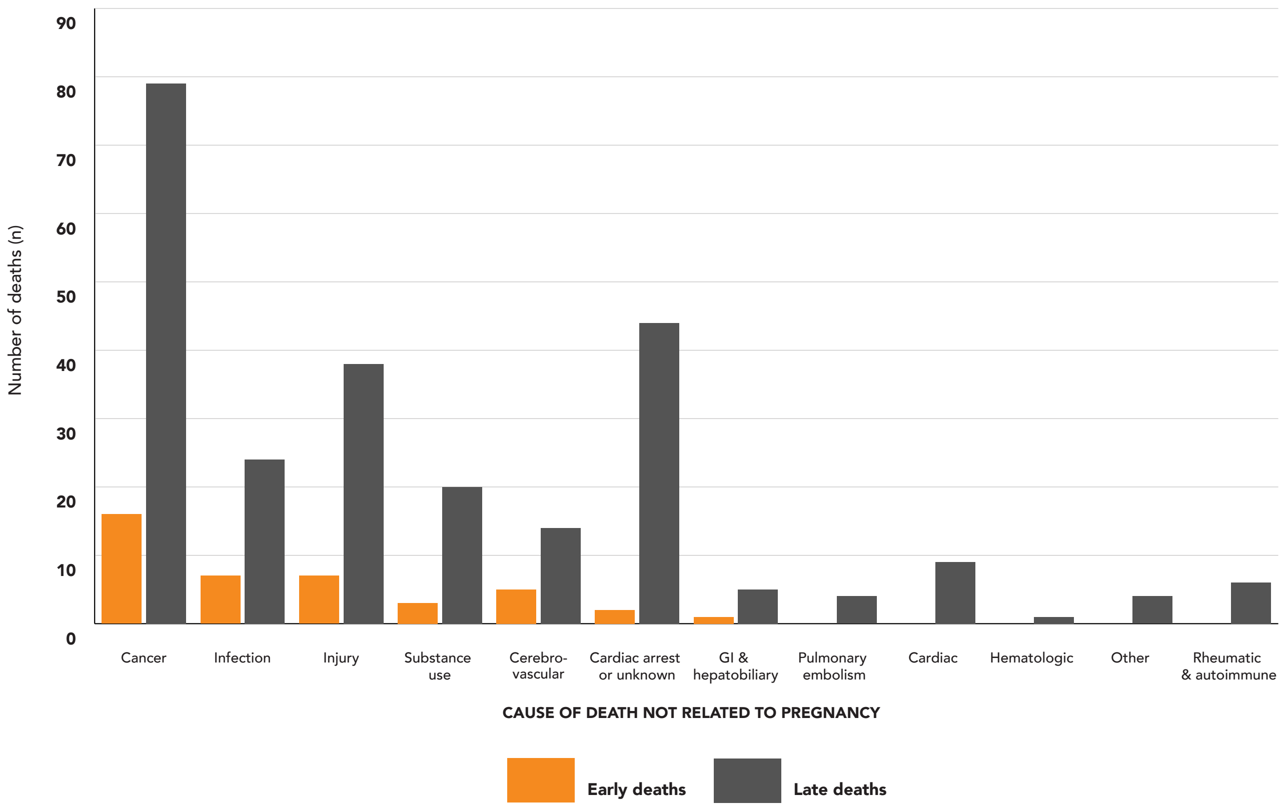


Denominator: Pregnancies resulting in a live or stillbirth in an Ontario hospital between 2002 and 2022 followed by a death within 365 days.

FIGURE 2.4.7B

Prevalence of non-pregnancy related deaths, 2002 to 2022 by primary cause and timing of death

To view an alternate to this graph see **Table 2.4.7B** in Appendix A for a table option of data points.



Denominator: Pregnancies resulting in a live or stillbirth in an Ontario hospital between 2002 and 2022 followed by a death within 365 days.

3.0 LABOUR

Labour and birth are a vulnerable time for pregnant individuals and their families (Moola et al., 2018). They are asked to trust a team of people, many of whom they have never met, to guide them through the process. Prenatal education helps pregnant individuals understand the process, learn about interventions that may occur and techniques and options to manage pain, discuss key decisions about care provider and birthplace, and learn about the early postpartum period and newborn care.

INTRODUCTION

While there is anticipation about the birth and finally seeing the newborn, many people also fear the unknown, pain, loss of control, the potential for injury to themselves or their baby, or unanticipated complications. Having reliable and trustworthy information on the local experience and outcomes may help reduce uncertainty among pregnant individuals and give care providers and prenatal educators accurate information to inform their counselling.

In Ontario, only about 50% of individuals have spontaneous labour, which means induction of labour and no labour cesarean deliveries are increasing. Some risks of adverse perinatal and maternal outcomes increase with gestational age, and although induction of labour may reduce these risks, the optimal timing of induction remains unknown (*Jeer et al., 2023*). In their systematic review and meta-analysis, Jeer and colleagues (2023) reviewed 44 trials and found that induction of labour compared to expectant management or delayed induction reduced the risk of adverse pregnancy outcomes, but the optimal timing may depend on the specific outcome of interest (maternal or newborn). At the individual hospital level, Mann and James (*Jeer et al., 2023; Mann & James, 2025*) discuss how increasing rates of induction may negatively impact hospital capacity, resources, staffing and potential outcomes and should be considered in any policy change that increases interventions. As we learn in subsequent chapters in this report, higher rates of diabetes, rising maternal age, higher pre-pregnancy BMI, and sometimes maternal requests for intervention, are all part of the complex decisions driving intervention rates.

Pain during the labour and birth process is a major concern for pregnant individuals. In 2023-24, over 80% of individuals giving birth in a hospital, across all levels of care, accessed some form of pharmacologic pain management. Epidural analgesia remains the predominant form of pain management for labour. In earlier days of epidural analgesia, there were more instances of dense motor block that impacted pushing efforts in second stage of labour leading to more assisted births. However, today's epidural techniques are generally not associated with higher rates of assisted vaginal or cesarean births. That is not to say that there are no side effects associated with opioids or epidurals. Hypotension, motor blockade, fever, and urinary retention can be associated with epidurals as can the need for oxytocin augmentation. And opioid use can be associated with respiratory depression requiring naloxone (*Anim-Somuah et al., 2018*). A Cochrane review found that individuals who received continuous labour support may be more likely to give birth 'spontaneously', i.e. give birth vaginally with neither vacuum nor forceps nor cesarean. In addition, women may be less likely to use pain medications or to have a cesarean birth, and may be more likely to be satisfied and have shorter labours (*Bohren et al., 2017*), However, if supportive care and non-pharmacologic methods do not meet the full needs of the laboring individual and pharmacologic methods are required, it is important to ensure up-to-date techniques for the administration and management of opioids and epidural analgesia to minimize side effects.

The intervention story is similar for birth. In the 2023-2024 period, 45.6% needed assistance with delivery (33.1% had cesareans and 12.5% had assisted vaginal birth) and VBAC rates have declined. In examining the Robson criteria to determine what is driving the cesarean birth rates, just over 60% of cesarean births were in nulliparous individuals with singleton pregnancies at term. In Canada, the Society of Obstetricians and Gynaecologists has developed numerous guidelines to support safe and effective care, including labour and birth. BORN Ontario demonstrated that using evidence-based guidelines with an audit and feedback system for sites to monitor their performance was an effective strategy to help improve care and reduce intervention rates. As the rates of interventions around birth continue to increase, it is prudent to monitor and investigate processes associated with the interventions and outcomes, determine whether there is an evidence-practice gap and need for change, and identify the barriers to practice improvement. In a study to understand 'why' some hospitals' rates of intervention did not improve with audit and feedback for key performance indicators, Reszel and colleagues (*Reszel et al., 2019*) (2019) found interdisciplinary collaboration and accountability, application of formal change strategies, team trust and use of evidence and data, as well as alignment with organizational priorities and support, were essential for change.

In conclusion, increased interventions during labour and birth in Ontario highlight the need for ongoing monitoring to identify gaps between evidence and practice and for the development and implementation of tailored strategies to optimize care and patient outcomes. Ongoing training for healthcare providers is important as well, not only to improve the management of births involving multiple interventions but also to ensure effective strategies are used to change practice when needed. Finally, policymakers need to consider the implications of rising intervention rates on healthcare costs and resource allocation, as well as the costs involved in ensuring best practice recommendations are implemented in a timely way when new guidelines are published.

3.1. TYPE OF LABOUR

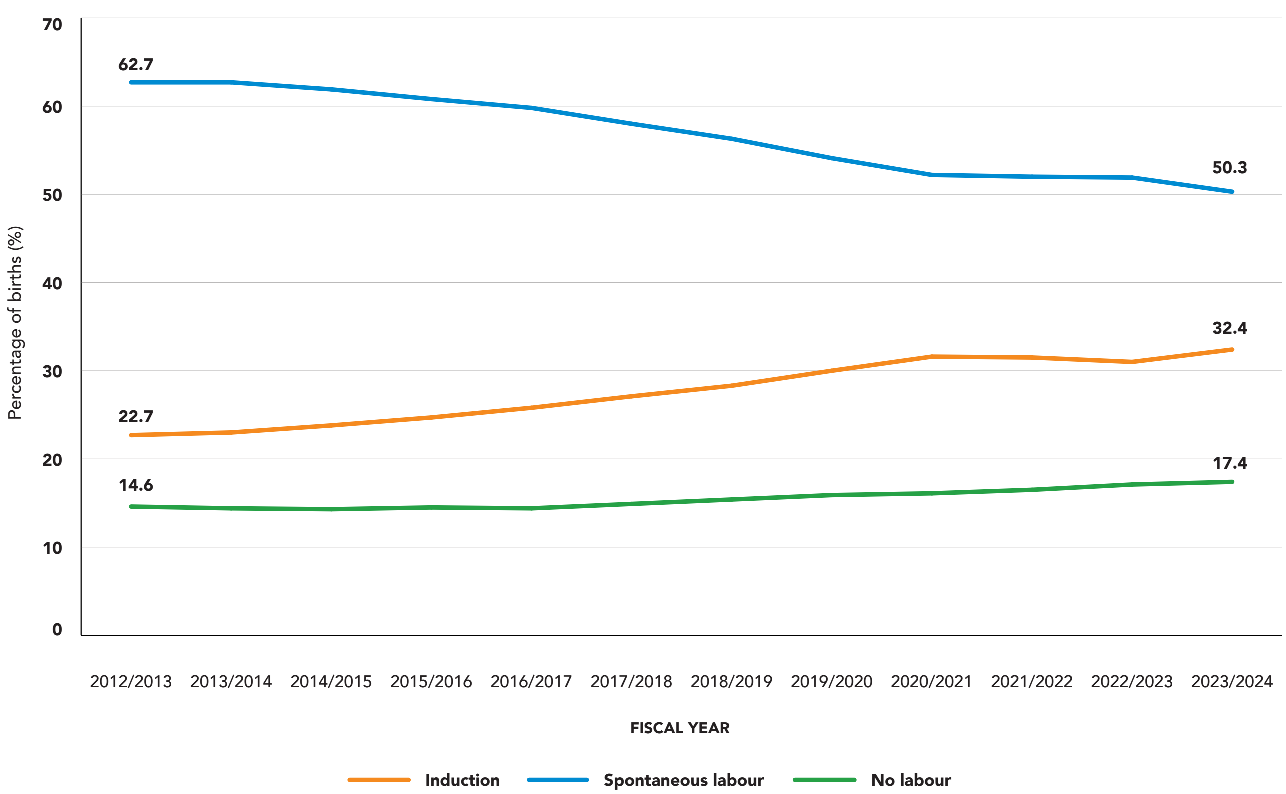
FIGURE 3.1.1

Distribution of labour type, Ontario, 2012/2013 to 2023/2024

Summary of Figure 3.1.1

- Spontaneous labour is an important metric because it represents the onset of labour without medical intervention.
- The prevalence of spontaneous labour has declined from 62.7% in 2012/2013 to 50.3% in 2023/2024, while induction rates rose from 22.7% to 32.4%. Births with no labour (e.g., elective cesarean) also increased from 14.6% to 17.4%.
- Rising induction rates, influenced by factors like maternal age and medical conditions, have sparked debate related to maternal and newborn outcomes. The ARRIVE Trial (2018) showed that routine induction at 39 weeks reduced cesarean rates without increasing adverse outcomes, and may be contributing to ongoing shifts in practice. Lack of confidence in birth, medico-legal concerns, and societal shifts might all play a role in these changing patterns of labour.
- For further information on labour type see **3.2.13** in Appendix A

To view an alternate to this graph see **Table 3.1.1** in Appendix A for a table option of data points.



Numerator: Births in each type of labour category.

Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

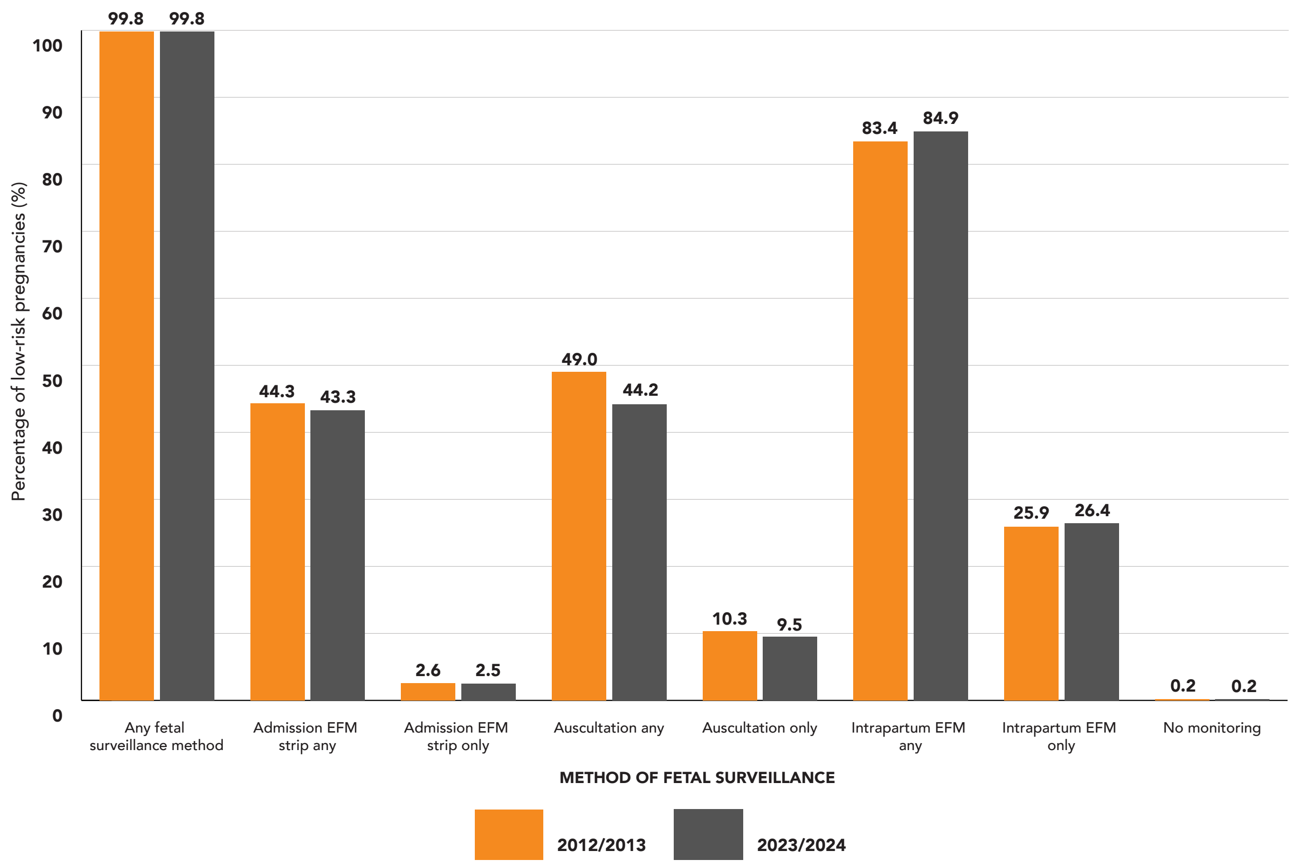
FIGURE 3.1.2

Prevalence of fetal surveillance methods used in low-risk pregnancies, Ontario, 2012/2013 compared to 2023/2024

Summary of Figure 3.1.2

- Fetal surveillance involves assessing fetal heart rate alongside uterine activity and interpreting the data for the total clinical picture. For low-risk pregnancies, intermittent auscultation (IA) is recommended to reduce interventions and support mobility during labour.
- The prevalence of fetal surveillance methods among low-risk pregnancies has remained stable over time, with 99.8% of low-risk pregnancies receive some form of surveillance – with 84.9% using electronic fetal monitoring (EFM) and 44.2% using IA. Methods may be combined.
- Despite guidelines favoring IA, EFM remains widely used, including for admission assessments. Practice change has been limited, even with knowledge translation efforts. EFM is an older technology and challenging to interpret; future improvements may arise from integrating additional fetal data into AI-enhanced surveillance.

To view an alternate to this graph see **Table 3.1.2** in Appendix A for a table option of data points.



Numerator: Method of fetal surveillance for each pregnancy.
Denominator: All low-risk pregnancies (using the 2023 MNOC low-risk definition) resulting in a hospital birth (live or stillbirth).

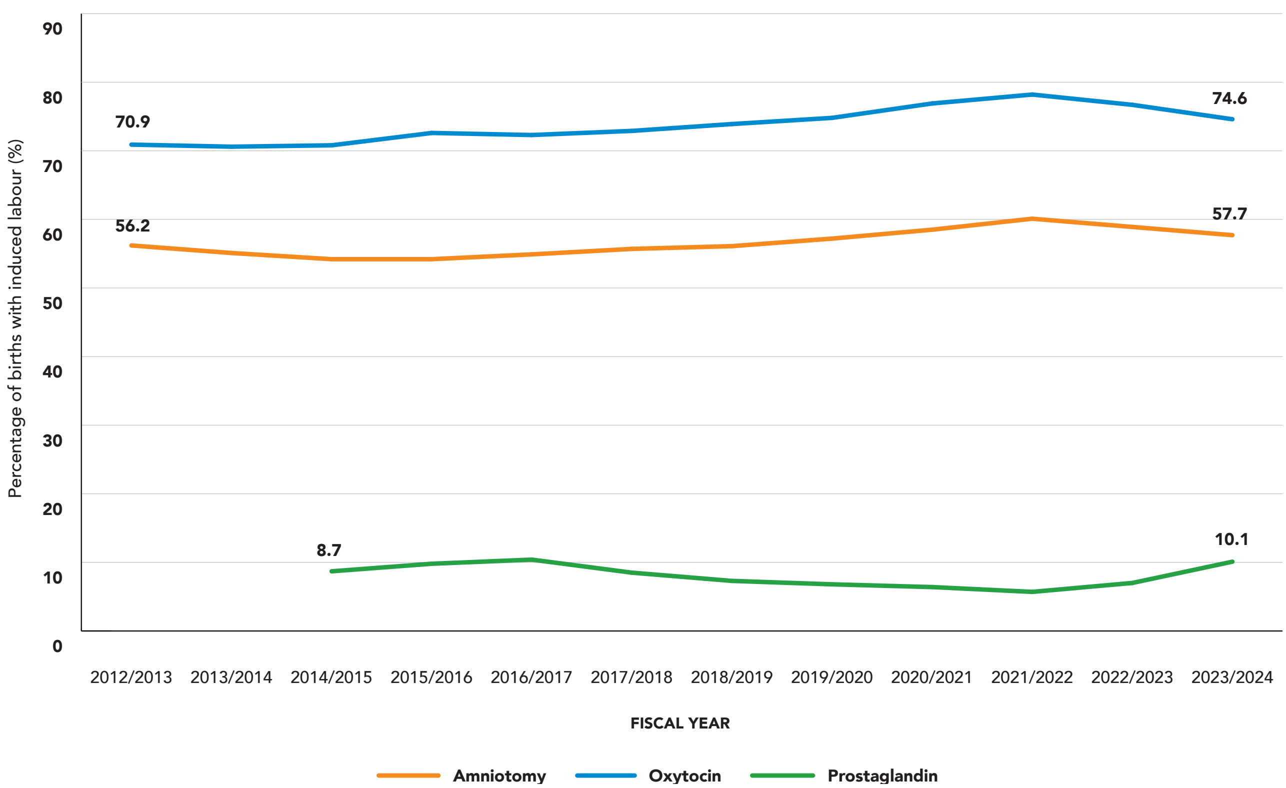
FIGURE 3.1.3

Prevalence of induction of labour methods, Ontario, 2012/2013 to 2023/2024

Summary of Figure 3.1.3

- Induction is performed to initiate labour when spontaneous labour has not yet occurred. The method and timing of induction have clinical practice variation and may pose risks to the pregnant individual or newborn.
- Among induced pregnancies, the methods used have remained fairly stable: 74.6% with oxytocin, 57.7% with amniotomy, and 10.1% with prostaglandin.
- The method of induction depends heavily on cervical 'ripeness'. Often, the cervix must be ripened before using oxytocin or amniotomy. As new induction methods (e.g., oral misoprostol) are shown to be safe and effective, the BIS will be updated to reflect these options. While oxytocin remains widely used, it is a high-alert medication with potential for harm and adverse events if not used properly. Resources for safe administration are available from the Provincial Council for Maternal and Child Health (PCMCH) Safe Administration of Oxytocin – PCMCH and the Society of Obstetricians and Gynaecologists of Canada (SOGC) Guideline No. 432c: Induction of Labour - Journal of Obstetrics and Gynaecology Canada.

To view an alternate to this graph see **Table 3.1.3** in Appendix A for a table option of data points.



Numerator: Method of induction (including amniotomy, oxytocin, and prostaglandin).
Denominator: All pregnancies with induced labour resulting in live or stillbirth that occurred in an Ontario hospital.

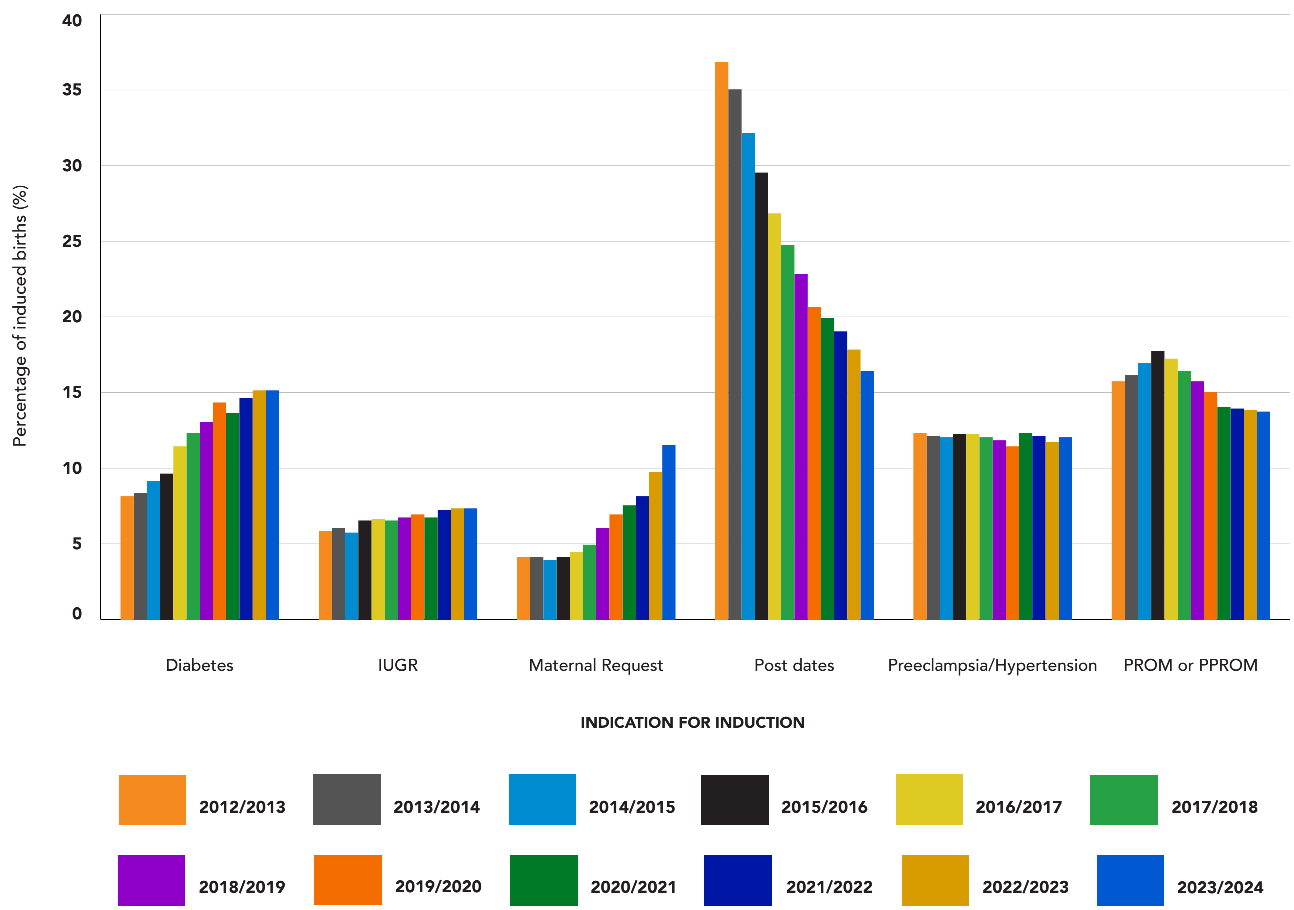
FIGURE 3.1.4

Prevalence of indications for induction of labour, Ontario, 2012/2013 to 2023/2024

Summary of Figure 3.1.4

- There are many indications to induce labour including pre-existing health conditions, pregnancy-related risks, or maternal request.
- Induction indications shifted: post-dates fell (36.8% → 16.4%), diabetes rose (8.1% → 15.1%), and maternal request increased (4.1% → 11.5%).
- Post-dates inductions fell after the 2012 BORN Maternal Newborn Dashboard tracking began; diabetes-related inductions rose with increasing obesity and diabetes among childbearing individuals.

To view an alternate to this graph see **Table 3.1.4** in Appendix A for a table option of data points.



Numerator: Indication for induction of labour (including diabetes, IUGR, maternal request, post dates, preeclampsia/hypertension, PROM or PPROM).
Denominator: All pregnancies with induced labour resulting in a live or stillbirth that occurred in Ontario hospitals.

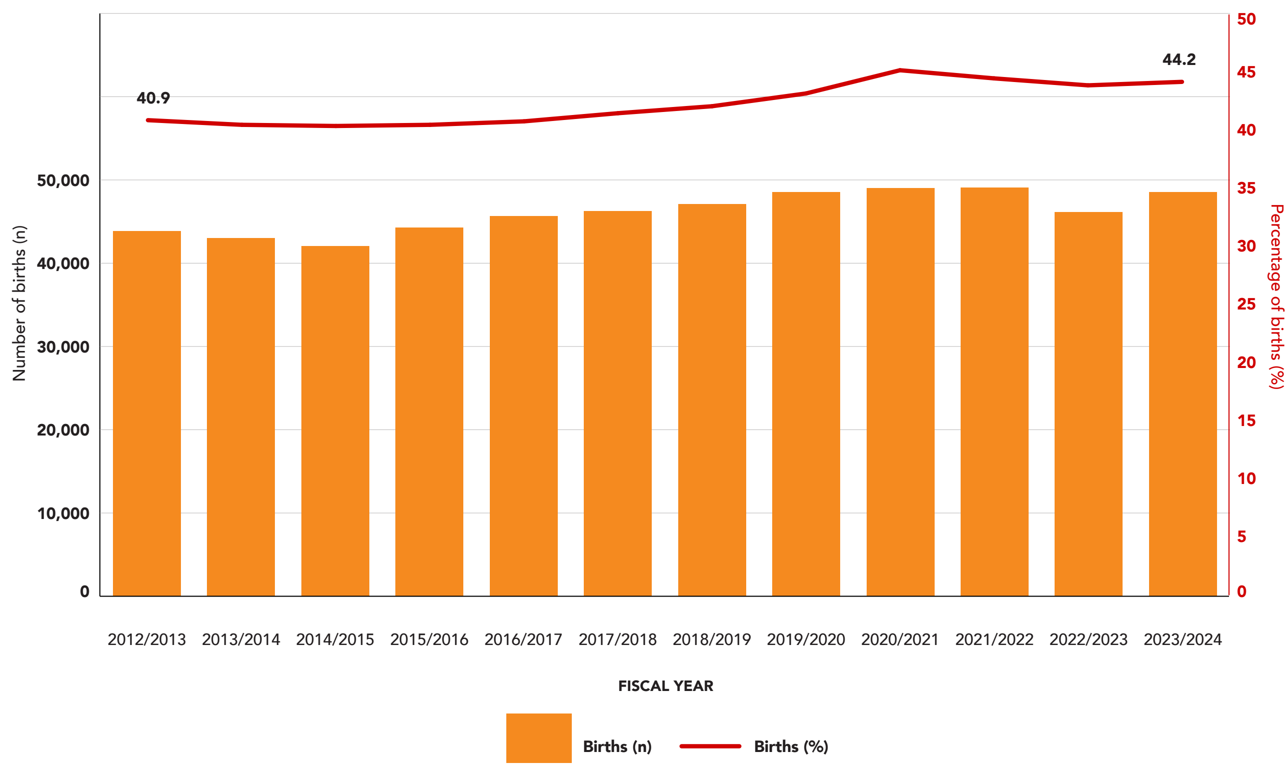
FIGURE 3.1.5

Prevalence of oxytocin use among those eligible for induction of labour, Ontario, 2012/2013 to 2023/2024

Summary of Figure 3.1.5

- Oxytocin is a high alert medication and carries considerable risks if used inappropriately including uterine hyperstimulation, fetal distress, and an increased likelihood of emergency interventions, such as cesarean delivery.
- The use of oxytocin for induction among eligible individuals has shown a slight increase over time, rising from 40.9% in 2012/2013 to 44.2% in 2023/2024, with a total of 48,528 pregnant individuals induced in 2023/2024.

To view an alternate to this graph see **Table 3.1.5** in Appendix A for a table option of data points.



Numerator: Pregnant individuals induced or augmented with oxytocin.
Denominator: All pregnancies resulting in a live or intrapartum stillbirth that occurred in Ontario hospitals that were eligible for oxytocin.

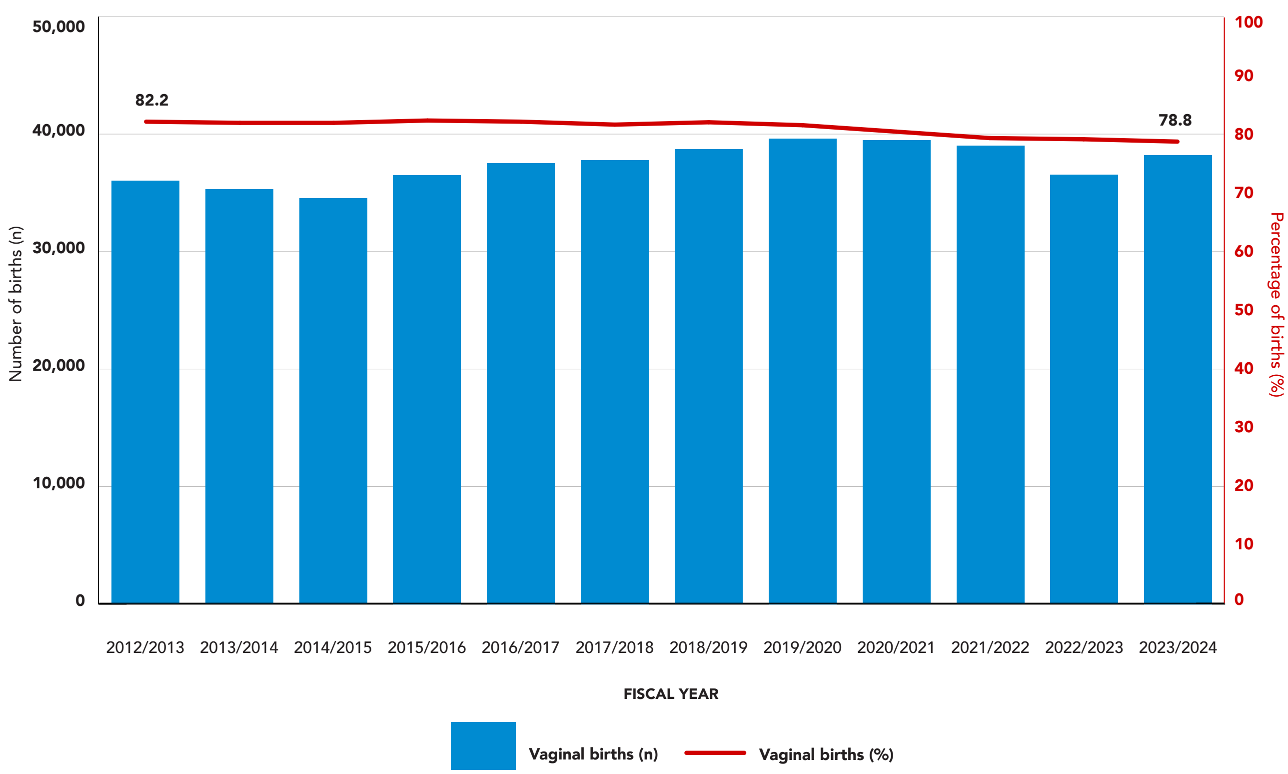
FIGURE 3.1.6

Prevalence of vaginal births among those induced with oxytocin, Ontario, 2012/2013 to 2023/2024

Summary of Figure 3.1.6

- Vaginal birth is an important outcome to measure when using oxytocin because it reflects effectiveness of the medication. Appropriate administration of oxytocin should ideally support a successful vaginal birth.
- The prevalence of vaginal birth among individuals induced with oxytocin has shown a slight decrease over time, falling from 82.2% in 2012/2013 to 78.8% in 2023/2024.
- In general, vaginal birth has been decreasing as cesarean birth rates have increased so it is not surprising to see the same trend reflected when oxytocin is used. Care providers have guidelines from the Provincial Council for Maternal and Child Health Safe Administration of Oxytocin – PCMCH to guide safe and effective use of oxytocin to promote vaginal birth.

To view an alternate to this graph see **Table 3.1.6** in Appendix A for a table option of data points.



Numerator: Pregnant individuals who had a vaginal birth.
Denominator: All pregnancies resulting in a live or intrapartum stillbirth that occurred in Ontario hospitals that were eligible for and who received oxytocin.

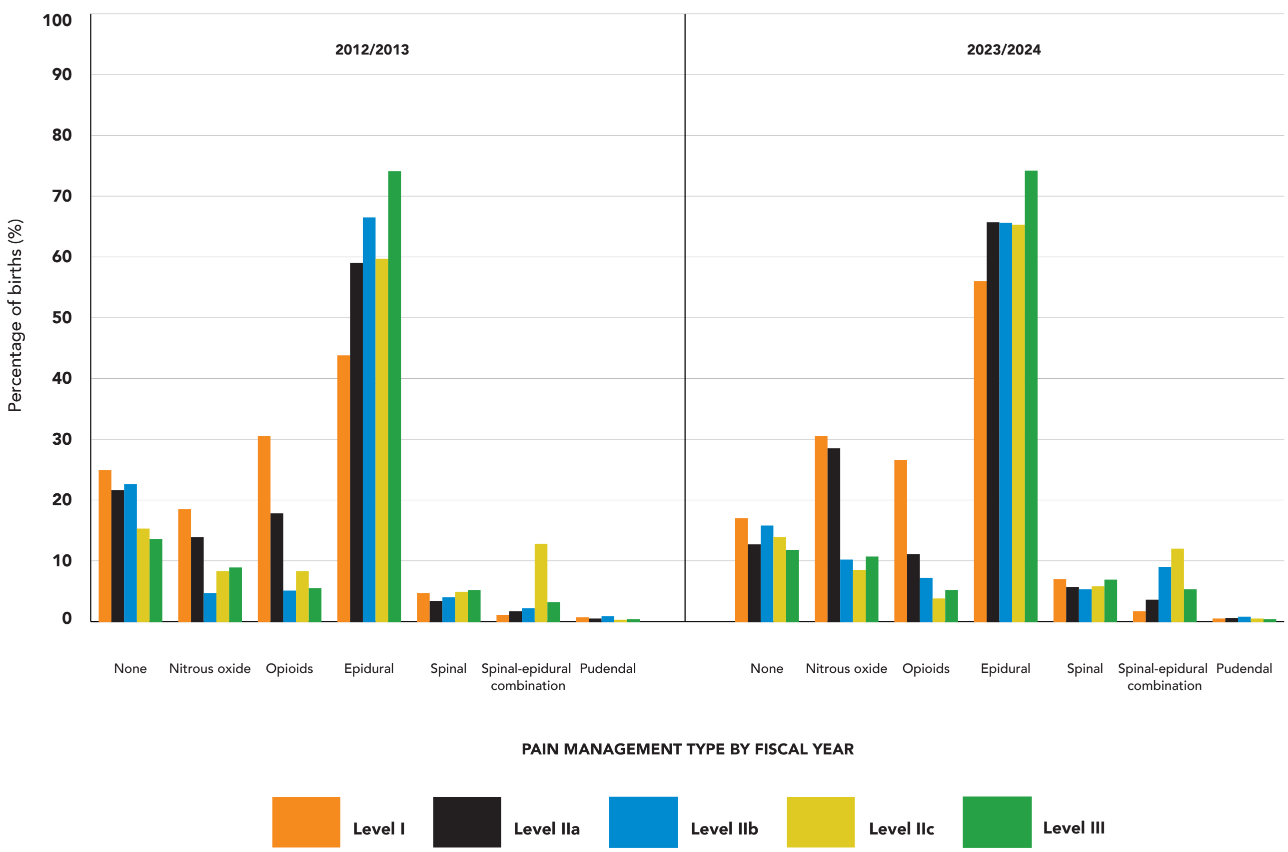
FIGURE 3.1.7A

Prevalence of pharmacologic pain management in labour among hospital births, Ontario, 2012/2013 compared to 2023/2024 by level of care and fiscal year

Summary of Figures 3.1.7A & 3.1.7B

- Over 75% of labouring individuals used pharmacologic pain relief throughout the reporting period, rising above 83% across all levels of care in 2023–2024. Level 1 and 3 hospitals saw a temporary dip in 2020–2021, likely due to COVID-19 care changes.
- Epidural analgesia in labour is the most predominant type of pain relief used in all level of care settings.
- Pain experiences are personal, influenced by factors such as tolerance, duration, expectations, support, past experiences, and physical state (e.g., fatigue, stress, illness). As all pharmacologic pain relief in labour carries side effects, evidence-based administration is essential, along with access to trained personnel and emergency resources.
- For further information on pharmacologic pain management, see **3.1.8** and **3.1.9** in Appendix A.

To view an alternate to this graph see **Table 3.1.7A** in Appendix A for a table option of data points.



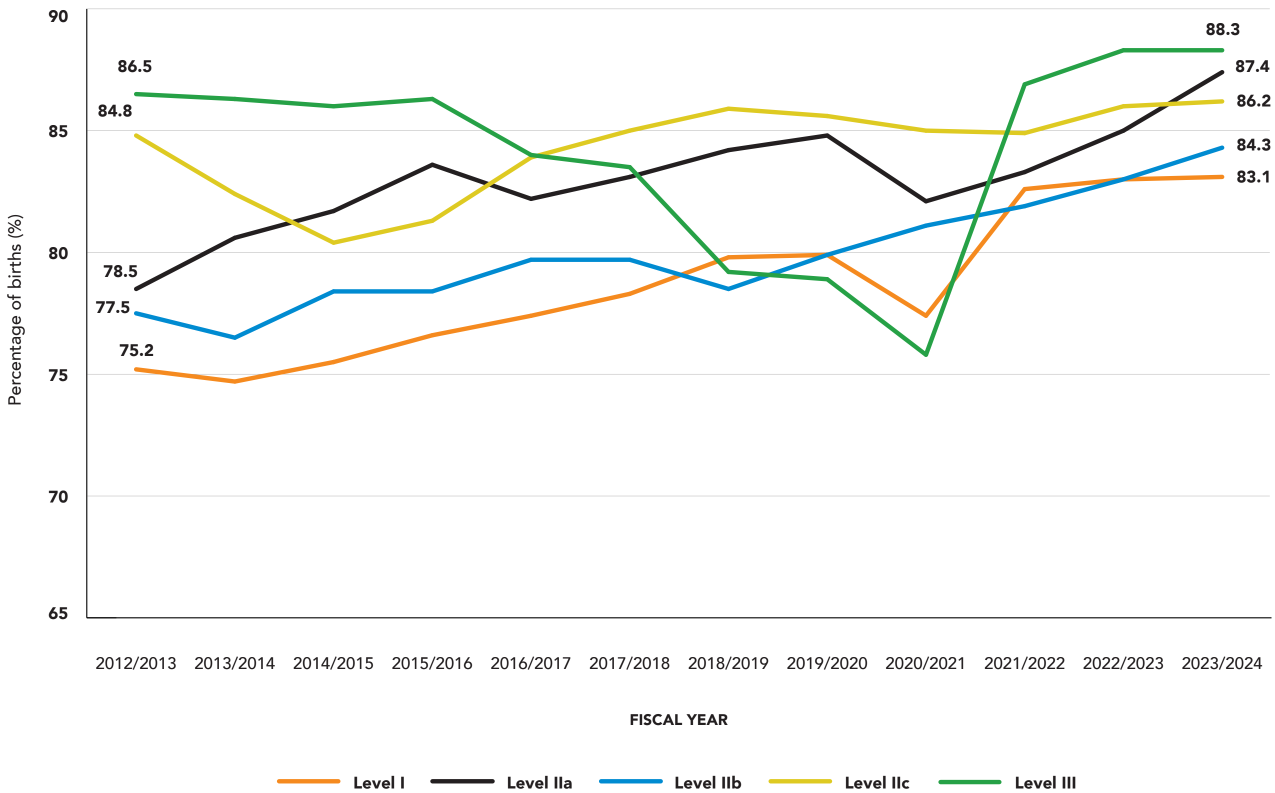
Numerator: Pharmacologic pain management type by hospital level of care.

Denominator: Pregnant individuals who laboured and had a live or stillbirth in hospital.

FIGURE 3.1.7B

Prevalence of any pharmacologic pain management in labour among hospital births, Ontario, 2012/2013 to 2023/2024 by level of care and fiscal year.

To view an alternate to this graph see [Table 3.1.7B] in Appendix A for a table option of data points.



Numerator: Use of any pharmacologic pain management by hospital level of care.
Denominator: Pregnant individuals who laboured and had a live or stillbirth in hospital.

3.2 BIRTH

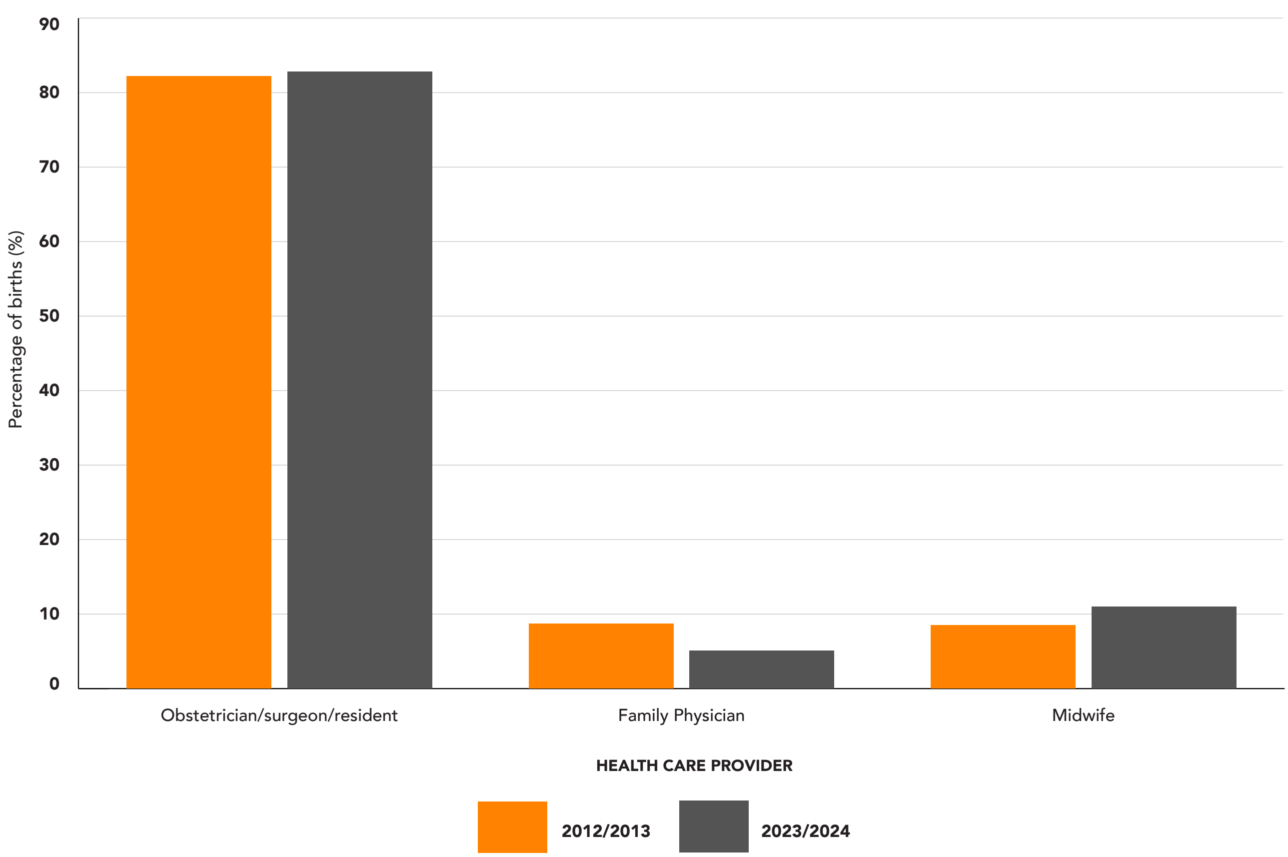
FIGURE 3.2.1

Distribution of health care provider type who delivered baby, Ontario, 2012/2013 compared to 2023/2024

Summary of Figure 3.2.1

- Obstetricians specialize in pregnancy and childbirth, including high-risk cases and cesarean births, while family physicians and midwives focus on low-risk pregnancies.
- Obstetricians attended 82.2% of births during the reporting period. Family physician involvement declined from 8.7% to 5.1%, while midwife-attended births rose from 8.5% to 11.0%.
- Differences in provider involvement reflect clinical risk, evolving care models, patient preferences, and availability of services often impacted by rurality. Midwifery care has expanded, while family physician participation has declined. Many view the current model as unsustainable, suggesting collaborative care could better align provider roles and responsibilities.

To view an alternate to this graph see **Table 3.2.1** in Appendix A for a table option of data points.



Numerator: Pregnancies delivered by each healthcare provider category.
Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

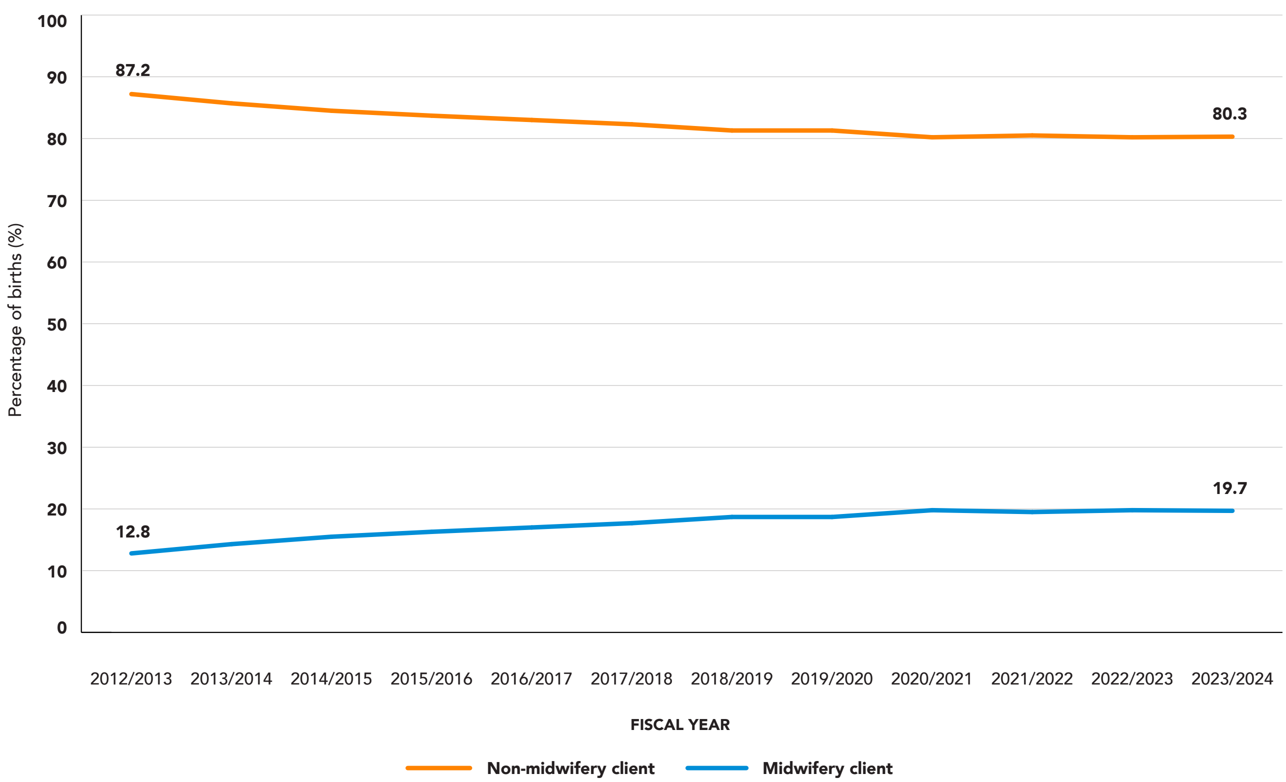
FIGURE 3.2.2

Distribution of births by midwifery client status, Ontario, 2012/2013 to 2023/2024

Summary of Figure 3.2.2

- Midwives in Ontario are funded by the Ministry of Health, and their services are free to residents. A billable course of care includes at least 12 weeks of perinatal care or having the baby delivered (referred to as "caught") by a midwife, with follow-up continuing up to six weeks postpartum.
- While the majority of pregnancies in Ontario are cared for by an obstetrician, there has been an increase in midwifery care involvement, from 12.8% in 2012/2013 to 19.7% in 2023/2024.
- Although 19.7% of births are to individuals in midwifery care, some clients develop risks requiring specialized care beyond midwifery scope, resulting in transition or transfer explaining the previous figure with 11% of births delivered by midwives.
- For further information on births by midwifery client status, see **3.2.14** in Appendix A.

To view an alternate to this graph see **Table 3.2.2** in Appendix A for a table option of data points.



Numerator: Births with a billable course of midwifery care.

Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

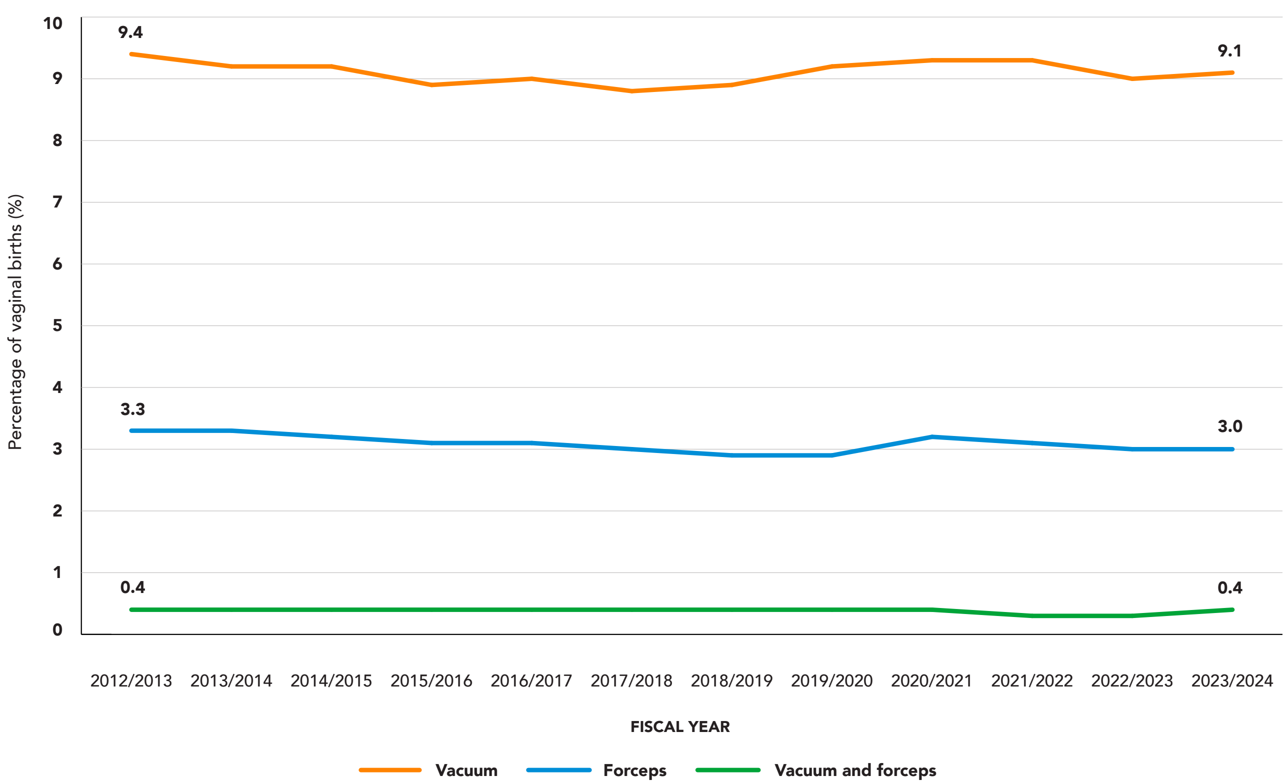
FIGURE 3.2.3

Prevalence of assisted vaginal birth, Ontario, 2012/2013 to 2023/2024 by type and fiscal year

Summary of Figure 3.2.3

- Assisted vaginal births involve the use of instruments to aid delivery when complications arise during labour such as prolonged second stage, fetal surveillance issues, maternal exhaustion, or fetal malposition.
- The prevalence of assisted vaginal births has remained stable over time, with 9.1% using vacuum, 3.0% using forceps, and 0.4% using both.
- Using two instruments (vacuum and forceps) to achieve a birth is not recommended due to the increased rate of trauma and this is still taking place in a small number of cases. There are several reasons this may occur and could be related to an emergency when cesarean birth is not immediately available. When used in a safe and appropriate manner, assisted vaginal birth can help reduce the need for cesarean birth. The skills needed to safely conduct an assisted vaginal birth should be reviewed and practiced regularly, ideally with an interdisciplinary team.
- For further information on assisted vaginal birth see **3.2.10** and **3.2.11**, and unassisted in **3.2.12** in Appendix A.

To view an alternate to this graph see **Table 3.2.3** in Appendix A for a table option of data points.



Numerator: Assisted vaginal births.
Denominator: All pregnancies resulting in a vaginal birth (live or stillbirth) that occurred in an Ontario hospital.

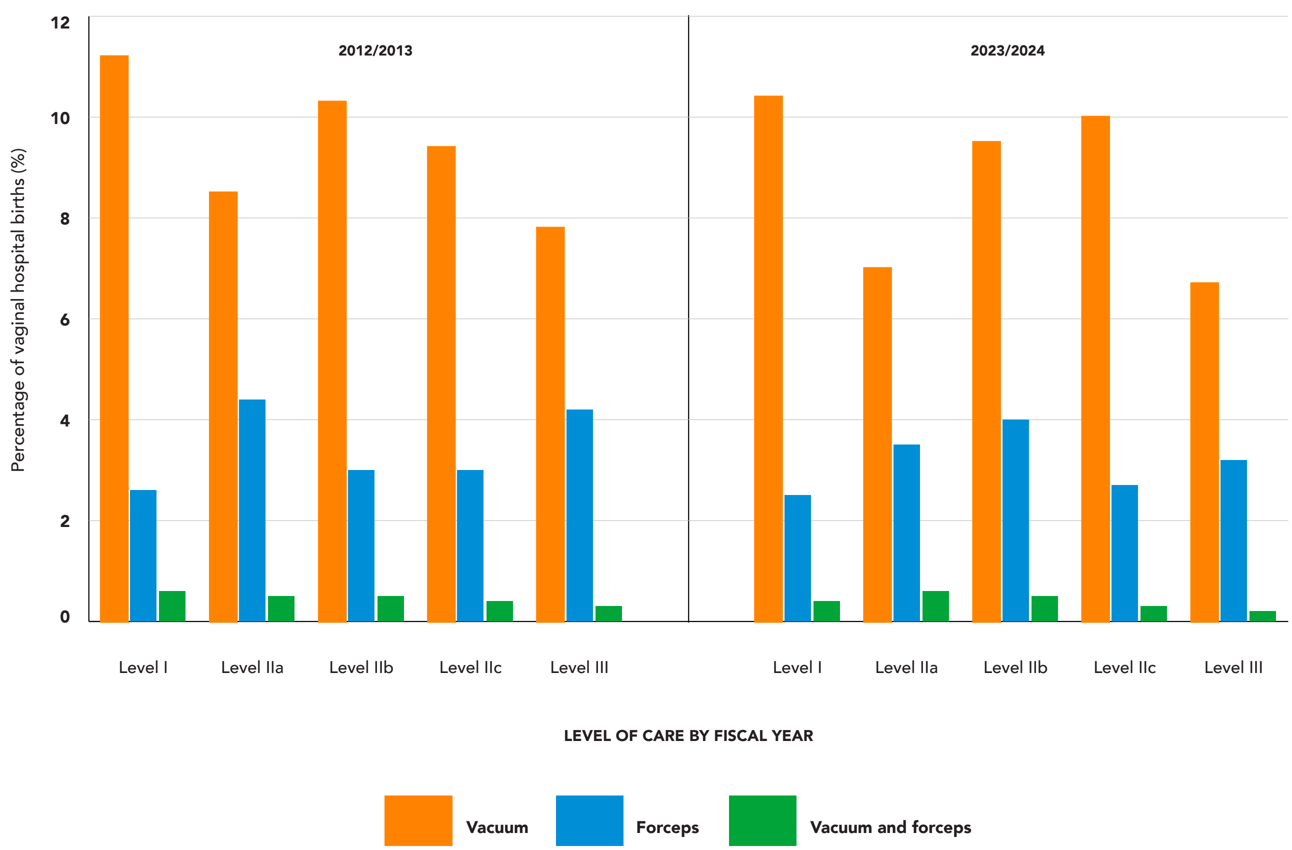
FIGURE 3.2.4

Prevalence of assisted vaginal birth, Ontario, 2012/2013 compared to 2023/2024

Summary of Figure 3.2.4

- Hospitals are categorized into different levels of care (LOC) according to the complexity and risk level of the pregnancies and newborns they are equipped and trained to manage safely. It follows a gradient, where Level I can manage lower risk pregnancies and Level III highest risk pregnancies. Please refer to the **Glossary** for a full description on LOC.
- In 2023/2024, vacuum-assisted vaginal births were the most common across all LOC, highest in Level I (10.4%) and lowest in Level III (6.7%). Forceps-assisted vaginal births were highest in Level IIb (4.0%) and lowest in Level I (2.5%).
- Preference for type of instrument is highly dependent on the training of the individual conducting the delivery. Those who trained with forceps tend to use them more often and the same is true for vacuum. Vacuum and forceps are associated with different short- and long-term benefits and risks. Unsuccessful vaginal delivery is more likely with vacuum than forceps.

To view an alternate to this graph see **Table 3.2.4** in Appendix A for a table option of data points.



Numerator: Assisted vaginal hospital births by assistance type, level of care and fiscal year.
Denominator: All pregnancies resulting in a live or still vaginal birth that occurred in an Ontario hospital.

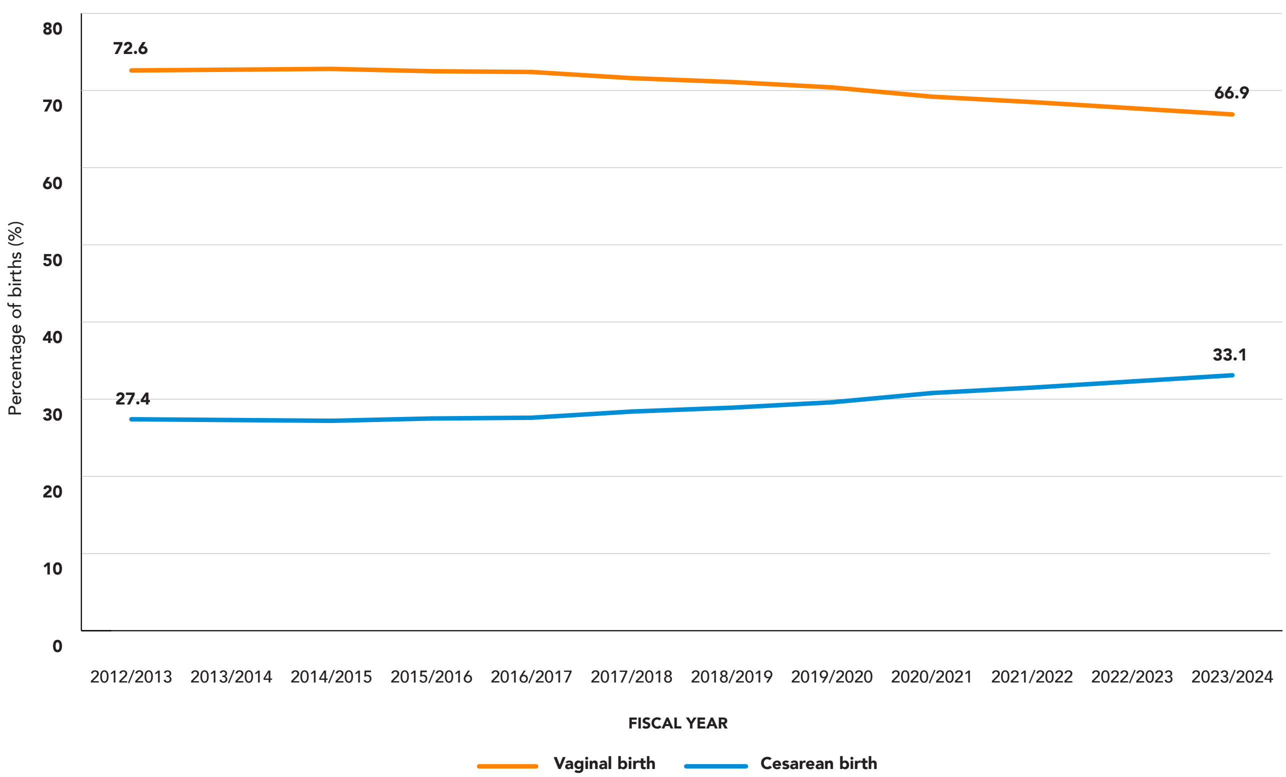
FIGURE 3.2.5

Distribution of birth type, Ontario, 2012/2013 to 2023/2024

Summary of Figure 3.2.5

- Assessing birth type patterns at the population level is important to reflect changes in the presenting population, monitor trends, examine outcomes associated with birth type and set improvement goals.
- The prevalence of cesarean birth has increased from 27.4% in 2012/2013 to 33.1% in 2023/2024, while vaginal birth has decreased.
- Ontario is consistent with the Canadian trend of rising cesarean birth rates. However, the rate alone is not particularly meaningful, other than to help hospitals and health planners/funders determine what resources they will require. More meaningful is to learn about what is driving the increase in rates and determine if anything can be to safely reduce the rate, and/or learn what resources are needed at home and in the community to properly support those having this surgery, especially when needing to care for a newborn at home.

To view an alternate to this graph see **Table 3.2.5** in Appendix A for a table option of data points.



Numerator: Cesarean births.
Denominator: All pregnancies resulting in a live or stillbirth in Ontario.

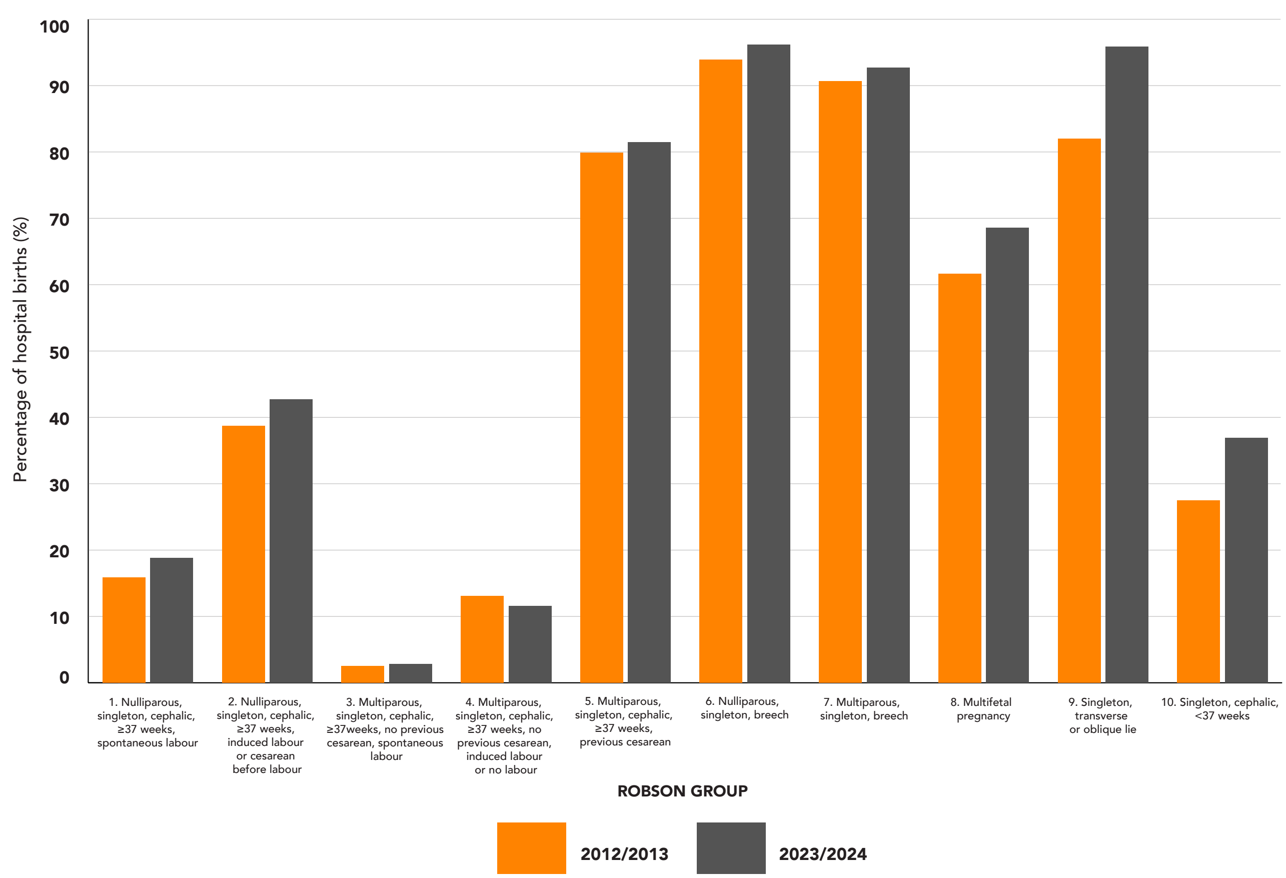
FIGURE 3.2.6

Prevalence of cesarean births among hospital births, Ontario, 2012/2013 compared to 2023/2024 by Robson group and fiscal year

Summary of Figure 3.2.6

- Robson classification groups obstetric patients into 10 categories based on factors such as parity, previous cesarean, fetal presentation, and gestational age [see Glossary].
- Cesarean rates have risen across most groups since 2012/13, notably in Groups 5 (79.9% → 81.5%), 2 (38.7% → 42.7%), and 1 (15.9% → 18.8%), highlighting opportunities to reduce unnecessary procedures through VBAC promotion, limiting elective inductions, and improving induction methods.
- Cesarean remains near-universal for breech; VBAC uptake remains low. Routine use of Robson criteria can guide tailored approaches to improve care and reduce unnecessary cesareans.

To view an alternate to this graph see Table 3.2.6 in Appendix A for a table option of data points.



Numerator: Cesarean births in each Robson group.
Denominator: All pregnancies resulting in a live or stillbirth that occurred in an Ontario hospital and could be assigned a Robson group.

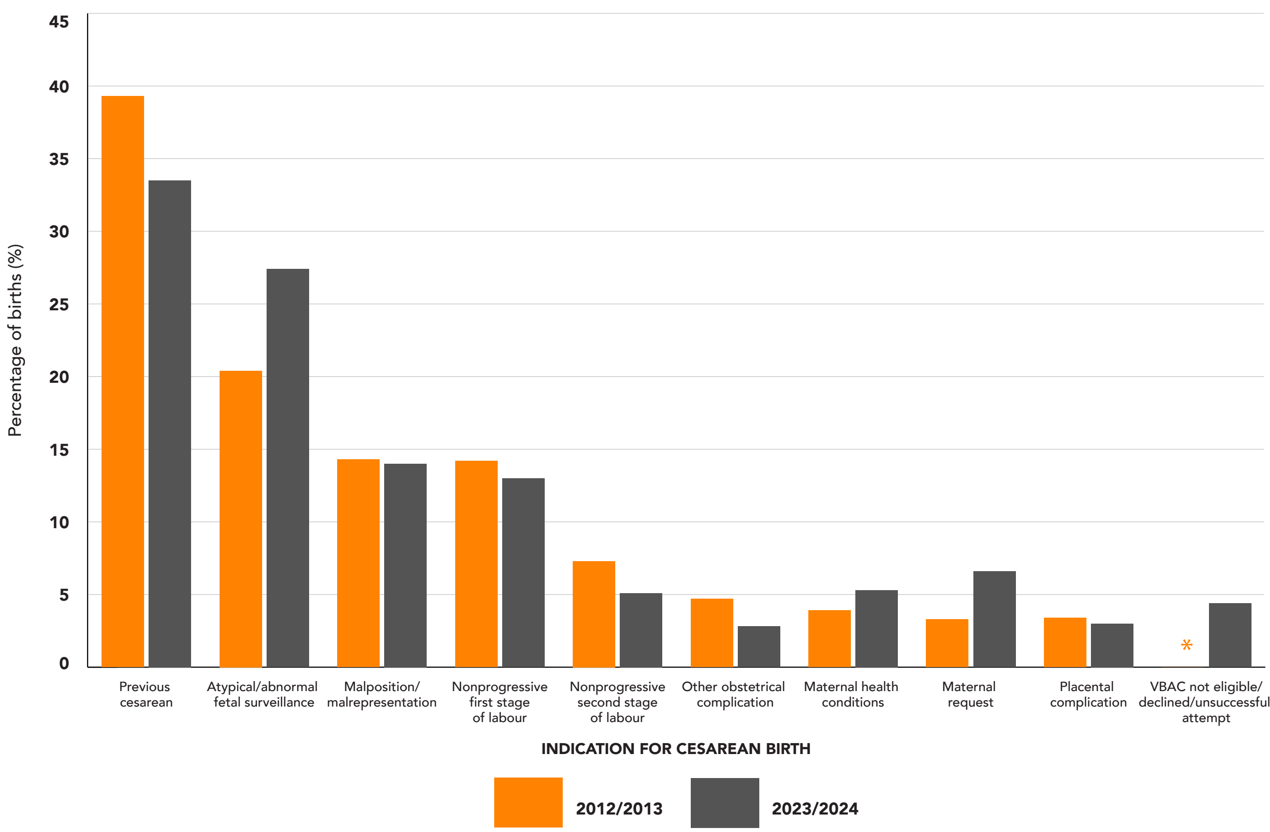
FIGURE 3.2.7

Prevalence of indications for cesarean birth, Ontario, 2012/2013 compared to 2023/2024

Summary of Figure 3.2.7

- As the prevalence of cesarean birth has increased over time, it is important to understand shifts in the presenting population and indications for cesarean birth.
- The patterns of indications for cesarean birth have varied over time. Previous cesarean remains the leading reason, though it has declined from 39.3% to 33.5% over ten years. Atypical/abnormal fetal surveillance rose from 20.4% to 27.4%, and maternal request increased from 3.3% to 6.6%.
- About 45% of cesarean births are linked to labour issues like abnormal fetal surveillance or non-progressive labour. There are clinical practice guidelines to support care during labour and monitoring. Using the BIS, Ontario hospitals can track labour practices (e.g., oxytocin use, supportive care, dystocia management) to identify areas for improvement.
- For further information on repeat cesarean birth, see **3.2.15** in Appendix A.

To view an alternate to this graph see **Table 3.2.7** in Appendix A for a table option of data points.



Numerator: Indications for cesarean delivery.
Denominator: All pregnancies resulting in a live or still cesarean birth that occurred in an Ontario hospital.

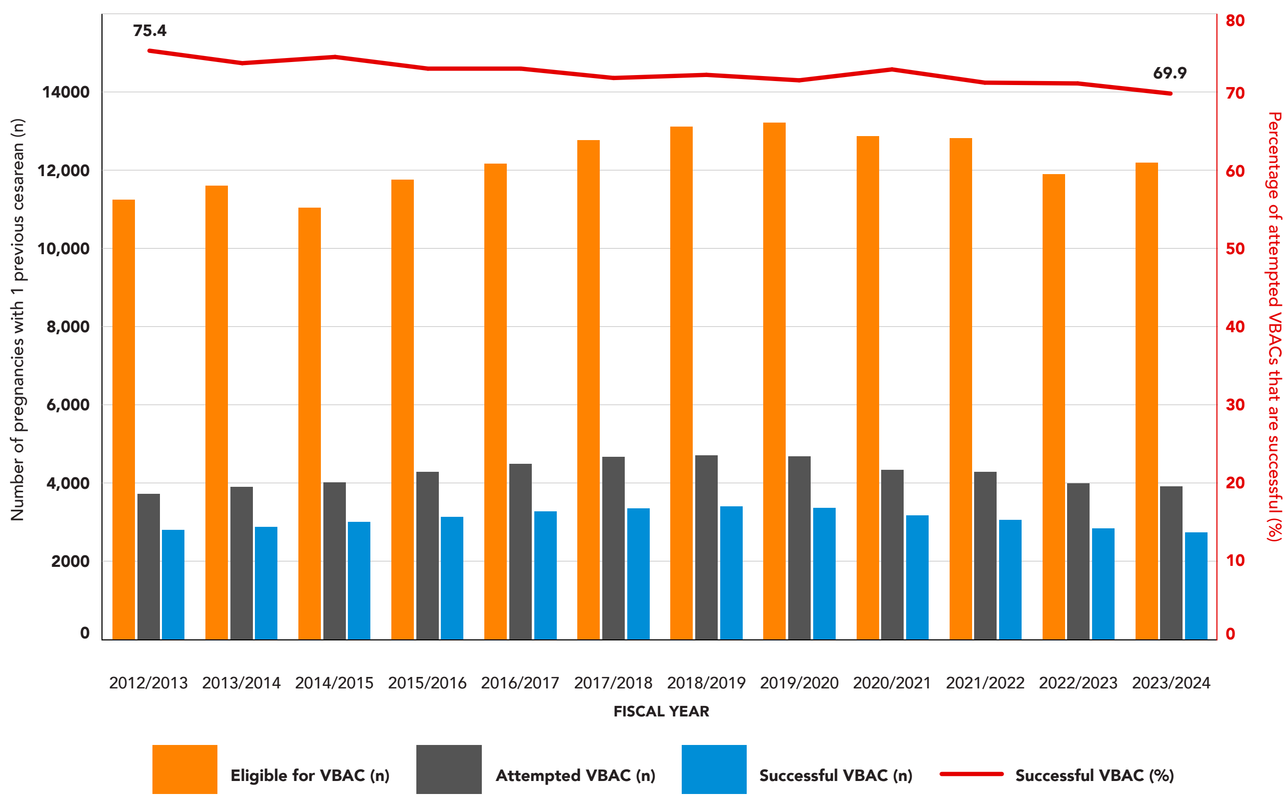
FIGURE 3.2.8

Frequency of vaginal birth after cesarean (VBAC), Ontario, 2012/2013 compared to 2023/2024 by VBAC status and fiscal year

Summary of Figure 3.2.8

- VBAC allows a pregnant individual to minimize the risks associated with a cesarean, including infection, blood loss, extended recovery time, and surgical scars to the uterus.
- Although nearly 60% of individuals with a prior cesarean birth are eligible for VBAC, many do not even attempt a VBAC. Success rates for people attempting VBAC are approximately 70%.
- Deciding to attempt a VBAC is a personal decision that needs to be guided by accurate and timely data about success rates and complications and hospital resources to support VBAC. Care providers in Ontario have resources from SOGC, AOM, and PCMCH among others to summarize the evidence and provide evidence-based resources to assist in shared decision making with pregnant individuals. Only around 30% of eligible individuals attempt a VBAC. There are many perceived and actual barriers to supporting pregnant individuals in attempting a VBAC.

To view an alternate to this graph see **Table 3.2.8** in Appendix A for a table option of data points.



Numerator: Pregnancies in each VBAC group.
Denominator: All pregnancies resulting in a live birth that occurred in an Ontario hospital to an individual with one previous cesarean birth.

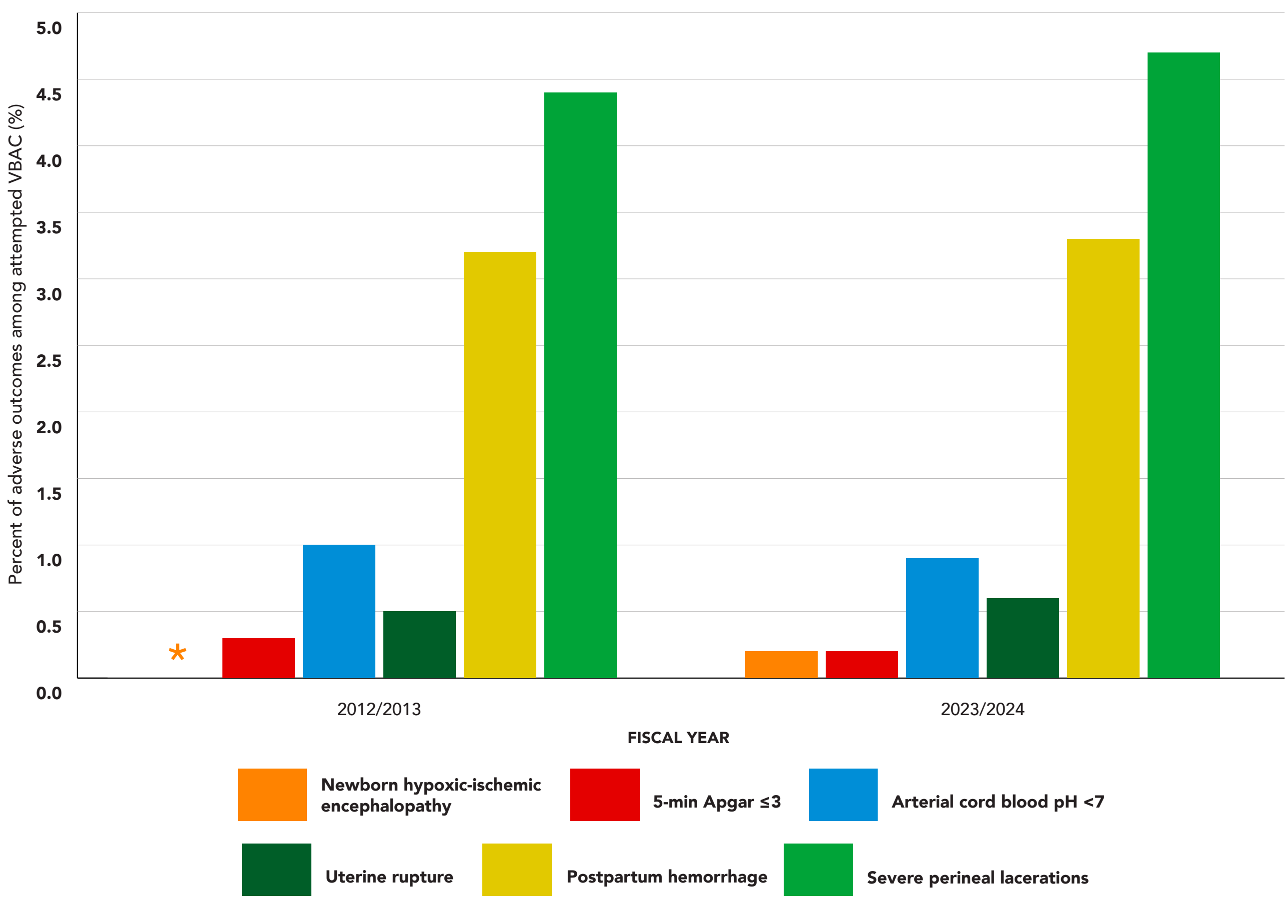
FIGURE 3.2.9

Prevalence of adverse outcomes among attempted vaginal birth after cesarean (VBAC), Ontario, 2012/2013 to 2023/2024

Summary of Figure 3.2.9

- Adverse neonatal outcomes for VBAC remain low: in 2023/24, hypoxic-ischemic encephalopathy (HIE) and 5-minute Apgar ≤3 were 0.2%, and cord pH ≤7 was 0.9%.
- Adverse maternal outcomes are stable over time: uterine rupture occurred in 0.6%, severe perineal lacerations in 4.7%, and postpartum hemorrhage in 3.3%.
- Low and stable adverse outcome rates among individuals with one prior cesarean support VBAC as a safe option. In 2023/24, HIE (0.2%), low Apgar (0.2%), and cord pH ≤7 (0.9%) were comparable to the general population, as were severe perineal lacerations (4.7%). These trends reinforce evidence-based counselling, informed decision-making, and resource planning, while ongoing training and vigilant management remain essential for safe VBAC practices.

To view an alternate to this graph see Table 3.2.9 in Appendix A for a table option of data points.



Numerator: Births with adverse outcomes.

Denominator: All pregnancies resulting in a live birth that occurred in an Ontario hospital to an individual with one previous cesarean birth who was eligible for and attempted a VBAC.

4.0 COMPLICATIONS OF LABOUR, BIRTH, AND POSTPARTUM

Monitoring rates of complications during the labour, birth, or postpartum periods is essential for quality-of-care assessments and to ensure there are appropriate resources and policies in place to manage these complications. This might involve transfer to another setting, involvement of specialists, and the ability to rapidly access help, including the availability of an emergency paging code or emergency supply cart. Since emergencies can happen at any time, every member of the team should be empowered to problem-solve and escalate the response as needed.

INTRODUCTION

ACOG has outlined measures which may reduce or prevent the severity of emergencies:

- establish early warning systems
- designate specialized first responders
- conduct emergency drills
- debrief teams after actual events to identify strengths and opportunities for improvement (*Committee on Patient Safety and Quality Improvement, 2018*).

Similar points were emphasized by the Ontario Coroner's Maternal and Perinatal Death Review Committee in their latest report (*Maternal and Perinatal Death Review Committee, 2020*).

Although we report on seven complications in this chapter, abnormal fetal heart rate surveillance, shoulder dystocia and postpartum hemorrhage within the first hour are complications that demand an immediate response to prevent the potential cascade of events leading to more serious morbidity and even mortality for the maternal-newborn dyad. The SOGC has clinical practice guidelines for each of these with specific algorithms to guide care.

While the rates of these complications have been fairly stable over the reporting period, we know that obstetric hemorrhage is the most common cause of pregnancy-related death in Ontario and thus requires thorough assessment and a rapid response (*Sprague et al., 2024*). There have been several quality improvement programs published where obstetric hemorrhage outcomes have been improved by implementing standardized triggers and team-based responses to hemorrhage (*Gallos et al., 2023*). The California Collaborative and others have used the 4-R approach, which includes Readiness, Recognition, Response and Reporting to guide improvements. The SOGC adapted this model and now has a 6-R approach including: Risk Assessment, Risk Reduction, Recognize and Reevaluate, React, Resuscitate, and Review. The comprehensive SOGC guideline should be reviewed by all providers, and the best practice recommendations discussed and implemented as the standard of care. These include:

- a risk assessment for every patient, including calculation of the maximum allowable blood loss
- a standardized approach for collecting, weighing, and reporting blood loss
- stage-based management strategies, including protocols specifically designed for massive blood loss
- 'hemorrhage carts' for storing medications and supplies
- regular multidisciplinary staff training and simulation
- debriefing with formal review of adverse events (*Robinson et al., 2022*).

Similarly, a systematic approach is also recommended for managing shoulder dystocia – another time-critical complication. While there are some known risk factors, unfortunately, this complication is still largely unpredictable, which makes it vital that a standardized approach is undertaken when this occurs (Davis et al., 2023). Regardless of the specific approach or mnemonic for managing a shoulder dystocia (ALARMER, HELPERR, BECALM), other key elements to the response include announcing the suspicion of shoulder dystocia to the obstetrical team so they can assume their roles, tracking and communicating the elapsed time between delivery time of the fetal head and the rest of the baby, and ensuring a full assessment of the mother and newborn post birth to look for potential injuries associated with the shoulder dystocia (*Davis et al., 2023*).

Third and fourth-degree perineal lacerations involve damage to the anal sphincter and can be associated with short and longer-term morbidity. OASIS is the term that describes this complication (Obstetrical Anal Sphincter Injuries). About 4.5% of individuals having a vaginal birth in a hospital setting in Ontario in 2023-2024 experienced this complication (4.1% had a third-degree and 0.4% had a fourth-degree laceration). Without proper assessment and repair, these injuries can lead to anal incontinence, recto-vaginal fistulas and pain (*Globerman et al., 2024*). The SOGC *guideline* discusses best practice recommendations for preventing OASIS, repairs, postoperative management and longer-term outcomes. In some centres in Canada, specialized OASIS clinics have been implemented, recognizing the importance of long-term monitoring and care for individuals who have experienced this complication.

In summary, the labour, birth and postpartum complications described in this chapter can have both short and long-term physical and psychological consequences. The Canadian Family Centred Maternity and Newborn Care *Guidelines* (*Moola et al., 2018*) discuss the challenges some individuals face in coming to terms with an obstetric emergency or unexpected interventions required during labour and birth. Conversations at the time of events, and again later when the individuals are ready to discuss what happened, can help with resolution (*Moola et al., 2018*). Good documentation of the event (s) will help care providers discuss the possibility of recurrence with subsequent pregnancies. Care providers can also benefit from debriefing following emergencies or adverse events to both give and receive support about the difficult situation and learn what was done well and what could be done differently in the future.

4.1 LACERATIONS

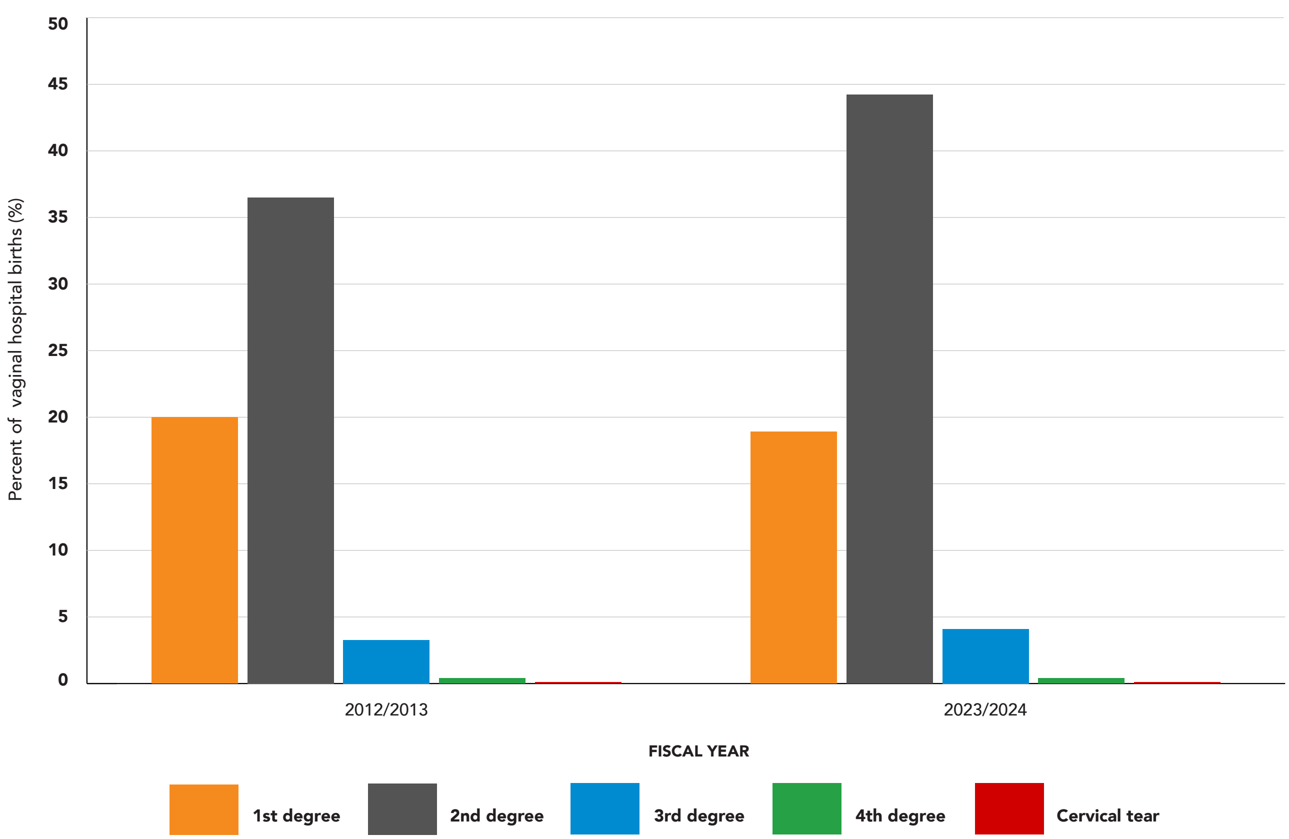
FIGURE 4.1.1

Prevalence of perineal laceration type among vaginal hospital births, Ontario, 2012/2013 compared to 2023/2024

Summary of Figure 4.1.1

- Perineal lacerations are common during vaginal birth and range from minor first-degree (skin only) to severe fourth-degree (anal sphincter).
- Second-degree tears, involving perineal muscles, increased from 36.5% (2012/13) to 44.2% (2023/24), while other tear types remained stable. Causes are unclear; assisted birth rates which can be linked to tearing are unchanged, and episiotomy — linked to severe tears — has declined.
- Standardized nomenclature and measurement is important in continuity of care. The 2024 SOGC Guideline No. 457 provides evidence-based recommendations for prevention, recognition, and management of obstetrical anal sphincter injuries. Guideline No. 457: Obstetrical Anal Sphincter Injuries (OASIS) Part I: Prevention, Recognition, and Immediate Management - Journal of Obstetrics and Gynaecology Canada.

To view an alternate to this graph see **Table 4.1.1** in Appendix A for a table option of data points.



Numerator: Births with each perineal laceration category.

Denominator: Pregnancies resulting in a vaginal live or stillbirth in hospitals.

4.2 OTHER COMPLICATIONS

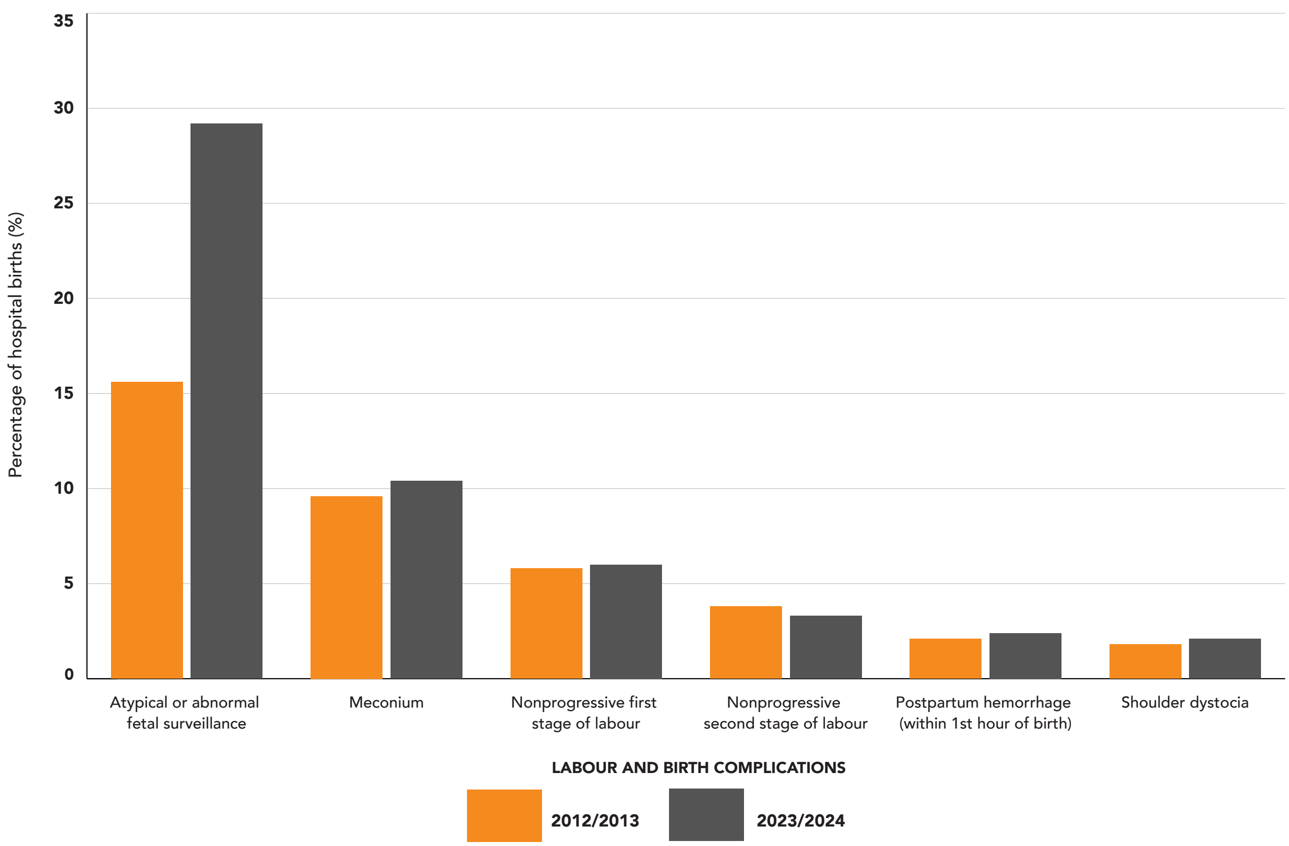
FIGURE 4.2.1

Prevalence of labour and birth complications, Ontario, 2012/2013 compared to 2023/2024

Summary of Figure 4.2.1

- Labour and birth complications are key indicators of quality care. Clinical guidelines are available, and hospitals can review their practices to ensure they align with these recommendations.
- The most common complication is atypical or abnormal fetal surveillance, which has increased from 15.6% in 2012/2013 to 29.2% in 2023/2024. Other complications, like the presence of meconium (10.4%), and stalled labour in the first (6.0%) or second stage (3.3%), have remained stable.
- Abnormal fetal surveillance often leads to unexpected or emergency cesarean births. With cesarean rates also rising, poor fetal surveillance may be a contributing factor. Clinical reports in the BORN Information System (BIS) support regular monitoring and are useful tools when implementing quality improvement (QI) strategies.

To view an alternate to this graph see Table 4.2.1 in Appendix A for a table option of data points.



Numerator: Births resulting in labour and birth complications.
Denominator: Pregnancies resulting in a live or stillbirth.

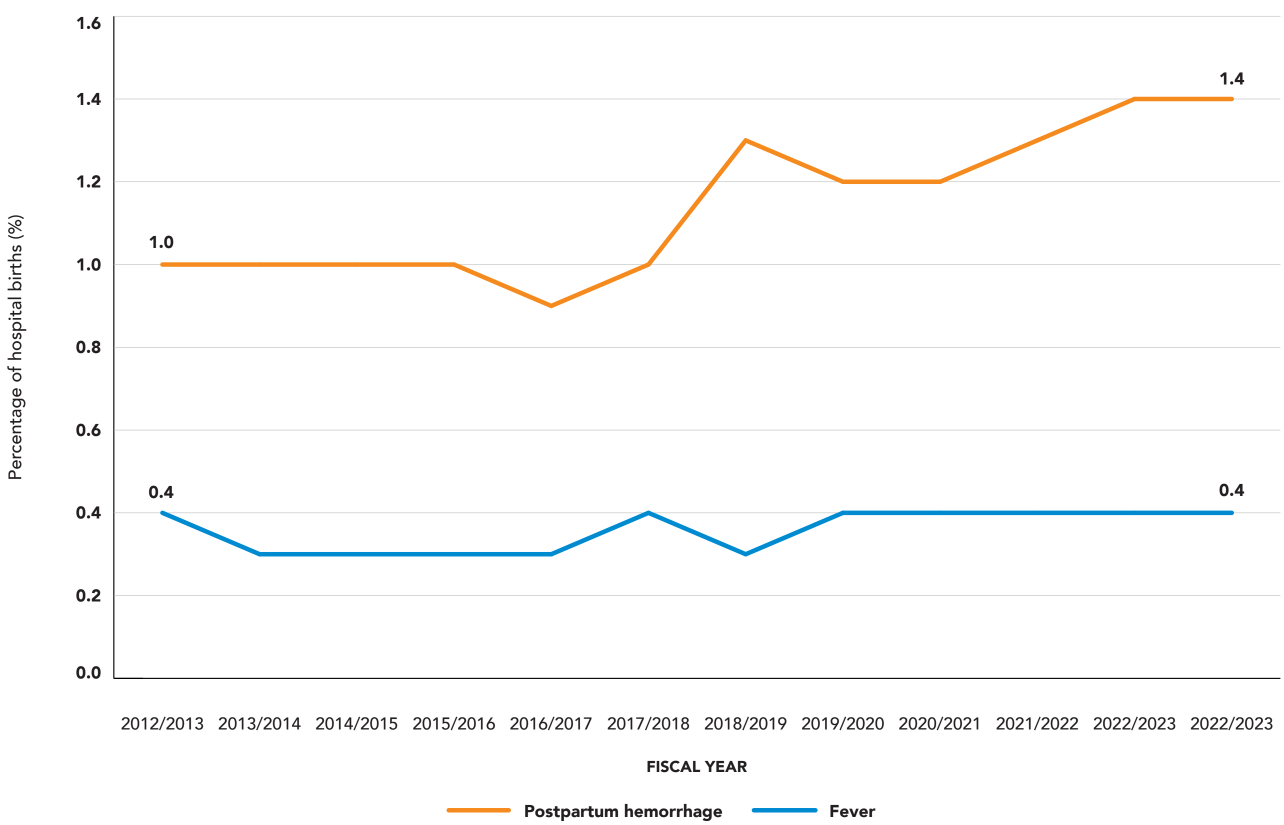
FIGURE 4.2.2

Prevalence of postpartum complications, Ontario, 2012/2013 to 2023/2024

Summary of Figure 4.2.2

- Postpartum complications are important to monitor as quality-of-care indicators.
- The prevalence of postpartum hemorrhage has increased from 1.0% in 2012/2013 to 1.4% in 2023/2024, while maternal fever has remained constant at 0.4% during the same time period.
- Obstetrical hemorrhage and sepsis are important causes of morbidity and mortality in Ontario and need to be carefully tracked and documented. While postpartum fever is not always indicative of sepsis, it is a potential early warning sign and needs to be investigated. These two events have been highlighted in recent publications by the Ontario Maternal and Perinatal Death Review Committee and by an overview of maternal death by BORN Ontario. Guidelines on the prevention and management of postpartum hemorrhage exist and hospitals can audit cases to determine if they have followed the recommendations to prevent further morbidity. It is important to carefully document all cases of hemorrhage to help understand antecedent factors that may be associated with blood loss.

To view an alternate to this graph see **Table 4.2.2** in Appendix A for a table option of data points.



Numerator: Births resulting in postpartum complications including postpartum hemorrhage and fever.
Denominator: Pregnancies resulting in a live or stillbirth.

5.0 BIRTH AND NEWBORN OUTCOMES

Factors Related to Birth and Newborn Outcomes

This chapter focuses on birth and newborn outcomes and highlights areas where improvements may be needed. Many factors including maternal health and behaviours, socioeconomic conditions, access to quality healthcare, and healthcare system interventions can impact birth and newborn outcomes.

INTRODUCTION

Maternal Health and Behaviours: Diabetes, hypertension, obesity or being underweight can significantly impact pregnancy and birth outcomes. Pregnant individuals with these conditions are at higher risk for complications such as preterm birth, gestational diabetes, preeclampsia and increased health service utilization. **Advanced ag**e (35 years and older) is associated with increased risks of chromosomal abnormalities, preterm birth, low birth weight and complications during delivery. **Smoking, alcohol consumption, and substance use during pregnancy** are detrimental to fetal development and can lead to adverse outcomes such as low birth weight, preterm birth, and congenital anomalies. **Maternal mental health concerns** during pregnancy can also impact the health and development of the child and are a risk factor for preterm birth and low birthweight (*Currie et al., 2021, 2024; Graafland et al., 2025; Muglia et al., 2022; Voit et al., 2022*).

Socioeconomic Conditions: Poor socioeconomic conditions are often associated with higher risks of adverse outcomes. **Higher income and education levels, stable housing and access to nutritious food** are fundamental for a healthy pregnancy as these factors influence access to healthcare, nutrition, and overall health literacy. Inadequate housing and food insecurity can lead to stress and poor nutritional status, adversely affecting birth and newborn outcomes (*Campbell et al., 2018; Miao et al., 2021, 2022, 2023*).

Access to Quality Healthcare: Regular prenatal visits are essential for monitoring the health of both the mother and the fetus, identifying and managing potential complications early, and helping families prepare for the birth and postpartum. *Access to quality healthcare services and the availability of specialized care units*, such as NICU, and trained healthcare professionals are critical for managing high-risk pregnancies and providing immediate care to newborns with complications. The availability and quality of prenatal, intrapartum and postpartum care are vital. Hospitals and healthcare providers' adherence to best practices and guidelines can influence outcomes (*Ladak et al., 2024; Simpson et al., 2024; Solnes Miltenburg et al., 2017*). **Lack of equitable access to quality healthcare** because of location, language, or other barriers can contribute to poor birth outcomes. Differences in health behaviours and healthcare utilization can be observed across different ethnic groups. New immigrants may face language and cultural barriers that can impact their access to and utilization of healthcare services. Other barriers to equity in prenatal care include travel and financial burdens, culturally insensitive practices that deter care engagement and continuity, and discriminatory behaviour that reduces care access and satisfaction (*Ladak et al., 2024; Miranda et al., 2009*). The availability of healthcare resources, healthcare services' consideration of socio-economic or lifestyle barriers to health, and the impact of colonization on interactions with healthcare providers influence Indigenous women's maternal health experiences. Medical evacuation, often due to limited availability of maternity care resources in remote communities, is associated with emotional, physical, and financial stress (*Kolahdooz et al., 2016*).

SUMMARY OF TRENDS IN BIRTH AND NEWBORN OUTCOMES IN ONTARIO

Although most newborns in Ontario are born full-term, of normal birthweight, and without complications, there are a significant number of high-risk births (multiple births, small or large-for-gestational age (SGA, LGA), preterm births, or newborns with congenital anomalies or complications at birth) that require immediate stabilization and specialized care in NICU, and possibly ongoing care post-discharge. The number of preterm births in hospitals not equipped to provide necessary advanced care for these at-risk neonates has decreased but there is still room for improvement for optimal outcomes

Ensuring that preterm infants are born in facilities equipped to meet their needs can significantly reduce the risk of long-term health issues and the need to transport neonates to a higher level of carestress associated with neonatal transport. The Provincial Council of for Maternal and Child Health (PCMCH) guidelines and the Critical Care Services Ontario (CCSO) NICU Guidance Documents outline the personnel and equipment necessary to support newborns at different gestational ages (Critical Care Services Ontario (CCSO), 2021; *Provincial Council of for Maternal and Child Health (PCMCH), 2023).*

Stillbirth rates remain consistent, around 4.5 to 4.9 per 1000 births. Monitoring stillbirth rates is essential for assessing the quality of prenatal care and developing prevention strategies. Policies should emphasize standardized protocols for fetal growth monitoring, routine prenatal care, screening for preeclampsia, diabetes and infections. Public health campaigns to reduce harmful lifestyle practices are also important.

In Ontario, although the prevalence of preterm birth has remained relatively stable over the reporting period, with 8.5% of newborns born preterm in 2023/2024, this represents 11,881 preterm infants who required highly complex, integrated care provided by skilled clinical teams to address the issues associated with preterm birth (e.g., respiratory distress, hypoglycemia, hyperbilirubinemia, cardiovascular, metabolic, developmental, and feeding issues). Early and regular prenatal care, addressing preexisting health conditions, and screening and treating infections are crucial strategies for preventing PTB. The consistent rates of NICU admissions and the need for specialized care for preterm infants highlight the importance of ensuring adequate NICU capacity and resources. Policies should support the expansion of NICU facilities and training for healthcare professionals to manage complex neonatal conditions.

Ensuring that preterm infants are born in facilities equipped to meet their needs can significantly reduce the risk of long-term health issues and the stress associated with neonatal transport. The Provincial Council for Maternal and Child Health (PCMCH) guidelines and the Critical Care Services Ontario (CCSO) NICU Guidance documents outline the personnel and equipment necessary to support newborns at different gestational ages (*Critical Care Services Ontario*

(CCSO), 2021; Provincial Council for Maternal and Child Health (PCMCH), 2023). Every effort should be made to ensure that births occur at the appropriate level of care. Ontario benefits from highly skilled neonatal and pediatric transport teams who are ready to expertly stabilize and transport newborns requiring higher levels of care. However, whenever possible, supporting high-risk births in the most appropriate hospitals helps ensure smoother care journeys by minimizing infant stress, reducing challenges related to bed or transport availability, eliminating travel distances, and ensuring complex clinical management is available, while preserving the maternal/infant dyad.

In 2023/2024, the average length of stay (LOS) in the NICU was 11.1 days, which has remained stable over time. However, extremely preterm infants (<24 weeks' gestation) have a much longer length of stay (82.3 days in 2023/2024). This highlights the higher level of acuity in this group, the greater complexity of critical care required, the need for additional healthcare resources, increased costs, and ongoing support required after discharge. Policies should support best practices in NICU care to reduce complications and healthcare costs

The number of newborns admitted to the NICU with a normal body temperature has increased and reflects improvements in care following birth. Despite these improvements, about one-quarter of primary admissions to the NICU still have abnormal temperatures, indicating ongoing clinical practice issues that need to be addressed. Stable temperatures can lead to shorter NICU stays, lower healthcare costs, and better use of resources. Birthing and NICU sites can monitor this indicator in the BORN Information system and design quality improvement projects to reduce complications and healthcare costs.

The decrease in neonatal deaths in Ontario from 414 (0.29%) in 2012/2013 to 365 (0.25%) in 2023/2024 reflects improvements in neonatal care practices, advancements in medical interventions, and better management of complications. Policies should continue to support advancements in medical interventions, infection control, and monitoring systems to further reduce mortality rates. A systematic review conducted by Spoljar and colleagues (2025) provides an overview of ethical issues, guidelines and recommendations related to end-of-life care in pediatric and neonatal ICUs (*Špoljar et al., 2025*).

Gastroschisis and congenital heart defects (CHD) are rare congenital anomalies with fluctuating prevalence rates in Ontario. In 2023/2024, there were 31 cases of gastroschisis (2.1 per 10,000 births) and 220 cases of CHD (15.4 per 10,000 births). Gastroschisis rates are highest among younger women and birthing parents and are associated with factors such as rural residence, tobacco or substance use, chronic illness, or depression. Factors associated with CHD include parental history of CHD, advanced reproductive age, infection, environmental exposures, pre-pregnancy risk factors, assisted reproductive technology (ART), medications, substance and alcohol use, genetic factors, infant sex, and parental socioeconomic status. Anomalies such as these require early identification and comprehensive assessment during pregnancy and long-term pediatric services and family supports. Ongoing research into causes and advanced surgical techniques and care practices are required.

IMPLICATIONS FOR PRACTICE, EDUCATION AND POLICY

Birth outcomes vary significantly by region and demographic factors. Indigenous populations often experience less favourable birth outcomes compared to non-Indigenous populations due to factors like reduced access to prenatal care and socioeconomic disparities. Immigrant mothers may face different birth outcomes based on their country of origin and post-migration experiences. Enhancing prenatal care accessibility, especially for vulnerable populations, is crucial.

Healthcare providers and policy makers need to adapt to the changing trends in birth volumes and newborn outcomes and ensure the care provided is aligned with best practice guidelines and integrated across the perinatal period to include comprehensive prenatal care, screening for and managing pre-existing conditions, promotion of healthy lifestyles, and ensuring timely access to specialized care when needed.

Continuous professional development and training on the latest evidence-based practices in maternal and newborn care and culturally sensitive care are essential to address the diverse needs of Ontario's population. **Public health education campaigns** can also raise awareness about the importance of prenatal care and healthy lifestyle choices during pregnancy.

Collaborative Efforts: The findings in this report and issues identified emphasize the importance of collaboration among healthcare providers, public health officials, and policymakers. Integrated care models and multidisciplinary approaches can improve maternal and newborn health outcomes.

Policymakers should consider these trends and address disparities in healthcare access and socioeconomic conditions when planning for future healthcare needs. This includes expanding healthcare coverage, improving maternal health programs, addressing disparities in birth outcomes among different demographic groups and ensuring equitable access to prenatal, birth, and postnatal care are essential. Consistent health policies and practices for maternal health in Canada and providing culturally safe and patient-centred maternity healthcare services are important (*Kolahdooz et al., 2016*). Policies should also support the use of customized growth charts for different ethnic groups to better predict and manage adverse outcomes (*Glauser, 2018; Urquia et al., 2015, 2016*).

In Ontario, the BORN registry exists to facilitate and improve maternal newborn care. Care providers and regional networks can access their outcomes, compare themselves to other like-sized and same level of care organizations to monitor and enhance care quality. The collection of high-quality data about each pregnancy and birth, the provision of specialized reports and response to data requests, and the development of novel audit and feedback systems to help alert clinicians to potential evidence-practice gaps are a few examples of how this data registry has helped to facilitate quality perinatal care across Ontario (*Murphy et al., 2021; Reszel et al., 2019; Solnes Miltenburg et al., 2017; Weiss et al., 2018*).

5.1 MULTIPLES

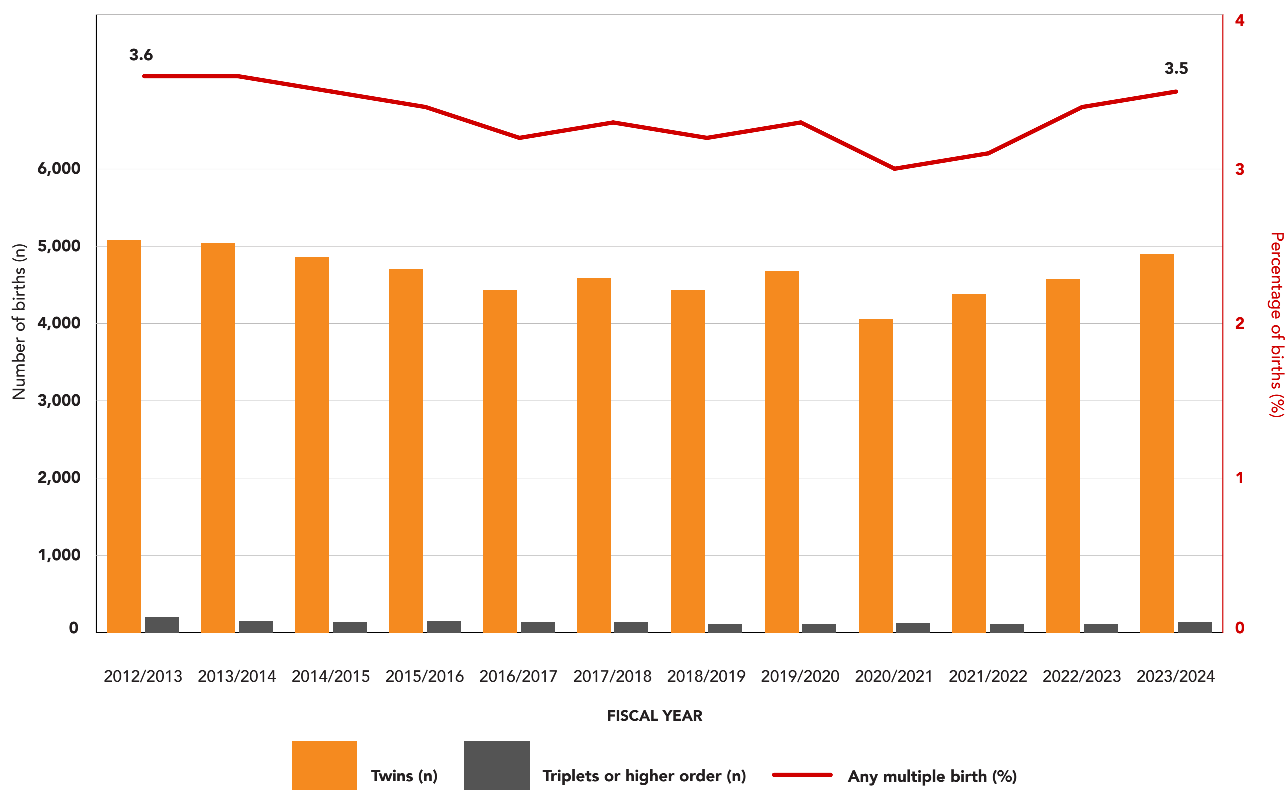
FIGURE 5.1.1A

Frequency of multiple birth(s), Ontario, 2012/2013 to 2023/2024

Summary of Figures 5.1.1A & 5.1.1B

- The prevalence of multiple births offers insight into reproductive health and demographic patterns. Multiple births carry higher risks of complications during pregnancy and birth.
- In 2023/2024, there were 4,895 twin births and 130 triplets or higher order multiples. The prevalence of multiples has remained relatively stable over the reporting period at 3.5%. In 2023/2024, 3.4% of births were twins, and 0.1% were higher order multiples.
- Multiple births are typically delivered earlier than singletons and contribute to higher NICU admission and occupancy rates. Over 60% of twins and most higher-order multiples are born preterm. These pregnancies carry increased risks such as gestational hypertension, anemia, congenital anomalies, and placental complications. While single embryo transfer policies have reduced multiple births from assisted reproduction (see **Figure 7.1.5**), they still occur in nearly 4% of IVF births.

To view an alternate to this graph see **Table 5.1.1A** in Appendix A for a table option of data points.



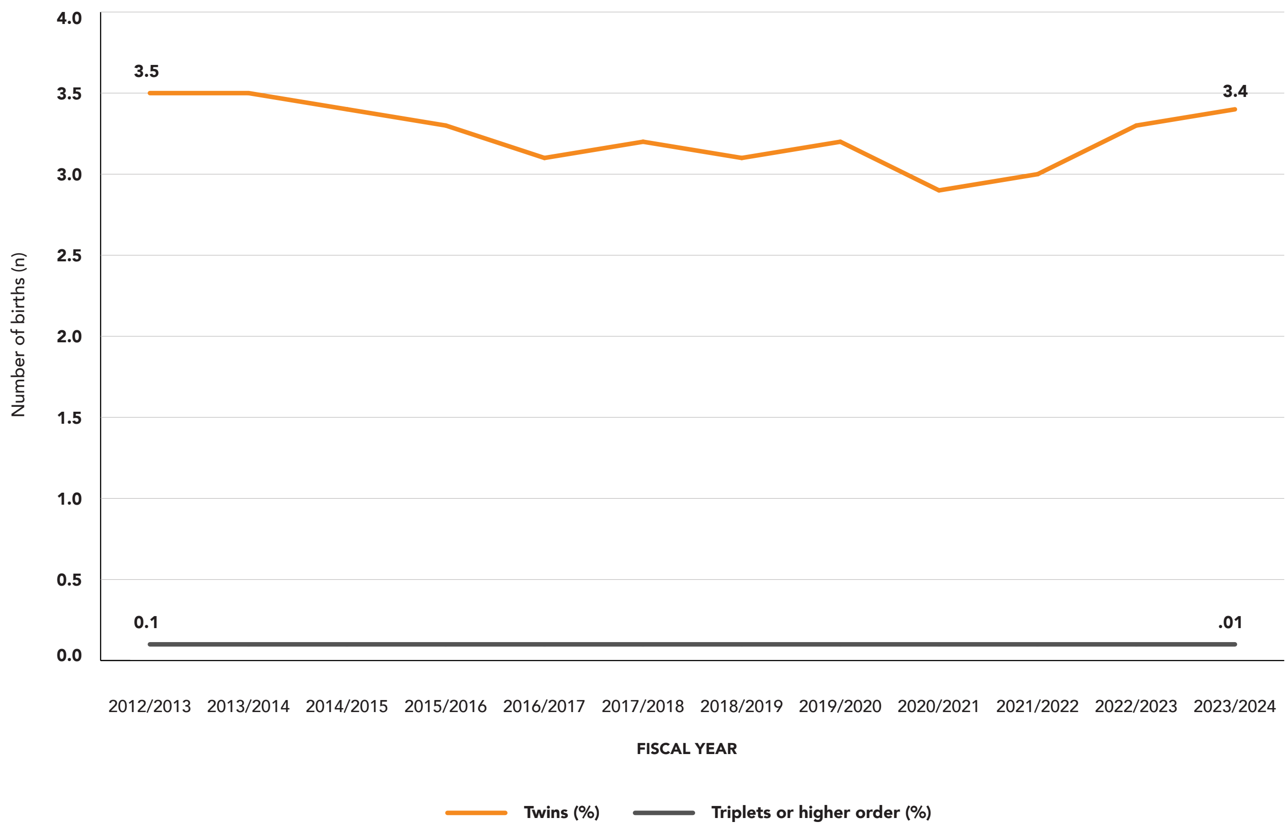
Numerator: Multiple births (including twins, triplets or higher order).

Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

FIGURE 5.1.1B

Frequency of multiple birth(s), Ontario, 2012/2013 to 2023/2024

To view an alternate to this graph see **Table 5.1.1B** in Appendix A for a table option of data points.



Numerator: Multiple births (including twins, triplets or higher order).

Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

5.2 GA AND BIRTHWEIGHT

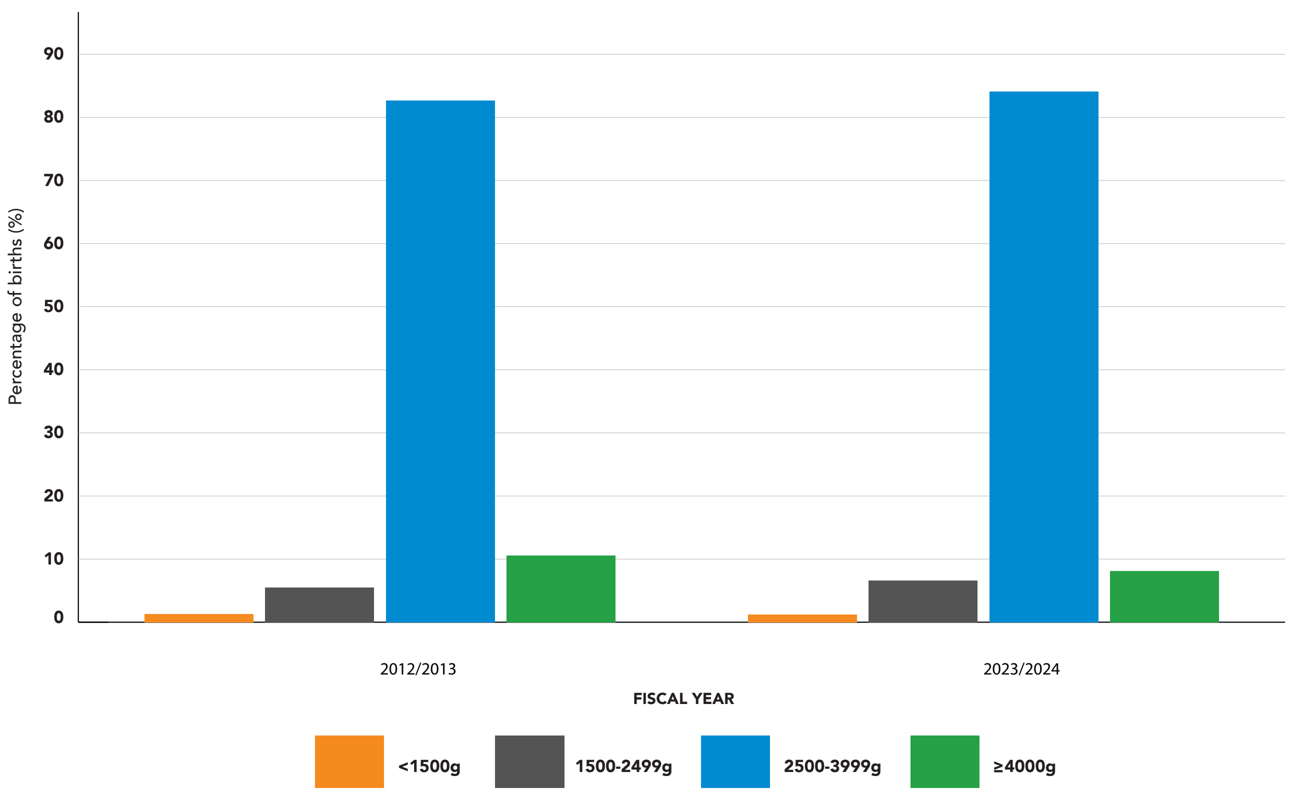
FIGURE 5.2.1A

Distribution of newborn birthweight, Ontario, 2012/2013 compared to 2023/2024

Summary of Figures 5.2.1A & 5.2.1B

- Birthweight and size for gestational age are important indicators of a newborn's health and development before birth.
- The overall patterns of birthweight and size for gestational age have remained steady. In 2023/2024, 84.1% of newborns weighed between 2500–3999g, and 80.7% were considered appropriate for their gestational age (AGA).
- Newborns who are small (SGA) or large (LGA) for gestational age face different health risks. SGA infants may experience low blood sugar, difficulty maintaining temperature, breathing or feeding issues, and require follow-up based on the cause. LGA infants are at risk for birth injuries, blood sugar problems, jaundice, and congenital anomalies. Caring for both groups involves significant use of ultrasound, lab, and hospital resources.

To view an alternate to this graph see Table 5.2.1A in Appendix A for a table option of data points.

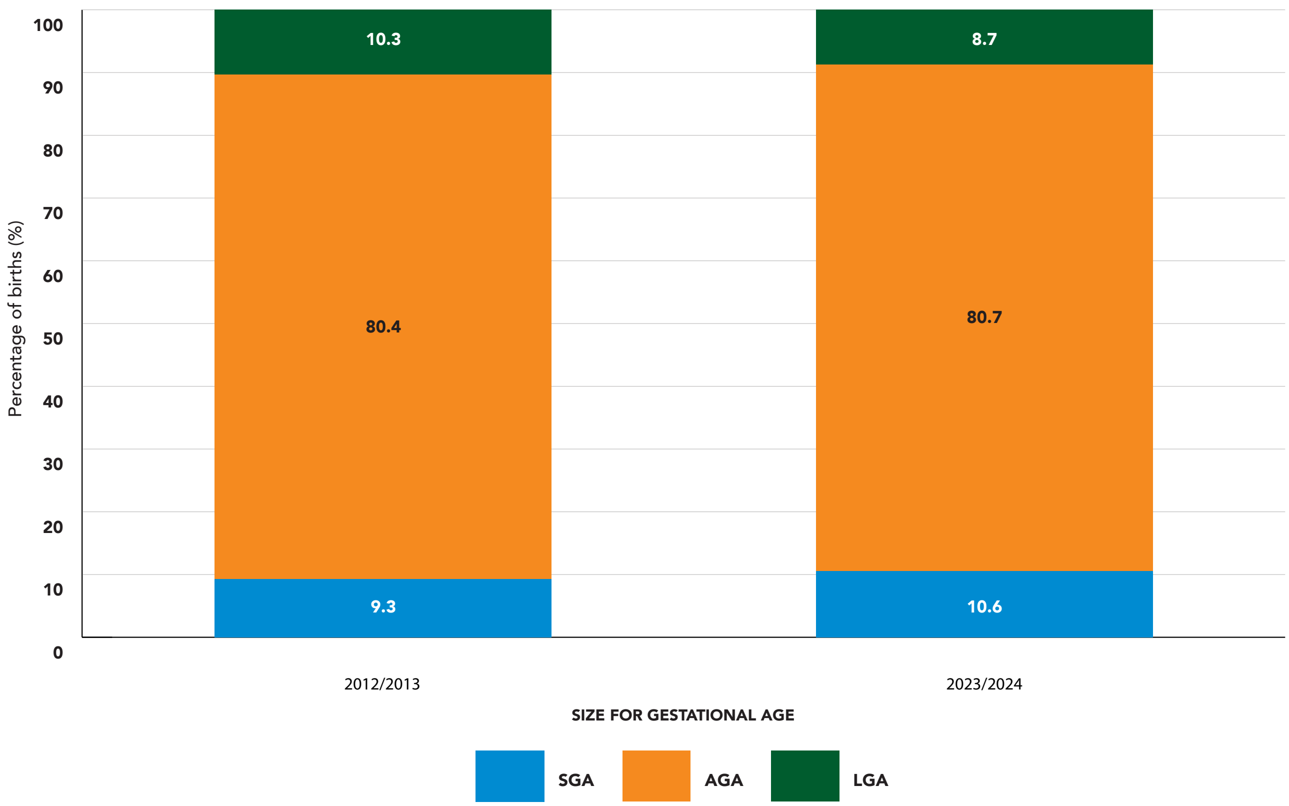


Numerator: Newborns in each birthweight category
Denominator: All infants born in Ontario.

FIGURE 5.2.1B

Distribution of size for gestational age among singleton births, Ontario, 2012/2013 compared to 2023/2024

To view an alternate to this graph see **Table 5.2.1B** in Appendix A for a table option of data points.



Numerator: Newborns in each size for gestational age category.
Denominator: Singleton newborns (live or stillbirth) in Ontario between 22 weeks and 43 weeks gestation.

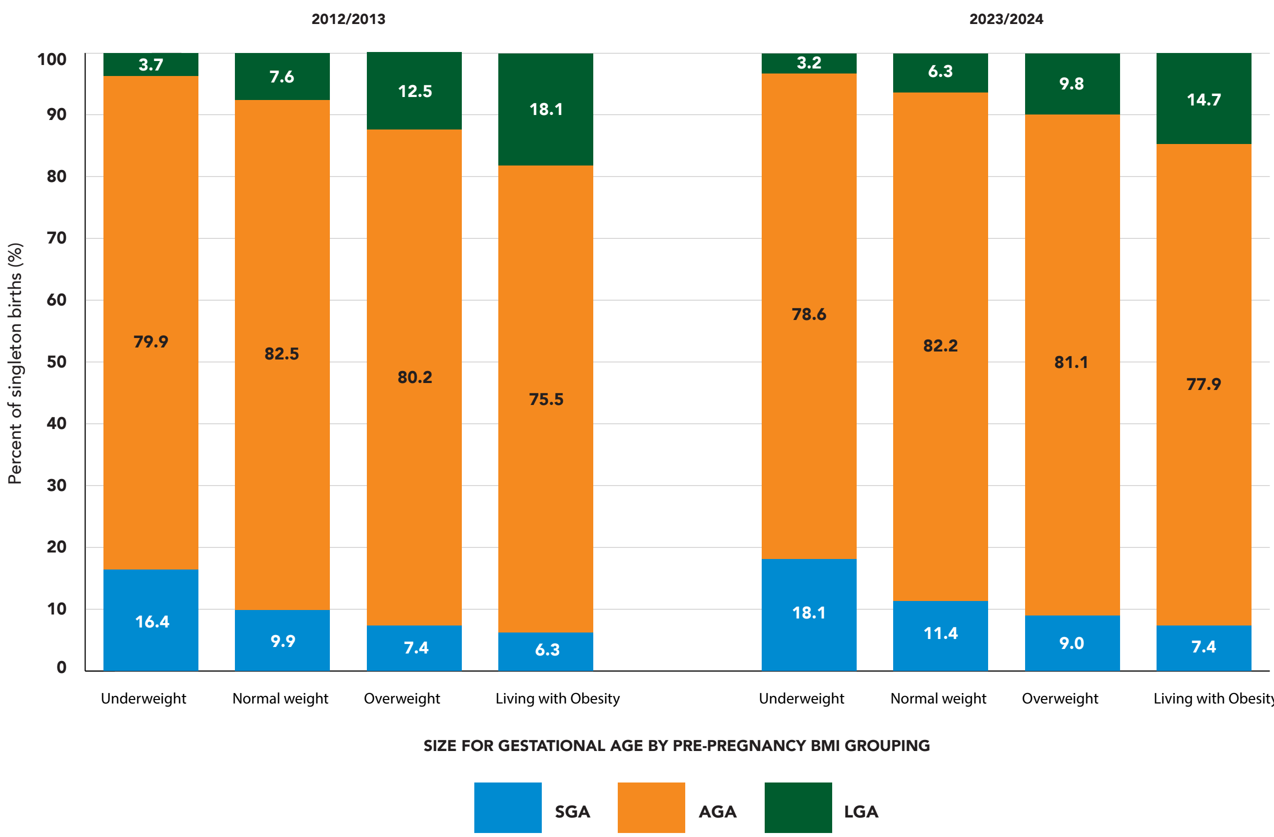
FIGURE 5.2.2A

Distribution of size for gestational age, Ontario, 2012/2013 compared to 2023/2024 by pre-pregnancy BMI groupings, and fiscal year

Summary of Figures 5.2.2A & 5.2.2B

- Maternal and newborn health are affected by several related weight factors, including size for gestational age, gestational weight gain (GWG), and pre-pregnancy BMI.
- In 2023/24, 14.7% of babies born to individuals with obesity and 11.5% with excessive GWG were LGA.
- Obesity can have lifelong health impacts and affect future generations. Addressing food insecurity, health equity, and stress-related eating is essential, alongside promoting healthy lifestyles. Low pregnancy weight gain or being underweight may reflect harmful societal pressures. Improving health before and after pregnancy requires collaboration across schools, public health, healthcare, and policy sectors.

To view an alternate to this graph see **Table 5.2.2A** in Appendix A for a table option of data points.



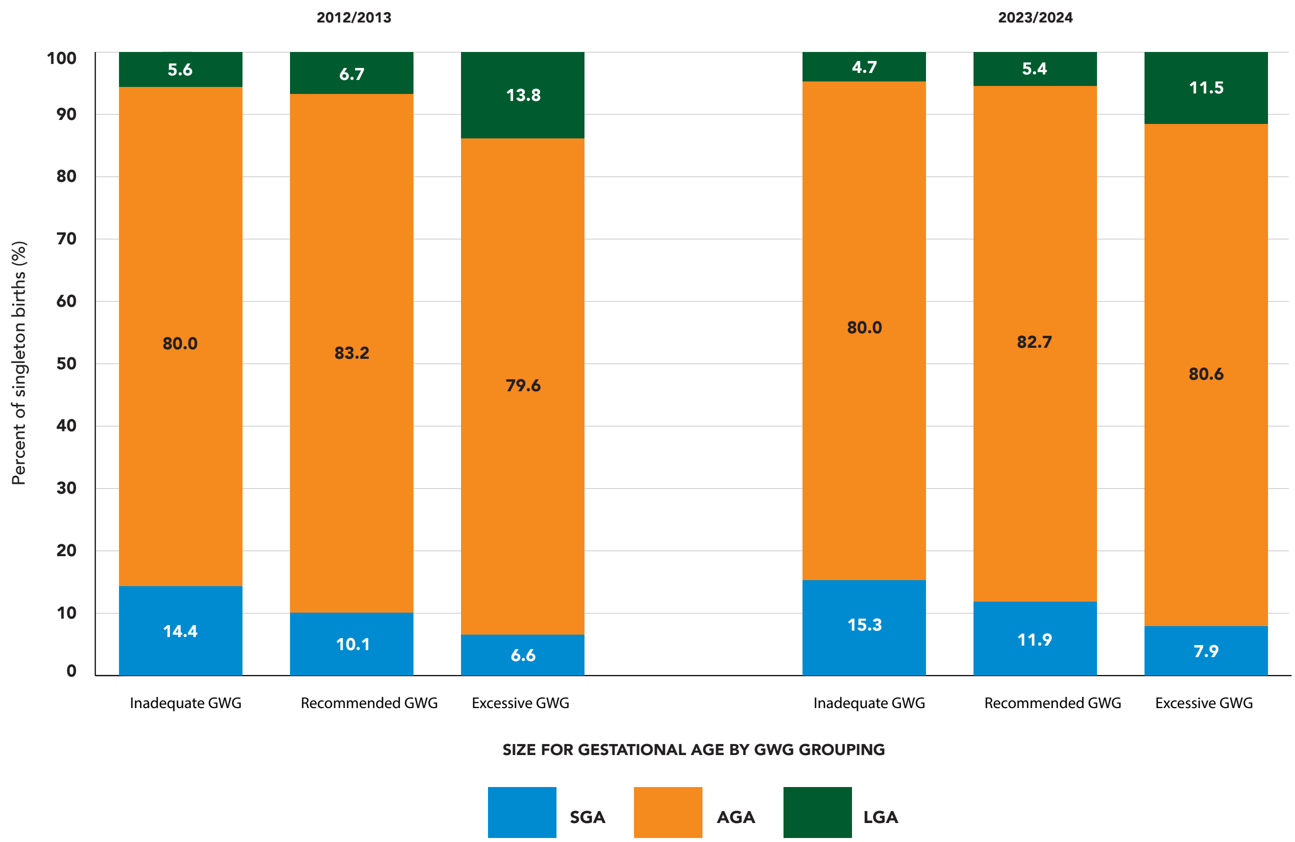
Numerator: Size for gestational age singleton births by maternal pre-pregnancy body mass index (BMI) grouping.

Denominator: Singleton newborns (live or stillbirth) in Ontario between 22 weeks and 43 weeks gestation.

FIGURE 5.2.2B

Distribution of size for gestational age, Ontario, 2012/2013 compared to 2023/2024 by gestational weight gain groupings, and fiscal year

To view an alternate to this graph see **Table 5.2.2B** in Appendix A for a table option of data points.



Numerator: Size for gestational age singleton births by gestational weight gain (GWG) grouping.
Denominator: Singleton newborns (live or stillbirth) in Ontario between 22 weeks and 43 weeks gestation.

5.3 STILLBIRTH

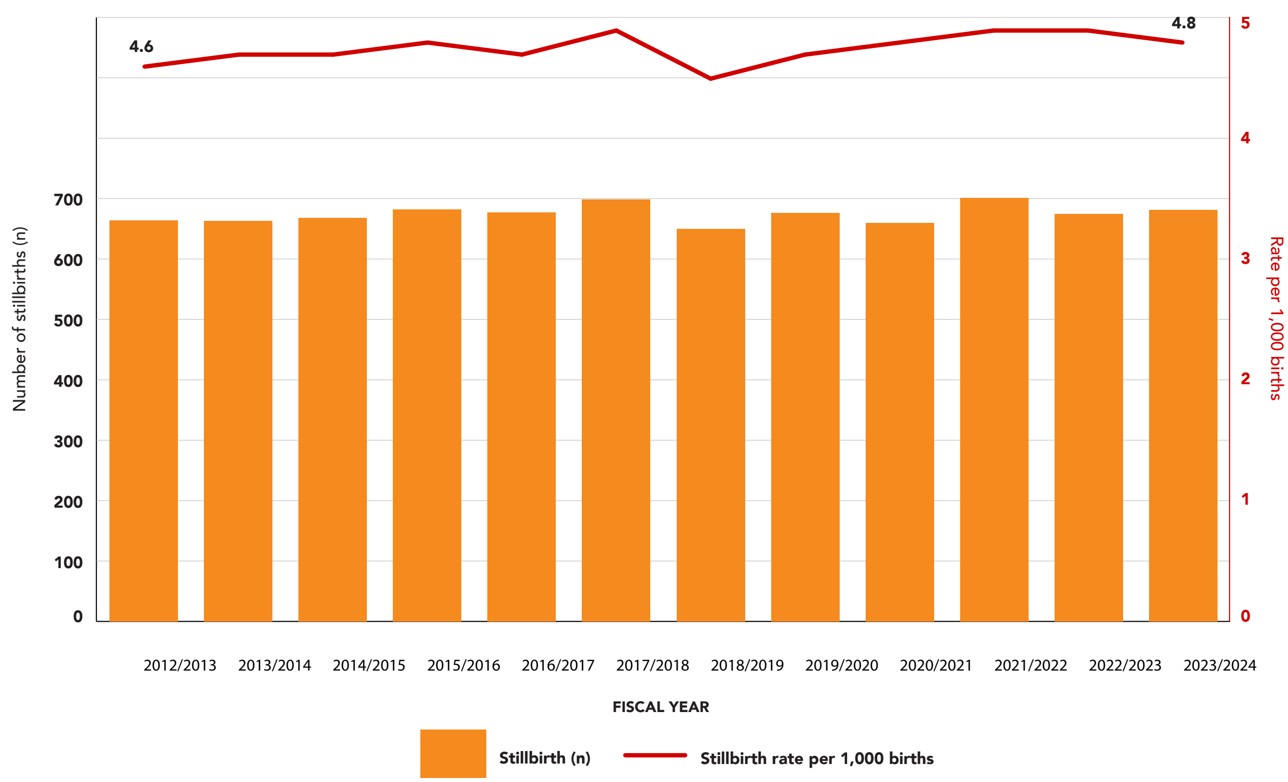
FIGURE 5.3.1

Rate of stillbirths, Ontario, 2012/2013 to 2023/2024

Summary of Figure 5.3.1

- Monitoring stillbirth rates over time is essential for assessing the quality of prenatal care, identifying causes, guiding prevention strategies, and understanding the support needs of affected families.
- The rate of stillbirth fluctuates slightly over time but is largely consistent between 4.5 to 4.9 per 1000 births which means that each year between 650 and 700 pregnant individuals and families lose a baby at or beyond 20 weeks of gestation (or ≥ 500 grams). Note that earlier pregnancy losses are not classified as stillbirth and not captured in this rate.
- Comparing Ontario stillbirth rates to other provinces or countries is difficult due to differing definitions, differing vital statistics registration processes, and problems in classifying fetal losses and fetal reductions. Regardless of the variations in numbers, quality improvement strategies do exist to reduce stillbirth. Standardized monitoring of fetal growth, ensuring individuals needing treatment for conditions like preeclampsia and diabetes are receiving regular prenatal care, routine screening and treatment for infections during pregnancy and reducing harmful lifestyle practices are key.

To view an alternate to this graph see **Table 5.3.1** in Appendix A for a table option of data points.



Numerator: All stillbirths.

Denominator: All infants (live or stillbirth) born in Ontario.

5.4 PRETERM BIRTHS

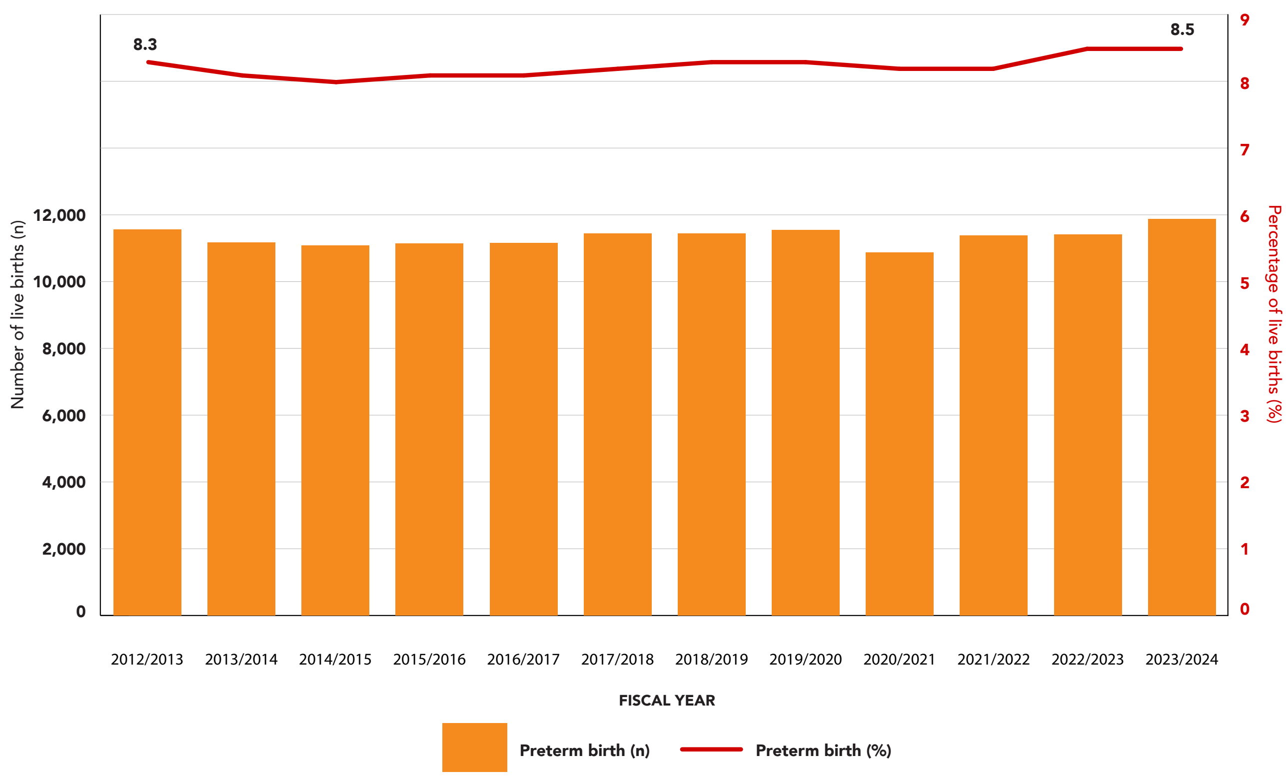
FIGURE 5.4.1

Prevalence of preterm birth (<37 weeks) among live hospital-born newborns, Ontario, 2012/2013 to 2023/2024

Summary of Figure 5.4.1

- Preterm birth (PTB) is a leading cause of neonatal morbidity and mortality. Preventing preterm birth is essential to improving infant survival and reducing long-term health complications.
- The prevalence of preterm birth has remained relatively stable over time. In 2023/2024 the prevalence of preterm birth was 8.5% and 11,881 newborns were born preterm.
- Ontario's preterm birth (PTB) rate matches the national average (see section 1.1.9). PTB is a major cause of NICU admissions, with just over 1% occurring before 32 weeks and requiring complex care. Babies born between 32–36 weeks may still face breathing, feeding, and developmental challenges. Families often need support across health, education, and social services. A history of PTB increases recurrence risk, but early prenatal care, managing health issues, and healthy habits can help. Timely care and delivery at a facility equipped for preterm infants are critical.

To view an alternate to this graph see Table 5.4.1 in Appendix A for a table option of data points.



Numerator: All live births before 37 weeks' gestation.
Denominator: All live births in Ontario hospitals.

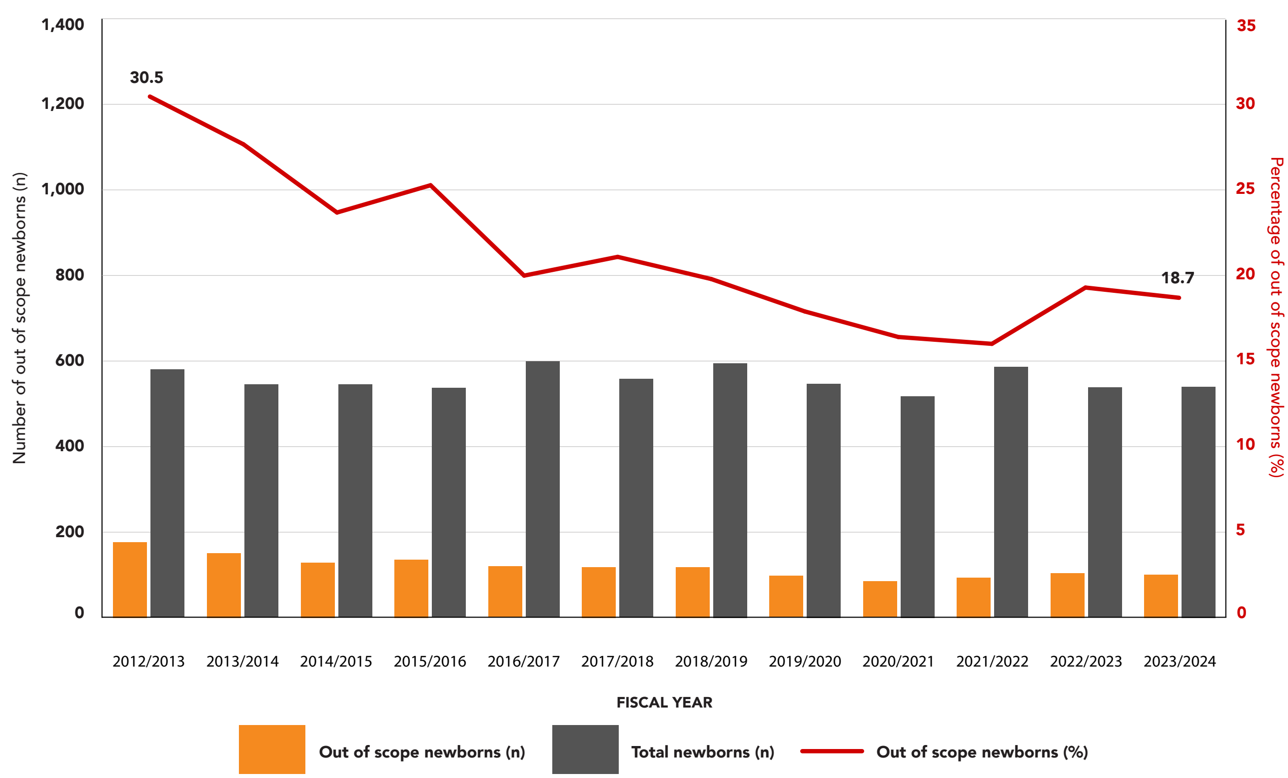
FIGURE 5.4.2

Prevalence of pregnancies with a birth of *less than 28 weeks' gestation* born at an institution out of the scope of practice for care requirements, Ontario, 2012/2013 to 2023/2024

Summary of Figure 5.4.2

- Newborns born out-of-scope — in hospitals unequipped for their gestational age and care needs — face increased risks due to limited access to specialized support and delayed transfers.
- In 2023/24, 18.7% of deliveries at less than 28 weeks GA were out-of-scope, down from 30.5% in 2012/13.
- These births often result from late presentation, bed shortages, or missed signs of destabilization. Affected infants face higher risks of long-term complications, including chronic organ dysfunction and complications from delayed transfer to specialized care. A provincial committee led by PCMCH monitors neonatal transfers, develops guidelines and collaborates with CritiCall Ontario to improve care. See Perinatal-Birthing-and-Newborn-LOC-GuidanceDocument_March-2023.pdf).

To view an alternate to this graph see **Table 5.4.2** in Appendix A for a table option of data points.



Numerator: All out-of-scope deliveries.
Denominator: All pregnancies resulting in a live birth (less than 28 weeks' gestation) in Ontario hospitals.

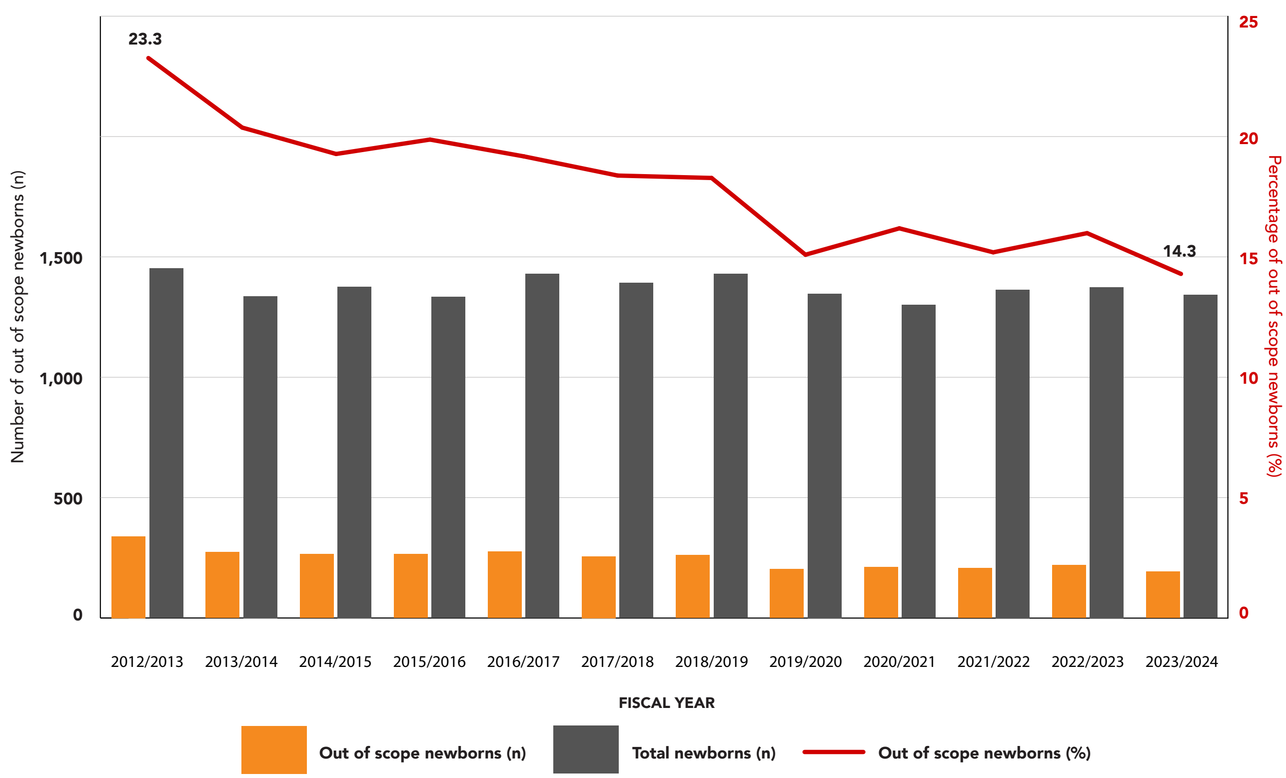
FIGURE 5.4.3

Prevalence of pregnancies with a birth of *less than 32 weeks' gestation* born at an institution out of the scope of practice for care requirements, Ontario, 2012/2013 to 2023/2024

Summary of Figure 5.4.3

- Newborns born at a hospital not equipped to provide the necessary advanced care for their gestational age, including specialized respiratory support, continuous monitoring, and access to specialists are referred to as being born out-of-scope.
- The prevalence of out-of-scope deliveries at less than 32 weeks gestational age has decreased from 23.3% in 2012/2013 to 14.6% in 2023/2024.
- Similar to 5.4.2, the same reasons apply for infants being born out-of-scope in this gestational age window. While these newborns tend to have better outcomes than the less than 28-week cohort, they still have complex needs and should be born in a facility equipped to deal with their issues. For the past five years, roughly 200 out-of-scope deliveries at less than 32 weeks annually.

To view an alternate to this graph see Table 5.4.3 in Appendix A for a table option of data points.



Numerator: All out-of-scope deliveries.
Denominator: All pregnancies resulting in a live birth (less than 32 weeks' gestation) in Ontario hospitals.

5.5 NEONATAL MORBIDITY AND MORTALITY

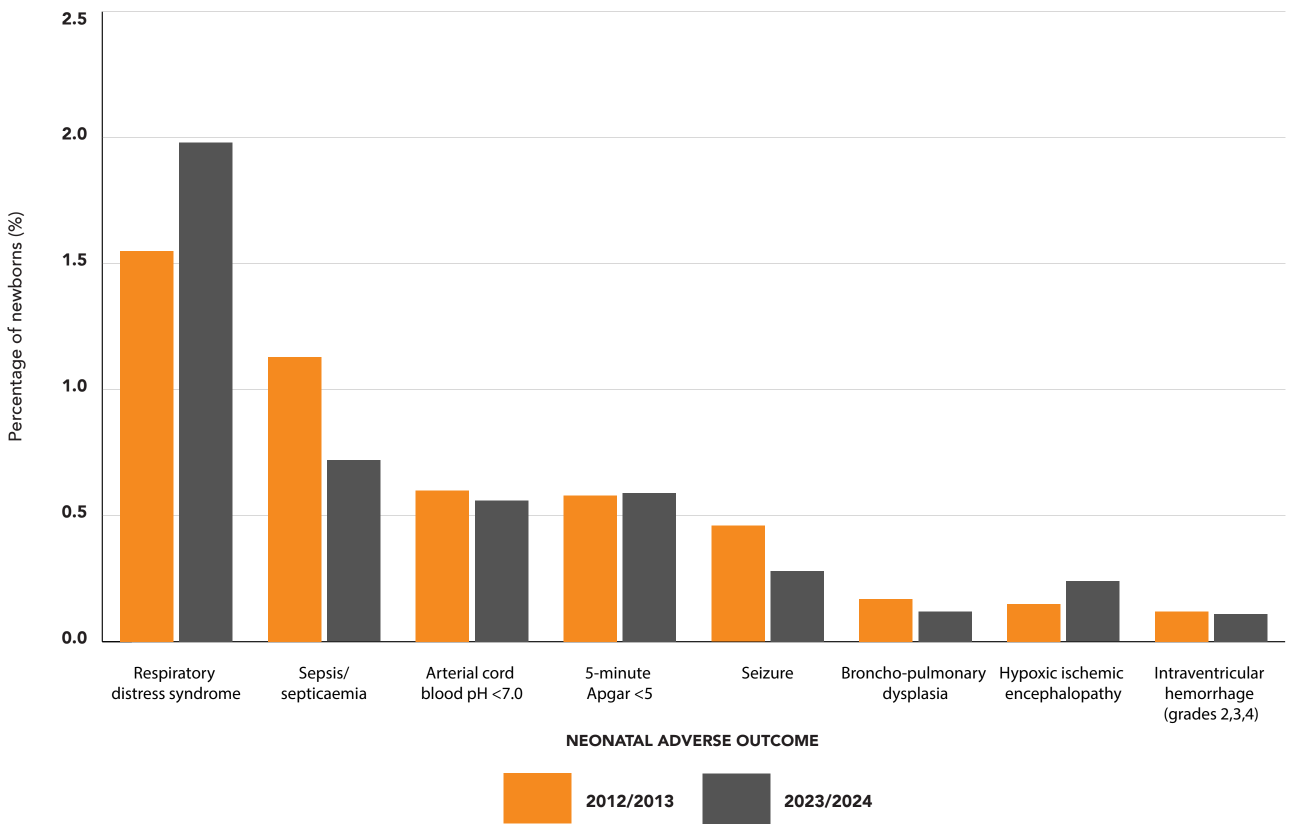
FIGURE 5.5.1

Prevalence of adverse neonatal outcomes among hospital-born live births, Ontario, 2012/2013 compared to 2023/2024

Summary of Figure 5.5.1

- The prevalence of respiratory distress syndrome (RDS) increased from 1.55% in 2012/2013 to 1.98% in 2023/2024, while sepsis/septicaemia decreased from 1.13% to 0.72% during the same time period.
- In 2023/2024, the prevalence of newborns with an arterial cord blood pH <7.0 was 0.56%, and those with a 5-minute Apgar score <5 was 0.59%. These rates have remained stable over time.
- Neonatal outcomes in Ontario show key shifts. RDS rose from 1.55% to 1.98%, contributing to NICU admissions and possibly linked to maternal health or clinical practices — underscoring the need for better respiratory support and research. Sepsis declined from 1.13% to 0.72%, reflecting improved infection control. Stable low cord pH and 5-minute Apgar rates highlight ongoing needs for effective fetal monitoring and newborn resuscitation.

To view an alternate to this graph see Table 5.5.1 in Appendix A for a table option of data points.



Numerator: Newborns with an adverse neonatal outcome.
Denominator: All live-born newborns born in an Ontario hospital whose data is captured in both BIS and CIHI.

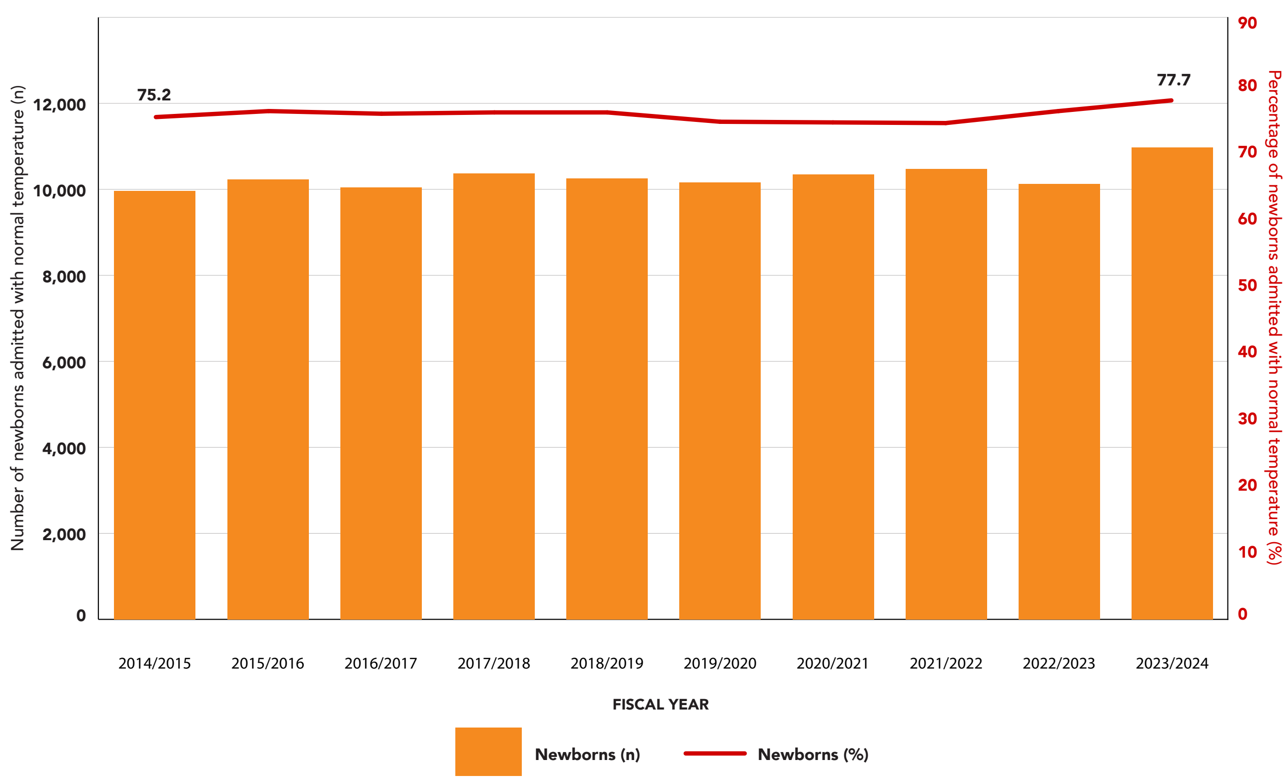
FIGURE 5.5.2

Prevalence of newborns with a normal body temperature (36.5-37.5) on first admission to the NICU in the birth hospital, Ontario, 2014/2015 to 2023/2024

Summary of Figure 5.5.2

- Newborns admitted to the NICU with a normal body temperature reflects the effectiveness of immediate post-birth care and is essential to prevent complications.
- The number of newborns admitted to the NICU with a normal body temperature has risen, from 9,968 (75.2%) in 2012/2013 to 10,972 (77.7%) in 2023/20244.
- The rising number of newborns admitted to NICU with normal body temperatures suggests improved temperature management at birth, helping prevent complications like respiratory distress and metabolic issues. This stability can reduce NICU stays, healthcare costs, and optimize resource use. BORN Ontario's NICU Dashboard supports clinical units by tracking admission temperature trends and providing alerts when practice changes may be needed. However, about 25% of primary NICU admissions still present with abnormal temperatures, indicating ongoing challenges and potential practice issues.

To view an alternate to this graph see Table 5.5.2 in Appendix A for a table option of data points.



Numerator: Newborns with normal infant temperature (36.5 to 37.5 C inclusive).
Denominator: All live born newborns admitted to NICU at the birth hospital (first NICU admission) with no therapeutic hypothermia.

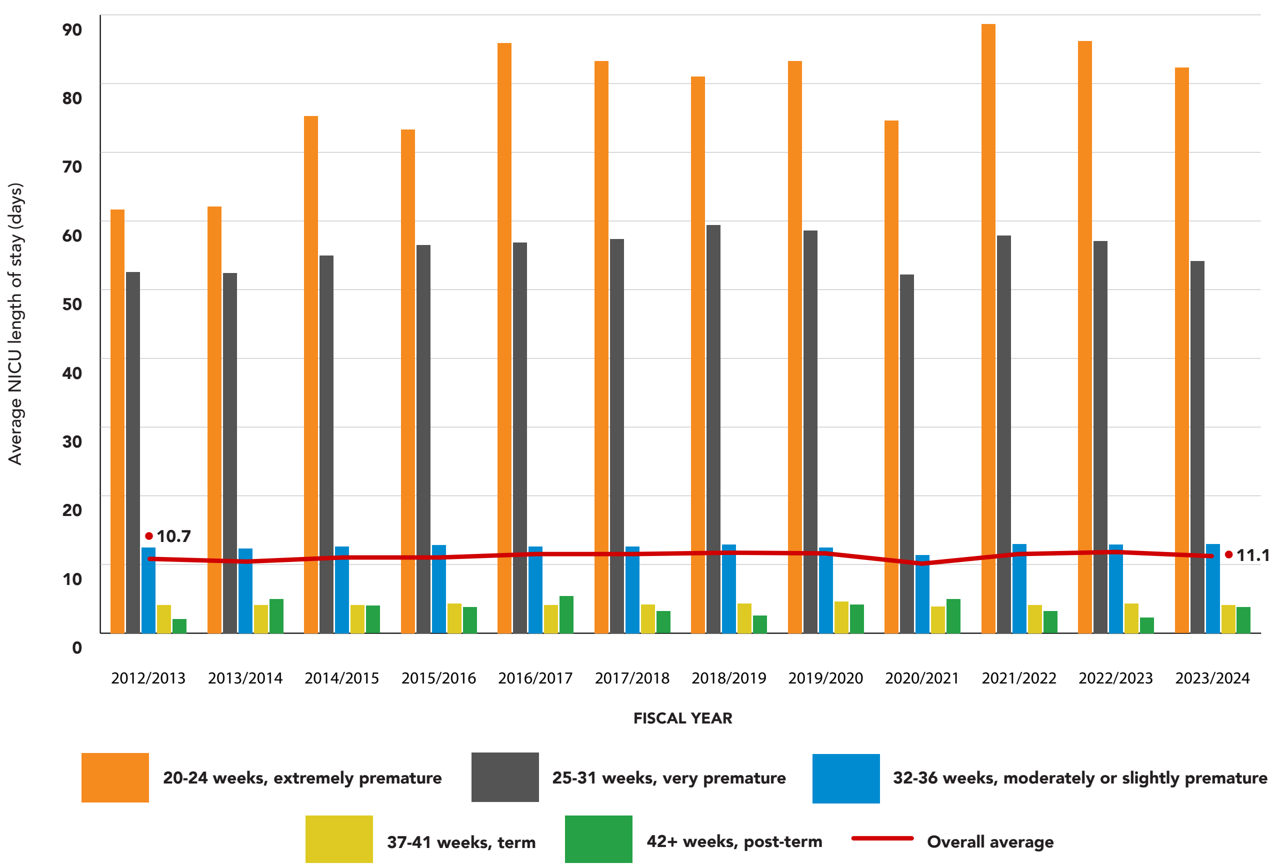
FIGURE 5.5.3

Average NICU length of stay (days), Ontario, 2012/2013 to 2023/2024 by gestational age at birth and fiscal year

Summary of Figure 5.5.3

- NICU length of stay is an important measure of neonatal care, human and health care resource requirements
- In 2023/24, the average NICU stay remained stable at 11.1 days. Newborns at 20–24 weeks gestation had longer stays, rising from 61.7 to 82.3 days since 2012/13, while other gestational age groups showed consistent lengths of stay.
- The stable average NICU stay of 11.1 days reflects consistent care quality. However, stays for extremely preterm infants (20–24 weeks) rose from 61.7 to 82.3 days, highlighting their complex needs and impact on family stress, and post-discharge support. These trends emphasize the need for tailored care, ongoing NICU improvements, and support for shared decision-making, guided by Canadian Pediatric Society, Fetus and Newborn Committee recommendations.

To view an alternate to this graph see **Table 5.5.3** in Appendix A for a table option of data points.



Numerator: NICU length of stay by gestational age at birth.
Denominator: All live born newborns admitted to NICU in Ontario.

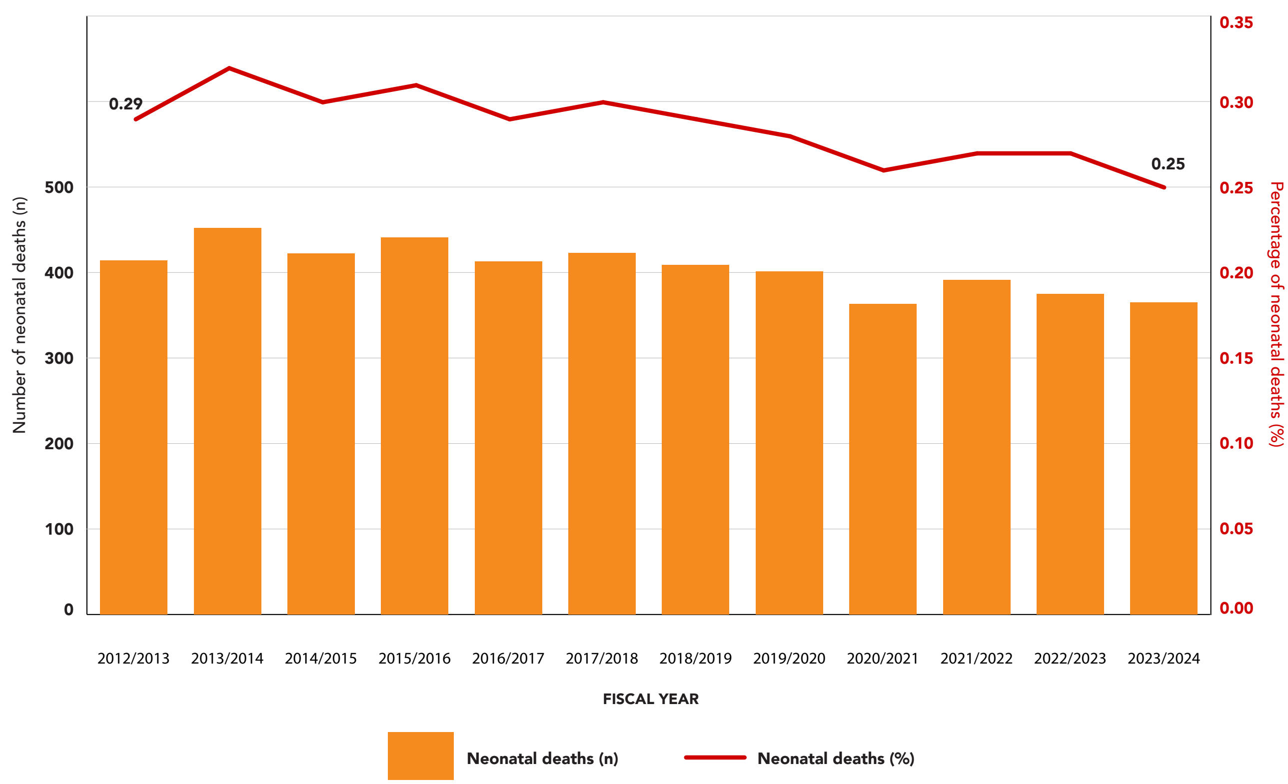
FIGURE 5.5.4

Prevalence of neonatal death in hospital, Ontario, 2012/2013 to 2023/2024

Summary of Figure 5.5.4

- Neonatal deaths are tracked during the first 28 days of life, which is the most vulnerable period for newborns, and are often linked to complications like prematurity, infections, or birth trauma.
- In 2012/2013, there were 414 neonatal deaths, with a prevalence of 0.29%. By 2023/2024, this number decreased to 365 neonatal deaths, with a prevalence of 0.25%.
- The reduction in neonatal deaths from 414 (0.29%) to 365 (0.25%) likely reflects improvements in neonatal care practices, advancements in medical interventions and technologies, and better management of complications like prematurity, infections, and birth trauma. Enhanced infection control, better respiratory support, and improved monitoring systems contribute to higher survival rates. While progress has been made, there is still a need for ongoing evaluation and refinement of neonatal care practices to further reduce mortality rates.

To view an alternate to this graph see **Table 5.5.4** in Appendix A for a table option of data points.



Numerator: Newborns who died in a hospital within the first 28 days of life.
Denominator: All liveborn infants at 20 weeks' gestation or later in Ontario.

5.6 CONGENITAL ANOMALIES

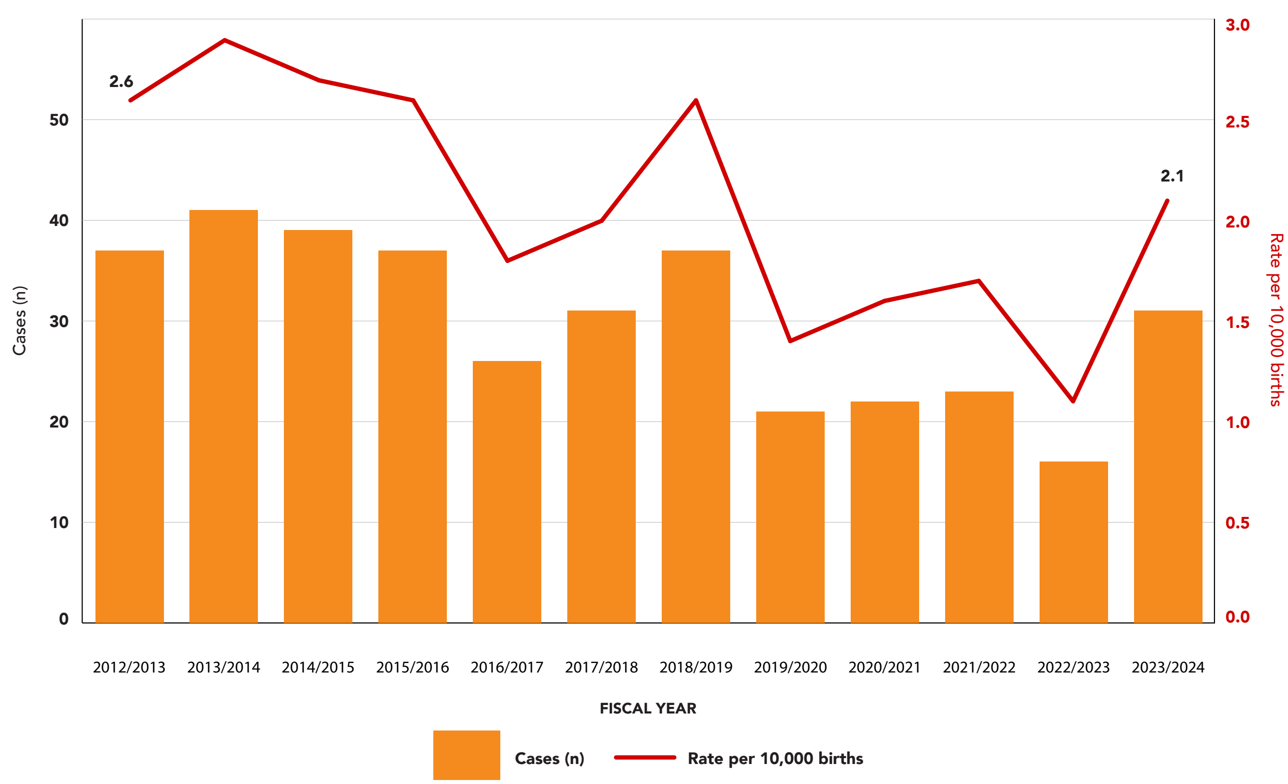
FIGURE 5.6.1

Rate of gastroschisis per 10,000 births, Ontario, 2012/2013 to 2023/2024

Summary of Figure 5.6.1

- Gastroschisis is a rare congenital anomaly where the abdominal wall of a developing fetus has a hole or opening. The intestines or other organs can protrude through the hole in the abdominal wall and sit outside the body. It is usually diagnosed during pregnancy via ultrasound.
- In 2023/2024, 31 gastroschisis cases were recorded, a rate of 2.1 per 10,000 births. Rates have varied over time, from a low of 1.1 in 2022/2023 to a peak of 2.9 in 2013/2014.
- Gastroschisis is more common in younger pregnant individuals, with risk factors like rural residence, substance use, chronic illness, and depression. While outcomes have improved with better surgical and neonatal care, long-term issues such as growth delays and malabsorption remain. Improving management and outcomes requires public health surveillance, clinical readiness, equitable care access, family support, and continued research guided by shared care experiences.

To view an alternate to this graph see Table 5.6.1 in Appendix A for a table option of data points.



Numerator: Newborns with gastroschisis.
Denominator: All births (live, stillbirths, and late terminations) with gestational age ≥20 weeks or birth weight ≥500 grams.

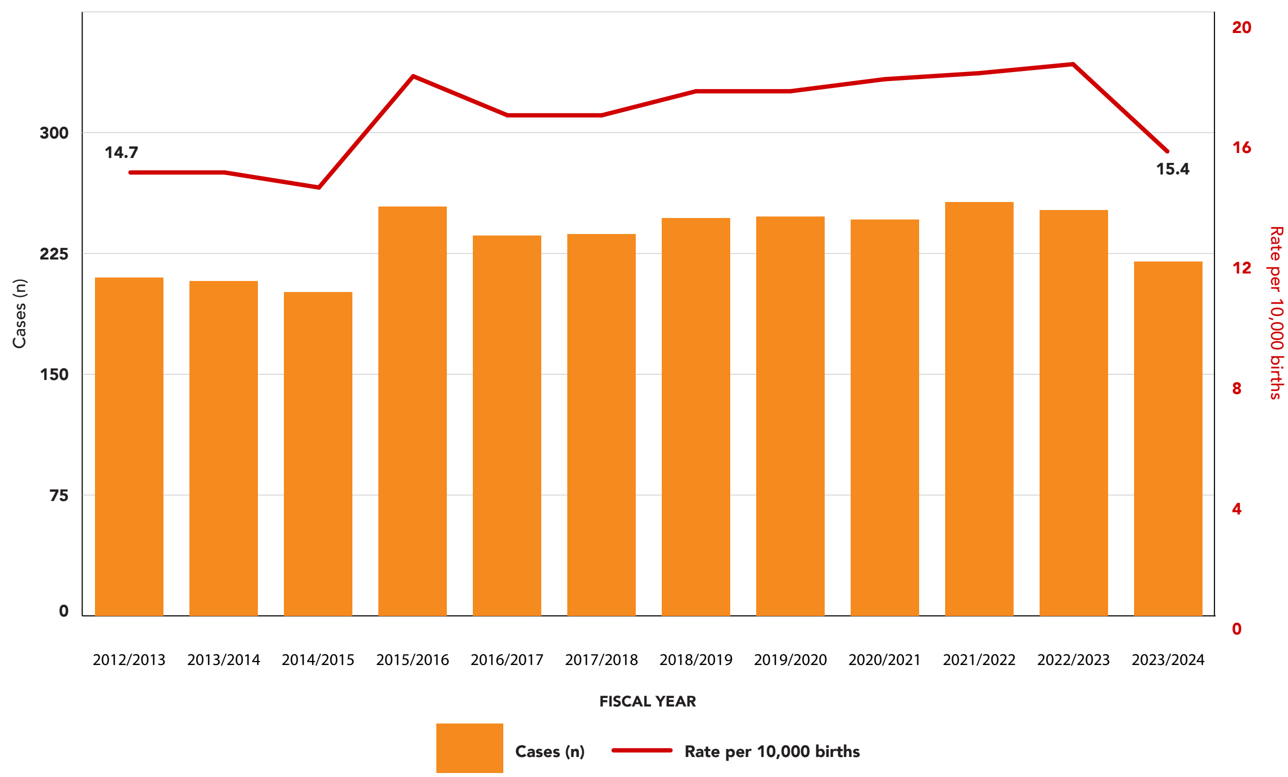
FIGURE 5.6.2

Rate of selected congenital heart defects per 10,000 births, Ontario, 2012/2013 to 2023/2024

Summary of Figure 5.6.2

- Congenital heart defects (CHDs) are structural problems in the heart or its major blood vessels that develop before birth. They can range from mild to severe, with some requiring immediate medical treatment.
- In 2023/2024, 220 select CHD cases were reported in the BIS, a rate of 15.4 per 10,000 births. The data presented from the BIS may be impacted by limited case ascertainment. For more information on selected CHDs review Technical Notes in Appendix A.
- Congenital heart defects (CHD) account for 30–45% of all congenital anomalies and have been estimated to affect 12.3 per 1,000 births in Canada. Risk factors include parental CHD history, advanced age, infections, environmental exposures, pre-pregnancy conditions such as diabetes or obesity, assisted reproductive technology (ART), medications, alcohol and substance use, genetic factors, infant sex, and socioeconomic status. CHD rates affect healthcare planning, requiring specialized care; despite advances in treatment, long-term care and family support remain essential.

To view an alternate to this graph see **Table 5.6.2** in Appendix A for a table option of data points.



Numerator: Newborns with select congenital heart defects (CHD).
Denominator: All births (live, stillbirths, and late terminations) with gestational age ≥20 weeks or birth weight ≥500 grams living in Ontario.

5.7 NEWBORN FEEDING

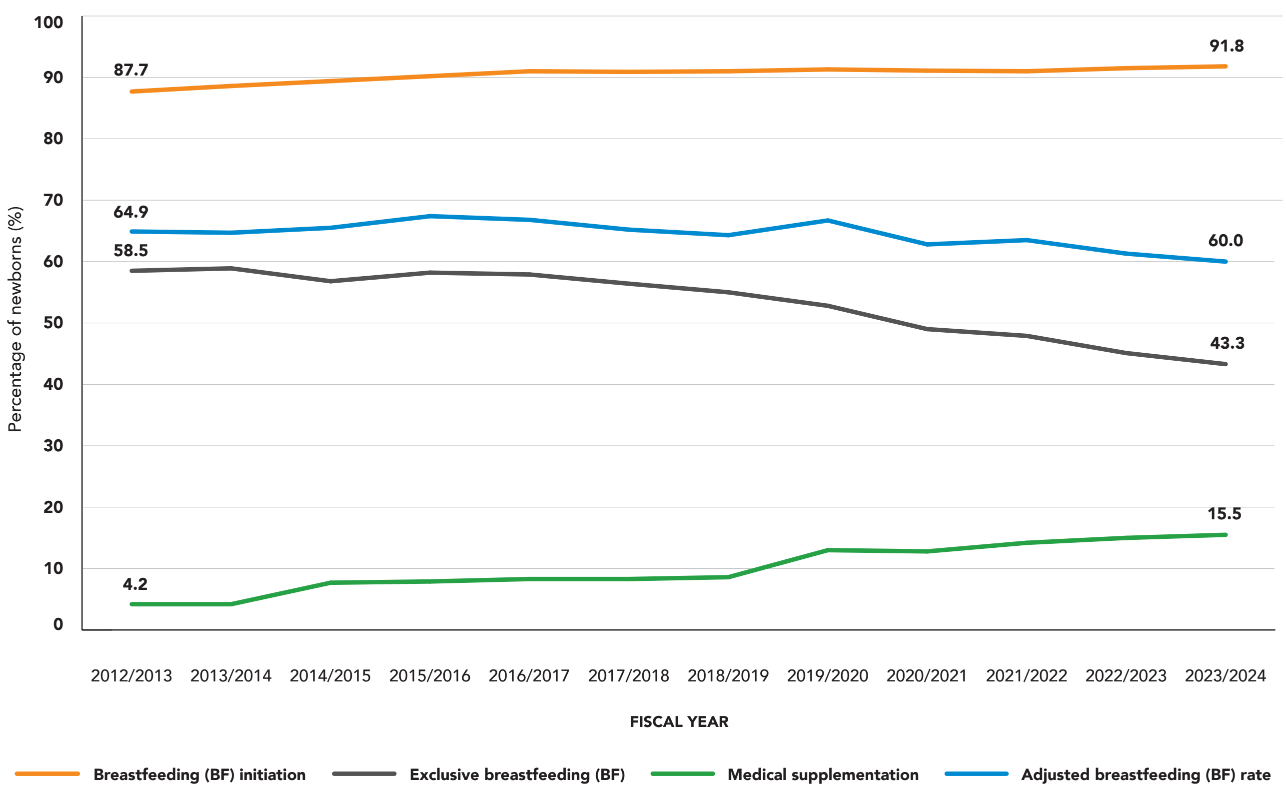
FIGURE 5.7.1

Prevalence of newborn feeding type for hospital births, Ontario, 2012/2013 to 2023/2024 by breastfeeding indicator and fiscal year

Summary of Figure 5.7.1

- Breastfeeding initiation, defined as a newborn receiving at least one feed of human milk, remained high in 2023/2024 at 91.8%, with consistent rates over time.
- Exclusive breastfeeding at hospital discharge declined from 58.5% in 2012/2013 to 43.3% in 2023/2024, while medical supplementation rose from 4.2% to 15.5%, lowering the adjusted breastfeeding rate below the Baby-Friendly Initiative (BFI) target of 75%.
- These trends highlight the need for stronger lactation support including resources and education to assist in overcoming common challenges in the early postpartum period, evidence-based supplementation practices, and broader implementation of the Baby-Friendly Hospital Initiative (BFHI) practices which promote breastfeeding and limit unnecessary supplementation.

To view an alternate to this graph see Table 5.7.1 in Appendix A for a table option of data points.



Numerator: Newborn feeding from birth to discharge including in the NICU.

Denominator: All live hospital births that occurred in Ontario with no gestational age restrictions.

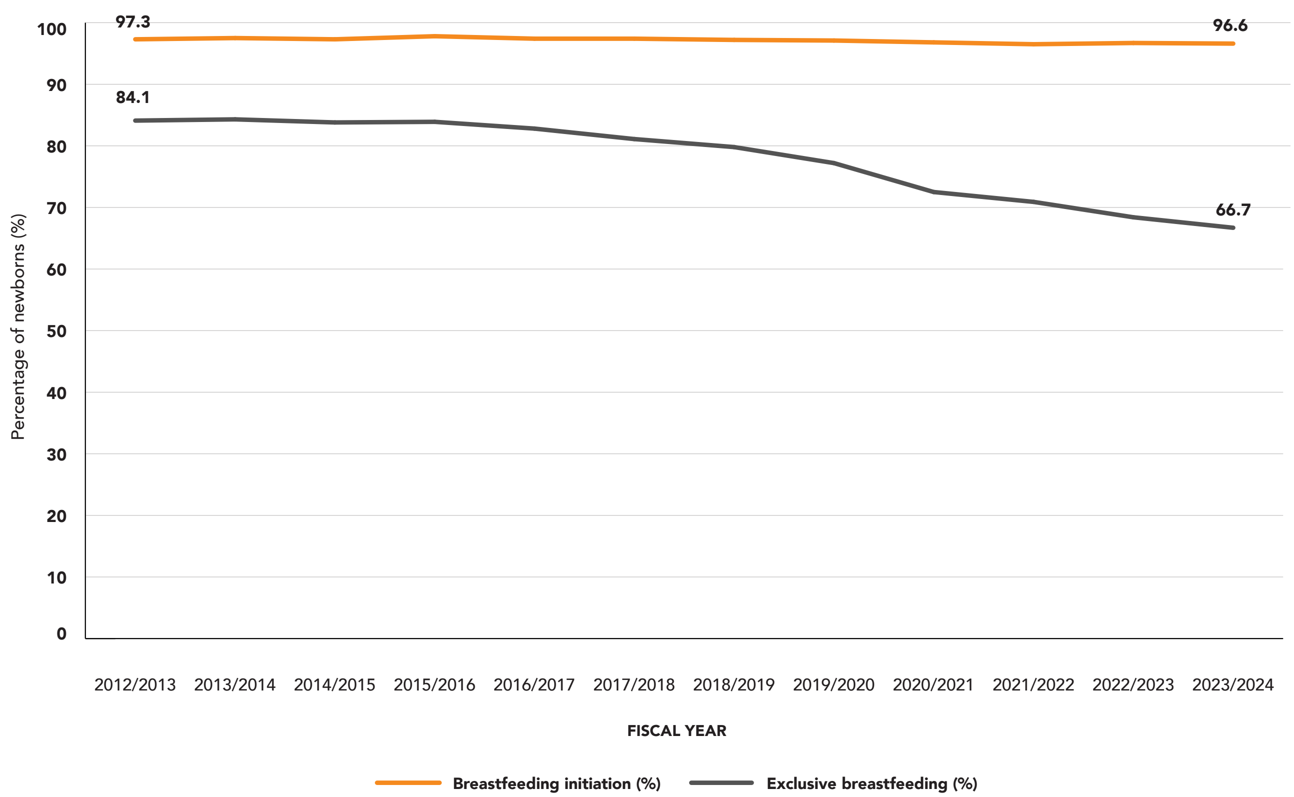
FIGURE 5.7.2

Prevalence of breastfeeding at 3 days among term newborns of midwifery clients, Ontario, 2012/2013 to 2023/2024 by breastfeeding indicator and fiscal year

Summary of Figure 5.7.2

- In 2023/2024, 96.6% of midwifery clients initiated breastfeeding by day 3, defined as a newborn receiving at least one feed of human milk. The prevalence has been consistent over time.
- Exclusive breastfeeding rates among midwife clients at day 3 have decreased from 84.1% in 2012/2013 to 66.7% in 2023/2024.
- Breastfeeding initiation among midwifery clients was high at 96.6%, showing strong willingness to breastfeed. However, declining exclusive breastfeeding rates point to a need for ongoing lactation support. Midwives play a key role in helping address early postpartum challenges. The downward trend of exclusive breastfeeding highlights the importance of monitoring and addressing supplementation practices.

To view an alternate to this graph see **Table 5.7.2** in Appendix A for a table option of data points.



Numerator: Breastfeeding status at day 3 among newborns (live births) born at term to billable midwifery clients.

Denominator: Live births born to billable midwifery clients with a gestational age at birth between 37 and 41 weeks.

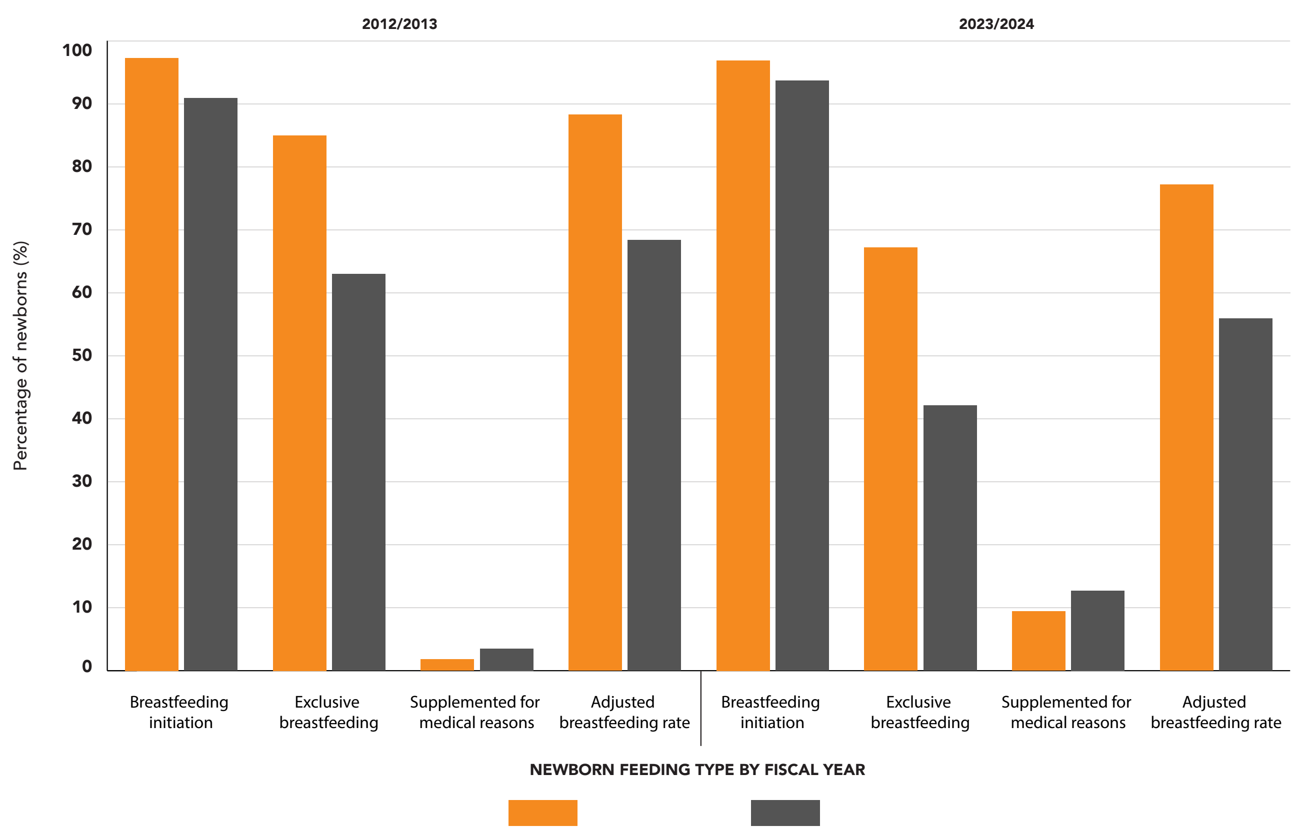
FIGURE 5.7.3

Prevalence of newborn feeding type for low-risk, term, hospital births to nulliparous pregnant individuals, Ontario, 2012/2013 compared to 2023/2024 by midwifery client status and fiscal year

Summary of Figure 5.7.3

- In 2023/2024, the breastfeeding initiation rate was slightly higher among low-risk midwifery clients at 96.9% compared with low-risk non-midwifery clients at 93.7%. These rates remained consistently high over time across both groups.
- A decline in exclusive breastfeeding at hospital discharge, alongside an increase in supplementation for medical reasons was observed over time in both midwifery and non-midwifery clients.
- Among low-risk midwifery clients, the adjusted breastfeeding rates remained above the targeted 75% rate established by the Baby-Friendly Initiative (BFI). In contrast, rates among low-risk non-midwifery clients remained consistently below this threshold, highlighting differences in lactation support between both groups.

To view an alternate to this graph see **Table 5.7.3** in Appendix A for a table option of data points.



Numerator: Newborn feeding type from birth to discharge, including in the NICU by billable midwifery client status.
Denominator: All low-risk (using the 2023 MNOC low-risk definition) resulting in live, full term (37 to 41 weeks) hospital births to nulliparous pregnant individuals.

6.0 ACCESS TO CARE

Healthcare quality is based on six core domains: safety, timeliness, effectiveness, efficiency, equity and person-centredness (*Institute of Medicine, 2001*). Equitable access to high-quality healthcare during the perinatal period is essential for optimal maternal and newborn outcomes.

INTRODUCTION

Despite Ontario's universal healthcare system, there are significant **disparities in access to perinatal care**, particularly among equity-deserving communities, including Indigenous populations, rural residents, and families with low-incomes (*Heaman et al., 2019; Sheppard et al., 2017*). These inequities highlight opportunities to strengthen the system, by enhancing systemic factors such as healthcare infrastructure, expanding access to culturally safe care, and reducing socioeconomic barriers (*PCMCH, 2021*). This report highlights some of the disparities in access to perinatal care for the pregnant population.

Access to healthcare: Lack of equitable access to quality healthcare can contribute to poor birth outcomes. Differences in health behaviours and healthcare utilization can be observed across different cultural groups. New immigrants may face **language and cultural barriers** that can impact their access to and utilization of healthcare services. Other barriers to equity in prenatal care include **travel and financial burdens, culturally insensitive practices** that deter care engagement and continuity, and discriminatory behaviour that reduces care access and satisfaction (*Ladak et al., 2024; Miranda et al., 2009*).

In rural and remote areas of Ontario, especially in Northern Ontario, pregnant individuals are travelling longer distances to access perinatal care due to shortages of healthcare providers and the closure of facilities (*Association of Ontario Midwives, 2015*). Longer travel can delay timely care, increasing risks like preterm births and maternal stress. There is also evidence suggesting an increase in the number of babies born before arrival at healthcare facilities following closures of obstetrical services in small communities, which can be associated with higher perinatal and neonatal mortality rates (*Hutcheon et al., 2017; Malouf et al., 2020*).

For Indigenous women, the availability of healthcare resources, incorporation of traditional cultural practices of healing into healthcare services provided, consideration of socio-economic or lifestyle barriers to health, and the impact of colonization on interactions with health care providers can influence their health experiences (*Sheppard et al, 2017; Allen, 2020; Asamoah, 2023*). Medical evacuation, often due to limited availability of maternity care resources in remote communities, is associated with **emotional, physical, and financial stress** (*Kolahdooz et al., 2016*). Other factors associated with inequitable access to high-quality healthcare in Ontario include communication barriers, education, health literacy, distance to care, models of care, childcare issues, and systemic racism (*Provincial Council for Maternal and Child Health (PCMCH), 2021*). Ontario's Regional Networks Operational Forum (RNOF) is focused on improving health outcomes and health equity for perinatal, newborn and paediatric populations. This includes connecting and coordinating providers to increase system capacity (Provincial Council of Maternal and Child Health (PCMCH), 2025). Collecting valid and reliable information on these factors is crucial for supporting activities aimed at improving care.

Regular prenatal visits: Prenatal care is essential for monitoring the health of both the pregnant individual and the fetus, identifying and managing potential complications early, and helping families prepare for the birth and postpartum. The number of pregnant individuals in Ontario who missed prenatal visits in the first trimester has improved from 12.4% in 2012/2013 to 6.8% in 2023/2024. However, many pregnant individuals (>9000) still lack access to early prenatal care, which is crucial for detecting and managing complications like gestational diabetes and hypertension, providing important health education, and supporting decision-making for care (*Public Health Agency of Canada, 2025*). The highest proportion of no first-trimester visits was seen in the most equity-deserving populations (Quintile 5), but the proportion of pregnant individuals from the least marginalized population (Quintile 1) with no first-trimester visits has increased as well, meaning there are still population-level access issues that need to be addressed. Missing early care can result in delayed diagnosis and treatment of conditions that could be managed effectively if identified early, and higher maternal and neonatal mortality rates (*Hutcheon et al., 2017; Malouf et al., 2020*).

Policymakers and healthcare providers need to prioritize culturally sensitive care, community outreach, and enhanced health literacy. Investing in community-based perinatal care and addressing systemic barriers is essential. Collaboration among healthcare providers, policymakers, and community organizations is necessary to develop comprehensive solutions (**Provincial Council for Maternal and Child Health (PCMCH), 2025**). Integrating midwives into primary healthcare settings and including midwifery-led care within interprofessional teams can also improve care appropriateness for equity-deserving populations (*Darling et al., 2025*).

Access to primary care: The Healthy Babies Healthy Children (HBHC) program in Ontario is a public health initiative that provides support to pregnant individuals and families with young children. It focuses on preventing health risks, identifying them early, and offering interventions to ensure healthy child development. The program uses a screening tool to identify families at risk and then connects them with resources and services to support their needs (*Russell et al., 2018*). BORN Ontario built an electronic version of the Healthy Babies Healthy Children screen (eHBHC) to augment current data collection mechanisms and ensure the secure transfer of Personal Health Information (PHI) to public health units (*BORN Ontario, 2025*).

Data from the eHBHC tool revealed an increasing number of newborns lack access to primary care providers, with 8.1% of parents reporting no primary care provider in 2023/2024, up from 3.5% in 2018/2019. Newborns need critical assessments early on, and without a primary care provider, these can be fragmented or missed entirely, leading to delayed diagnosis and treatment, increased stress for families, and negatively impacting mental health (*Guttmann et al., 2010*). Lack of access to a primary care provider is associated with increased healthcare costs, particularly in populations with higher burdens of comorbidities, added strain on the healthcare system, and higher utilization of acute care services, including emergency department visits and hospitalization (*Fitzsimon et al., 2025*). Efforts are needed to improve access to primary care, especially in underserved areas. Programs like HBHC can support families, and policymakers should focus on strategies to improve access and collect data to inform interventions (*Ontario Ministry of Children, Community and Social Services, 2023*).

Focus on Equity and Inclusivity: BORN recognizes that health is not distributed equally, and that equity-deserving and vulnerable communities may face unique barriers to accessing high-quality perinatal care. They have formed an External Health Equity Advisory Group (HEAG) to advise on how to collect, store, and use sociodemographic data to promote health equity. BORN aims to ensure that all individuals have access to timely, evidence-based, high-quality perinatal care, regardless of their background or circumstances, and also develops resources to help health care providers improve their knowledge and skills in providing equitable care.

Monitoring and Evaluation: BORN Ontario plays a crucial role in promoting equitable access to perinatal care in Ontario. By collecting and analyzing data, BORN helps identify disparities in care and informs strategies to improve outcomes for all pregnant individuals and their families, especially those who are from equity-deserving or vulnerable populations. BORN is working collaboratively to integrate data on race, ethnicity, and other social determinants of health into their registry holdings. This data enables the identification of disparities in care and outcomes across different groups. By emphasizing data-driven strategies, collaborative efforts, and a commitment to equity, BORN Ontario strives to ensure that all pregnant individuals and their families in Ontario have access to the best possible perinatal care.

6.1 DISTANCE TO CARE

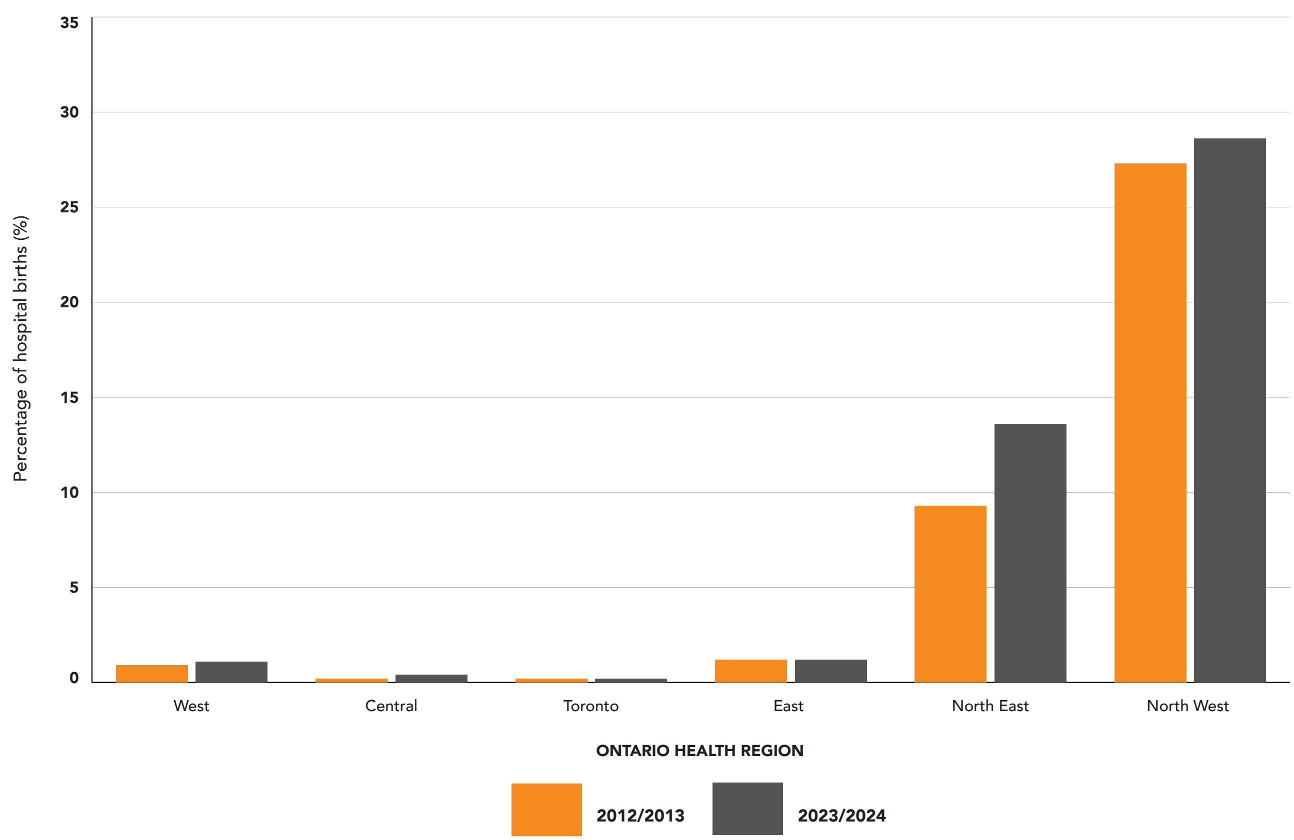
FIGURE 6.1.1

Prevalence of hospital births requiring at least 100 km of travel, Ontario, 2012/2013 to 2023/2024 by Ontario Health region and fiscal year

Summary of Figure 6.1.1

- In Ontario, hospital births requiring travel of 100+ km range from 0.2% to 28.6%, with the highest rates in North East and North West OH regions.
- Travel over 100 km remained stable in most regions but rose in the North East (9.3% → 13.6%) and North West (27.3% → 28.6%) between 2012/13 and 2023/24.
- Distance for birth has grown in Western and Central Ontario, especially rural and remote Northern communities, due to provider shortages and facility closures. Winter conditions add unpredictability. As part of its scope in supporting local gap analysis and planning, RNOF collaborates to identify resources and improve access to care.

To view an alternate to this graph see Table 6.1.1 in Appendix A for a table option of data points.



Numerator: Individuals travelling ≥100km to give birth.
Denominator : All pregnancies resulting in a live or stillbirth in hospital that occurred in Ontario with non-missing Ontario Health region.

6.2 PRENATAL VISIT

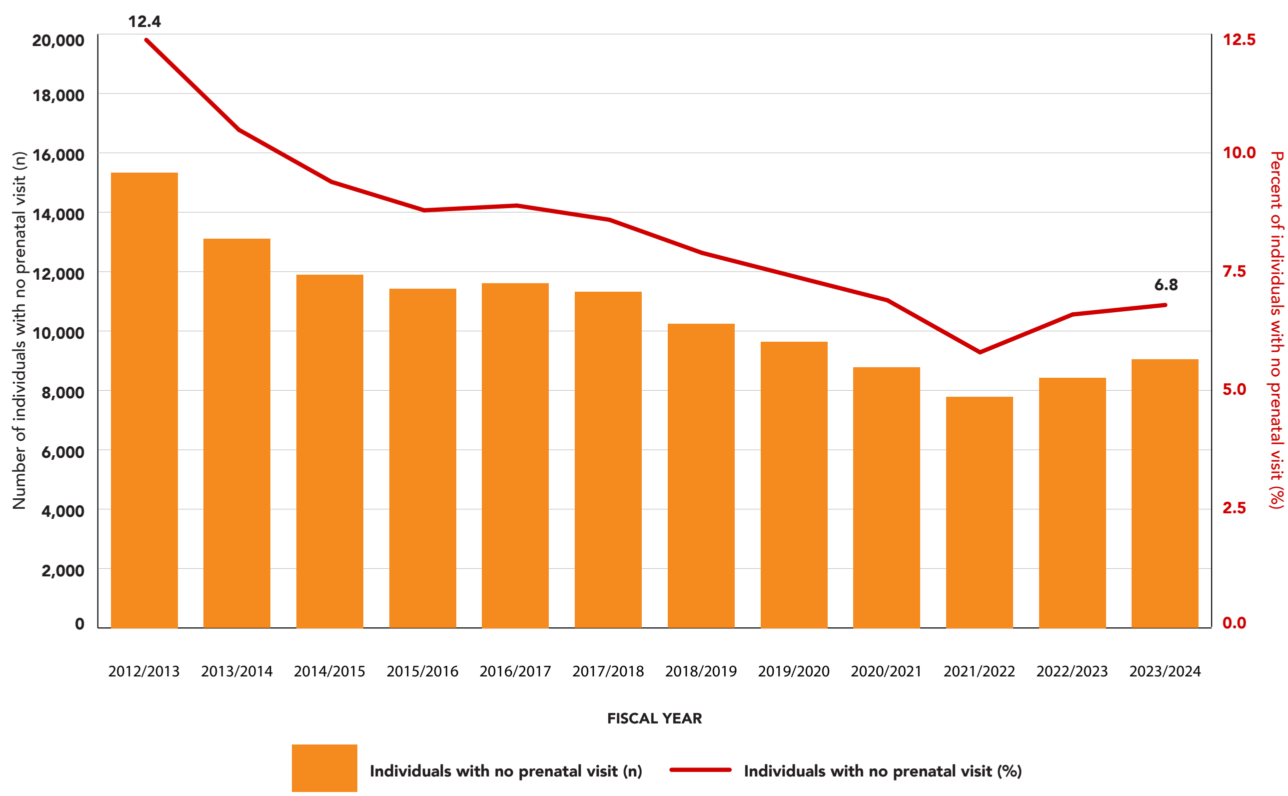
FIGURE 6.2.1

Prevalence of individuals with no first trimester prenatal visit, Ontario, 2012/2013 to 2023/2024

Summary of Figure 6.2.1

- There has been an improvement over the time period with a smaller proportion of individuals without a first trimester prenatal visit from 12.4% in 2012/2013 to 6.8% in 2023/2024.
- This still means that in 2023-2024 there were over 9000 individuals who either did not or could not access care during this critical period. The focus of early prenatal care is to focus on preventative health and assess for complications that if identified early, can be treated. During early visits, prenatal screening, ultrasounds, and risk assessments are conducted, along with support for individuals at risk to help them access resources for their physical, mental, and social health needs.

To view an alternate to this graph see **Table 6.2.1** in Appendix A for a table option of data points.



Numerator: Individuals with no prenatal visit in the first trimester.

Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

6.3 ON-MARG

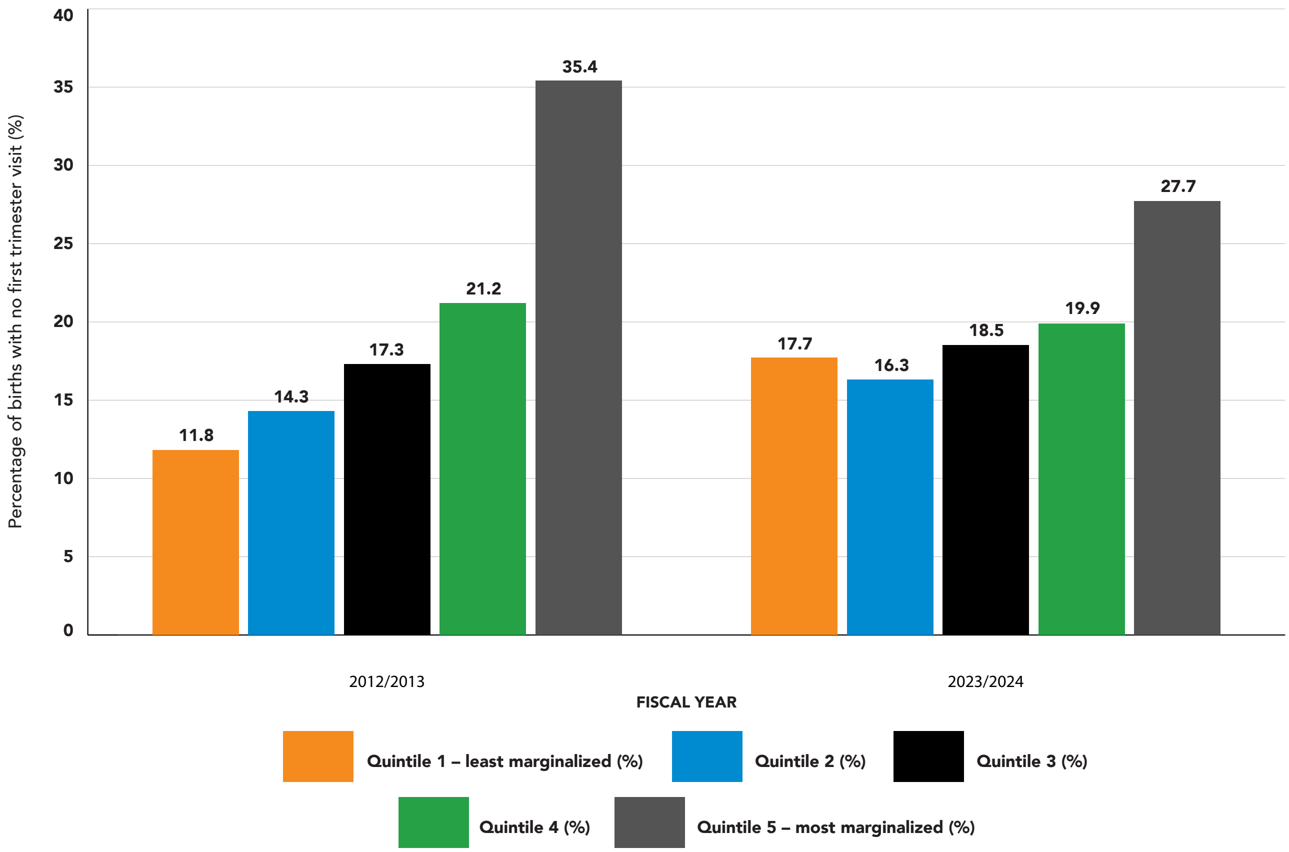
FIGURE 6.3.1

Distribution of 2016 ON-Marg material resource quintiles among pregnant individuals with no first trimester visit, Ontario, 2012/2013 compared to 2023/2024

Summary of Figure 6.3.1

- The ON-Marg material resources dimension reflects access to basic material needs such as housing, food, clothing, and education with indicators at the neighbourhood level. Contributing indicators measure housing in need of major repair, unemployment, low-income, one parent families, and attainment of a high-school diploma.
- In both 2012/2013 and 2023/2024, the highest percentage of pregnant individuals without a first trimester visit came from Quintile 5 (most marginalized), though the percentage decreased from 35.4% to 27.7%. The proportion of pregnant individuals without a first trimester visit in Quintile 1 (least marginalized) increased from 11.8% in 2012/2013 to 17.7% in 2023/2024. The distribution in 2023/2024 is more balanced across quintiles compared to 2012/2013, indicating some reduction in disparity by material deprivation.
- Equitable access to prenatal care is still an issue in Ontario despite our universal healthcare system. Many issues drive inequities: communication, financial factors, lack of cultural safety, education, health literacy, distance to care, models of care, childcare issues and racism to name a few. Collecting valid and reliable information on factors associated with marginalization can help support activities to improve care. If we do not know the factors driving the problems, we have limited ability to improve them.

To view an alternate to this graph see **Table 6.3.1** in Appendix A for a table option of data points.



Numerator: Births in each material resource quintile.
Denominator: All pregnancies resulting in a live or stillbirth in Ontario with a valid Ontario postal code and no prenatal visit in first trimester.

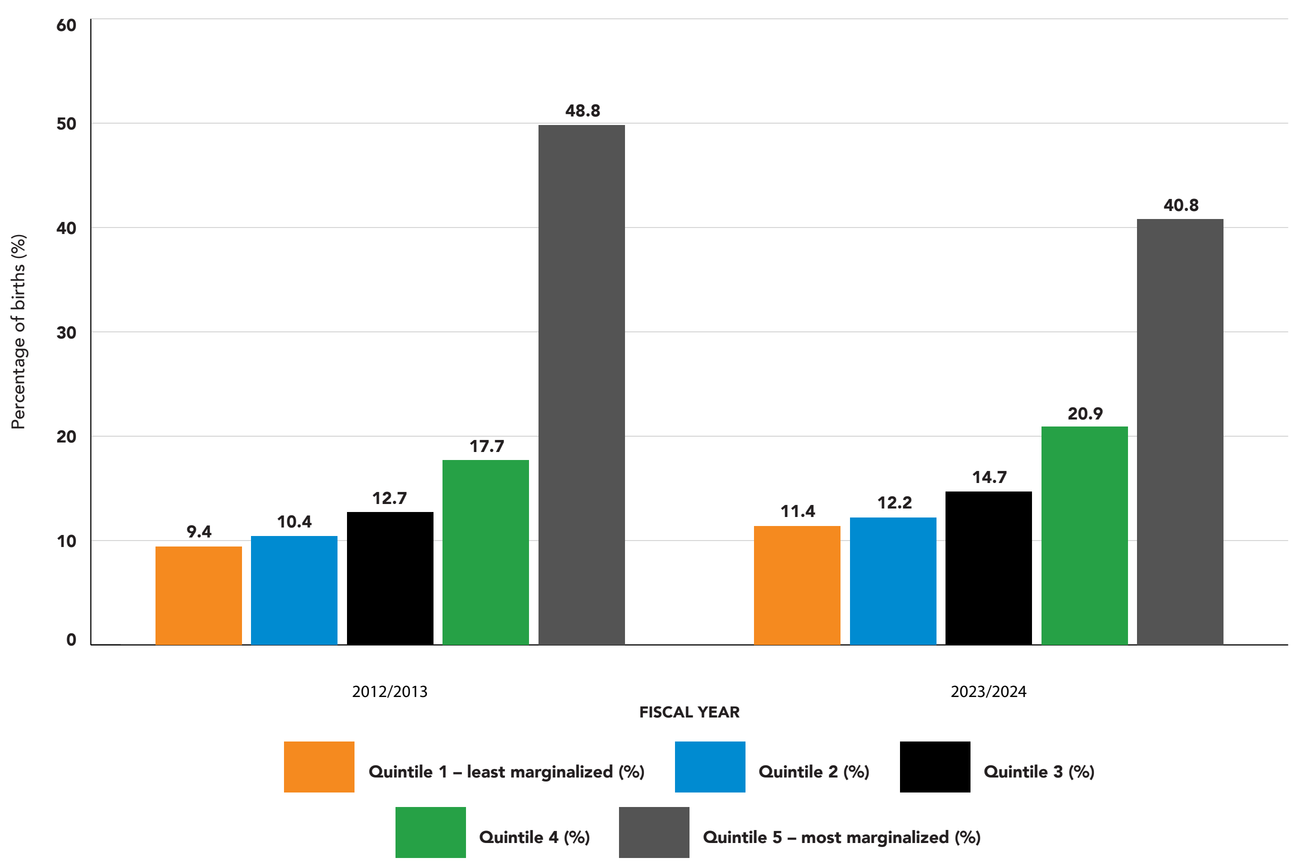
FIGURE 6.3.2

Distribution of 2016 ON-Marg racialized newcomer population quintiles among pregnant individuals with no first trimester visit, Ontario, 2012/2013 compared to 2023/2024

Summary of Figure 6.3.2

- ON-Marg's racialized newcomer dimension includes two indicators: the proportion of recent immigrants and those who self-identify as visible minorities.
- Pregnant individuals in the most marginalized group (Quintile 5) had the highest rates of no first trimester visits—though this dropped from 49.8% in 2012/2013 to 40.8% in 2023/2024, showing a modest move toward equity.
- Despite improvements, disparities persist, especially for the people in Quintile 5. Continued efforts are needed to address barriers like socioeconomic status, language, systemic racism, and access to care—underscoring the importance of culturally sensitive care, community outreach and targeted prenatal programs. Early prenatal care is crucial to optimizing maternal and neonatal health outcomes.

To view an alternate to this graph see **Table 6.3.2** in Appendix A for a table option of data points.



Numerator: Individuals with no prenatal visit in the first trimester.

Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

7.0 ASSISTED REPRODUCTIVE TECHNOLOGIES (ART)

Globally 1 in 6 adults struggle with infertility; most likely an underestimation due to the inability to accurately describe its prevalence (*World Health Organization, 2023*). There are many national registries that attempt to document the use of in vitro fertilization (IVF) and other forms of assisted reproductive technologies with varying success. In Canada, the Canadian Assisted Reproductive Technologies Register (CARTR Plus) has been capturing and analyzing IVF data since 2013, from fertility clinics across the country (*CARTR Plus Annual Report, 2025*). CARTR Plus data has enabled identification of national clinical practice changes over time.

INTRODUCTION

There has been an increase in the used of assisted reproductive technologies as women have delayed childbearing due to increased years spent in education and career advancement. Additionally, an increase has occurred due to the rise in societal awareness of its benefits and a decrease in the perceived stigma associated with the use of assisted reproductive technologies. Since 2013, the number of patients in Canada that have used assisted reproductive technologies has more than double from 7,364 to 15,137 in 2022.

Over the past decade there has been a shift to more freeze-all cycles, where all embryos retrieved are frozen and therefore no fresh transfer is attempted. Often this is done so that embryos can be biopsied for preimplantation genetic testing for aneuploidy, which have a higher cumulative pregnancy rate among certain age groups. However, patients who have poor blastocyst conversion will have a lower chance of having an embryo transferred.

Assisted reproductive technologies allow patients undergoing surgeries impacting spontaneous conception, as well as chemotherapy or other gonadotoxic therapies the ability to preserve their fertility. Medical oocyte retrieval has increased due to collaborations between fertility clinics and oncologists. Often cancer centres have a simplified pathway to ensure that cancer patients are offered access to fertility treatment in a timely manner. Elective oocyte cryopreservation has also increased over the past ten years, especially since the COVID-19 pandemic, as it allows women to preserve their fertility if they are not in a position to conceive spontaneously. Some employers are offering health insurance that includes elective fertility preservation for their employees.

Ontario started funding one cycle of IVF in December 2015, through the Ontario Fertility Program. Through the first seven years of funding, almost 40,000 cycles have been provided to Ontario residents, which has resulted in over 13,000 live births. A condition of the funded cycle is that embryos are transferred one at a time to reduce the chance of a multiple pregnancy. Funded cycles have a very low multiple live birth rate (0.9%) per embryo transfer and have influenced the practice patterns of private-pay cycles in Ontario resulting in a decrease from 2.8% in 2016 to 1.5% in 2022. The decrease in the multiple live birth rate directly correlates with improved pregnancy and birth outcomes, as well as the decreased cost for care in the neonatal intensive care unit. CARTR Plus has provided the ability to analyze and interpret population-level practice pattern changes over the past decade at both national and provincial level.

7.1 ART OUTCOMES

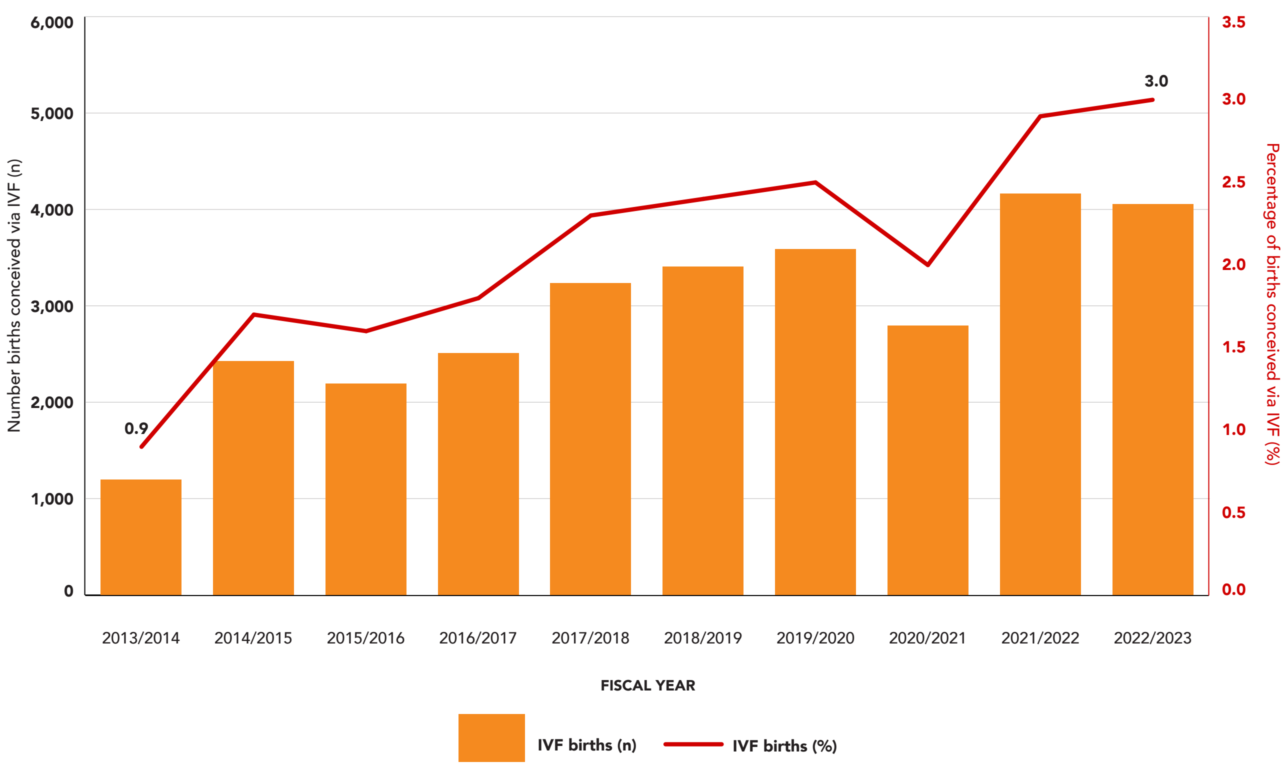
FIGURE 7.1.1

Prevalence of births conceived by ART procedures, Ontario, 2013/2014 to 2022/2023

Summary of Figure 7.1.1

- BORN Ontario assists fertility clinics in Canada to collect, store, and use fertility treatment data through the Canadian Assisted Reproductive Technologies Register (CARTR Plus). Births from IVF in Ontario are linked to BORN pregnancy and birth data to obtain birth outcomes.
- The prevalence of births conceived through IVF in Ontario increased from 0.9% (1136 births) in 2013/2014 to 3.0% (4053 births) in 2022/2023.
- Many factors have contributed to the rise in births from IVF in Ontario. Demographically, many individuals are choosing to have children later in life, which can affect fertility. The Ontario Fertility Program (OFP) began providing funding for fertility treatment (see figure 7.2.1), which has made treatments more affordable and accessible. Advancements in technology, including embryo freezing and genetic testing, have made treatments more effective.

To view an alternate to this graph see **Table 7.1.1** in Appendix A for a table option of data points.



Numerator: Births conceived via in vitro fertilization (IVF).

Denominator: All pregnancies that resulted in a live birth in Ontario.

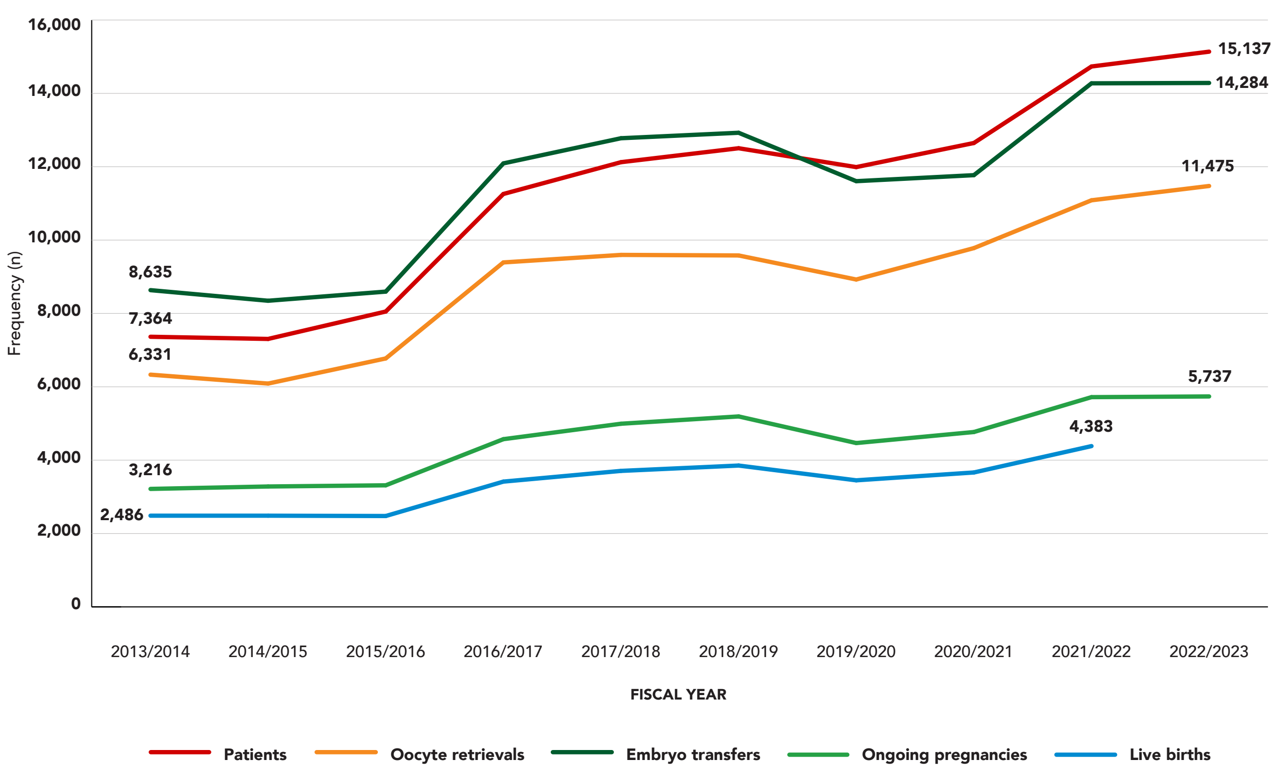
FIGURE 7.1.2

Frequency of patients, oocyte retrievals, embryo transfers, ongoing pregnancies, and live births following IVF, Ontario, 2013/2014 to 2022/2023

Summary of Figure 7.1.2

- The use of IVF has increased over time. By 2022/2023, 15,137 individuals underwent IVF, resulting in 11,475 oocyte retrievals, 14,284 embryo transfers, and, 5,737 ongoing pregnancies. Birth outcome data are available up until 2021/2022, when there were 4,383 live births.
- The introduction of the Ontario Fertility Program (OFP) in late 2015 marked an increase in access. See figure [7.2.1] for more information on OFP. The COVID-19 pandemic disrupted access to the IVF services in 2019/2020, but recovered afterwards, and has since continued to grow.
- Live birth rates are highly dependent on egg age, quality of the embryos, and laboratory processes.

To view an alternate to this graph see **Table 7.1.2** in Appendix A for a table option of data points.



Numerator: N/A.

Denominator: Fertility patients, oocyte retrievals, ongoing pregnancies, live births.

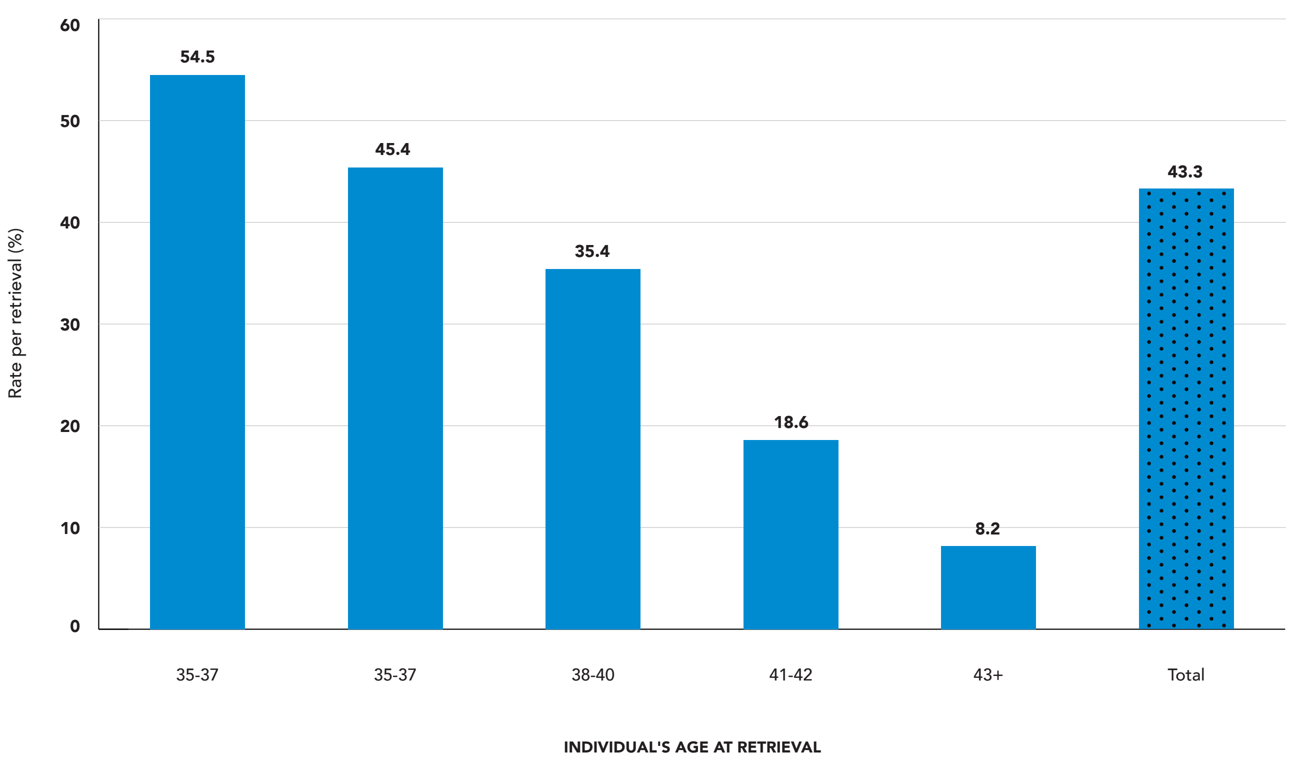
FIGURE 7.1.3A

Cumulative live birth rate for retrievals *without* preimplantation genetic testing for aneuploidy (PGT-A), Ontario, 2019/2020 to 2021/2022 by age at time of retrieval

Summary of Figures 7.1.3A & 7.1.3B

- Following an oocyte retrieval, many patients choose to have preimplantation genetic testing for aneuploidies (PGT-A) to assess the aneuploidy risk before they are transferred.
- The cumulative live birth rate is a measure of the prevalence of live births that occur within 12 months of an oocyte retrieval when there has been at least one embryo transfer. The cumulative live birth rate varies substantially by age. Among those without PGT-A, the prevalence is as high as 54.5% for those under 35 years, and 8.2% of those 43 years and older. The cumulative live birth rate among those with PGT-A is as high as 56.6% for those under 35 years old, and 36.6% among those 41-42 years.
- PGT-A testing has the largest impact among those over 35 years because the risk of chromosomal abnormalities increases with age. By identifying and selecting euploid (chromosomally normal) embryos, PGT-A may increase the chances of successful implantation, and reduce the risk of miscarriage.

To view an alternate to this graph see [Table 7.1.3A] in Appendix A for a table option of data points.

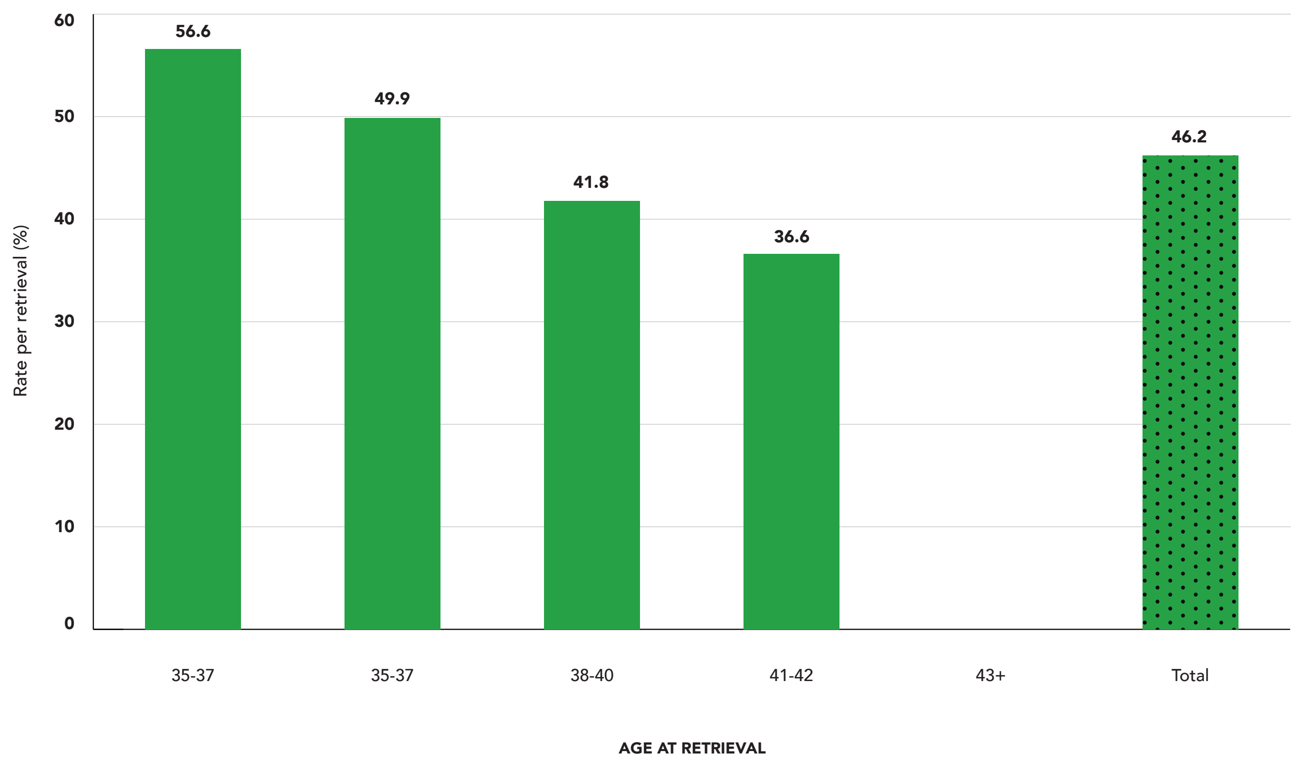


Numerator: Oocyte retrievals with no PGT-A resulting in at least one live birth within one year of the retrieval.
Denominator: All oocyte retrievals with at least one embryo transfer.

FIGURE 7.1.3B

Cumulative live birth rate for retrievals *with* preimplantation genetic testing for aneuploidy (PGT-A), Ontario, 2019/2020 to 2021/2022 by age at time of retrieval

To view an alternate to this graph see **Table 7.1.3B** in Appendix A for a table option of data points.



Numerator: Ooctye retrievals with PGT-A testing resulting in at least one live birth within one year of the retrieval.
Denominator: All oocyte retrievals with at least one embryo transfer.

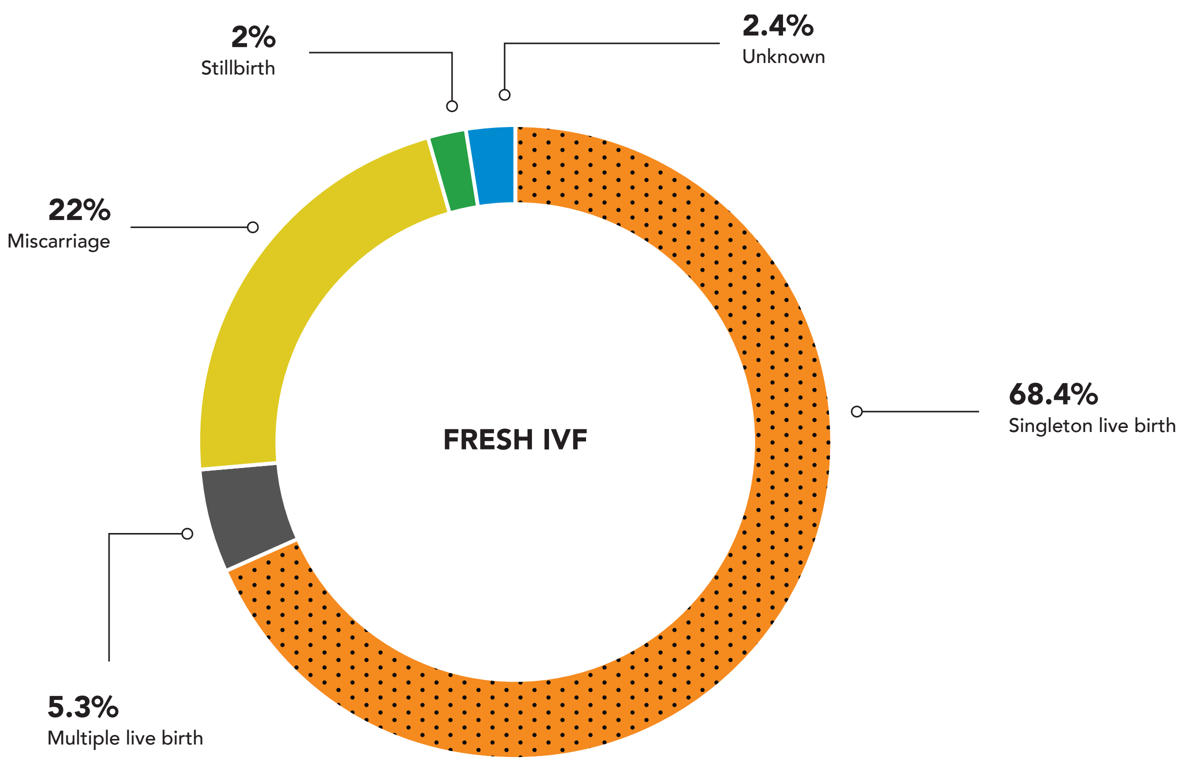
FIGURE 7.1.4A

Prevalence of birth outcomes among ongoing pregnancies, Ontario, 2021/2022 by embryo transfer protocols: Fresh embryo transfer with PGT-A

Summary of Figures 7.1.4A, 7.1.4B & 7.1.4C

- Fresh IVF refers to the process where the embryo is transferred after oocyte retrieval, without undergoing freezing. Frozen embryo transfers (FET) involve the process of thawing a previously frozen embryo and transferring it to the uterus. PGT-A involves removing a few cells from the trophectoderm of the embryo to test for aneuploidies. The embryos are then frozen until the biopsy results are received.
- Among ongoing pregnancies, singleton live births are the most common outcome. Ongoing pregnancies from embryos that have undergone PGT-A have the highest prevalence of singleton births (81.4%) and the lowest prevalence of miscarriage (11.7%). The prevalence of singleton live births for fresh IVF was 68.4% and the prevalence of miscarriage was 22.0%. The estimates are similar to the group with FET without PGT-A.
- PGT-A may improve pregnancy outcomes, especially for those above 35 years of age (Figure 7.1.2).

To view an alternate to this graph see **Table 7.1.4A** in Appendix A for a table option of data points.

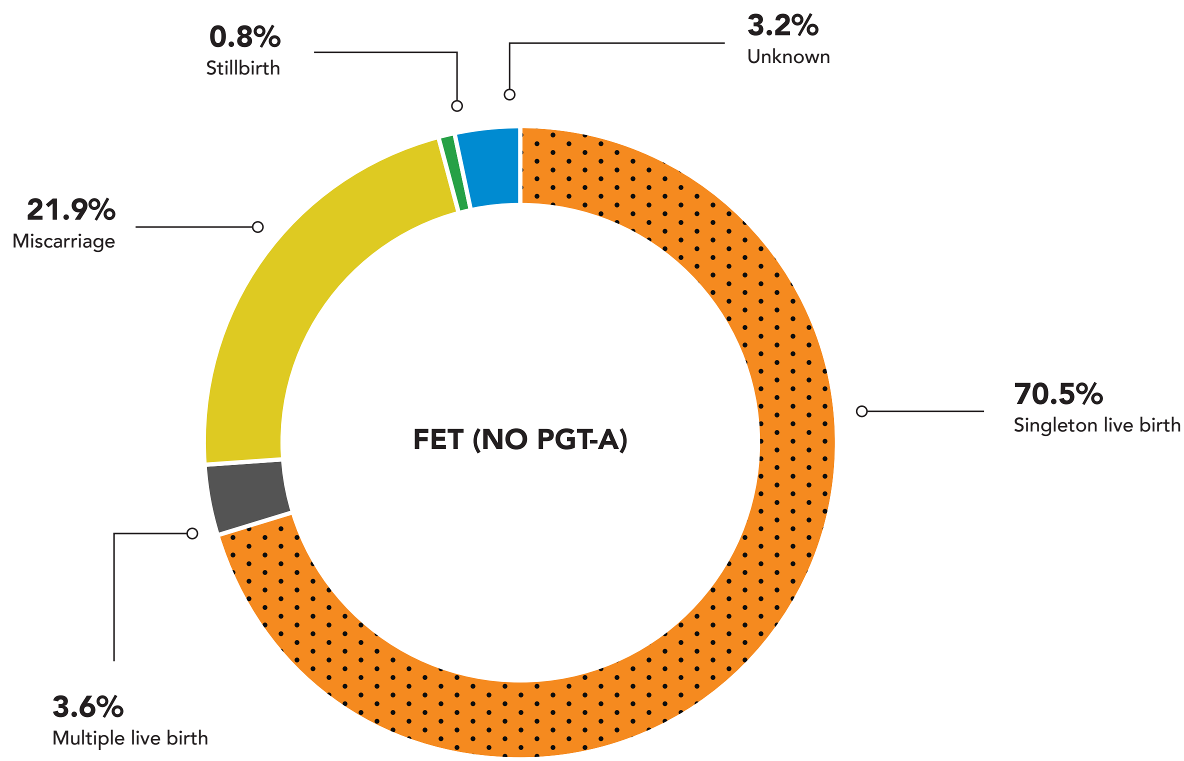


Numerator: Each birth outcomes.
Denominator: All fresh in vitro fertlization.

FIGURE 7.1.4B

Prevalence of birth outcomes among ongoing pregnancies, Ontario, 2021/2022 by embryo transfer protocols: Frozen embryo transfer with no PGT-A

To view an alternate to this graph see **Table 7.1.4B** in Appendix A for a table option of data points.



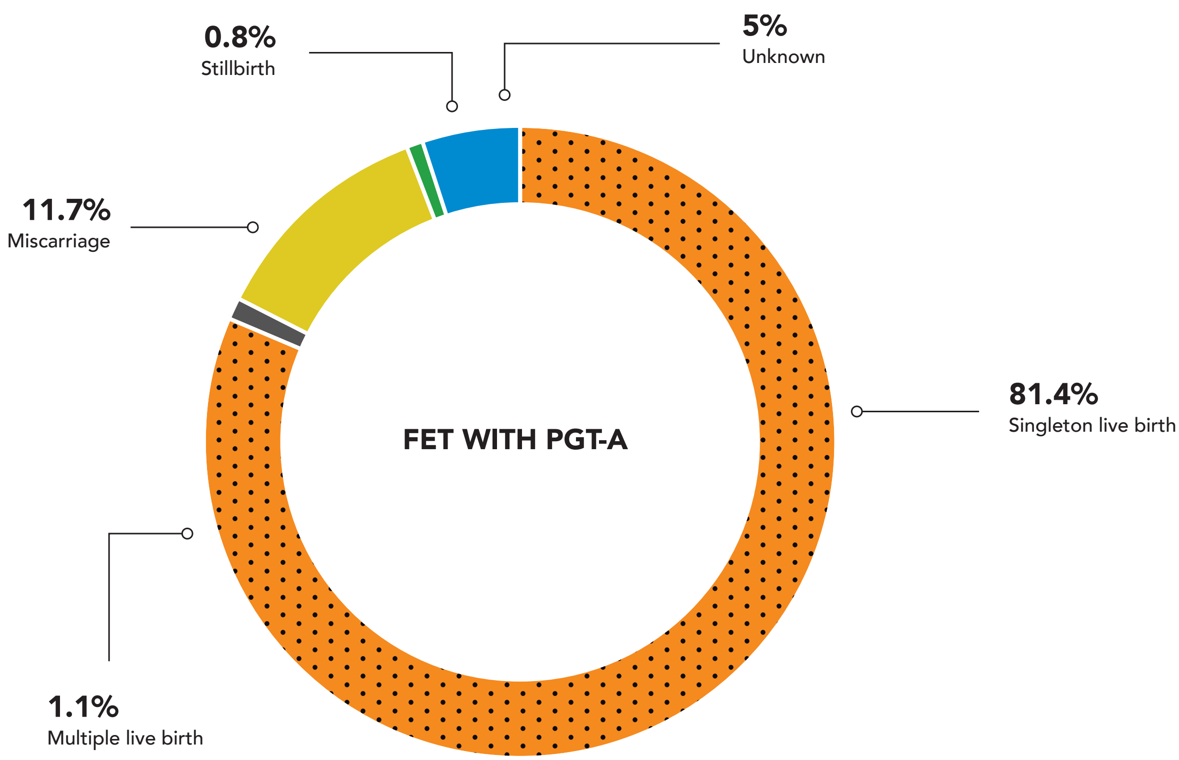
Numerator: Each birth outcomes.

Denominator: All frozen embryo transfers with no preimplantation genetic transfer for aneuploidy.

FIGURE 7.1.4C

Prevalence of birth outcomes among ongoing pregnancies, Ontario, 2021/2022 by embryo transfer protocols: Frozen embryo transfer with PGT-A

To view an alternate to this graph see **Table 7.1.4C** in Appendix A for a table option of data points.



Numerator: Each birth outcomes.

Denominator: All frozen embryo transfers with preimplantation genetic transfer for aneuploidy.

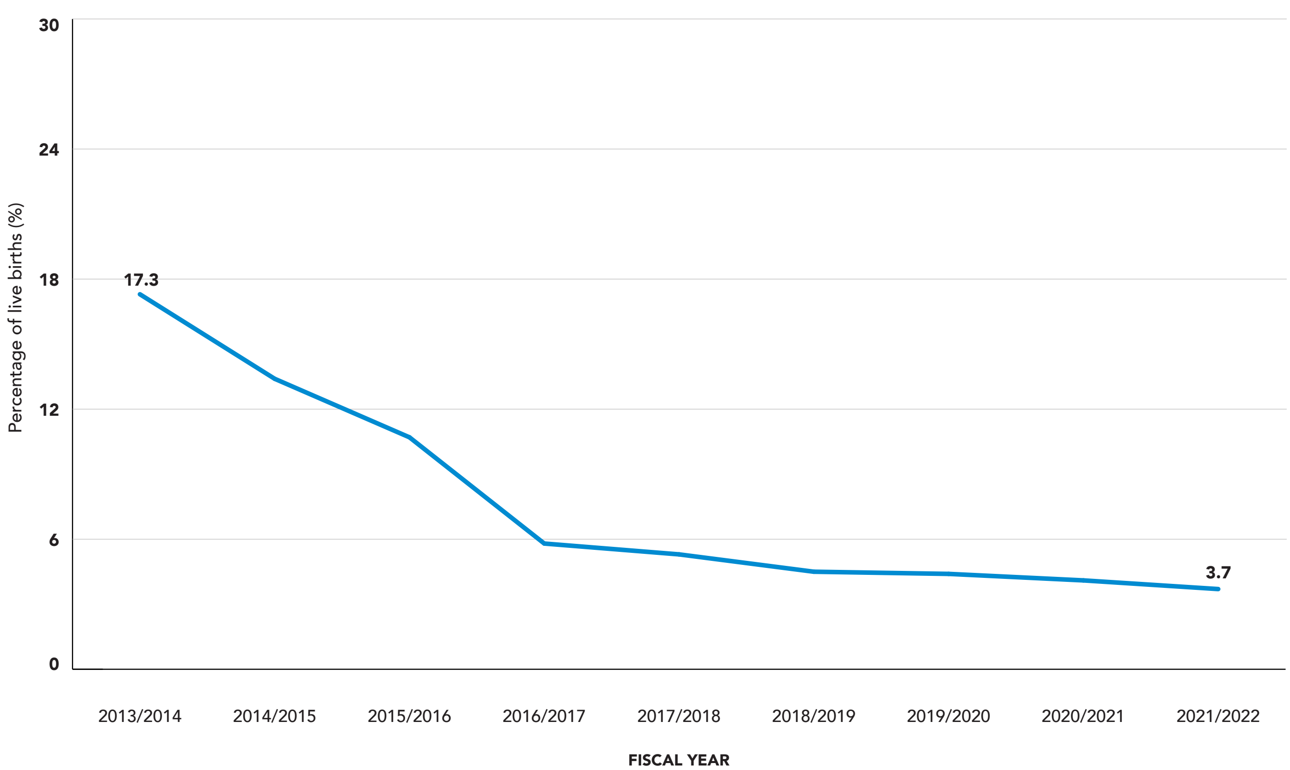
FIGURE 7.1.5

Distribution of multiple live births following IVF, Ontario, 2013/14 to 2021/2022

Summary of Figures 7.1.5

- In the early years of IVF, transferring multiple embryos was a common practice aimed at increasing the chances of achieving a successful pregnancy. However, this practice increased the risk of multiple pregnancies, which are associated with health complications
- The prevalence of multiple live births in the CARTR Plus dataset has decreased from 17.3% in 2013/2014 to 3.7% in 2021/2022.
- The decline in multiples is attributed to the increase in single embryo transfers. Improvements in embryo freezing techniques and genetic testing have also contributed to decreasing the transfer of multiple embryos. These changes reflect a broader effort to enhance the safety and outcomes of IVF.

To view an alternate to this graph see **Table 7.1.5** in Appendix A for a table option of data points.



Numerator: Multiple births.
Denominator: Live births conceived via in vitro fertilization (IVF).

7.2 ONTARIO FERTILITY PROGRAM

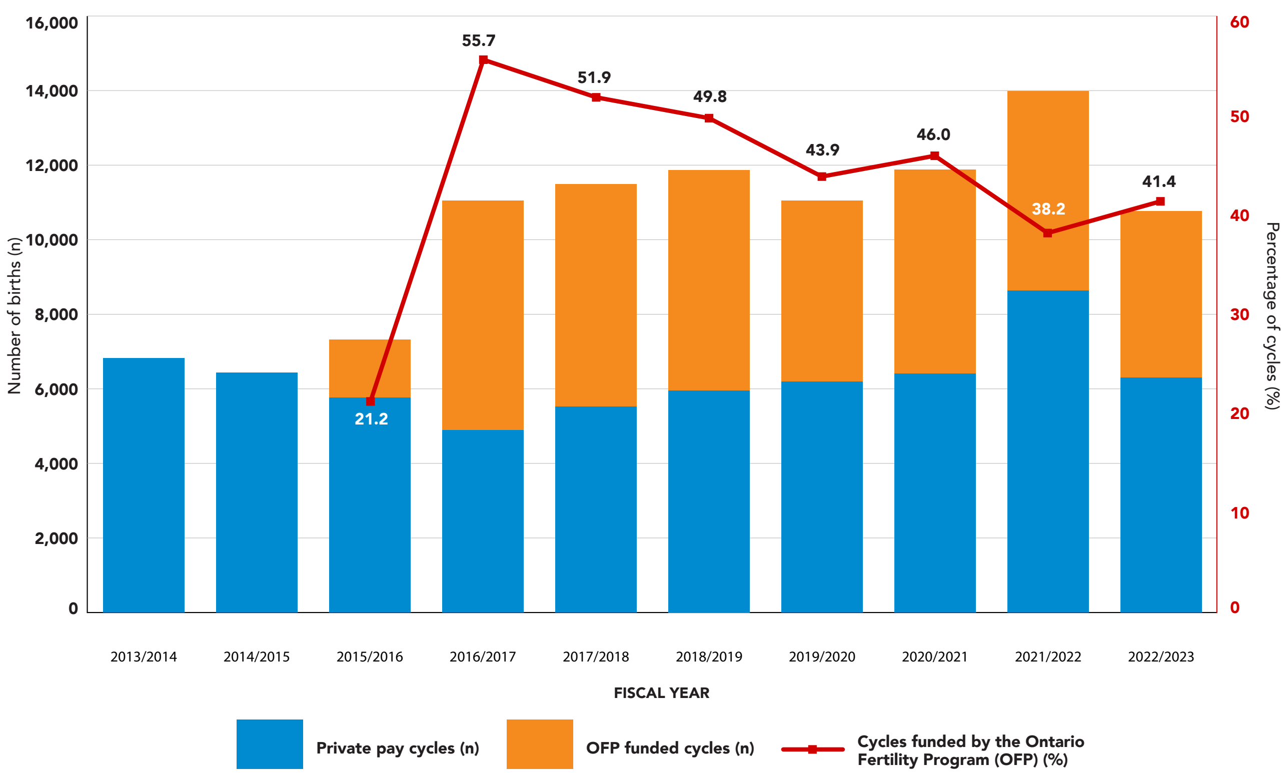
FIGURE 7.2.1

Frequency and prevalence of funding for IVF, Ontario, 2013/2014 to 2022/2023

Summary of Figures 7.2.1

- The Ontario Fertility Program (OFP), launched in late 2015, offers financial support for individuals under 43 years of age to cover treatment expenses for a single oocyte retrieval cycle, as well as all related embryo transfers resulting from that cycle.
- OFP contributed to a substantial increase in the number of fertility treatment cycles each year.
- The overall number of IVF cycles in Ontario has increased. However, the proportion of these cycles funded by OFP is declining, indicating a shift toward greater reliance on privately funded IVF treatments

To view an alternate to this graph see Table 7.2.1 in Appendix A for a table option of data points.



Numerator: Funding types for in vitro fertilization (IVF) cycles.

Denominator: All in vitro fertilization (IVF) cycles.

8.0 COMMUNICABLE DISEASES OF PUBLIC HEALTH INTEREST

The world's attention and focus on communicable diseases changed dramatically in 2020 with the COVID-19 pandemic. In the general population and especially in health care settings, people were talking about numbers of cases, hospitalizations, deaths, short and long-term complications and the general impact on the health care system. Pregnant individuals were a specific focus as early warning signs pointed to worsening outcomes within this patient population. Wastewater testing was developed as a novel way to track pathogens and help to predict the burden of illness.

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The pandemic also led to a renewed focus on improving health equity as inequities were evident in rates of illness, death and vaccination. This report presents information on what we learned in Ontario during the COVID-19 pandemic.

While COVID-19 waned with the assistance of vaccinations, public health professionals are concerned that we haven't fully embraced the lessons learned through COVID-19 from the other infectious outbreaks (H1N1, SARS and avian flu) and are not well prepared for the next infectious outbreak (Feldscher, 2024). Most public health professionals believe this is not an '*if*', but a '*when*' situation of what the next major pandemic will be.

While not to the same magnitude as COVID-19, we are currently seeing a serious infectious but preventable disease affecting the maternal-newborn population. Rates of syphilis and congenital syphilis are on the rise in Canada. This report documents nearly a six-fold increase in cases of syphilis exposure in pregnancy over the reporting period. Similar to work done during the COVID-19 pandemic, BORN is participating in a national surveillance effort to understand more about the number of cases in different jurisdictions and trying to determine why this infection is not being fully recognized and treated. Again, health equity issues and access to care need further investigation.

Another infectious disease that puts a tremendous burden on hospitals and families is Respiratory Syncytial Virus (RSV), with young infants and high-risk children are more often infected and hospitalized (*Buchan et al., 2023*). In the 2024-25 RSV season, Ontario funded and implemented a new RSV prevention program, with a universal monoclonal antibody immunization for newborns and a prenatal vaccine for pregnant individuals. BORN rapidly implemented a new data collection tool to track the implementation of this new program, uptake, coverage, reasons immunization was not received and patient outcomes. We will report on this first season but know there are still important implementation strategies to improve uptake in subsequent RSV seasons and ways to improve data collection from sites.

At BORN, we are committed to working with our public health partners to ensure comprehensive and timely information is available about infectious disease and vaccination patterns. Health policy decisions, care provider counselling, accurate science, and information to support pregnant individuals' decisions rely on having this information. Currently, in Canada, we have significant barriers to sharing data across provincial and territorial boundaries. In Ontario, there is no comprehensive and easily accessible vaccine registry – the recent measles outbreak is the latest example of how this type of system would have value. BORN continues to advocate for improvements to address both problems and is working on technological solutions to improve care and information sharing in line with the recommendations of the Digital Health Interoperability Task Force (*DHITF, 2024*).

8.1 SYPHILIS

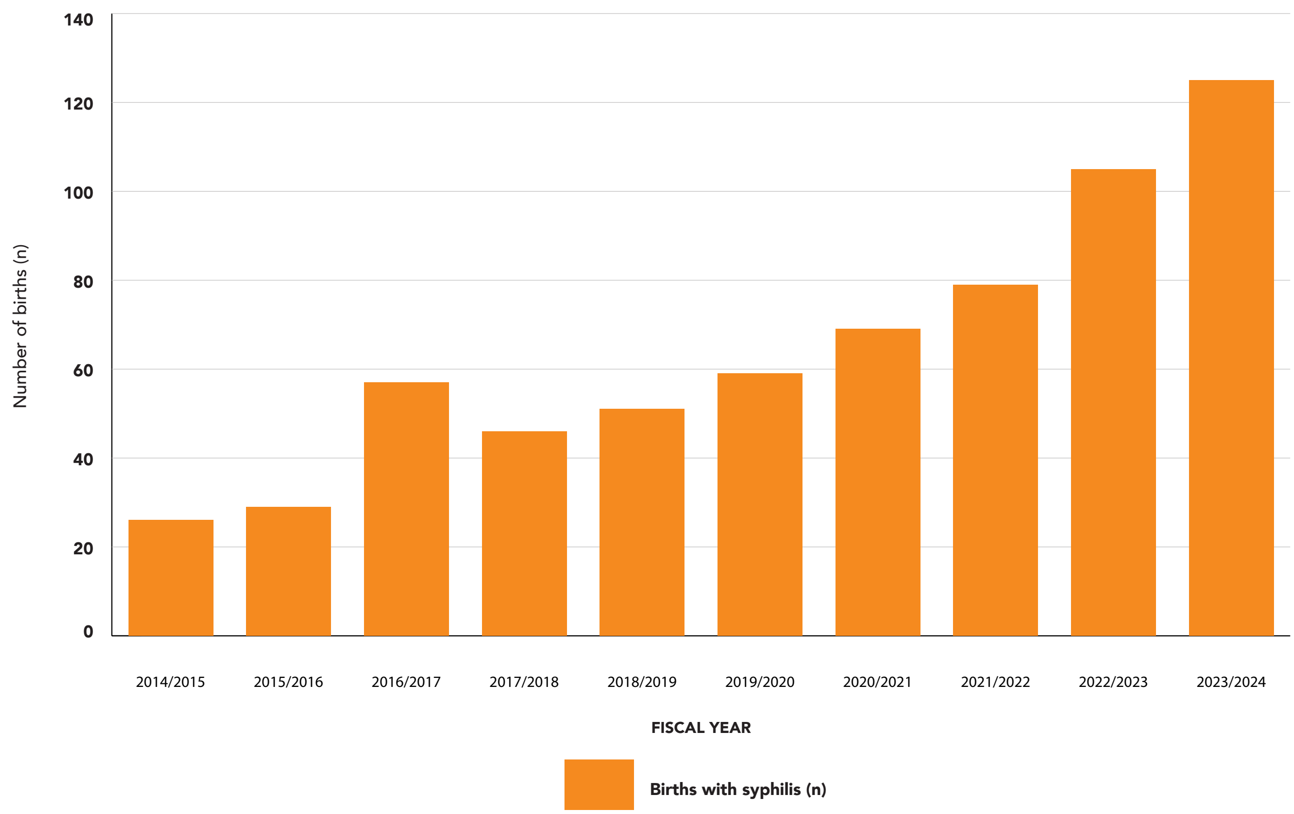
FIGURE 8.1.1

Frequency of births with syphilis exposure in pregnancy, Ontario, 2014/2015 to 2023/2024

Summary of Figures 8.1.1

- The frequency of births with exposure to syphilis during pregnancy ranges from 26 – 125 infants over the time period.
- There has been a nearly 5-fold increase in the number of infants with syphilis exposure over the time period.
- Syphilis rates are rising across Canada, including Ontario—affecting the general population, women, and pregnancies. Congenital syphilis, though entirely preventable, is also increasing due to missed diagnoses and treatment gaps, often linked to lack of prenatal care, delayed treatment, or reinfection. It can cause pregnancy loss and serious newborn complications, some of which appear weeks or months after birth. The Canadian Paediatric Society's position statement, Diagnosis and management of congenital syphilis – Avoiding missed opportunities, offers a helpful overview. All pregnancy care providers should stay current on symptoms and treatment protocols.

To view an alternate to this graph see **Table 8.1.1** in Appendix A for a table option of data points.



Numerator: Births with syphilis exposure during pregnancy.

Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

APPENDIX A | TABLES

NOTE: For more information on terms used to interpret the information contained within this report, please refer to **Appendix B – Notes for Interpretation**. Appendix A contains extra tables and figures providing supplementary information contained in the chapters.

1.0 PERINATAL OVERVIEW

1.1 PERINATAL OVERVIEW

TABLE FOR FIGURE 1.1.1

Birth volumes, Ontario, 2012/2013 to 2023/2024 by Ontario Health region of residence and fiscal year

To view a visual representation of Figure 1.1.1 view graph **here**.

	Birth volume by Ontario Health Region of Infant residence							
Fiscal Year	**West (n)**	**Central (n)**	**Toronto (n)**	**East (n)**	**North East (n)**	**North West (n)**	**Missing OHR* (n)**	**Total (All Ontario births) (n)**
2012/2013	38,505	36,783	31,837	27,079	5,427	2,548	2,287	**144,466**
2013/2014	38,497	35,535	31,075	27,281	5,497	2,524	2,640	**143,049**
2014/2015	38,943	35,634	30,709	27,088	5,559	2,540	2,821	**143,294**
2015/2016	39,050	35,871	30,562	27,227	5,509	2,504	2,587	**143,310**
2016/2017	39,242	36,528	30,706	26,981	5,263	2,405	2,448	**143,573**
2017/2018	38,380	36,612	30,494	27,107	5,283	2,466	4,114	**144,456**
2018/2019	39,960	36,510	30,130	27,042	4,829	2,439	2,932	**143,842**
2019/2020	39,820	36,143	29,948	27,556	4,838	2,278	4,134	**144,717**
2020/2021	39,248	35,684	28,026	26,943	4,708	2,354	2,279	**139,242**
2021/2022	41,146	35,738	27,398	28,566	4,706	2,299	4,273	**144,126**
2022/2023	39,855	35,565	26,477	26,747	4,469	2,117	3,865	**139,095**
2023/2024	39,001	37,051	27,880	28,229	4,543	2,067	5,297	**144,068**

Technical Notes: Ontario Health (OH) region is based on infant residence address.
Missing OH region may be due to unknown Ontario residence or non-Ontario residence.

TABLE FOR FIGURE 1.1.2

Birth volume by population density, Ontario, 2012/2013 to 2023/2024 by urban/rural residence and fiscal year

To view a visual representation of Figure 1.1.2 view graph **here**.

Fiscal Year	Birth volume for infant urban vs rural residence			
	Urban births (n)	**Urban births (%)**	**Rural births (n)**	**Rural births (%)**
2012/2013	128,010	90.6	13,259	9.4
2013/2014	125,979	90.3	13,557	9.7
2014/2015	125,983	90.2	13,685	9.8
2015/2016	126,242	90.3	13,637	9.7
2016/2017	126,338	90.1	13,901	9.9
2017/2018	126,792	90.1	13,993	9.9
2018/2019	126,075	89.9	14,124	10.1
2019/2020	126,768	90.0	14,114	10.0
2020/2021	122,235	89.7	13,975	10.3
2021/2022	124,534	89.4	14,741	10.6
2022/2023	121,023	89.8	13,742	10.2
2023/2024	124,561	90.1	13,737	9.9

Technical Notes: Urban and rural/remote residence is defined by the Statistics Canada's Statistical Area Classification type (SACtype) according to the CIHI recommendations for Health Equity Stratification (Canadian Institute for Health Information, Geographic Location Stratifier: Guidance on Measuring and Reporting Health Inequalities. 2022).

Statistics Canada. Postal Code OM Conversion File Plus (PCCF+). Catalogue no. 82F0086X. https://www150.statcan.gc.ca/n1/en/catalogue/82F0086X

TABLE FOR FIGURE 1.1.3

Out-of-hospital birth volumes, Ontario, 2012/2013 to 2023/2024 by birth location and fiscal year

To view a visual representation of Figure 1.1.3 view graph **here**.

Fiscal Year	Birth volume by birth location			
	Home (n)	Birth centre (n)	Midwifery clinic (n)	Other (n)
2012/2013	3,529	0	0	166
2013/2014	3,753	43	0	361
2014/2015	3,854	425	0	238
2015/2016	3,799	549	0	293
2016/2017	3,823	574	0	279
2017/2018	3,935	690	0	236
2018/2019	3,611	736	0	257
2019/2020	3,365	707	27	232
2020/2021	4,111	604	268	108
2021/2022	3,931	583	259	109
2022/2023	3,354	508	278	102
2023/2024	3,258	400	311	116

Technical Notes: Out-of-hospital birth locations include home, birth centre, midwifery clinic, and other. Midwifery clinic was introduced as a separate option in 2020. The "other" birth location category includes Nursing Station, other Ontario location, or Outside of Ontario location.

TABLE FOR FIGURE 1.1.4

Birth volumes by neighbourhood income, Ontario, 2012/2013 to 2023/2024 by median income quintiles 1 (lowest) and 5 (highest) and fiscal year

To view a visual representation of Figure 1.1.4 view graph **here**.

Fiscal Year	Quintile 1 (n)	Quintile 1 (%)	Quintile 5 (n)	Quintile 5 (%)
2012/2013	33,349	23.6	22,745	16.1
2013/2014	32,377	23.2	22,561	16.2
2014/2015	32,303	23.1	22,577	16.2
2015/2016	31,423	22.5	22,832	16.3
2016/2017	31,347	22.4	22,746	16.2
2017/2018	31,821	22.6	22,617	16.1
2018/2019	31,225	22.3	22,813	16.3
2019/2020	30,866	21.9	22,873	16.2
2020/2021	29,150	21.4	22,440	16.5
2021/2022	28,038	20.1	23,819	17.1
2022/2023	27,970	20.8	22,361	16.6
2023/2024	28,738	20.8	22,175	16.0

Technical Notes: Neighbourhood median income used before-tax, single-person equivalent (SPE) annual income data for the calendar year 2015 from Statistics Canada’s 2016 Census categorized into 5 quintiles (quintile 1 (poorest) – quintile 5 (richest)) at the infant dissemination area (DA) level in Ontario.

Statistics Canada. Postal Code OM Conversion File Plus (PCCF+). Catalogue no. 82F0086X. https://www150.statcan.gc.ca/n1/en/catalogue/82F0086X

TABLE FOR FIGURE 1.1.5

Birth volumes by neighbourhood education, Ontario, 2012/2013 to 2023/2024 by quintiles 1 (lowest) and 5 (highest) and fiscal year

To view a visual representation of Figure 1.1.5 view graph **here**.

Fiscal Year	Quintile 1 (n)	Quintile 1 (%)	Quintile 5 (n)	Quintile 5 (%)
2012/2013	27,495	19.5	28,572	20.3
2013/2014	26,714	19.2	28,595	20.6
2014/2015	26,808	19.3	28,383	20.4
2015/2016	25,989	18.6	28,527	20.5
2016/2017	26,308	18.8	28,808	20.6
2017/2018	26,281	18.7	28,179	20.1
2018/2019	26,419	18.9	28,076	20.1
2019/2020	25,836	18.4	28,069	20.0
2020/2021	25,156	18.5	26,700	19.7
2021/2022	24,950	18.0	27,458	19.8
2022/2023	24,232	18.0	26,265	19.6
2023/2024	24,899	18.1	27,030	19.6

Technical Notes: Neighbourhood education level is the percentage of individuals with a postsecondary certificate, degree, or diploma among individuals aged 25 to 64 from Statistics Canada's 2016 Census, categorized into 5 quintiles (Quintile 1(lowest), Quintile 5 (highest) at the infant dissemination area (DA) level in Ontario.

Reference: Statistics Canada, 2016 Census, Catalogue no. 98-401-X2016044.

TABLE FOR FIGURE 1.1.6

Distribution of parity, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Figure 1.1.6 view graph **here**.

Fiscal Year	Parity		
	0 (%)	1 (%)	2+ (%)
2012/2013	43.4	35.4	21.2
2013/2014	43.4	35.4	21.2
2014/2015	43.5	35.5	21.0
2015/2016	42.7	35.1	22.1
2016/2017	42.0	34.5	23.5
2017/2018	41.9	34.4	23.7
2018/2019	42.3	35.7	22.0
2019/2020	43.5	34.9	21.6
2020/2021	44.2	34.7	21.1
2021/2022	43.8	35.1	21.1
2022/2023	44.8	34.4	20.9
2023/2024	46.7	33.6	19.7

Technical Notes: None to report.

TABLE FOR FIGURE 1.1.7

Distribution of maternal age at birth, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Figure 1.1.7 view graph **here**.

Fiscal Year	Maternal age at birth					
	<20 (%)	20-24 (%)	25-29 (%)	30-34 (%)	35-39 (%)	40+ (%)
2012/2013	2.9	11.9	27.9	35.1	18.1	4.1
2013/2014	2.5	11.6	27.6	35.8	18.3	4.2
2014/2015	2.4	11.2	27.5	36.2	18.6	4.1
2015/2016	2.1	10.7	27.0	36.7	19.2	4.3
2016/2017	1.9	10.2	26.9	37.3	19.5	4.3
2017/2018	1.7	9.7	26.4	37.4	20.4	4.5
2018/2019	1.4	9.2	25.9	37.7	21.1	4.7
2019/2020	1.3	8.7	25.7	38.2	21.3	4.9
2020/2021	1.2	8.2	25.3	39.1	21.5	4.7
2021/2022	1.0	7.1	24.0	40.0	22.8	5.0
2022/2023	1.0	7.1	24.0	39.8	22.9	5.2
2023/2024	0.9	6.8	23.7	40.3	23.0	5.2

Technical Notes: Maternal age refers to age of birthing individual at time of live birth or stillbirth in the current pregnancy.

TABLE FOR FIGURE 1.1.8

Mean maternal/pregnant individual age at birth (years), Ontario, 2012/2013 to 2023/2024 by parity and fiscal year

To view a visual representation of Figure 1.1.8 view graph here.

Fiscal Year	Parity	
	Nulliparous	**Primiparous or multiparous**
2012/2013	28.7	31.5
2013/2014	28.9	31.6
2014/2015	29.0	31.7
2015/2016	29.1	31.8
2016/2017	29.2	31.9
2017/2018	29.5	32.0
2018/2019	29.7	32.2
2019/2020	29.8	32.3
2020/2021	29.9	32.4
2021/2022	30.2	32.6
2022/2023	30.3	32.7
2023/2024	30.3	32.9

Technical Notes: None to report.

TABLE FOR FIGURE 1.1.9A & 1.1.9B

1.1.9.A Distribution of gestational age among live births, Ontario, 2012/2013 compared to 2023/2024

1.1.9.B Distribution of gestational age among stillbirths, Ontario, 2012/2013 compared to 2023/2024

To view a visual representation of Figure 1.1.9A & 1.1.9B view graph **here**.

Live births (%)	2012/2013	2023/2024
<28 weeks	0.5	0.4
28-29 weeks + 6 days	0.2	0.2
30-31 weeks + 6 days	0.4	0.4
32-33 weeks + 6 days	0.9	0.95
34-36 weeks + 6 days	5.8	6.2
37-38 weeks + 6 days	27.1	32.17
≥39 weeks	64.8	59.4

Stillbirth (%)	2012/2013	2023/2024
<28 weeks	39.9	42.0
28-29 weeks + 6 days	6.3	7.3
30-31 weeks + 6 days	4.5	6.7
32-33 weeks + 6 days	5.7	6.1
34-36 weeks + 6 days	15.2	13.0
37-38 weeks + 6 days	11.7	13.2
≥39 weeks	16.5	11.4

Technical Notes for Figure 1.1.9A: Gestational age at birth among all infants.

Technical Notes for Figure 1.1.9B: Gestational age at birth among all stillborn infants.

Stillbirth includes any spontaneous stillbirths at ≥20 weeks or ≥ 500 grams that occur during the antepartum or intrapartum period. Stillbirths that resulted in an intentional termination are excluded..

TABLE 1.1.10A GA BIRTH DISTRIBUTION EXPANDED TO INCLUDE ALL YEARS

	Gestational age among live births						
Fiscal Year	**<28 weeks (%)**	**28-29 weeks + 6 days (%)**	**30-31 weeks + 6 days (%)**	**32-33 weeks + 6 days (%)**	**34-36 weeks + 6 days (%)**	**37-38 weeks + 6 days (%)**	**≥39 weeks (%)**
2012/2013	0.52	0.26	0.49	0.99	5.82	27.1	64.83
2013/2014	0.48	0.24	0.43	0.93	5.81	25.95	66.15
2014/2015	0.49	0.27	0.43	0.90	5.74	25.71	66.47
2015/2016	0.48	0.25	0.39	0.91	5.82	26.46	65.69
2016/2017	0.51	0.26	0.44	0.89	5.77	26.93	65.19
2017/2018	0.50	0.25	0.43	0.89	5.94	27.41	64.57
2018/2019	0.51	0.26	0.42	0.90	5.96	28.63	63.32
2019/2020	0.47	0.26	0.41	0.83	6.12	29.59	62.31
2020/2021	0.45	0.26	0.40	0.90	5.92	30.30	61.77
2021/2022	0.49	0.24	0.41	0.90	5.95	30.85	61.15
2022/2023	0.46	0.30	0.42	0.94	6.17	31.60	60.11
2023/2024	0.47	0.25	0.42	0.95	6.27	32.17	59.47

Numerator: Births in each gestational age.
Denominator: All live births that occurred in Ontario.

Technical Notes: Gestational age at birth among all infants (live born).

TABLE 1.1.10B GA BIRTH DISTRIBUTION EXPANDED TO INCLUDE ALL YEARS

Gestational age among stillbirths

Fiscal Year	<28 weeks (%)	28-29 weeks + 6 days (%)	30-31 weeks + 6 days (%)	32-33 weeks + 6 days (%)	34-36 weeks + 6 days (%)	37-38 weeks + 6 days (%)	≥39 weeks (%)
2012/2013	39.91	6.33	4.52	5.72	15.21	11.75	16.57
2013/2014	42.84	6.33	4.22	7.54	13.12	14.03	11.92
2014/2015	43.03	7.35	4.35	7.80	12.29	10.49	14.69
2015/2016	44.72	5.43	6.45	5.28	14.08	12.32	11.73
2016/2017	44.90	7.53	5.61	5.76	13.00	10.04	13.15
2017/2018	47.35	5.87	4.72	6.15	11.87	12.45	11.59
2018/2019	46.46	4.15	5.23	7.54	11.69	13.23	11.69
2019/2020	48.96	4.88	6.07	7.40	11.54	10.80	10.36
2020/2021	44.09	5.61	7.27	6.52	11.67	12.58	12.27
2021/2022	44.94	6.28	5.42	7.85	11.27	12.98	11.27
2022/2023	46.96	5.19	4.74	6.22	13.93	11.70	11.26
2023/2024	42	7.34	6.75	6.17	13.07	13.22	11.45

Numerator: Births in each gestational age.
Denominator: All stillbirths that occurred in Ontario.

Technical Notes: Gestational age at birth among all infants (still born).

Stillbirth includes any spontaneous stillbirths at ≥20 weeks or ≥ 500 grams that occur during the antepartum or intrapartum period. Stillbirths that resulted in an intentional termination are not included.

2.0 MATERNAL HEALTH

2.1 PREGNANCY RISKS

TABLE FOR FIGURE 2.1.1

Distribution of pre-pregnancy BMI, Ontario, 2012/2013 to 2023/2024 by weight category and fiscal year

To view a visual representation of Table 2.1.1 view graph here.

	Pre-pregnancy BMI category			
Fiscal Year	**Underweight (%)**	**Normal weight (%)**	**Overweight (%)**	**Living with Obesity (%)**
2012/2013	5.6	52.6	24.1	17.7
2013/2014	5.6	52.4	23.9	18.0
2014/2015	5.8	52.3	24.0	18.0
2015/2016	5.5	52.0	24.5	18.0
2016/2017	5.8	51.6	24.4	18.2
2017/2018	5.4	50.3	24.8	19.5
2018/2019	5.3	49.7	25.4	19.7
2019/2020	5.2	49.0	25.7	20.1
2020/2021	4.9	48.5	26.2	20.4
2021/2022	4.4	47.5	26.7	21.4
2022/2023	4.7	47.0	26.9	21.5
2023/2024	4.6	46.8	27.1	21.5

Technical Notes: BMI: Body Mass Index.

Pre-pregnancy BMI is calculated by dividing pre-pregnancy weight (in kilograms) by the square of the pregnant individual's height (in metres). Pre-pregnancy weight is estimated using (1) the measured weight in the first trimester at the time of Multiple Marker Screening (MMS) minus 1.64 kg; or (2) self-reported pre-pregnancy weight at the time of admission to labour and birth, if measured first-trimester weight at MMS is missing. if measured first-trimester weight at MMS is missing. Maternal weight prior to pregnancy is categorised into 4 groups based on the World Health Organization (WHO) definition using pre-pregnancy BMI (World Health Organization. Obesity: preventing and managing the global epidemic. Report of a WHO consultation.

TABLE FOR FIGURE 2.1.2

Distribution of pre-pregnancy obesity Class among individuals living with obesity, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 2.1.2 view graph **here**.

Pre-pregnancy obesity class

Fiscal Year	I (30.0 – 34.9) (%)	II (35.0 – 39.9) (%)	III (40.0 – 44.9) (%)	IV (45.0 – 49.9) (%)	V (≥50.0) (%)
2012/2013	58.5	24.2	9.8	4.0	3.4
2013/2014	58.5	24.9	9.7	3.9	3.1
2014/2015	58.0	25.4	9.9	3.7	3.0
2015/2016	59.7	25.0	10.0	3.4	1.9
2016/2017	59.1	25.8	9.9	3.4	1.8
2017/2018	57.9	25.5	10.1	3.8	2.8
2018/2019	58.0	25.3	10.3	3.7	2.6
2019/2020	58.8	25.1	9.9	3.8	2.4
2020/2021	58.4	25.4	9.9	3.8	2.6
2021/2022	58.5	25.1	10.1	3.8	2.5
2022/2023	58.8	25.2	9.9	3.7	2.4
2023/2024	58.8	25.2	10.0	3.7	2.3

Technical Notes: Pre-pregnancy BMI is calculated by dividing pre-pregnancy weight (in kilograms) by the square of the pregnant individual's height (in metres). Pre-pregnancy weight is estimated using (1) the meaured weight in the first trimester at the time of Multiple Marker Screening (MMS) minus 1.64 kg; or (2) self-reported pre-pregnancy weight at the time of admission to labour and birth, if measured first-trimester weight at MMS is missing.

Based on maternal pre-pregnancy BMI, obesity classes were further categorized as Class I (30–34.9 kg/m^2), Class II (35–39.9 kg/m^2), Class III (40–44.9 kg/m^2), Class IV (45–49.9 kg/m^2), and Class V (≥ 50 kg/m^2).

TABLE FOR FIGURE 2.1.3

Distribution of gestational weight gain and loss categories among pregnancies with singleton deliveries, Ontario, 2012/2013 to 2023/2024 by category and fiscal year

To view a visual representation of Table 2.1.3 view graph **here**.

	Weight change in pregnancy			
Fiscal Year	**Gestational weight loss (%)**	**Inadequate GWG (%)**	**Adequate GWG (%)**	**Excessive GWG (%)**
2012/2013	2.0	18.0	22.6	57.4
2013/2014	1.8	17.3	22.6	58.3
2014/2015	1.8	17.6	22.6	58.1
2015/2016	1.9	17.8	22.9	57.3
2016/2017	2.1	19.4	23.2	55.3
2017/2018	2.1	19.3	22.9	55.7
2018/2019	2.2	19.3	22.5	56.0
2019/2020	2.2	19.2	22.3	56.2
2020/2021	2.2	18.1	21.3	58.5
2021/2022	2.3	17.6	20.7	59.4
2022/2023	2.7	19.0	21.1	57.2
2023/2024	2.4	18.6	20.9	58.1

Technical Notes: Pre-pregnancy BMI is calculated by dividing pre-pregnancy weight (in kilograms) by the square of the pregnant individual's height (in metres). Pre-pregnancy weight is estimated using (1) the meaured weight in the first trimester at the time of Multiple Marker Screening (MMS) minus 1.64 kg; or (2) self-reported pre-pregnancy weight at the time of admission to labour and birth, if measured first-trimester weight at MMS is missing.

Actual total gestational weight change is calculated from the difference between maternal weight at delivery and pre-pregnancy weight in the BIS. Maternal weight at delivery was measured or self-reported at delivery, and, if not available, the weight at the last prenatal visit was used.

Total GWG recommendations from the 2009 Institute of Medicine (IOM) guidelines for singleton pregnancies (which were adopted by Health Canada in 2010) are used to classify GWG according to pre-pregnancy BMI categories as inadequate, adequate, and excessive GWG.

Because GWG is associated with gestational length, the duration of gestation is accounted for in the calcualtion of expected GWG by using the recommended amount of weight gain during the first trimester according to the pre-pregnancy BMI categories (underweight, 2 kg; normal weight, 2 kg; overweight, 1 kg; obesity, 0.5 kg) and weight gain during the second and third trimester. Subsequently, the expected GWG is then calculated as the recommended first trimester gain + (weekly recommended gain in the second and third trimesters) × (number of gestational weeks beyond the first trimester). If the actual total gestational weight change falls into the recommended range, then the pregnant individual is classified as adequate GWG group. If the actual total gestational weight change falls above or below these recommended ranges, then total gestational weight change was considered to be excessive or inadequate GWG, respectively. Among inadequate GWG, gestional weight loss is defined as negative gestational weight change.

2009 Institute of Medicine (IOM) total GWG recommendations for singleton pregnancy

Pre-pregnancy BMI (kg/m^2)	Recommended first trimester weight gain Mean in kg	Weekly recommended gain in 2nd and 3rd trimester Mean (range) in kg/week	Recommended total GWG (kg) for full-term gestational age Range in kg
Underweight, <18.5	2	0.51 (0.44–0.58)	12.5–18.0
Normal weight, 18.5 to < 25.0	2	0.42 (0.35–0.50)	11.5–16.0
Overweight, 25.0 to < 30.0	1	0.28 (0.23–0.33)	7.0–11.5
Obese, BMI ≥30	0.5	0.22 (0.17–0.27)	5.0–9.0

TABLE FOR FIGURE 2.1.4

Prevalence of any pre-existing health condition in pregnant women and individuals, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 2.1.4 view graph **here**.

Fiscal Year	Pre-existing health conditions in pregnancy
2012/2013	17.0
2013/2014	18.2
2014/2015	20.0
2015/2016	19.8
2016/2017	20.2
2017/2018	20.8
2018/2019	21.7
2019/2020	22.4
2020/2021	24.2
2021/2022	25.5
2022/2023	25.0
2023/2024	25.6

Technical Notes: Pre-existing health conditions are derived from the data element "Maternal Health Conditions", a multi-selection variable. A pregnancy may have more than one pre-existing condition selected. Pre-existing health conditions include any of the following pick-list values:

Classification of Disorders	Specific Conditions
Autoimmune	Lupus; Rheumatoid Arthritis; Autoimmune Other Cancer
Cancer	Prior to Pregnancy
Cardiovascular	Acquired Heart Disease; Antihypertensive Therapy Outside of Pregnancy; Cardiovascular Disease; Congenital Heart Defect; Congenital Heart Disease; Pre-existing Hypertension; Renal Disease; Cardiovascular Other
Craniofacial	Cleft Lip and/or Palate; Craniosynostosis; Craniofacial Other
Diabetes	Diabetes Type I; Diabetes Type II – insulin-dependent; Diabetes Type II – not insulin-dependent; Diabetes Type II – not insulin-dependent (Diet management only); Diabetes Type II – not insulin-dependent (Oral Antihyperglycemic Agents); Diabetes type unknown

Endocrine	Hyperthyroidism (Management Unknown); Hypothyroidism (Management Unknown); Thyroid Disease; Endocrine Other; Hyperthyroidism (Managed); Hyperthyroidism (Unmanaged); Hypothyroidism (Managed); Hypothyroidism (Unmanaged)
Genetics	CGH Microarray Abnormality Polymorphism; Chromosome Abnormality; Chromosome Rearrangement (Balanced); Other Birth Defects; Other Genetic Inherited Disorders/Syndromes
Gastrointestinal	Liver/Gallbladder (Cholecystitis); Colitis; Crohn's; Hepatitis; Liver; Gastrointestinal Other; Liver/Gallbladder (Other)
Genito Urinary	Acquired Renal (Insufficiency – Chronic Infections); Congenital/Genetic Renal (Renal Agenesis – Pelvic Kidney); Renal Disease; Uterine Anomalies; Genitourinary Other
Haematology	Chronic Anemia; Haemophilia (A and B / Von Willebrand's); Idiopathic Thrombocytopenia; Sickle Cell Disease; Thalassemia; Thrombophilia; Haematology Other
Musculoskeletal	Limb Reduction Defects; Muscular Dystrophy / Neuromuscular Disorder; Myotonic Dystrophy; Osteogenesis Imperfecta; Achondroplasia; Musculoskeletal Other; Musculoskeletal (Unspecified)
Neurology	Cerebral Palsy; Epilepsy/Seizures (Pre-existing); Multiple Sclerosis; Myasthenia Gravis; Spina Bifida/NTD; Neurology Other
Neurodevelopmental	Autism; Developmental Delay (Mental Retardation); Fragile X; Hearing Disorder; Learning Disabilities; Vision Disorder; Neurodevelopmental Other
Pulmonary	Asthma (Pre-existing); Cystic Fibrosis; Previous Pulmonary Embolism/DVT; Pulmonary Hypertension; Pulmonary Other
Reproductive / Pregnancy-Related	Recurrent Spontaneous Abortion
Infection	Infection

TABLE FOR FIGURE 2.1.5

Prevalence of hypertensive disorders of pregnancy, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 2.1.5 view graph **here**.

	Hypertensive disorders of pregnancy	
Fiscal Year	**Yes (n)**	**Yes (%)**
2012/2013	7,829	5.9
2013/2014	7,891	6.0
2014/2015	7,885	6.1
2015/2016	8,013	6.1
2016/2017	8,230	6.1
2017/2018	8,431	6.3
2018/2019	8,689	6.5
2019/2020	9,072	6.7
2020/2021	9,744	7.5
2021/2022	10,273	7.5
2022/2023	9,650	7.4
2023/2024	10,726	7.9

Technical Notes : Any hypertensive disroders of pregancy (HDP) includes pre-existing (chronic) hypertension, gestational hypertension, preeclampsia (including hemolysis, elevated liver enzymes and low platelets [HELLP] syndrome), eclampsia or unspecified maternal hypertension.

TABLE FOR FIGURE 2.1.6

Prevalence of gestational hypertension, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 2.1.6 view graph **here**.

	Gestational hypertension	
Fiscal Year	**Yes (n)**	**Yes (%)**
2012/2013	4,401	3.2
2013/2014	4,329	3.1
2014/2015	4,114	3.0
2015/2016	4,136	3.0
2016/2017	4,208	3.0
2017/2018	4,505	3.2
2018/2019	4,683	3.4
2019/2020	5,045	3.6
2020/2021	5,782	4.3
2021/2022	6,110	4.4
2022/2023	5,684	4.4
2023/2024	6,184	4.5

Technical Notes : None to report.

TABLE FOR FIGURE 2.1.7

Prevalence of preeclampsia, eclampsia or HELLP syndrome, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 2.1.7 view graph **here**.

	Preeclampsia, superimposed preeclampsia, eclampsia or HELLP syndrome	
Fiscal Year	**Yes (n)**	**Yes (%)**
2012/2013	1,912	1.4
2013/2014	1,876	1.4
2014/2015	2,093	1.5
2015/2016	2,188	1.6
2016/2017	2,225	1.6
2017/2018	2,108	1.5
2018/2019	2,251	1.6
2019/2020	2,066	1.5
2020/2021	2,085	1.5
2021/2022	2,466	1.8
2022/2023	2,365	1.8
2023/2024	2,741	2.0

Technical Notes : None to report.

TABLE FOR FIGURE 2.1.8

Prevalence of preeclampsia, eclampsia or HELLP syndrome , Ontario, 2012/2013 compared to 2023/2024 by maternal/pregnant individual race and fiscal year

To view a visual representation of Table 2.1.8 view graph here.

	Asian	Black	White	Other/ unknown	Missing
Fiscal Year	**%**	**%**	**%**	**%**	**%**
2012/2013	1.1	2.0	1.5	1.3	1.4
2023/2024	1.5	3.1	2.0	2.3	2.2

Technical Notes: Race is collected through screening requisitions completed by health care providers ordering multiple marker screening (MMS) during pregnancy (or their delegates).

Race can be self-reported by the pregnant individual (best practice) or ascribed by the person completing the requisition.

Please use caution in the interpretation of rates based on race due to the substantial rate of missing data for race. For more information please see **Appendix B: Notes for Interpretation** "Other" race category includes more than one race reported, First Nation, unknown and other.

"Missing data on maternal race results from 1) pregnant individuals without prenatal screening; or 2) no race information reported among those who undergo prenatal screening.

TABLE FOR FIGURE 2.1.9

Prevalence of pre-existing hypertension in pregnancy, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 2.1.9 view graph **here**.

	Pre-existing hypertension in pregnancy (including superimposed preeclampsia)	
Fiscal Year	**Yes (n)**	**Yes (%)**
2012/2013	1,274	1.0
2013/2014	1,402	1.1
2014/2015	1,402	1.1
2015/2016	1,249	1.0
2016/2017	1,276	1.0
2017/2018	1,343	1.0
2018/2019	1,409	1.1
2019/2020	1,499	1.1
2020/2021	1,636	1.3
2021/2022	1,385	1.0
2022/2023	1,339	1.0
2023/2024	1,495	1.1

Technical Notes : None to report.

TABLE FOR FIGURE 2.1.10

Prevalence of diabetes mellitus in pregnancy, Ontario, 2012/2013 to 2023/2024 by diabetes type and fiscal year

To view a visual representation of Table 2.1.10 view graph **here**.

	Type	
Fiscal Year	**Pre-existing diabetes (%)**	**Gestational diabetes (%)**
2012/2013	0.9	5.2
2013/2014	1.0	5.5
2014/2015	1.0	6.3
2015/2016	1.0	6.3
2016/2017	1.0	7.2
2017/2018	1.0	7.9
2018/2019	1.1	8.4
2019/2020	1.1	9.4
2020/2021	1.2	9.0
2021/2022	1.3	9.5
2022/2023	1.4	9.8
2023/2024	1.4	10.1

Technical Notes: Pre-existing diabetes mellitus included Type I diabetes, Type II diabetes, and Unknown type.

Gestational diabetes mellitus is typically defined as any degree of glucose intolerance with first diagnosis or onset during pregnancy.

Pre-existing diabetes mellitus and gestational diabetes mellitus are mutually exclusive.

TABLE FOR FIGURE 2.1.11

Prevalence of gestational diabetes mellitus, Ontario, 2012/2013 to 2023/2024 by maternal/pregnant individual age group (years) and fiscal year

To view a visual representation of Table 2.1.11 view graph **here**.

	Maternal/pregnant individual age (years)					
Fiscal Year	**<20 (%)**	**20-24 (%)**	**25-29 (%)**	**30-34 (%)**	**35-39 (%)**	**40+ (%)**
2012/2013	1.2	2.1	3.8	5.6	8.1	11.1
2013/2014	0.9	2.1	4.0	5.8	8.3	12.5
2014/2015	1.2	2.5	4.5	6.7	9.5	13.7
2015/2016	1.6	2.3	4.5	6.6	9.5	13.6
2016/2017	1.9	3.0	5.0	7.5	10.9	14.5
2017/2018	1.9	3.1	5.6	8.1	11.6	16.4
2018/2019	2.4	4.0	5.8	8.3	12.3	17.0
2019/2020	2.0	4.2	6.7	9.3	13.2	18.6
2020/2021	3.1	4.0	6.4	8.9	12.8	17.0
2021/2022	2.8	4.3	6.9	9.3	12.8	17.8
2022/2023	2.4	4.3	6.7	9.9	12.9	17.8
2023/2024	3.2	4.3	7.2	9.9	13.6	19.2

Technical Notes: Maternal/pregnant individual age is in reference to the age of the individual at the time of birth.

TABLE FOR FIGURE 2.1.12A

Prevalence of gestational diabetes mellitus, Ontario, 2012/2013 to 2023/2024 by maternal/pregnant individual race and fiscal year

To view a visual representation of Table 2.1.12A view graph **here**.

	Maternal/pregnant individual race				
GDM	**Asian (%)**	**Black (%)**	**White (%)**	**Other/ unknown (%)**	**Missing (%)**
Fiscal Year					
2012/2013	10.3	5.1	3.9	7.1	4.5
2013/2014	11.2	5.4	4.0	7.0	4.4
2014/2015	12.7	6.3	4.5	8.4	5.0
2015/2016	12.2	6.4	4.7	7.7	5.0
2016/2017	13.5	6.2	5.4	9.0	5.8
2017/2018	14.4	7.3	6.1	9.1	6.5
2018/2019	15.3	7.6	6.3	9.4	7.0
2019/2020	16.4	8.4	7.1	10.3	7.9
2020/2021	15.6	8.4	6.7	8.7	7.7
2021/2022	16.2	8.8	7.0	9.2	8.4
2022/2023	16.0	8.2	7.0	10.0	8.8
2023/2024	16.2	8.4	7.2	9.9	9.1

Technical Notes: Race is collected through screening requisitions completed by health care providers ordering multiple marker screening (MMS) during pregnancy (or their delegates).

Race can be self-reported by the pregnant individual (best practice) or ascribed by the person completing the requisition.

"Other" race category includes more than one race reported, First Nation, unknown and other.

Missing data on maternal race results from 1) pregnant individuals without prenatal screening ; or 2) no race information reported among those who undergo prenatal screening.

TABLE FOR FIGURE 2.1.12B

Prevalence of type II diabetes mellitus in pregnancy, Ontario, 2012/2013 to 2023/2024 by maternal/pregnant individual race and fiscal year

To view a visual representation of Table 2.1.12B view graph here.

			Maternal race		
Type II diabetes	**Asian (%)**	**Black (%)**	**White (%)**	**Other/ unknown (%)**	**Missing (%)**
Fiscal Year					
2012/2013	0.7	1.0	0.4	1.1	0.5
2013/2014	1.0	1.0	0.5	1.1	0.6
2014/2015	0.9	0.7	0.4	1.2	0.5
2015/2016	0.9	1.1	0.4	1.2	0.5
2016/2017	0.8	0.8	0.4	1.1	0.5
2017/2018	1.0	0.9	0.4	1.2	0.6
2018/2019	1.1	1.1	0.4	1.2	0.6
2019/2020	1.2	1.1	0.4	1.2	0.7
2020/2021	1.3	1.1	0.5	1.1	0.7
2021/2022	1.4	1.5	0.4	1.4	0.8
2022/2023	1.6	1.7	0.4	1.4	0.8
2023/2024	1.5	1.5	0.5	1.8	0.8

Technical Notes: Race/ethnicity is collected through screening requisitions completed by health care providers ordering multiple marker screening (MMS) during pregnancy (or their delegates).

Race can be self-reported by the pregnant individual (best practice) or ascribed by the person completing the requisition.

"Other" race category includes mixed ethnicity, First Nation, unknown and other.

Missing data on maternal race/ethnicity results from 1) pregnant individuals without prenatal screening ; or 2) no race information reported among those who undergo prenatal screening.

2.2 MENTAL HEALTH AND SUBSTANCE USE

TABLE FOR FIGURE 2.2.1

Prevalence of pregnant women and individuals with mental health concerns, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 2.2.1 view graph **here**.

Fiscal Year	Anxiety (%)	Depression (%)	Any mental health conditions (%)
2012/2013	5.9	7.2	13.5
2013/2014	7.1	7.5	14.5
2014/2015	8.1	7.3	15.0
2015/2016	9.4	7.8	16.2
2016/2017	10.4	8.3	17.1
2017/2018	12.0	8.9	18.4
2018/2019	13.7	9.4	19.7
2019/2020	15.1	9.7	20.6
2020/2021	16.7	10.2	22.0
2021/2022	18.0	10.3	22.9
2022/2023	18.0	10.4	22.9
2023/2024	17.6	10.1	22.2

Technical Notes: Mental health conditions indicate any mental health concerns during this pregnancy, including those pre-existing, diagnosed during pregnancy or active during pregnancy. It can be diagnosed or self-reported.

Any mental health concerns include addiction, anxiety, bipolar, depression, history of postpartum depression, schizophrenia or other.

TABLE FOR FIGURE 2.2.2

Prevalence of postpartum depression history among pregnant women and individuals with at least one previous birth, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 2.2.2 view graph here.

Fiscal Year	History of postpartum depression (n)	History of postpartum depression (%)
2012/2013	2,544	3.4
2013/2014	2,644	3.5
2014/2015	2,641	3.5
2015/2016	2,770	3.6
2016/2017	3,044	3.9
2017/2018	3,179	4.1
2018/2019	3,379	4.4
2019/2020	3,325	4.4
2020/2021	3,050	4.2
2021/2022	3,195	4.2
2022/2023	3,108	4.3
2023/2024	3,142	4.4

Technical Notes: None to report.

TABLE FOR FIGURE 2.2.3

Prevalence of pregnant women and individuals reporting smoking in pregnancy, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 2.2.3 view graph **here**.

Fiscal Year	Smoking exposure (n)	Smoking exposure (%)
2012/2013	14,701	11.2
2013/2014	14,293	10.9
2014/2015	13,889	11.2
2015/2016	13,448	10.3
2016/2017	13,065	9.7
2017/2018	12,641	9.1
2018/2019	11,580	8.4
2019/2020	10,663	7.8
2020/2021	9,551	7.2
2021/2022	8,425	6.3
2022/2023	7,082	5.5
2023/2024	6,780	5.0

Technical Notes: Smoking during pregnancy is self-reported by pregnant individuals, which captures any smoking at the first prenatal visit or at the time of labour or admission for delivery.

Smoking in pregnancy includes the following picklists: <10 cigarettes/day, 10-20 cigarettes/day, >20 cigarettes/day, Amount unknown.

TABLE FOR FIGURE 2.2.4

Prevalence of alcohol exposure in pregnancy, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 2.2.4 view graph here.

Fiscal Year	Alcohol exposure (n)	Alcohol exposure (%)
2012/2013	2,476	2.0
2013/2014	2,146	1.6
2014/2015	3,295	2.5
2015/2016	3,481	2.6
2016/2017	3,556	2.6
2017/2018	3,445	2.5
2018/2019	3,679	2.7
2019/2020	3,624	2.6
2020/2021	2,942	2.2
2021/2022	2,608	1.9
2022/2023	2,286	1.8
2023/2024	2,384	1.8

Technical Notes: Alcohol exposure in pregnancy is self-reported by pregnant individuals and captures any alcohol consumption during pregnancy. Alcohol exposure in pregnancy includes the following picklists: 'Less than one drink per month', 'One drink per month', '2-3 drinks per month', 'One drink per week', 'More than one drink per week', 'Episodic excessive drinking (binging)', 'Exposure prior to pregnancy confirmed, amount unknown', and 'Exposure, amount unknown (Prior to April 2015)'.

TABLE FOR FIGURE 2.2.5

Prevalence of cannabis exposure in pregnancy, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 2.2.5 view graph **here**.

Fiscal Year	Cannabis exposure (n)	Cannabis exposure (%)
2012/2013	1,652	1.3
2013/2014	1,711	1.3
2014/2015	1,910	1.4
2015/2016	2,012	1.5
2016/2017	2,318	1.7
2017/2018	2,512	1.8
2018/2019	3,076	2.2
2019/2020	5,445	4.2
2020/2021	5,464	4.3
2021/2022	5,732	4.2
2022/2023	5,082	3.9
2023/2024	4,848	3.6

Technical Notes: In Canada, the legalization of cannabis was implemented on 17 October 2018, under the Cannabis Act (Bill C-45).

Cannabis exposure in pregnancy is self-reported by pregnant individuals during prenatal care, which captures any amount of cannabis use in any form in the current pregnancy.

Subsequent to the legalization of cannabis in October 2018, a new data element, Cannabis Exposure in Pregnancy, was added to the BIS in April 2019 and the picklist value of marijuana was retired from the data element Drug and Substance Exposure in Pregnancy.

TABLE FOR FIGURE 2.2.6

Prevalence of substance exposure in pregnancy, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 2.2.6 view graph **here**.

Fiscal Year	Any substance exposure (n)	Any substance exposure (%)
2012/2013	17,613	14.4
2013/2014	16,903	13.6
2014/2015	17,550	14.4
2015/2016	17,843	13.7
2016/2017	17,759	13.5
2017/2018	17,432	13.3
2018/2019	16,701	12.7
2019/2020	16,933	13.3
2020/2021	15,146	12.2
2021/2022	14,018	10.9
2022/2023	12,043	9.5
2023/2024	11,669	8.8

Technical Notes: Any substance exposure in pregnancy is self-reported use of any cannabis, alcohol, smoking, or use of illicit drugs and substances during pregnancy, including opioids (prescribed or through agonists therapy), cocaine, gas, glue, hallucinogens, amphetamines (prescribed or illicit use), and other.

TABLE FOR FIGURE 2.2.7

Prevalence of pregnant women and individuals with mental health concerns among individuals using substances, Ontario, 2012/2013 to 2023/2024 by maternal/pregnant individual age group (years) and fiscal year

To view a visual representation of Table 2.2.7 view graph **here**.

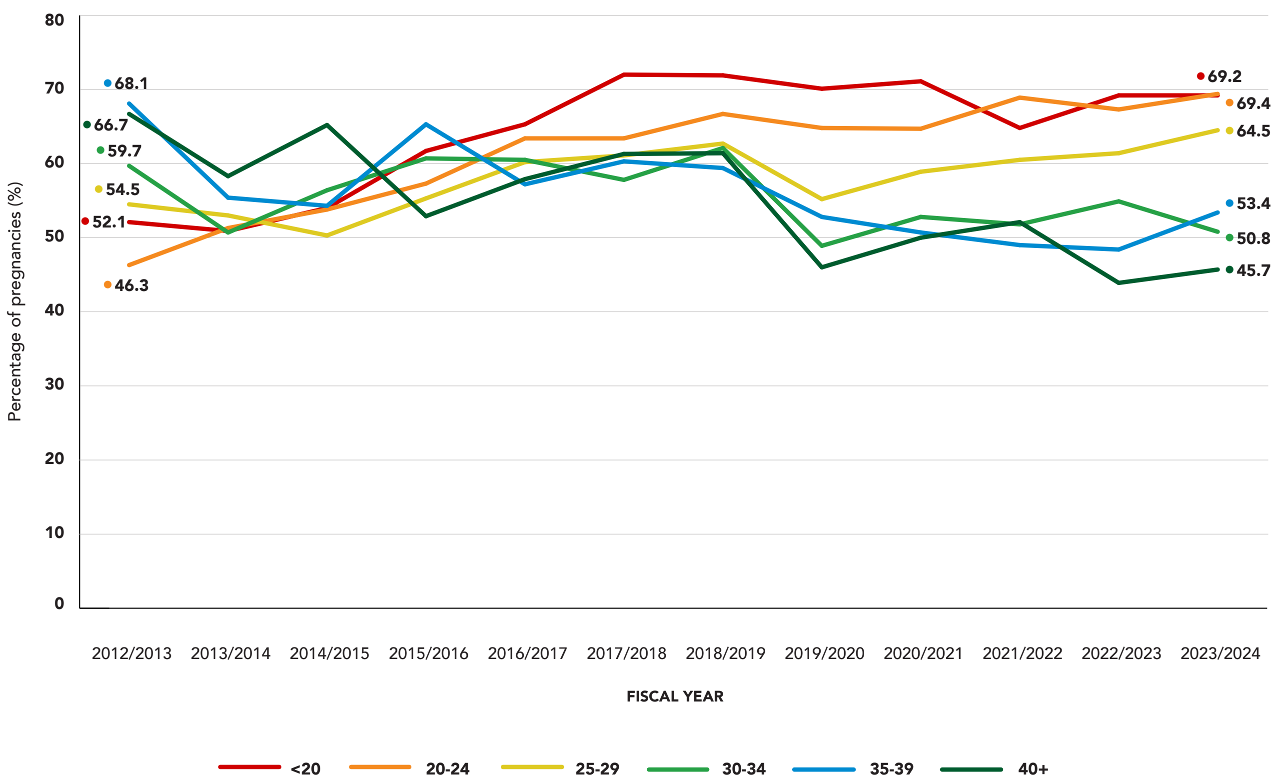
Fiscal Year	<20 (%)	20-24 (%)	25-29 (%)	30-34 (%)	35-39 (%)	40+ (%)
2012/2013	34.3	31.9	29.3	29.4	30.5	27.4
2013/2014	39.5	35.3	32.2	30.1	31.4	29.7
2014/2015	43.4	37.2	31.8	31.8	31.3	30.3
2015/2016	48.9	40.3	35.2	32.1	29.4	31.0
2016/2017	50.0	44.8	38.1	33.0	30.5	27.6
2017/2018	58.5	47.9	40.0	35.8	33.4	29.8
2018/2019	61.8	52.4	44.0	37.0	36.3	36.5
2019/2020	62.7	56.8	46.0	39.8	39.7	38.8
2020/2021	66.8	57.4	49.6	44.0	41.4	43.0
2021/2022	63.8	62.8	53.6	44.7	41.3	43.1
2022/2023	64.6	62.6	54.3	47.5	44.4	36.6
2023/2024	63.9	61.4	55.7	45.5	45.0	43.4

Technical Notes: Any substance use in pregnancy is self-reported use of any cannabis, alcohol, smoking, or use of illicit drugs and substances during pregnancy, including opioids (prescribed or through agonists therapy), cocaine, gas, glue, hallucinogens, amphetamines (prescribed or illicit use), and other.

FIGURE 2.2.8

Prevalence of pregnancies with mental health conditions among cannabis users, Ontario, 2012/2013 to 2023/2024

To view an alternate to this graph see the **Table** option of data points on the next page.



Numerator: Pregnancies in each age group with any mental health concerns including addiction, anxiety, bipolar disorder, depression, history of postpartum depression, schizophrenia, and other.
Denominator: All pregnancies with cannabis exposure resulting in a live or stillbirth that occurred in Ontario.

TABLE FOR FIGURE 2.2.8

Prevalence of pregnancies with mental health conditions among cannabis users, Ontario, 2012/2013 to 2023/2024

To view a visual representation of this Table , view graph **here**.

Fiscal Year	<20 (%)	20-24 (%)	25-29 (%)	30-34 (%)	35-39 (%)	40+ (%)
2012/2013	52.1	46.3	54.5	59.7	68.1	66.7
2013/2014	50.9	51.3	53.0	50.7	55.4	58.3
2014/2015	54.0	53.8	50.3	56.4	54.3	65.2
2015/2016	61.7	57.3	55.3	60.7	65.3	52.9
2016/2017	65.3	63.4	60.2	60.5	57.2	57.9
2017/2018	72.0	63.4	61.1	57.8	60.3	61.3
2018/2019	71.9	66.7	62.7	62.1	59.4	61.4
2019/2020	70.1	64.8	55.2	48.9	52.8	46.0
2020/2021	71.1	64.7	58.9	52.8	50.7	50.0
2021/2022	64.8	68.9	60.5	51.8	49.0	52.1
2022/2023	69.2	67.3	61.4	54.9	48.4	43.9
2023/2024	69.2	69.4	64.5	50.8	53.4	45.7

Technical Notes: In Canada, the legalization of cannabis was implemented on 17 October 2018, under the Cannabis Act (Bill C-45).

Cannabis exposure in pregnancy is self-reported by pregnant individuals during prenatal care, which captures any amount of cannabis use in any form in the current pregnancy.

Cannabis exposure is derived from substance and cannabis exposure in pregnancy data elements.

2.3 PRENATAL SCREENING

TABLE FOR FIGURE 2.3.1A

Overall uptake of prenatal screening for singleton pregnancies, Ontario, 2020/2021 to 2022/2023 by age at Estimated Date of Delivery (EDD) of pregnant individual (years)

To view a visual representation of Table 2.3.1A view graph **here**.

	Overall prenatal screening uptake as a proportion of pregnancies in that age group
Age at EDD of pregnant individual	**(%)**
<20	51.6
20-24	62.1
25-29	75.1
30-34	82.3
35-39	83.4
40+	85.7
Total	**79.2**

Technical Notes:

- Fiscal year was defined by estimated date of delivery. Each fiscal year ranges from April 1 to March 31, inclusive. Data were extracted on Nov. 8, 2024. The cohort timeline was defined by pregnant individual estimated date of delivery.
- Only singleton pregnancies were included in this analysis for Ontario residents.

TABLE FOR FIGURE 2.3.1B

Proportion of pregnant individuals receiving prenatal screening, Ontario, 2020/2021 to 2022/2023 by type of screening and age at EDD of pregnant individual (years)

To view a visual representation of Table 2.3.1B view graph **here**.

	Screening modality		
Age at EDD	**Multiple marker screening only (%)**	**NIPT only (%)**	**Multiple marker screening and NIPT (%)**
<20	95.7	0.9	3.0
20-24	95.0	1.3	3.7
25-29	92.3	2.7	5.0
30-34	84.8	6.4	8.8
35-39	72.2	11.1	16.7
40 and over	19.8	42.9	37.2

Technical Notes:

- Fiscal year was defined by estimated date of delivery. Each fiscal year ranges from April 1 to March 31, inclusive. The cohort timeline was defined by pregnant individual estimated date of delivery.
- Only singleton pregnancies were included in this analysis for Ontario residents.
- NIPT only and MMS and NIPT categories include OHIP-funded and self-paid

TABLE 2.3.1C

Uptake of OHIP-funded NIPT and/or MMS among singleton pregnancies by region, Ontario, 2016 to 2023

		Prevalence of OHIP-funded NIPT and/or MMS	
Ontario Health Region	**Number of singleton pregnancies**	**Pregnancies with funded screening (OHIP-funded NIPT and/or MMS)**	
	(n)	**(n)**	**(%)**
West	243,695	154,976	63.6
Central	289,213	225,491	78.0
Toronto	201,480	151,322	75.1
East	137,697	93,777	68.1
North	47,167	23,497	49.8
Missing	16,720	2,625	15.7
Ontario overall	935,972	651,688	69.6

Technical Notes: Ontario Health (OH) region is based on infant residence address. Missing OH region may be due to unknown Ontario residence or non-Ontario residence.

TABLE FOR FIGURE 2.3.2

Proportion of OHIP-funded NIPT by clinical funding indicator, Ontario, 2020/2021 to 2022/2023

To view a visual representation of Table 2.3.2 view graph **here**.

Clinical funding indicator	(%)
Pregnant individual age 40 and over	37.1
Positive multiple marker screening	40.0
Increased nuchal translucency	2.0
Previous aneuploidy	4.9
Fetal anomalies on ultrasound	2.0
Risk greater than a positive multiple marker screen	5.8
RIsk of sex-linked condition/DSD	0.6
Multiple indicators for funding	7.6

Technical Notes:

- Fiscal year was defined by estimated date of delivery. Each fiscal year ranges from April 1 to March 31, inclusive. Data were extracted on Nov. 8, 2024. The cohort timeline was defined by pregnant individual estimated date of delivery.
- Only singleton pregnancies were included in this analysis for Ontario residents.

TABLE FOR PSO PERFORMANCE MMS 2.3.3

Performance of Multiple Marker Screening (MMS) for singleton pregnancies, Ontario

"Chromosome difference"	Trisomy 21	Trisomy 18
Screening type	Enhanced First Trimester Screening Second Trimester Screening	Enhanced First Trimester Screening Second Trimester Screening
"Sensitivity (95% CI)"	88.23 (86.38, 89.91) 87.18 (77.68, 93.68)	87.31 (83.61, 90.43) S (45.13, 86.14)
"Specificity (95% CI)"	93.94 (93.87, 94.01) 91.38 (91.08, 91.68)	99.71 (99.70, 99.73) 99.38 (99.30, 99.46)
"Positive Predictive Value (PPV) (95% CI)"	3.9 (3.69, 4.13) 2.22 (1.73, 2.80)	20.11 (18.23, 22.08) 6.22 (3.53, 10.06)
"Negative Predictive Value (NPV) (95% CI)"	99.97 (99.96, 99.97) 99.97 (99.94, 99.98)	99.99 (99.99, 99.99) 99.98 (99.96, 99.99)

Denominator: MMS screening tests from singleton pregnancies with an EDD from September 1, 2016 to March 31, 2023.

Technical Notes:

Prenatal Screening Performance - Prenatal Screening Ontario

Data Source: BORN Ontario, 1 September 2016 - 31 March 2023 by EDD

- Fiscal year was defined by estimated date of delivery. Each fiscal year ranges from April 1 to March 31, inclusive. Data were extracted on Nov. 8, 2024. The cohort timeline was defined by pregnant individual estimated date of delivery.
- Only singleton pregnancies were included in this analysis for Ontario residents.
- S = point estimate suppressed when confidence interval >20%.
- Only singleton pregnancies were included in this analysis.
- Only pregnancies with a valid MMS result and cytogenetic result were included in this analysis. Outcome data were supplemented using clinical examination data from the BORN Information system (BIS) for negative results for T21, and 18 when cytogenetic results were missing.
- "eFTS" includes both "4-marker eFTS" and "5-marker eFTS."

- The screen-positive cut-off for STS (MSS Quad) for T21 changed over the timeline of this analysis from 1/200 before April 2020 to 1/350 after April 2020. The data presented here are with the 1 in 350 cut-off applied throughout the entire timeline of these data.
- MMS screens were performed by Ontario MMS Laboratories.

Sample size	
eFTS T21	355,404
eFTS T18	355,409
STS T21	36,591
STS T18	36,595

TABLE FOR PSO PERFORMANCE NIPT 2.3.4

Performance of OHIP-funded Non-Invasive Prenatal Testing (NIPT) for singleton pregnancies, Ontario, 2016 to 2023

"Chromosome difference"	Trisomy 21	Trisomy 18
Screening type	Enhanced First Trimester Screening Second Trimester Screening	Enhanced First Trimester Screening Second Trimester Screening
"Sensitivity (95% CI)"	88.23 (86.38, 89.91) 87.18 (77.68, 93.68)	87.31 (83.61, 90.43) S (45.13, 86.14)
"Specificity (95% CI)"	93.94 (93.87, 94.01) 91.38 (91.08, 91.68)	99.71 (99.70, 99.73) 99.38 (99.30, 99.46)
"Positive Predictive Value (PPV) (95% CI)"	3.9 (3.69, 4.13) 2.22 (1.73, 2.80)	20.11 (18.23, 22.08) 6.22 (3.53, 10.06)
"Negative Predictive Value (NPV) (95% CI)"	99.97 (99.96, 99.97) 99.97 (99.94, 99.98)	99.99 (99.99, 99.99) 99.98 (99.96, 99.99)

Denominator: OHIP-funded NIPT tests from singleton pregnancies with an EDD from September 1, 2016 to March 31, 2023.

Technical Notes:
Data Source: BORN Ontario, 1 September 2016 - 31 March 2023 by EDD
Define sensitivity, specificity, PPV, NPV, and CI

- Data were extracted from the BORN Information System (BIS) on 1 June 2024. Note that data submission to the BIS is both voluntary and open to updates and amendments. This table represents a snapshot of the BIS on the date of data extraction.
- The cohort timeline was defined by estimated date of delivery.
- Only singleton pregnancies were included in this analysis.
- Only pregnancies with a valid NIPT result and cytogenetic result were included in this analysis. Outcome data were supplemented using clinical examination data from the BORN Information system (BIS) for negative results for T21, 18 and 13 when cytogenetic results were missing.
- OHIP-funded NIPT screens were performed by Ontario-based labs.
- BORN Ontario strives to better understand how our data can be used to inform health system partners on the intersection between social determinants of health, indigeneity, and perinatal and child health outcomes. This table includes data that may or may not support reflections on

indigeneity and health equity. We cannot conclusively or accurately identify the extent to which BORN data reflect indigeneity and equity-deserving groups. This pursuit is ongoing, and we appreciate your support and ideas related to enabling our efforts in pursuit of more equitable outcomes and programming.

Sample size	
T21	62,061
T18	62,079
T13	62,084

TABLE FOR FIGURE 2.3.5A

Turnaround time from sample collection to date of report for Multiple Marker Screening in singleton pregnancies, Ontario, 2020/2021 to 2022/2023

To view a visual representation of Table 2.3.5A view graph here.

Days	% of MMS screens
0-1	0.1
2	23.5
3	17.7
4	18.1
5	23.9
6	8.7
7	3.2
8-14	2.6
>14	1.8

Technical Notes:

Prenatal Screening Performance - Prenatal Screening Ontario

- Data were extracted from the BORN Information System (BIS) on June 1, 2024. Note that data submission to the BIS is both voluntary and open to updates and amendments. This table represents a snapshot of the BIS on the date of extraction.
- Fiscal year was defined by pregnant individual estimated date of delivery. Each fiscal year ranges from April 1 to March 31, inclusive.
- The cohort timeline was defined by pregnant individual date of delivery.
- Only singleton pregnancies were included in this analysis.

TABLE FOR FIGURE 2.3.5B

Turnaround time from sample collection to date of report for OHIP-funded Non-invasive Prenatal Testing in singleton pregnancies, Ontario, 2020/2021 to 2022/2023

To view a visual representation of Table 2.3.5B view graph **here**.

Days	% of NIPT screens
<5	0.2
5	6.7
6	5.0
7	36.0
8-14	50.7
>14	1.6

Technical Notes:

- Data were extracted from the BORN Information System (BIS) on June 1, 2024.
- The cohort timeline was defined by pregnant individual date of delivery.
- Only singleton pregnancies were included in this analysis.

2.4 MATERNAL MORBIDITY AND MORTALITY

TABLE FOR FIGURE 2.4.1

Prevalence of births with a pregnancy complication, excluding hypertension and diabetes, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 2.4.1 view graph **here**.

Fiscal Year	Any complication	Fetal	Maternal	Placental
2012/2013	15.2	6.1	7.7	2.6
2013/2014	15.8	5.9	9.2	1.9
2014/2015	17.4	6.7	10.0	2.0
2015/2016	18.5	7.4	10.4	2.0
2016/2017	19.0	8.0	10.5	2.1
2017/2018	19.8	8.4	10.6	2.3
2018/2019	20.8	8.9	11.1	2.5
2019/2020	21.8	9.5	11.5	2.6
2020/2021	22.7	10.5	11.5	2.7
2021/2022	21.7	9.0	11.8	2.8
2022/2023	21.4	8.9	11.6	2.6
2023/2024	21.6	9.0	11.7	2.7

Technical Notes:
Complications consist of Fetal: anomaly(ies), intrauterine growth restriction (IUGR), isoimmunization/alloimmunization, LGA (prior to April 2021), oligohydramnios, polyhydramnios, other.

Maternal: anemia unresponsive to therapy, antepartum bleeding (persistent and unexplained), cancer – diagnosed in this pregnancy, haematology – gestational thrombocytopenia, hyperemesis gravidarum (requiring hospital admission), liver/gallbladder – acute fatty liver of pregnancy (after March 2021), liver/gallbladder – intrahepatic cholestasis of pregnancy, neurology – epilepsy/seizures – seizure occurred in current pregnancy, prelabour rupture of membranes (PROM), preterm labour, preterm prelabour rupture of membranes (PPROM), pulmonary – asthma occurred during current pregnancy, other.

Placental: placenta accreta, placenta increta, placenta percreta, placenta previa, placental abruption, other.

TABLE FOR FIGURE 2.4.2

Prevalence of selected complications in pregnancy, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 2.4.2 view graph **here**.

Fiscal Year	PROM/PPROM (%)	IUGR (%)
2012/2013	5.1	2.4
2013/2014	5.5	2.3
2014/2015	5.9	2.6
2015/2016	6.3	2.9
2016/2017	6.4	3.1
2017/2018	6.5	3.2
2018/2019	6.7	3.4
2019/2020	6.8	3.7
2020/2021	6.7	3.9
2021/2022	6.5	4.1
2022/2023	6.6	4.3
2023/2024	6.7	4.3

Technical Notes:

PROM/PPROM is derived from "All Indications for Cesarean Section", "All Indications for Induction of Labour", and "Complications of Pregnancy".

IUGR is derived from "Neonatal Health Conditions" , "Complications of Pregnancy", "All Indications for Cesarean Section", and "All Indications for Induction of Labour".

Table for Figure 2.4.3

Prevalence of maternal transfer to ICU in labour, birth, or postpartum, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 2.4.3 view graph **here**.

	Maternal transfer to ICU in labour/birth/postpartum	
Fiscal Year	**Number of transfers (n)**	**Percent of hospital births (%)**
2012/2013	199	0.14
2013/2014	178	0.13
2014/2015	158	0.12
2015/2016	163	0.12
2016/2017	166	0.12
2017/2018	190	0.14
2018/2019	200	0.15
2019/2020	232	0.17
2020/2021	208	0.16
2021/2022	251	0.19
2022/2023	194	0.15
2023/2024	248	0.18

Technical Notes:

Maternal hospital ICU/CCU transfers includes any ICU/CCU transfer during labour, birth or the postpartum period.

TABLE FOR FIGURE 2.4.4

Median maternal postpartum length of hospital stay (hours), Ontario, 2012/2013 to 2023/2024 by birth type and fiscal year

To view a visual representation of Table 2.4.4 view graph **here**.

Fiscal Year	Vaginal birth (hours)	Cesarean birth (hours)
2012/2013	32	56
2013/2014	32	54
2014/2015	31	53
2015/2016	30	51
2016/2017	29	50
2017/2018	29	50
2018/2019	29	49
2019/2020	29	49
2020/2021	28	46
2021/2022	28	45
2022/2023	28	45
2023/2024	28	45

Technical Notes:

Maternal postpartum length of stay refers to the number of hours spent in the hospital, from the time of birth to the time of discharge home indicated in maternal labour/birth or postpartum encounters.

The time of maternal discharge home is derived from the last enounter if there are multiple encounters indicated for maternal discharge home from hospital.

Table for Figure 2.4.5A

Prevalence of post-delivery readmission within 42 days of delivery, Ontario, 2022/2023 compared to 2023/2024

To view a visual representation of Table 2.4.5A view graph here.

Fiscal Year	Percent of readmissions (%)	Number of readmissions (n)
2022/2023	1.6	2053
2023/2024	1.7	2242

Technical Notes:

Ontario residents who had a live or stillbirth between 2022/2023 and 2023/2024 in BIS were linked to CIHI-DAD maternal non-delivery records using a valid Ontario health card number.

Readmission includes transferring to another hospital or home delivery and readmission to an for acute care hospital.

Some data could be missing for deliveries in 2023/24, as DAD data only includes discharges before or on March 31, 2024. Some readmissions will be missing for deliveries in 2023/24 due to a truncated follow-up period in the available CIHI-DAD information held at BORN. Any post-delivery admissions to hospitals after March 31, 2024 or that were not discharged before April 1, 2024 are not included in the count for fiscal year of delivery 2023/2024.

TABLE FOR FIGURE 2.4.5B

Frequency of primary reason for post-delivery readmissions within 42 days of delivery, Ontario, 2022/2023 compared to 2023/2024

To view a visual representation of Table 2.4.5B view graph **here**.

	Fiscal Year	
Most Responsible Diagnosis	**2022/2023 (n)**	**2023/2024 (n)**
Puerperal infections	418	468
Postpartum hemorrhage	314	346
Preeclampsia	241	304
Hypertension	157	205
Other	923	919

Technical Notes:

The most responsible diagnosis was captured from diagnosis 1 with diagnosis type=M in DAD according to ICD-10-CA coding manual

ICD-10-CA category for most responsible diagnosis: Pre-eclampsia (O14), Hypertension (O13), Puerperal infections (O85 and O86), Postpartum hemorrhage (O72), Other: any other diagnoses”

Readmission includes intertransferring to another hospital or home delivery and readmission to an acute hospital.

Some data could be missing for deliveries in 2023/24, as DAD data only includes discharges before or on March 31, 2024. Any post-delivery admissions after March 31, 2024 or that were not discharged before April 1, 2024 are not included in the 2023/24 count.

Table for Figure 2.4.6

Frequency of maternal death within 365 days of delivery, 2002 to 2022 by number of weeks following the birth

To view a visual representation of Table 2.4.6 view graph **here**.

Week following birth	Pregnancy-related (n)	Non-pregnancy-related (n)
1	115	14
2	23	11
3	11	5
4	1	2
5	2	4
6	4	5
7	3	3
8	1	5
9	3	3
10	0	6
11	0	5
12	0	4
13	0	3
14	2	6
15	0	4
16	0	4
17	0	7
18	0	4
19	0	3
20	1	6
21	0	8
22	0	12
23	0	9
24	0	6
25	0	5
26	0	7
27	0	3
28	0	6

Week following birth	Pregnancy-related (n)	Non-pregnancy-related (n)
29	0	4
30	1	3
31	0	4
32	0	10
33	0	5
34	0	4
35	0	4
36	0	9
37	1	5
38	0	4
39	0	4
40	0	4
41	0	7
42	1	7
43	0	1
44	0	4
45	0	7
46	0	2
47	0	2
48	0	10
49	0	9
50	0	7
51	0	7
52	0	6

Technical Notes:

Adapted from: Mortality Following Childbirth in Ontario: A 20-Year Analysis of Temporal Trends and Causes

Journal of Obstetrics and Gynaecology Canada. 2024 Dec 1;46(12):102689

https://www.jogc.com/action/showPdf?pii=S1701-2163%2824%2900512-7

Table for Figure 2.4.7A

Prevalence of pregnancy-related deaths, 2002 to 2022 by primary cause and timing of death

To view a visual representation of Table 2.4.7A view graph [here](#).

	Early deaths (n)	Late deaths (n)
Hemorrhage	46	0
Infection	30	1
Preeclampsia	18	0
Pulmonary Embolism	16	2
Cardiac	12	4
Amniotic Fluid Embolism	11	1
Cardiac Arrest/Unknown	11	2
Cerebrovascular	10	0
Hematologic	1	2
Other	1	0
Cancer	0	1

Technical Notes for Figures 2.4.7A & 2.4.7B:

Early death is defined as a death ≤42 days after delivery. Late death is defined as a death ≥ 43 to 365 days after delivery.

Adapted from: Mortality Following Childbirth in Ontario: A 20-Year Analysis of Temporal Trends and Causes

Journal of Obstetrics and Gynaecology Canada. 2024 Dec 1;46(12):102689

https://www.jogc.com/action/showPdf?pii=S1701-2163%2824%2900512-7

TABLE FOR FIGURE 2.4.7B

Prevalence of non-pregnancy related deaths, 2002 to 2022 by primary cause and timing of death

To view a visual representation of Table 2.4.7B view graph **here**.

	Early deaths (n)	Late deaths (n)
Cancer	16	79
Infection	7	24
Injury	7	38
Substance use	3	20
Cerebrovascular	5	14
Cardiac arrest or unknown	2	44
GI & hepatobiliary	1	5
Pulmonary embolism	0	4
Cardiac	0	9
Hematologic	0	1
Other	0	4
Rheumatic & autoimmune	0	6

3.0 LABOUR

3.1 LABOUR

TABLE FOR FIGURE 3.1.1

Distribution of labour type, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 3.1.1 view graph **here**.

Fiscal Year	Induction (%)	Spontaneous labour (%)	No labour (%)
2012/2013	22.7	62.7	14.6
2013/2014	23.0	62.7	14.4
2014/2015	23.8	61.9	14.3
2015/2016	24.7	60.8	14.5
2016/2017	25.8	59.8	14.4
2017/2018	27.1	58.0	14.9
2018/2019	28.3	56.3	15.4
2019/2020	30.0	54.1	15.9
2020/2021	31.6	52.2	16.1
2021/2022	31.5	52.0	16.5
2022/2023	31.0	51.9	17.1
2023/2024	32.4	50.3	17.4

Technical Notes: None to report.

TABLE FOR FIGURE 3.1.2

Prevalence of fetal surveillance methods used in low-risk pregnancies, Ontario, 2012/2013 compared to 2023/2024

To view a visual representation of Table 3.1.2 view graph **here**.

	2012/2013 (%)	2023/2024 (%)
Any fetal surveillance method	99.8	99.8
Admission EFM strip any	44.3	43.3
Admission EFM strip only	2.6	2.5
Auscultation any	49.0	44.2
Auscultation only	10.3	9.5
Intrapartum EFM any	83.4	84.9
Intrapartum EFM only	25.9	26.4
No monitoring	0.2	0.2

Technical Notes: EFM refers to electronic fetal monitoring. Method of fetal surveillance is derived from 'fetal surveillance', which is a multiple-selection variable. Intrapartum EFM includes the following pick-list values: Intrapartum EFM (external) and Intrapartum EFM (internal).

Any fetal surveillance method includes admission EFM strip, auscultation, internal or external intrapartum EFM.

The BORN Maternal Newborn Outcomes Committee (MNOC), a multi-disciplinary group of care providers who provide advice and clinical direction to the organization agreed to standardize the definition of low-risk pregnancies for consistency. This definition was last revised in June 2023. MNOC approved the following inclusion/exclusion criteria for the definition of low-risk birth and primary cesarean birth rates:

Inclusions:

- Nulliparous
- ≥37 weeks' gestation
- Cephalic
- Singleton
- Spontaneous labour
- Maternal pre-pregnancy BMI <40 kg/m^2

Exclusions:

Classification of Disorders or Condition	Specific Condition Excluded
Maternal Health Conditions [added June 2023]	
Autoimmune	Lupus; Rheumatoid Arthritis; Autoimmune Other
Cancer	Diagnosed in Pregnancy; Medication exposure in pregnancy – Chemotherapeutic Agents
Cardiovascular – 2	Acquired Heart Disease; Antihypertensive Therapy Outside of Pregnancy; Cardiovascular Disease; Congenital Heart Defect; Congenital Heart Disease; Pre-existing Hypertension; Renal Disease; Cardiovascular Other
Endocrine	Diabetes and Pregnancy; [Hyperthyroidism (Unmanaged); Hypothyroidism (Unmanaged); Hyper/Hypothyroidism Management unknown]
Gastrointestinal	Liver/ Gallbladder -Cholecystitis; Colitis; Crohn's; Hepatitis; Liver/ Gallbladder -Intrahepatic Cholestasis of Pregnancy
Genitourinary	Acquired Renal (Insufficiency -Chronic Infections); Congenital/ Genetic Renal (Renal Agenesis – Pelvic Kidney); Renal Disease; Uterine Anomalies; Genitourinary other
Infections	[Sexually Transmitted Infections (Chlamydia; Gonorrhea; Active Herpes Simplex Virus (HSV); Human Immunodeficiency Virus (HIV); Viruses; Other]
Hematology	Gestational Thrombocytopenia; Hemophilia (A and B Von Willebrand); Idiopathic Thrombocytopenia; Sickle Cell Disease; Thalassemia; Thrombophilia; Hematology Other
Hypertensive Disorders in Pregnancy	Gestational Hypertension; Eclampsia; HELLP; Preeclampsia; Preeclampsia Requiring Magnesium Sulfate; Pre-existing Hypertension with Superimposed Preeclampsia; Maternal Unknown
Musculoskeletal	Achondroplasia; Muscular Dystrophy/ Neuromuscular Disorder; Myotonic Dystrophy; Osteogenesis Imperfecta; Musculoskeletal Other
Neurology	Cerebral Palsy; Multiple Sclerosis; Myasthenia Gravis; Spina Bifida/ Neural Tube Defect; Neurology Other; [Epilepsy/Seizures/Seizure occurred in current pregnancy]
Pulmonary	Cystic Fibrosis; Previous Pulmonary Embolism/ Deep Vein Thrombosis; Pulmonary Hypertension; Pulmonary
Other	Maternal health conditions other
Complications of Pregnancy	
Maternal	[Preterm labour prior to this admission; antepartum bleeding (persistent and unexplained); Preterm prelabour rupture of membranes (PPROM); pregnant individuals age greater than 40 years]
Fetal	Anomalies; Isoimmunization/ Alloimmunization; Intrauterine Growth Restriction; Oligohydramnios; Fetal therapy – Fetal surgery; [Polyhydramnios; Fetal other]
Placental	Placenta Accreta; Placenta Increta; Placenta Percreta; Placenta Previa; Placental Abruption; Placental Other,
Other criteria not classified	Multiparous • Excluded as they have already proven their ability to give birth • Induction of labour: – Higher rate of labour and birth maternal/neonatal complications with induction

TABLE FOR FIGURE 3.1.3

Prevalence of induction of labour methods, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 3.1.3 view graph **here**.

Fiscal Year	Amniotomy (%)	Oxytocin (%)	Prostaglandin (%)
2012/2013	56.2	70.9	–
2013/2014	55.1	70.6	–
2014/2015	54.2	70.8	8.7
2015/2016	54.2	72.6	9.8
2016/2017	54.9	72.3	10.4
2017/2018	55.7	72.9	8.5
2018/2019	56.1	73.9	7.3
2019/2020	57.2	74.8	6.8
2020/2021	58.5	76.9	6.4
2021/2022	60.1	78.2	5.7
2022/2023	58.9	76.7	7.0
2023/2024	57.7	74.6	10.1

Technical Notes: Prostaglandin was introduced as a BIS pick-list choice for method of induction in September 2013.

Method of Induction is a multiple-selection variable. Each record can have more than one type of induction method selected. Therefore, percentages of each method of induction will not sum to 100.

TABLE FOR FIGURE 3.1.4

Prevalence of indications for induction of labour, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 3.1.4 view graph **here**.

	Diabetes	IUGR	Maternal Request	Post dates	Preeclampsia/ Hypertension	PROM or PPROM
2012/2013	8.1	5.8	4.1	36.8	12.3	15.7
2013/2014	8.3	6.0	4.1	35.0	12.1	16.1
2014/2015	9.1	5.7	3.9	32.1	12.0	16.9
2015/2016	9.6	6.5	4.1	29.5	12.2	17.7
2016/2017	11.4	6.6	4.4	26.8	12.2	17.2
2017/2018	12.3	6.5	4.9	24.7	12.0	16.4
2018/2019	13.0	6.7	6.0	22.8	11.8	15.7
2019/2020	14.3	6.9	6.9	20.6	11.4	15.0
2020/2021	13.6	6.7	7.5	19.9	12.3	14.0
2021/2022	14.6	7.2	8.1	19.0	12.1	13.9
2022/2023	15.1	7.3	9.7	17.8	11.7	13.8
2023/2024	15.1	7.3	11.5	16.4	12.0	13.7

Technical Notes: Indication for induction of labour is a multi-selection variable. As a result, multiple reasons can be identified as indications for induction of labour.

IUGR: intrauterine growth restriction

PROM: Prelabour rupture of membranes

PPROM: Preterm prelabour rupture of membranes

TABLE FOR FIGURE 3.1.5

Prevalence of oxytocin use among those eligible for induction of labour, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 3.1.5 view graph **here**.

Fiscal Year	Births (n)	Births (%)
2012/2013	43,843	40.9
2013/2014	43,018	40.5
2014/2015	42,093	40.4
2015/2016	44,273	40.5
2016/2017	45,672	40.8
2017/2018	46,255	41.5
2018/2019	47,136	42.1
2019/2020	48,565	43.2
2020/2021	49,036	45.2
2021/2022	49,093	44.5
2022/2023	46,144	43.9
2023/2024	48,528	44.2

Technical Notes:

Eligibility for oxytocin is defined as:

- Singleton gestation
- Cephalic presentation
- Gestational age ≥37+0 weeks to ≤41+6 weeks

And pregnant individuals with the following criteria are excluded:

- Pregnant individuals with ‘placenta previa’ or ‘fetal anomaly’ as an indication for cesarean section birth
- Pregnant individuals with ‘fetal anomaly’ as an indication for induction of labour
- Pregnant individuals with ‘placenta previa’ or ‘fetal anomaly’ for complication of pregnancy
- Previous T incision/classical incision/uterine surgery,
- Pregnant individuals with ‘fetal anomaly’, ‘malposition/malpresentation’ or ‘other obstetrical complication’ as an indication for cesarean section.

TABLE FOR FIGURE 3.1.6

Prevalence of vaginal births among those induced with oxytocin, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 3.1.6 view graph here.

Fiscal Year	Vaginal births (n)	Vaginal births (%)
2012/2013	36,027	82.2
2013/2014	35,290	82.0
2014/2015	34,526	82.0
2015/2016	36,501	82.4
2016/2017	37,537	82.2
2017/2018	37,777	81.7
2018/2019	38,703	82.1
2019/2020	39,621	81.6
2020/2021	39,471	80.5
2021/2022	39,001	79.4
2022/2023	36,531	79.2
2023/2024	38,216	78.8

Technical Notes:

Eligibility for oxytocin is defined as:

- Singleton gestation
- Cephalic presentation - Gestational age ≥37+0 weeks to ≤41+6 weeks

And pregnant individuals with the following criteria are excluded:

- Pregnant individuals with ‘placenta previa’ or ‘fetal anomaly’ as an indication for cesarean section birth
- Pregnant individuals with ‘fetal anomaly’ as an indication for induction of labour
- Pregnant individuals with ‘placenta previa’ or ‘fetal anomaly’ for complication of pregnancy
- Previous T incision/classical incision/uterine surgery,
- Pregnant individuals with ‘fetal anomaly’, ‘malposition/malpresentation’ or ‘other obstetrical complication’ as an indication for cesarean section.

TABLE FOR FIGURE 3.1.7A

Prevalence of pharmacologic pain management in labour among hospital births, Ontario, 2012/2013 compared to 2023/2024 by level of care and fiscal year

To view a visual representation of Table 3.1.7A view graph **here**.

2012/2013	Level I	Level IIa	Level IIb	Level IIc	Level III
None	24.8	21.5	22.5	15.2	13.5
Nitrous oxide	18.4	13.8	4.6	8.2	8.8
Opioids	30.4	17.7	5.0	8.2	5.4
Epidural	43.7	58.9	66.4	59.6	74.0
Spinal	4.6	3.3	3.9	4.8	5.1
Spinal-epidural combination	1.0	1.6	2.1	12.7	3.1
Pudendal	0.6	0.4	0.8	0.2	0.3

2023/2024	Level I	Level IIa	Level IIb	Level IIc	Level III
None	16.9	12.6	15.7	13.8	11.7
Nitrous oxide	30.4	28.4	10.1	8.4	10.6
Opioids	26.5	11.0	7.1	3.7	5.1
Epidural	55.9	65.6	65.5	65.2	74.1
Spinal	6.9	5.6	5.2	5.7	6.8
Spinal-epidural combination	1.6	3.5	8.9	11.9	5.2
Pudendal	0.4	0.5	0.7	0.4	0.3

Technical Notes: Pain management is a multiple-selection variable. That is, a record can have more than one type of pain management selected during labour and/or birth. Therefore, the numbers inside the table represent the number of times each picklist was selected. Percentages will not sum to 100 due to this property.

This table excludes individuals who gave birth without labour.

TABLE FOR FIGURE 3.1.7B

Prevalance of any pharmacologic pain management in labour among hospital births, Ontario, 2012/2013 to 2023/2024 by level of care and fiscal year

To view a visual representation of Table 3.1.7B view graph here.

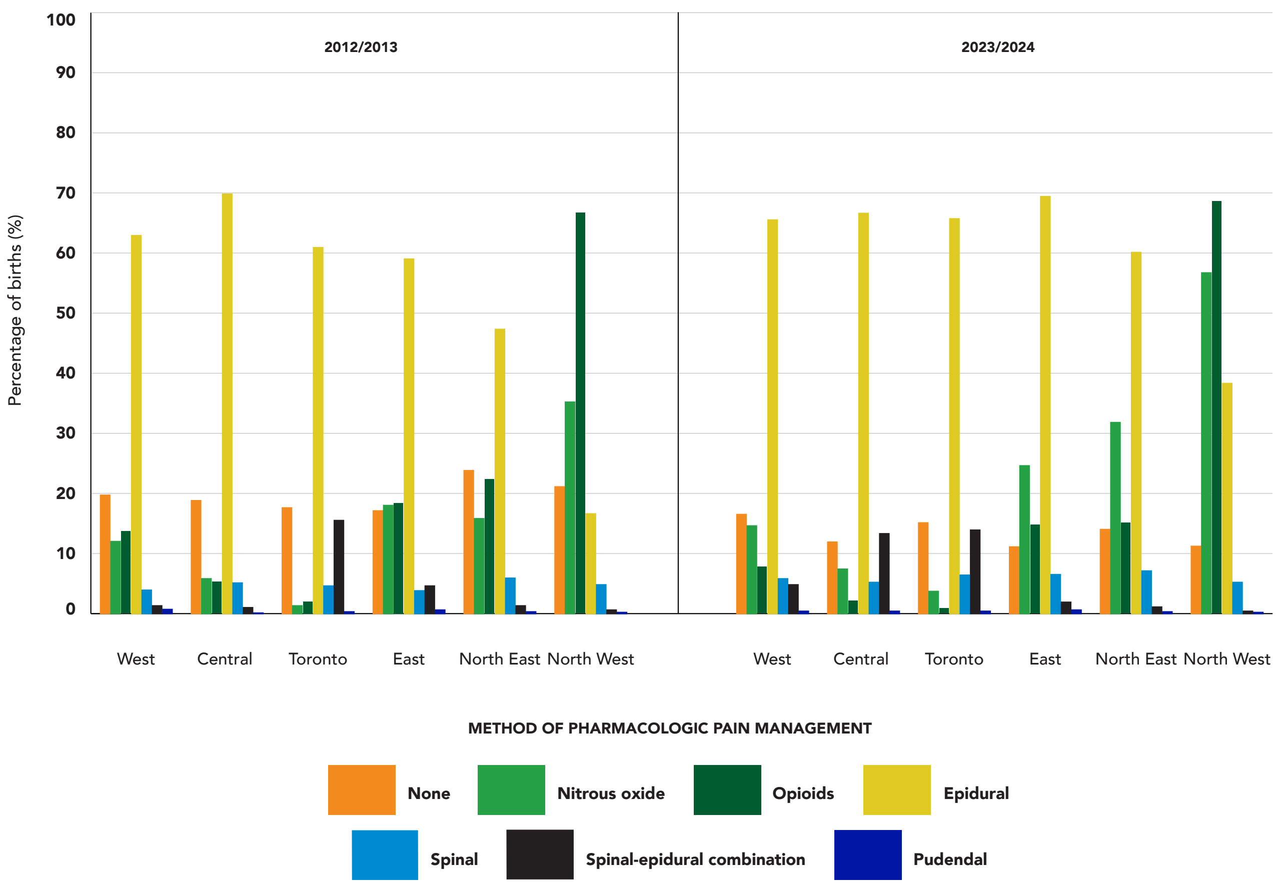
	Level I	Level IIa	Level IIb	Level IIc	Level III
2012/2013	75.2	78.5	77.5	84.8	86.5
2013/2014	74.7	80.6	76.5	82.4	86.3
2014/2015	75.5	81.7	78.4	80.4	86.0
2015/2016	76.6	83.6	78.4	81.3	86.3
2016/2017	77.4	82.2	79.7	83.9	84.0
2017/2018	78.3	83.1	79.7	85.0	83.5
2018/2019	79.8	84.2	78.5	85.9	79.2
2019/2020	79.9	84.8	79.9	85.6	78.9
2020/2021	77.4	82.1	81.1	85.0	75.8
2021/2022	82.6	83.3	81.9	84.9	86.9
2022/2023	83.0	85.0	83.0	86.0	88.3
2023/2024	83.1	87.4	84.3	86.2	88.3

Technical Notes: This table excludes individuals who gave birth without labour.

FIGURE 3.1.8

Prevalence of pharmacologic pain management in labour among hospital births, Ontario, 2012/2013 compared to 2023/2024 by pain management type, Ontario Health region and fiscal year

To view an alternate to this graph see [Table 3.1.8]() option of data points on the next page.



Numerator: Pharmacologic pain management type by hospital Ontario Health region.
Denominator: Pregnant individuals who had a live or still hospital birth and had labour.

TABLE FOR FIGURE 3.1.8

Prevalence of pharmacologic pain management in labour among hospital births, Ontario, 2012/2013 compared to 2023/2024 by pain management type, Ontario Health region and fiscal year

To view a visual representation of Table 3.1.8 view graph here.

2012/2013	West	Central	Toronto	East	North East	North West
None	19.7	18.8	17.6	17.1	23.8	21.1
Nitrous oxide	12.0	5.8	1.3	18.0	15.8	35.2
Opioids	13.7	5.3	2.0	18.4	22.4	66.7
Epidural	62.9	69.8	60.9	59.0	47.3	16.6
Spinal	3.9	5.1	4.6	3.8	5.9	4.8
Spinal-epidural combination	1.3	1.0	15.5	4.6	1.3	0.6
Pudendal	0.7	0.1	0.3	0.6	0.3	0.2

2023/2024	West	Central	Toronto	East	North East	North West
None	16.5	11.9	15.1	11.1	14.0	11.2
Nitrous oxide	14.6	7.4	3.7	24.6	31.8	56.7
Opioids	7.8	2.2	0.9	14.8	15.1	68.6
Epidural	65.5	66.6	65.7	69.4	60.1	38.3
Spinal	5.8	5.2	6.4	6.5	7.1	5.2
Spinal-epidural combination	4.8	13.3	13.9	1.9	1.1	0.4
Pudendal	0.4	0.4	0.4	0.6	0.3	0.2

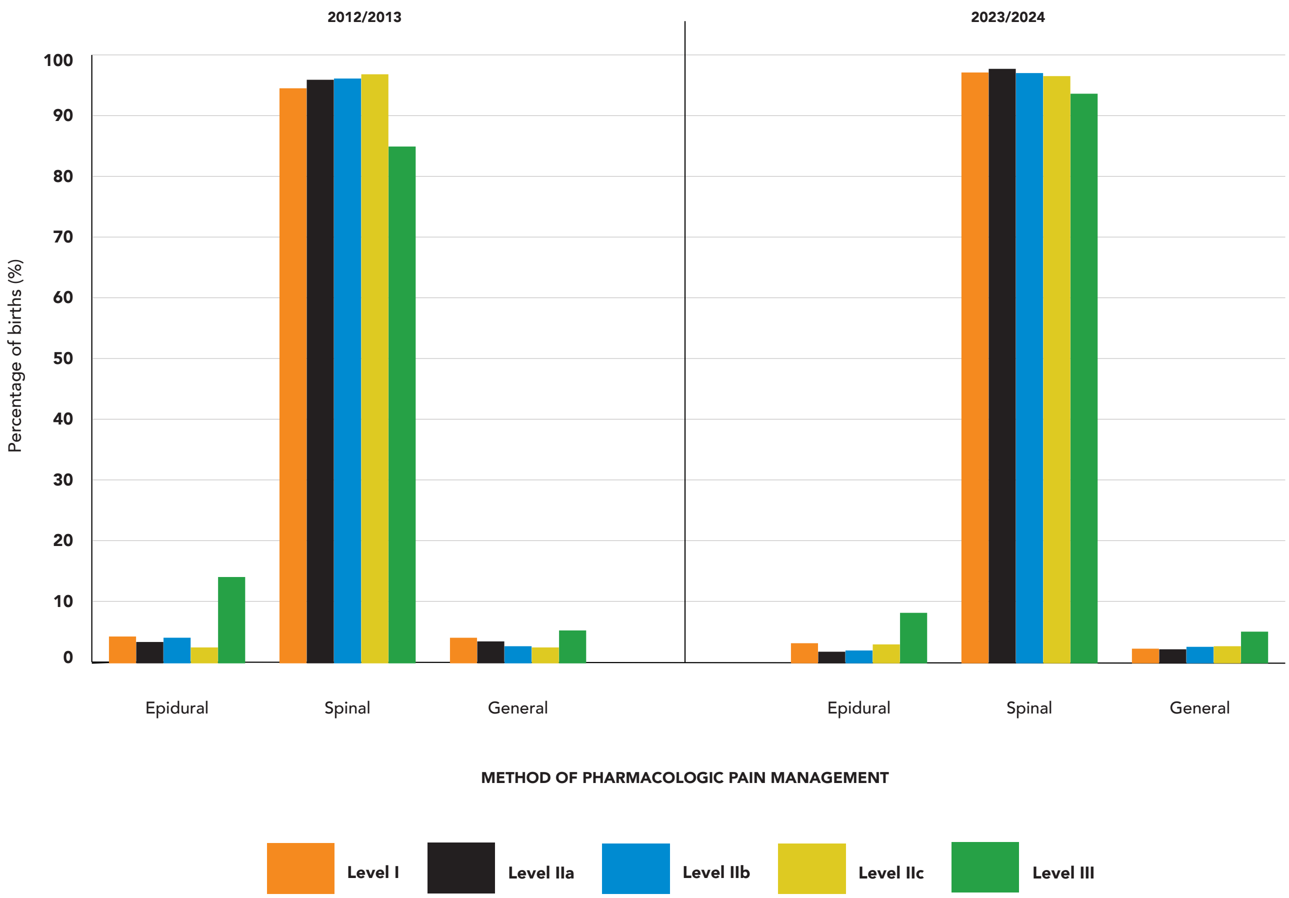
Technical Notes: Pain management is a multiple-selection variable. That is, a record can have more than one type of pain management selected during labour and/or birth. Therefore, the numbers inside the table represent the number of times each picklist was selected. Percentages will not sum to 100 due to this property.

This table excludes individuals who gave birth without labour.

FIGURE 3.1.9

Prevalence of pharmacologic pain management among no-labour cesarean births, Ontario, 2012/2013 compared to 2023/2024 by method, level of care and fiscal year

To view an alternate to this graph see **Table 3.1.9** option of data points on the next page.



Numerator: Pharmacologic pain management type by hospital level of care.

Denominator: Pregnant individuals who had a live or still no-labour cesarean hospital birth.

TABLE FOR FIGURE 3.1.9

Prevalence of pharmacologic pain management among no-labour cesarean births, Ontario, 2012/2013 compared to 2023/2024 by method, level of care and fiscal year

To view a visual representation of Table 3.1.9 view graph **here**.

2012/2013	Level I	Level IIa	Level IIb	Level IIc	Level III
Epidural	4.0	3.1	3.8	2.2	13.8
Spinal	94.3	95.7	95.9	96.6	84.7
General	3.8	3.2	2.4	2.2	5.0
Spinal-epidural combination	–	–	–	–	–

2023/2024	Level I	Level IIa	Level IIb	Level IIc	Level III
Epidural	2.9	1.5	1.7	2.7	7.9
Spinal	96.9	97.5	96.8	96.3	93.4
General	2.0	1.9	2.3	2.4	4.8
Spinal-epidural combination	0.0	0.0	0.2	0.1	0.0

Technical Notes: Pain management is a multiple-selection variable. That is, a record can have more than one type of pain management selected during labour and/or birth. Therefore, the numbers inside the table represent the number of times each picklist was selected. Percentages will not sum to 100 due to this property.

Spinal-epidural combination is a new data element added in 2023/2024 with no data captured in 2012/2013.

TABLE 3.1.10

Prevalence of fetal surveillance methodology for low-risk pregnancies, Ontario, 2012/2013 to 2023/2024 by method and fiscal year

	2012/ 2013	2013/ 2014	2014/ 2015	2015/ 2016	2016/ 2017	2017/ 2018	2018/ 2019	2019/ 2020	2020/ 2021	2021/ 2022	2022/ 2023	2023/ 2024
Any fetal surveillance method	99.8	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.8	99.8
Admission EFM strip any	44.2	44.1	47.7	46.7	47.8	46.4	44.1	43.2	41.5	41.6	42.4	43.3
Admission EFM strip only	2.5	2.6	2.5	2.3	2.3	2.5	3.1	3.5	3.2	3.2	2.5	2.5
Auscultation any	48.9	50.2	51.3	51.8	51.3	50.9	50.9	50.6	47.2	47.3	44.9	44.3
Auscultation only	10.2	11.4	11.1	10.3	9.3	9.9	10.1	9.9	9.0	9.8	9.8	9.5
Intrapartum EFM any	83.5	81.9	81.7	82.5	83.9	83.0	83.1	83.0	84.6	83.8	84.9	84.9
Intrapartum EFM only	25.9	24.6	21.3	22.1	22.1	22.5	22.4	22.8	26.2	26.5	27.4	26.4
No monitoring	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2

Technical Notes: EFM refers to electronic fetal monitoring. Method of fetal surveillance is derived from 'fetal surveillance', which is a multiple-selection variable. Intrapartum EFM includes the following pick-list values: Intrapartum EFM (external) and Intrapartum EFM (internal).

Any fetal surveillance method includes admission EFM strip, auscultation, internal or external intrapartum EFM.

The BORN Maternal Newborn Outcomes Committee (MNOC), a multi-disciplinary group of care providers who provide advice and clinical direction to the organization agreed to standardize the definition of low-risk pregnancies for consistency. This definition was last revised in June 2023. MNOC approved the following inclusion/exclusion criteria for the definition of low-risk birth and primary cesarean birth rates:

Inclusions:

- Nulliparous
- ≥37 weeks' gestation
- Cephalic
- Singleton
- Spontaneous labour
- Maternal pre-pregnancy BMI <40 kg/m^2

Exclusions:

Classification of Disorders or Condition	Specific Condition Excluded
Maternal Health Conditions [added June 2023]	
Autoimmune	Lupus; Rheumatoid Arthritis; Autoimmune Other
Cancer	Diagnosed in Pregnancy; Medication exposure in pregnancy – Chemotherapeutic Agents
Cardiovascular – 2	Acquired Heart Disease; Antihypertensive Therapy Outside of Pregnancy; Cardiovascular Disease; Congenital Heart Defect; Congenital Heart Disease; Pre-existing Hypertension; Renal Disease; Cardiovascular Other
Endocrine	Diabetes and Pregnancy; [Hyperthyroidism (Unmanaged); Hypothyroidism (Unmanaged); Hyper/Hypothyroidism Management unknown]
Gastrointestinal	Liver/ Gallbladder -Cholecystitis; Colitis; Crohn's; Hepatitis; Liver/ Gallbladder -Intrahepatic Cholestasis of Pregnancy
Genitourinary	Acquired Renal (Insufficiency -Chronic Infections); Congenital/ Genetic Renal (Renal Agenesis – Pelvic Kidney); Renal Disease; Uterine Anomalies; Genitourinary other
Infections	[Sexually Transmitted Infections (Chlamydia; Gonorrhea; Active Herpes Simplex Virus (HSV); Human Immunodeficiency Virus (HIV); Viruses; Other]
Hematology	Gestational Thrombocytopenia; Hemophilia (A and B Von Willebrand); Idiopathic Thrombocytopenia; Sickle Cell Disease; Thalassemia; Thrombophilia; Hematology Other
Hypertensive Disorders in Pregnancy	Gestational Hypertension; Eclampsia; HELLP; Preeclampsia; Preeclampsia Requiring Magnesium Sulfate; Pre-existing Hypertension with Superimposed Preeclampsia; Maternal Unknown
Musculoskeletal	Achondroplasia; Muscular Dystrophy/ Neuromuscular Disorder; Myotonic Dystrophy; Osteogenesis Imperfecta; Musculoskeletal Other
Neurology	Cerebral Palsy; Multiple Sclerosis; Myasthenia Gravis; Spina Bifida/ Neural Tube Defect; Neurology Other; [Epilepsy/Seizures/Seizure occurred in current pregnancy]
Pulmonary	Cystic Fibrosis; Previous Pulmonary Embolism/ Deep Vein Thrombosis; Pulmonary Hypertension; Pulmonary
Other	Maternal health conditions other
Complications of Pregnancy	
Maternal	[Preterm labour prior to this admission; antepartum bleeding (persistent and unexplained); Preterm prelabour rupture of membranes (PPROM); pregnant individuals age greater than 40 years]
Fetal	Anomalies; Isoimmunization/ Alloimmunization; Intrauterine Growth Restriction; Oligohydramnios; Fetal therapy – Fetal surgery; [Polyhydramnios; Fetal other]
Placental	Placenta Accreta; Placenta Increta; Placenta Percreta; Placenta Previa; Placental Abruption; Placental Other,
Other criteria not classified	Multiparous • Excluded as they have already proven their ability to give birth • Induction of labour: – Higher rate of labour and birth maternal/neonatal complications with induction

3.2 BIRTH

TABLE FOR FIGURE 3.2.1

Distribution of health care provider type who delivered baby, Ontario, 2012/2013 compared to 2023/2024

To view a visual representation of Table 3.2.1 view graph **here**.

	2012/2013	2023/2024
Obstetrician/surgeon/resident	82.2	82.8
Family Physician	8.7	5.1
Midwife	8.5	11.0
Other (CNS/NP/Registered Nurse/Other)	0.6	0.7

Technical Notes: These data are from the data element 'Healthcare provider who caught/delivered baby'.

"Resident" was added as a picklist option for health care provider who caught/delivered baby in 2015/2016.

The category of "Resident" may include family physician residents, however it is likely to be a small number.

The category of "Midwife" includes registered midwife, midwifery student, and Aboriginal midwife. It does not reflect the number of pregnant individulas with a billable course of midwifery care.

Table for Figure 3.2.2

Distribution of births by midwifery client status, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 3.2.2 view graph **here**.

	Non-midwifery client (%)	Midwifery client (%)
2012/2013	87.2	12.8
2013/2014	85.7	14.3
2014/2015	84.5	15.5
2015/2016	83.7	16.3
2016/2017	83.0	17.0
2017/2018	82.3	17.7
2018/2019	81.3	18.7
2019/2020	81.3	18.7
2020/2021	80.2	19.8
2021/2022	80.5	19.5
2022/2023	80.2	19.8
2023/2024	80.3	19.7

Technical Notes: Billable course of care means at least 12 weeks of midwifery care and/or the midwife caught/delivered the baby.

Table for Figure 3.2.3

Prevalence of assisted vaginal birth, Ontario, 2012/2013 to 2023/2024 by type and fiscal year

To view a visual representation of Table 3.2.3 view graph **here**.

	Vacuum (%)	Forceps (%)	Vacuum and forceps (%)
2012/2013	9.4	3.3	0.4
2013/2014	9.2	3.3	0.4
2014/2015	9.2	3.2	0.4
2015/2016	8.9	3.1	0.4
2016/2017	9.0	3.1	0.4
2017/2018	8.8	3.0	0.4
2018/2019	8.9	2.9	0.4
2019/2020	9.2	2.9	0.4
2020/2021	9.3	3.2	0.4
2021/2022	9.3	3.1	0.3
2022/2023	9.0	3.0	0.3
2023/2024	9.1	3.0	0.4

Technical Notes: Assisted vaginal birth can be performed using vaccum, forceps, or both vacuum and forceps.

Table for Figure 3.2.4

Prevalence of assisted vaginal birth, Ontario, 2012/2013 compared to 2023/2024

To view a visual representation of Table 3.2.4 view graph here.

2012/2013	Level I	Level IIa	Level IIb	Level IIc	Level III
Vacuum	11.20	8.50	10.30	9.40	7.80
Forceps	2.60	4.40	3.00	3.00	4.20
Vacuum and forceps	0.60	0.50	0.50	0.40	0.30

2023/2024	Level I	Level IIa	Level IIb	Level IIc	Level III
Vacuum	10.40	7.00	9.50	10.00	6.70
Forceps	2.50	3.50	4.00	2.70	3.20
Vacuum and forceps	0.40	0.60	0.50	0.30	0.20

Technical Notes: Level of care (LOC) refers to neonatal level of care.

Table for Figure 3.2.5

Distribution of birth type, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 3.2.5 view graph **here**.

	Vaginal birth (%)	Cesarean birth (%)
2012/2013	72.6	27.4
2013/2014	72.7	27.3
2014/2015	72.8	27.2
2015/2016	72.5	27.5
2016/2017	72.4	27.6
2017/2018	71.6	28.4
2018/2019	71.1	28.9
2019/2020	70.4	29.6
2020/2021	69.2	30.8
2021/2022	68.5	31.5
2022/2023	67.7	32.3
2023/2024	66.9	33.1

Technical Notes: Vaginal births include spontaneous or assisted vaginal births, and vaginal births with unknown status of assistance.

Cesarean births include induced or spontaneous cesarean, no labour cesarean, and cesarean births with unknown labour type.

Table for Figure 3.2.6

Prevalence of cesarean births among hospital births, Ontario, 2012/2013 compared to 2023/2024 by Robson group and fiscal year

To view a visual representation of Table 3.2.6 view graph **here**.

	2012/2013	2023/2024
Nulliparous, singleton, cephalic, ≥37 weeks, spontaneous labour	15.9	18.8
Nulliparous, singleton, cephalic, ≥37 weeks, induced labour or cesarean before labour	38.7	42.7
Multiparous, singleton, cephalic, ≥37weeks, no previous cesarean, spontaneous labour	2.5	2.8
Multiparous, singleton, cephalic, ≥37 weeks, no previous cesarean, induced labour or no labour	13.1	11.6
Multiparous, singleton, cephalic, ≥37 weeks, previous cesarean	79.9	81.5
Nulliparous, singleton, breech	93.9	96.2
Multiparous, singleton, breech	90.7	92.7
Multifetal pregnancy	61.6	68.6
Singleton, transverse or oblique lie	82.0	95.9
Singleton, cephalic, <37 weeks	27.5	36.9

Technical Notes: This table follows the Robson criteria (*Robson, 2001*).

Only records that could be assigned into a Robson Group are included in this table.

Cesarean births include induced or spontaneous cesarean, no labour cesarean births, and cesarean births with unknown type of labour.

Table for Figure 3.2.7

Prevalence of indications for cesarean birth, Ontario, 2012/2013 compared to 2023/2024

To view a visual representation of Table 3.2.7 view graph **here**.

	2012/2013	2023/2024
Previous cesarean	39.3	33.5
Atypical/abnormal fetal surveillance	20.4	27.4
Malposition/malpresentation	14.3	14.0
Nonprogressive first stage of labour	14.2	13.0
Nonprogressive second stage of labour	7.3	5.1
Other obstetrical complication	4.7	2.8
Maternal health conditions	3.9	5.3
Maternal request	3.3	6.6
Placental complication	3.4	3.0
VBAC not eligible/declined/unsuccessful attempt	–	4.4

Technical Notes: Indications for cesarean section is derived from the data element "All Indications for Cesarean Section", which is a multi-select variable. Therefore, a pregnancy record can have more than one type of indication selected. Percentages of each indication will not sum to 100 due to this property.

VBAC: Vaginal birth after cesarean.

*VBAC not eligible and declined VBAC started collection in 2014/2015.

Maternal health conditions include the following pick-list values: Gestational hypertension, HIV—Human immunodeficiency virus, HSV - Herpes simplex virus, Eclampsia, HELLP, Preeclampsia, Maternal health conditions and Obesity.

Placental complications include the following pick-list values: Placenta increta/accreta/percreta, Placenta previa, and Placental abruption.

Table for Figure 3.2.8

Frequency of vaginal birth after cesarean (VBAC), Ontario, 2012/2013 compared to 2023/2024 by VBAC status and fiscal year

To view a visual representation of Table 3.2.8 view graph **here**.

	Eligible for VBAC (n)	Attempted VBAC (n)	Successful VBAC (n)	Successful VBAC (%)
2012/2013	11,246	3,712	2,799	75.4
2013/2014	11,596	3,898	2,878	73.8
2014/2015	11,036	4,016	2,996	74.6
2015/2016	11,756	4,284	3,133	73.1
2016/2017	12,167	4,480	3,273	73.1
2017/2018	12,771	4,658	3,351	71.9
2018/2019	13,111	4,697	3,397	72.3
2019/2020	13,218	4,683	3,355	71.6
2020/2021	12,862	4,332	3,164	73.0
2021/2022	12,822	4,275	3,048	71.3
2022/2023	11,890	3,989	2,840	71.2
2023/2024	12,191	3,913	2,737	69.9

Technical Notes: VBAC: Vaginal birth after cesarean.

Eligibility for VBAC is defined as:

- Multiparous | Singleton gestation
- Cephalic presentation | Gestational age ≥37 weeks
- One previous cesarean birth
- Live birth

Pregnant individuals with the following criteria are excluded:

- Placenta accreta | Placenta increta
- Placenta percreta | Placenta previa
- Previous uterine rupture

- Previous T incision/classical incision/uterine surgery,
- Pregnant individuals with 'fetal anomaly', 'malposition/malpresentation' or 'other obstetrical complication' as an indication for cesarean section.

Percentage of successful VBAC is calculated as a percentage of pregnant individuals with one previous cesarean birth who were eligible for and attempted a VBAC.

There are three scenarios that indicate that a pregnant individual attempted a VBAC:

1) Type of Birth is 'Vaginal birth'

2a) Type of Birth is 'Induced or Spontaneous Labour Cesarean Section', and All Indications for Cesarean Section includes 'Maternal\VBAC – Failed Attempt', 'Maternal\ Failed forceps / vacuum', 'Maternal\Failed Induction', ' Maternal\Nonprogressive first stage of labour', and 'Maternal\Nonprogressive second stage of labour'

2b) Type of Labour is 'Induced labour prior to onset of contractions ('cold induction'),' Induced labour in latent phase', 'Active labour achieved without any intervention ', and Type of Birth is'Cesarean birth', and All Indications for Cesarean Section is 'Maternal \ VBAC - Failed Attempt', ' Maternal \ Failed forceps/vacuum', 'Maternal \ Failed induction', 'Maternal \ Nonprogressive first stage of labour', 'Maternal \ Nonprogressive second stage of labour'

3a) Type of Birth is 'Induced or Spontaneous Labour Cesarean Section' and Type of Cesarean Section is 'Unplanned'

3b) Type of Labour is 'Induced labour prior to onset of contractions ('cold induction')', 'Induced labour in latent phase', 'Active labour achieved without any intervention', and Type of Birth is 'Cesarean Birth', and Type of Cesarean is 'Unplanned'

Successful VBAC is defined based on Type of Birth where 'Vaginal Birth' is considered to be a successful VBAC.

Table for Figure 3.2.9

Prevalence of adverse outcomes among attempted vaginal birth after caesarean (VBAC), Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 3.2.9 view graph here.

	Adverse outcomes among attempted VBAC					
	Newborn HIE (%)	5-min Apgar ≤3 (%)	Arterial cord blood pH <7 (%)	Uterine rupture (%)	PPH (%)	Severe perineal lacerations (%)
2012/2013	–	0.3	1.0	0.5	3.2	4.4
2013/2014	–	0.5	1.2	0.7	2.9	4.8
2014/2015	0.3	0.3	1.2	0.4	2.5	4.3
2015/2016	0.2	0.3	1.3	0.4	2.5	3.9
2016/2017	0.1	0.2	1.0	0.7	2.3	3.8
2017/2018	0.1	0.2	1.7	0.3	2.5	3.9
2018/2019	0.3	0.3	1.3	0.6	2.7	4.1
2019/2020	0.2	0.3	1.3	0.8	3.1	4.8
2020/2021	0.4	0.1	1.3	0.6	3.1	4.4
2021/2022	0.2	0.2	1.2	0.4	3.6	4.4
2022/2023	0.1	0.2	1.4	0.8	3.0	4.5
2023/2024	0.2	0.2	0.9	0.6	3.3	4.7

Technical Notes: See sections 4.1.1, 4.2.1 and 5.5.1

* Adverse outcomes are derived exclusively from BIS data. Hypoxic-ischemic encephalopathy (HIE) became available as a picklist option in 2014/2015.

There are three scenarios that indicate that a pregnant individual attempted a VBAC after a previous cesarean:

1) Type of Birth is 'Vaginal birth'

2a) Type of Birth is 'Induced or Spontaneous Labour Cesarean Section', and All Indications for Cesarean Section includes 'Maternal\VBAC – Failed Attempt', 'Maternal\ Failed forceps / vacuum', 'Maternal\Failed Induction', 'Maternal\Nonprogressive first stage of labour', and 'Maternal\Nonprogressive second stage of labour'

2b) Type of Labour is 'Induced labour prior to onset of contractions ('cold induction'),' Induced labour in latent phase', 'Active labour achieved without any intervention ', and Type of Birth is'Cesarean birth', and All Indications for Cesarean Section is 'Maternal\VBAC - Failed Attempt', ' Maternal\Failed forceps/vacuum', 'Maternal\Failed induction', 'Maternal\Nonprogressive first stage of labour', 'Maternal\Nonprogressive second stage of labour'

3a) Type of Birth is 'Induced or Spontaneous Labour Cesarean Section' and Type of Cesarean Section is 'Unplanned'

3b) Type of Labour is 'Induced labour prior to onset of contractions ('cold induction')', 'Induced labour in latent phase', 'Active labour achieved without any intervention', and Type of Birth is 'Cesarean Birth', and Type of Cesarean is 'Unplanned'

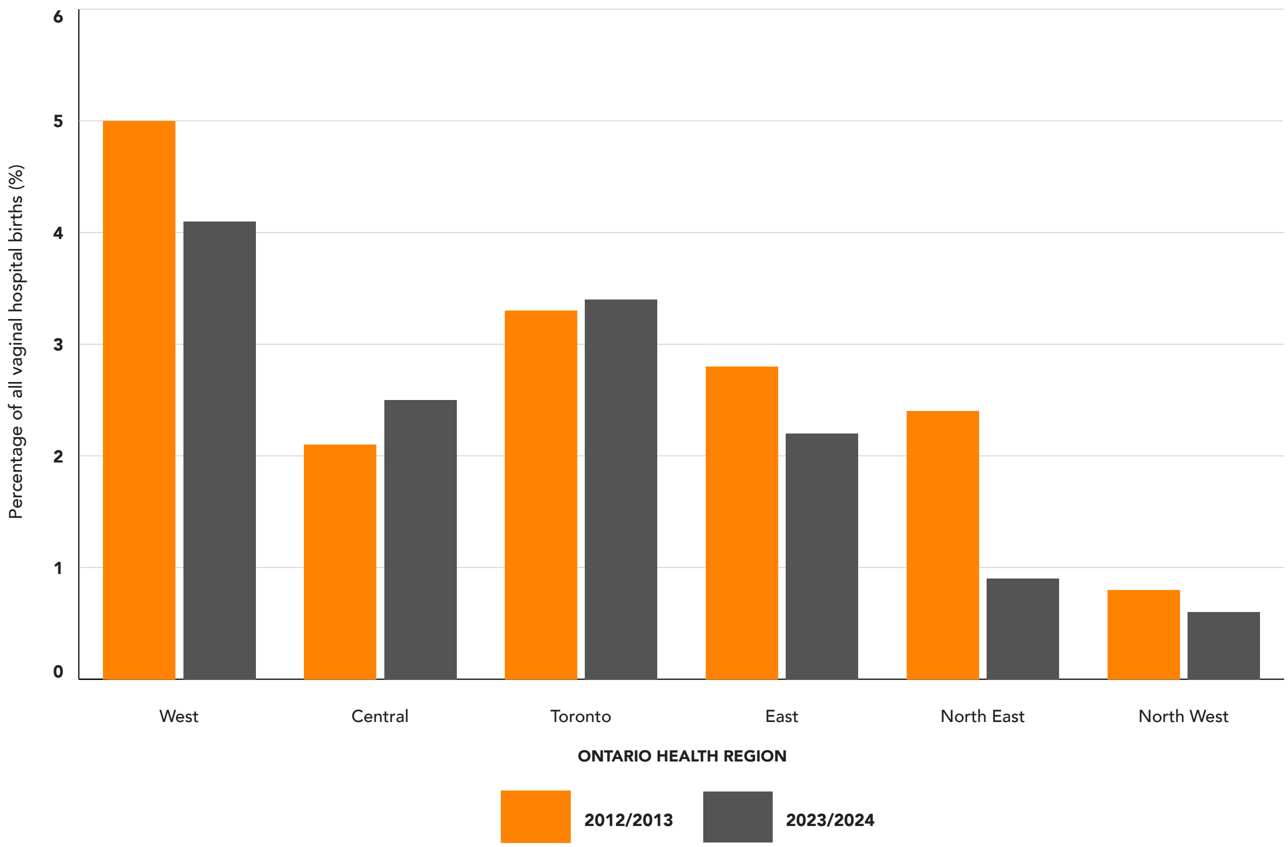
Severe perineal lacerations include 3rd and 4th degree perineal tears and cervical tears.

Postpartum hemorrhage includes any postpartum hemorrhage that occurred up to 24 hours after birth and any late postpartum hemorrhage (PPH) that occurred from 24 hours to 6 weeks after birth.

FIGURE 3.2.10

Prevalence of forceps-assisted vaginal hospital births, Ontario, 2012/2013 compared to 2023/2024, by Ontario Health region

To view an alternate to this graph see Table 3.2.10 option of data points on the next page.



Numerator: Assisted vaginal hospital births by assistance type, OH region and fiscal year.
Denominator: All pregnancies resulting in a vaginal birth of a live or stillborn infant in an Ontario hospital.

TABLE FOR FIGURE 3.2.10

Prevalence of forceps-assisted vaginal hospital births, Ontario, 2012/2013 compared to 2023/2024, by Ontario Health region

To view a visual representation of Table 3.2.10 view graph **here**.

Forceps by OH region

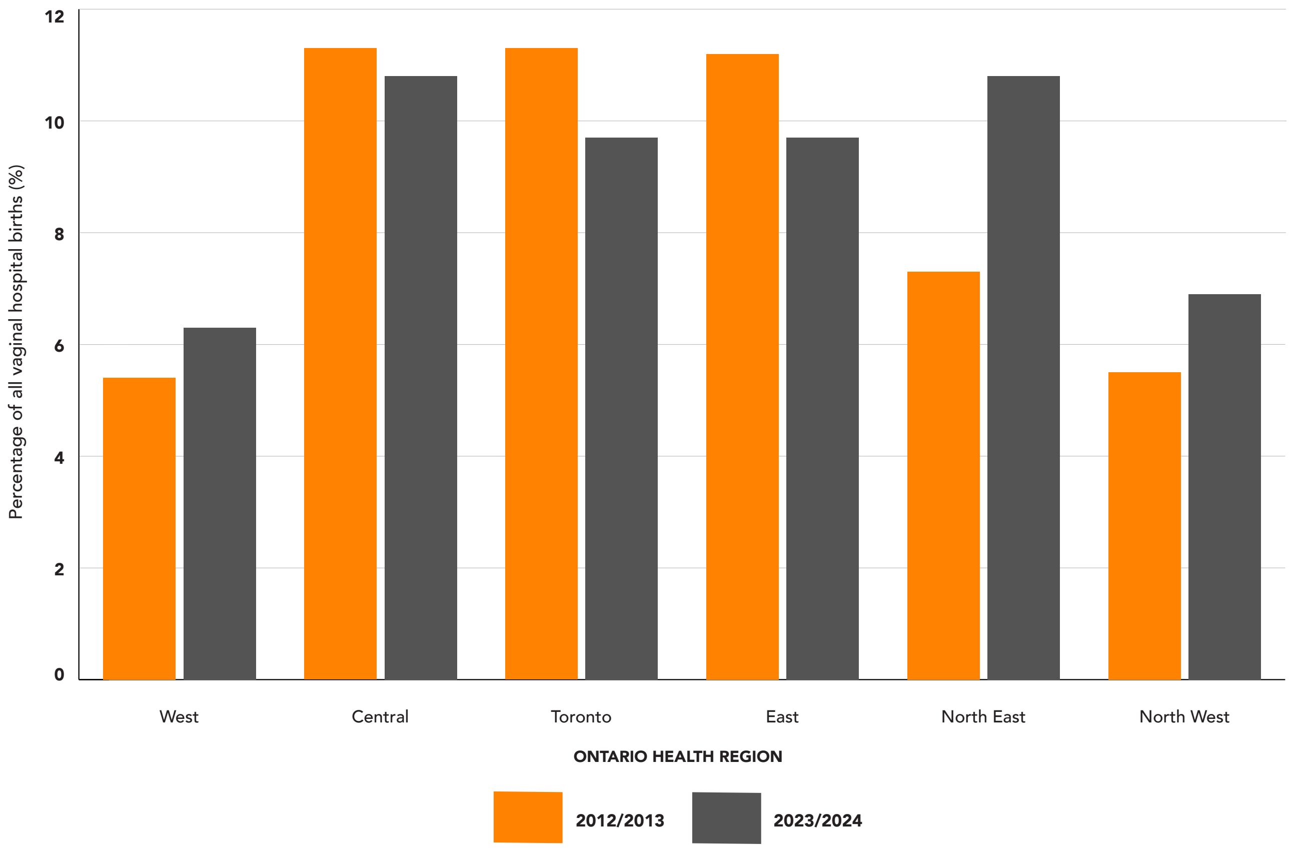
	2012/2013 (%)	2023/2024 (%)
West	5.0	4.1
Central	2.1	2.5
Toronto	3.3	3.4
East	2.8	2.2
North East	2.4	0.9
North West	0.8	0.6
Total	3.3	3.0

Technical Notes: None to report.

FIGURE 3.2.11

Prevalence of vacuum-assisted vaginal hospital births, Ontario, 2012/2013 compared to 2023/2024, by Ontario Health region

To view an alternate to this graph see **Table 3.2.11** option of data points on the next page.



Numerator: Assisted vaginal hospital births by assistance type, OH region and fiscal year.
Denominator: All pregnancies resulting in a vaginal birth of a live or stillborn infant in an Ontario hospital.

TABLE FOR FIGURE 3.2.11

Prevalence of vacuum-assisted vaginal hospital births, Ontario, 2012/2013 compared to 2023/2024, by Ontario Health region

To view a visual representation of Table 3.2.10 view graph **here**.

Vacuum by OH region

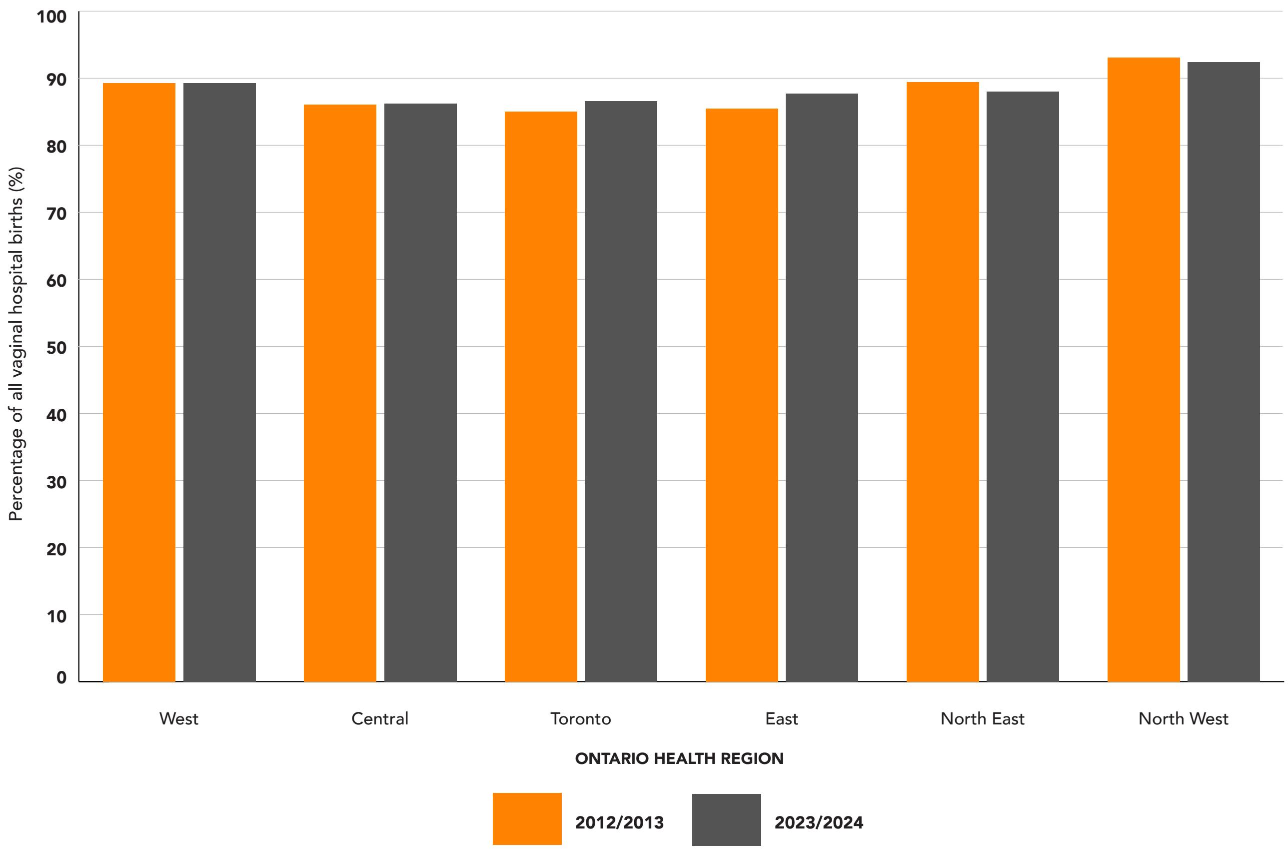
	2012/2013 (%)	2023/2024 (%)
West	5.4	6.3
Central	11.3	10.8
Toronto	11.3	9.7
East	11.2	9.7
North East	7.3	10.8
North West	5.5	6.9
Total	9.4	9.1

Technical Notes: None to report.

FIGURE 3.2.12

Prevalence of vaginal hospital births with no assisted intervention, Ontario, 2012/2013 compared to 2023/2024, by Ontario Health region

To view an alternate to this graph see [Table 3.2.12](#) option of data points on the next page.



Numerator: Vaginal hospital births by assistance type, OH region and fiscal year.
Denominator: All pregnancies resulting in a vaginal birth of a live or stillborn infant in an Ontario hospital.

TABLE FOR FIGURE 3.2.12

Prevalence of vaginal hospital births with no assisted intervention, Ontario, 2012/2013 compared to 2023/2024, by Ontario Health region

To view a visual representation of Table 3.2.12 view graph **here**.

No assisted intervention

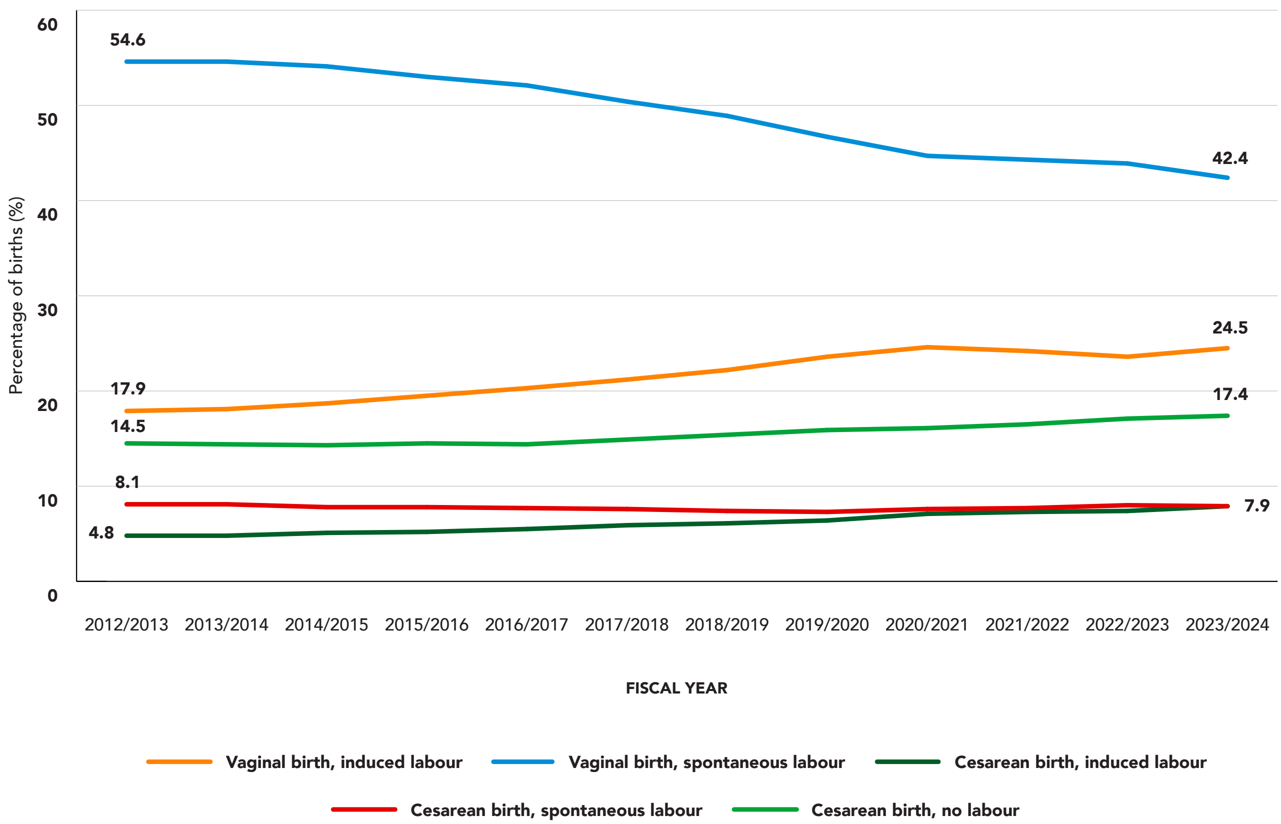
	2012/2013 (%)	2023/2024 (%)
West	89.3	89.3
Central	86.1	86.2
Toronto	85.0	86.6
East	85.5	87.7
North East	89.4	88.0
North West	93.1	92.4
Total	86.8	87.6

Technical Notes: None to report.

FIGURE 3.2.13

Distribution of labour type, Ontario, 2012/2013 to 2023/2024

To view an alternate to this graph see Table 3.2.13 option of data points on the next page.



Numerator: Births in each type of vaginal or cesarean birth.

Denominator: All pregnancies resulting in live or stillbirth that occurred in Ontario.

TABLE FOR FIGURE 3.2.13

Distribution of labour type, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 3.2.12 view graph **here**.

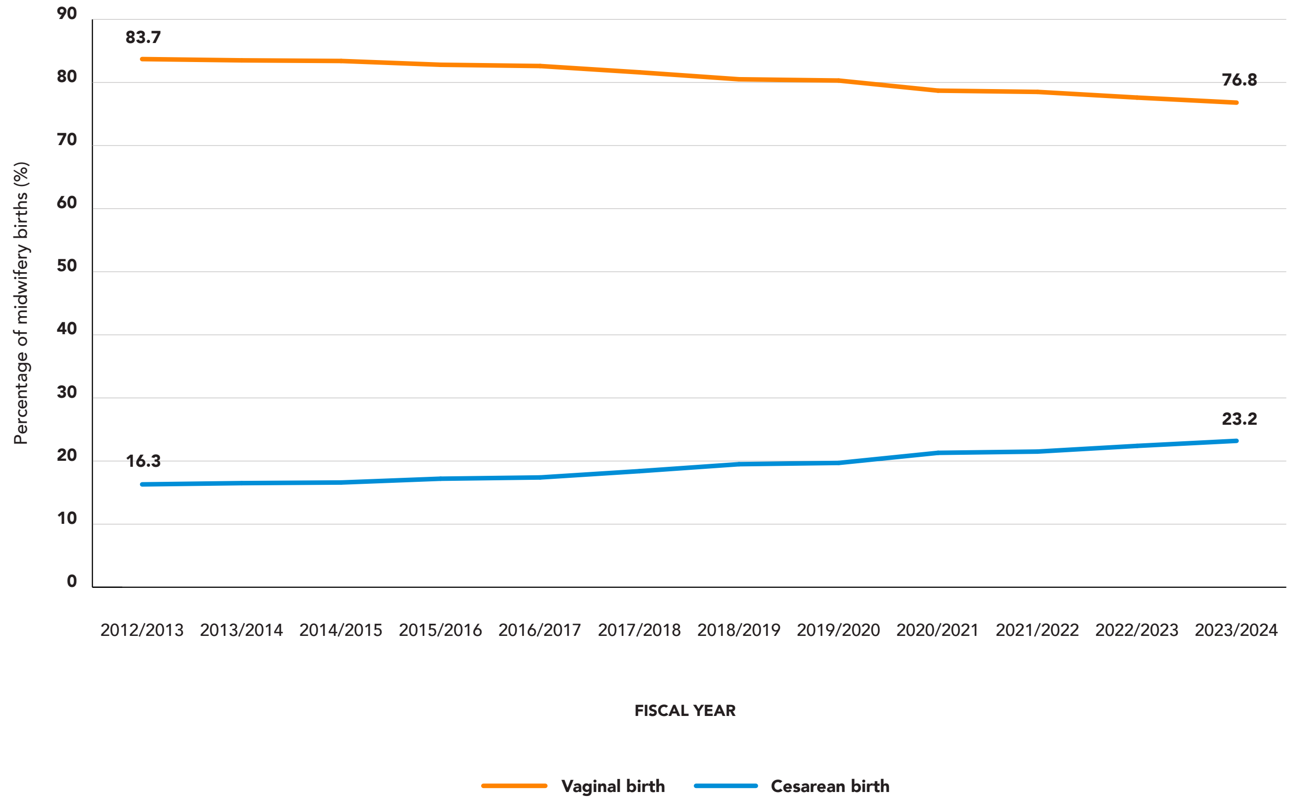
	Vaginal birth, induced labour (%)	Vaginal birth, spontaneous labour (%)	Cesarean birth, induced labour (%)	Cesarean birth, spontaneous labour (%)	Cesarean birth, no labour (%)
2012/2013	17.9	54.6	4.8	8.1	14.5
2013/2014	18.1	54.6	4.8	8.1	14.4
2014/2015	18.7	54.1	5.1	7.8	14.3
2015/2016	19.5	53.0	5.2	7.8	14.5
2016/2017	20.3	52.1	5.5	7.7	14.4
2017/2018	21.2	50.4	5.9	7.6	14.9
2018/2019	22.2	48.9	6.1	7.4	15.4
2019/2020	23.6	46.7	6.4	7.3	15.9
2020/2021	24.6	44.7	7.1	7.6	16.1
2021/2022	24.2	44.3	7.3	7.7	16.5
2022/2023	23.6	43.9	7.4	8.0	17.1
2023/2024	24.5	42.4	7.9	7.9	17.4

Technical Notes: None to report.

FIGURE 3.2.14

Distribution of birth type of midwifery client births, Ontario, 2012/2013 to 2023/2024

To view an alternate to this graph see **Table 3.2.14** option of data points on the next page.



Numerator: Births by type.

Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario with a billable course of midwifery care.

TABLE FOR FIGURE 3.2.14

Distribution of birth type of midwifery client births, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 3.2.12 view graph **here**.

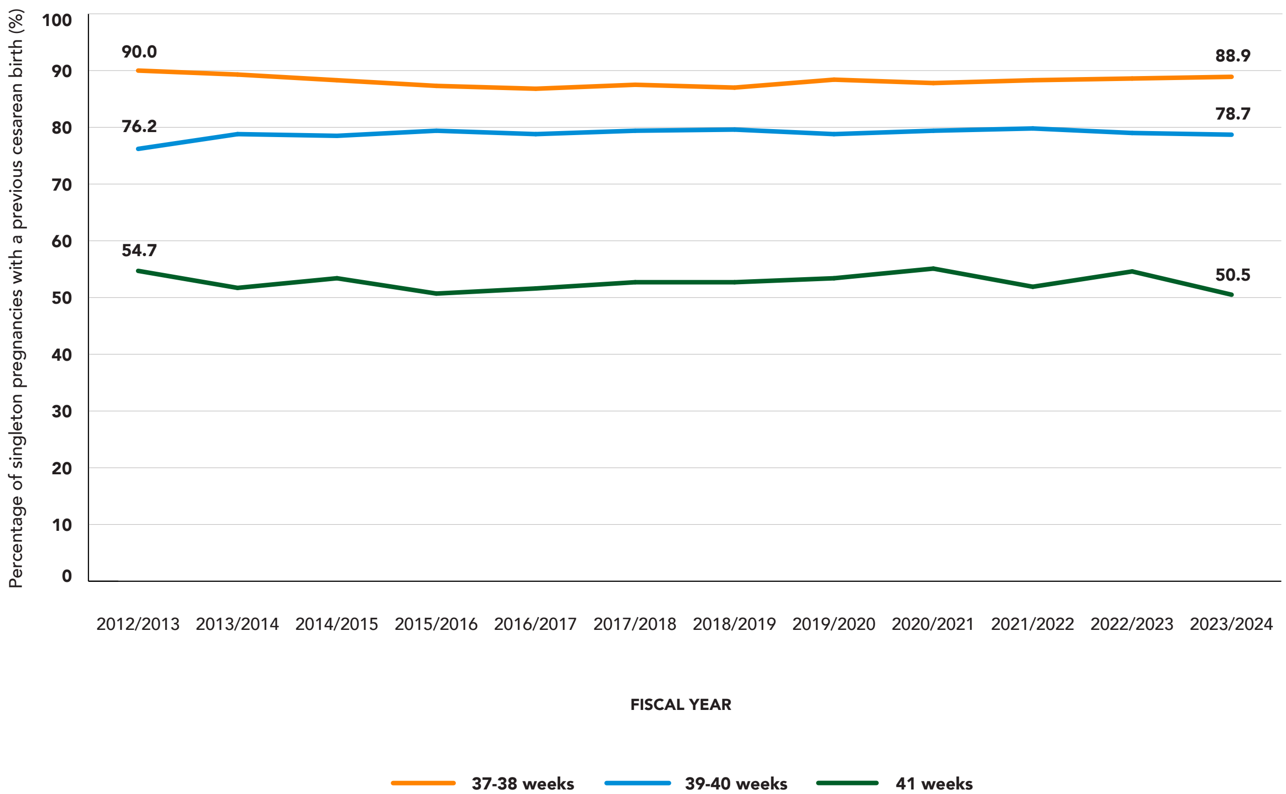
	Vaginal birth (%)	Cesarean birth (%)
2012/2013	83.7	16.3
2013/2014	83.5	16.5
2014/2015	83.4	16.6
2015/2016	82.8	17.2
2016/2017	82.6	17.4
2017/2018	81.6	18.4
2018/2019	80.5	19.5
2019/2020	80.3	19.7
2020/2021	78.7	21.3
2021/2022	78.5	21.5
2022/2023	77.6	22.4
2023/2024	76.8	23.2

Technical Notes: None to report.

FIGURE 3.2.15

Prevalence of repeat cesarean birth among term pregnancies with a previous cesarean birth, 2012/2013 to 2023/2024

To view an alternate to this graph see [Table 3.2.15] option of data points on the next page.



Numerator: Cesarean births at each gestational age.

Denominator: All singleton pregnancies resulting in a term live or still hospital birth at 37 to 41 weeks gestational age in Ontario to a person with at least one previous cesarean birth.

TABLE FOR FIGURE 3.2.15

Prevalence of repeat cesarean birth among term pregnancies with a previous cesarean birth, 2012/2013 to 2023/2024

To view a visual representation of Table 3.2.12 view graph **here**.

	37-38 weeks (%)	39-40 weeks (%)	41 weeks (%)
2012/2013	90.0	76.2	54.7
2013/2014	89.3	78.8	51.7
2014/2015	88.3	78.5	53.4
2015/2016	87.3	79.4	50.7
2016/2017	86.8	78.8	51.6
2017/2018	87.5	79.4	52.7
2018/2019	87.0	79.6	52.7
2019/2020	88.4	78.8	53.4
2020/2021	87.8	79.4	55.1
2021/2022	88.3	79.8	51.9
2022/2023	88.6	79.0	54.6
2023/2024	88.9	78.7	50.5

Technical Notes: None to report.

4.0 COMPLICATIONS OF LABOUR, BIRTH, AND POSTPARTUM

4.1 LACERATIONS

TABLE FOR FIGURE 4.1.1

Prevalence of perineal laceration type among vaginal hospital births, Ontario, 2012/2013 compared to 2023/2024

To view a visual representation of Table 4.1.1 view graph **here**.

	Perineal laceration				
Fiscal Year	**1st degree**	**2nd degree**	**3rd degree**	**4th degree**	**Cervical tear**
2012/2013	20.0	36.5	3.3	0.4	0.1
2023/2024	18.9	44.2	4.1	0.4	0.1

Technical Notes: None to report.

Table 4.1.2

Prevalence of perineal laceration type among vaginal hospital births, Ontario, 2012/2013 to 2023/2024 by year

	Perineal laceration				
	1st degree	**2nd degree**	**3rd degree**	**4th degree**	**Cervical tear**
2012/2013	20.0	36.5	3.3	0.4	0.1
2013/2014	19.9	37.1	3.3	0.4	0.1
2014/2015	19.2	36.8	3.2	0.4	0.1
2015/2016	19.8	38.4	3.2	0.3	0.1
2016/2017	19.8	38.9	3.3	0.4	0.1
2017/2018	19.2	39.1	3.2	0.3	0.1
2018/2019	19.0	40.1	3.4	0.3	0.1
2019/2020	19.0	41.1	3.6	0.3	0.1
2020/2021	19.1	42.6	3.7	0.3	0.1
2021/2022	18.8	43.4	3.8	0.3	0.1
2022/2023	18.6	43.5	3.9	0.3	0.1
2023/2024	18.9	44.2	4.1	0.4	0.1

Numerator: Births with each perineal laceration category.
Denominator: Pregnancies resulting in vaginal live or stillbirth in hospitals with NSO supplementation.

Technical Notes: None to report.

4.2 OTHER COMPLICATIONS

TABLE FOR FIGURE 4.2.1

Prevalence of labour and birth complications, Ontario, 2012/2013 compared to 2023/2024

To view a visual representation of Table 4.2.1 view graph **here**.

	2012/2013	2023/2024
Atypical or abnormal fetal surveillance	15.6	29.2
Meconium	9.6	10.4
Nonprogressive first stage of labour	5.8	6.0
Nonprogressive second stage of labour	3.8	3.3
Postpartum hemorrhage (within 1st hour of birth)	2.1	2.4
Shoulder dystocia	1.8	2.1

Denominator: All pregnancies with a birth.

Technical Notes: Labour and birth complications are derived from the data element "Labour and Birth Complications", which is a multi-selection variable. A pregnancy record can have more than one type of complication selected. Percentages of each complication will not sum to 100 due to this property.

Table for Figure 4.2.2

Prevalence of postpartum complications, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 4.2.2 view graph **here**.

	Postpartum hemorrhage (%)	Fever (%)
2012/2013	1.0	0.4
2013/2014	1.0	0.3
2014/2015	1.0	0.3
2015/2016	1.0	0.3
2016/2017	0.9	0.3
2017/2018	1.0	0.4
2018/2019	1.3	0.3
2019/2020	1.2	0.4
2020/2021	1.2	0.4
2021/2022	1.3	0.4
2022/2023	1.4	0.4
2023/2024	1.4	0.4

Denominator: All pregnancies with a birth.

Technical Notes: Postpartum complications are derived from the data element "Postpartum Complications", which is a multi-selection variable. A pregnancy record can have more than one type of complication selected. Percentages will not sum to 100 due to this property.

Postpartum hemorrhage includes the following pick-list values: Late postpartum hemorrhage, Postpartum hemorrhage requiring transfusion, Postpartum hemorrhage (occurring from 1hr to 24 hours after birth) and Late postpartum hemorrhage (occurring 24 hrs to discharge from care which is 6 weeks postpartum for midwifery clients).

TABLE 4.2.3

Prevalence of labour and birth complications, Ontario, 2012/2013 to 2023/2024 by year

	Atypical or abnormal fetal surveillance (%)	Meconium (%)	Nonprogressive first stage of labour (%)	Nonprogressive second stage of labour (%)	Postpartum hemorrhage (within 1st hour of birth) (%)	Shoulder dystocia (%)
2012/2013	15.6	9.6	5.8	3.8	2.1	1.8
2013/2014	16.4	10.0	5.7	3.6	2.0	1.9
2014/2015	18.4	10.6	5.7	3.5	1.9	2.0
2015/2016	19.6	10.6	5.9	3.3	2.0	2.0
2016/2017	21.0	10.6	5.9	3.4	2.0	2.0
2017/2018	22.3	10.4	5.8	3.3	2.1	2.1
2018/2019	23.6	10.4	5.8	3.1	2.2	2.1
2019/2020	24.8	10.5	5.8	3.3	2.2	2.3
2020/2021	25.9	10.2	6.2	3.3	2.2	2.4
2021/2022	27.0	10.2	5.9	3.4	2.2	2.2
2022/2023	27.5	10.3	6.1	3.2	2.3	2.1
2023/2024	29.2	10.4	6.0	3.3	2.4	2.1

Technical Notes: Labour and birth complications are derived from the data element "Labour and Birth Complications", which is a multi-selection variable. A pregnancy record can have more than one type of complication selected. Percentages of each complication will not sum to 100 due to this property.

5.0 BIRTH AND NEWBORN OUTCOMES

5.1 MULTIPLES

TABLE FOR FIGURE 5.1.1A

Frequency of multiple birth(s), Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 5.1.1A view graph **here**.

Fiscal Year	Twins (n)	Triplets or higher order (n)	Any multiple birth (%)
2012/2013	5,078	196	3.6
2013/2014	5,035	143	3.6
2014/2015	4,865	133	3.5
2015/2016	4,701	143	3.4
2016/2017	4,431	137	3.2
2017/2018	4,584	135	3.3
2018/2019	4,435	114	3.2
2019/2020	4,675	105	3.3
2020/2021	4,061	118	3.0
2021/2022	4,385	115	3.1
2022/2023	4,578	106	3.4
2023/2024	4,895	130	3.5

Technical Notes: None to report.

TABLE FOR FIGURE 5.1.1B

Frequency of multiple birth(s), Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 5.1.1B view graph **here**.

Fiscal Year	Twins (%)	Triplets or higher order (%)
2012/2013	3.5	0.1
2013/2014	3.5	0.1
2014/2015	3.4	0.1
2015/2016	3.3	0.1
2016/2017	3.1	0.1
2017/2018	3.2	0.1
2018/2019	3.1	0.1
2019/2020	3.2	0.1
2020/2021	2.9	0.1
2021/2022	3.0	0.1
2022/2023	3.3	0.1
2023/2024	3.4	0.1

Technical Notes: None to report.

5.2 GA AND BIRTHWEIGHT

TABLE FOR FIGURE 5.2.1A

Distribution of newborn birthweight, Ontario, 2012/2013 compared to 2023/2024

To view a visual representation of Table 5.2.2A view graph **here**.

Fiscal Year	<1500g (%)	1500-2499g (%)	2500-3999g (%)	≥4000g (%)
2012/2013	1.3	5.5	82.7	10.6
2023/2024	1.2	6.6	84.1	8.1

Technical Notes: None to report.

TABLE 5.2.1A EXPANDED TO INCLUDE ALL YEARS

Distribution of newborn birthweight, 2012/2013 to 2023/2024

Birthweight	<1500g (%)	1500-2499g (%)	2500-3999g (%)	≥4000g (%)
2012/2013	1.3	5.5	82.7	10.6
2013/2014	1.3	5.5	82.5	10.7
2014/2015	1.3	5.6	82.7	10.5
2015/2016	1.2	5.7	82.9	10.2
2016/2017	1.3	5.6	83.1	9.9
2017/2018	1.3	5.8	83.2	9.7
2018/2019	1.3	5.9	83.5	9.4
2019/2020	1.2	6.0	83.8	9.0
2020/2021	1.2	5.8	83.5	9.5
2021/2022	1.2	5.9	83.6	9.3
2022/2023	1.2	6.4	83.9	8.5
2023/2024	1.2	6.6	84.1	8.1

Numerator: Newborns in each birthweight category.
Denominator: All pregnancies resulting in a live or stillbirth that occurred in Ontario.

Technical Notes: None to report.

TABLE FOR FIGURE 5.2.1B

Distribution of size for gestational age among singleton births, Ontario, 2012/2013 compared to 2023/2024

To view a visual representation of Table 5.2.1B view graph **here**.

Fiscal Year	SGA (%)	AGA (%)	LGA (%)
2012/2013	9.3	80.4	10.3
2023/2024	10.6	80.7	8.7

Technical Notes: SGA: Small for gestation age; AGA: Appropriate for gestational age; LGA: Large for gestational age.

SGA is defined as birthweight <10th percentile for sex-specific birthweight distribution for gestational age based on a Canadian reference standard.

AGA is defined as birthweight ≥10th percentile and ≤90th percentile of the sex-specific birthweight distribution for gestational age based on a Canadian reference standard.

LGA is defined as birthweight >90th percentile for sex-specific birthweight distribution for gestational age based on a Canadian reference standard.

SGA, AGA and LGA are based on *Michael S. Kramer et al. (2001). A New and Improved Population-based Canadian Reference for Birth Weight for Gestational Age. Pediatrics, August, 2001.*

TABLE 5.2.1B EXPANDED TO INCLUDE ALL YEARS

Distribution of newborn size for gestational age, Ontario 2012/2013 to 2023/2024

Size for gestational age	SGA (%)	AGA (%)	LGA (%)
2012/2013	9.3	80.4	10.3
2013/2014	9.3	80.6	10.1
2014/2015	9.5	80.6	9.9
2015/2016	9.5	80.8	9.7
2016/2017	9.8	80.6	9.6
2017/2018	9.7	80.8	9.5
2018/2019	9.7	80.9	9.4
2019/2020	9.8	81.0	9.2
2020/2021	9.6	80.5	9.8
2021/2022	9.5	80.7	9.8
2022/2023	10.2	80.6	9.1
2023/2024	10.6	80.7	8.7

Numerator: Newborns in each size for gestational age category.
Denominator: Singleton newborns (live or stillbirth) in Ontario between 22 weeks and 43 weeks gestational age.

Technical Notes: SGA: Small for gestation age; AGA: Appropriate for gestational age; LGA: Large for gestational age.

SGA is defined as birthweight <10th percentile for sex-specific birthweight distribution for gestational age based on a Canadian reference standard.

AGA is defined as birthweight ≥10th percentile and ≤90th percentile of the sex-specific birthweight distribution for gestational age based on a Canadian reference standard.

LGA is defined as birthweight >90th percentile for sex-specific birthweight distribution for gestational age based on a Canadian reference standard.

SGA, AGA and LGA are based on *Michael S. Kramer et al. (2001). A New and Improved Population-based Canadian Reference for Birth Weight for Gestational Age . Pediatrics, August, 2001.*

TABLE FOR FIGURE 5.2.2A

Distribution of size for gestational age, Ontario, 2012/2013 compared to 2023/2024 by pre-pregnancy BMI groupings, and fiscal year

To view a visual representation of Table 5.2.2A view graph **here**.

2012/2013	SGA (%)	AGA (%)	LGA (%)
Underweight	16.4	79.9	3.7
Normal weight	9.9	82.5	7.6
Overweight	7.4	80.2	12.5
Living with Obesity	6.3	75.5	18.1

2023/2024	SGA (%)	AGA (%)	LGA (%)
Underweight	18.1	78.6	3.2
Normal weight	11.4	82.2	6.3
Overweight	9.0	81.1	9.8
Living with Obesity	7.4	77.9	14.7

Technical Notes: SGA: Small for gestation age; AGA: Appropriate for gestational age; LGA: Large for gestational age.

SGA is defined as birthweight <10th percentile for sex-specific birthweight distribution for gestational age based on a Canadian reference standard.

AGA is defined as birthweight ≥10th percentile and ≤90th percentile of the sex-specific birthweight distribution for gestational age based on a Canadian reference standard.

LGA is defined as birthweight >90th percentile for sex-specific birthweight distribution for gestational age based on a Canadian reference standard.

SGA, AGA and LGA are based on *Kramer M. et al (2001)* A new and improved population-based Canadian reference for birth weight for gestational age. Pediatrics, 108(2):E35. DOI: 10.1542/peds.108.2.e35

DOI: 10.1542/peds.108.2.e35

Pre-pregnancy BMI is calculated by dividing pre-pregnancy weight (in kilograms) by the square of the pregnant individual's height (in metres). Pre-pregnancy weight is estimated using (1) the meaured weight in the first trimester at the time of Multiple Marker Screening (MMS) minus 1.64 kg; or (2) self-reported pre-pregnancy weight at the time of admission to labour and birth, if measured first-trimester weight at MMS is missing.

Maternal weight prior to pregnancy is categorised into 4 groups based on the World Health Organization (WHO) definition using Pre-pregnancy body weight index (BMI) is: Under weight: BMI <18.5 kg/m^2; Normal weight: BMI 18.5-24.9 kg/m^2; Overweight: BMI 25.0-29.9 kg/m^2; Living with Obesity (Obese): BMI ≥ 30.0 kg/m^2.

Table 5.2.2A expanded to include all years

Size for gestational age by pre-pregnancy BMI grouping, 2012/13 to 2023/24

Fiscal Year	Pre-pregnancy BMI grouping	SGA	AGA	LGA
2012/2013	Underweight	16.4	79.9	3.7
	Normal weight	9.9	82.5	7.6
	Overweight	7.4	80.2	12.5
	Obese	6.3	75.5	18.1
2013/2014	Underweight	16.6	79.8	3.6
	Normal weight	10	82.4	7.6
	Overweight	7.3	80.2	12.5
	Obese	6.6	75.7	17.6
2014/2015	Underweight	16.7	79.7	3.6
	Normal weight	10.2	82.4	7.4
	Overweight	7.7	80.5	11.8
	Obese	6.5	75.9	17.5
2015/2016	Underweight	16.9	79.0	4.1
	Normal weight	10.1	82.9	7.0
	Overweight	8.0	80.1	11.9
	Obese	6.2	76.5	17.3
2016/2017	Underweight	17.2	79.3	3.5
	Normal weight	10.3	82.6	7.1
	Overweight	8.4	80.3	11.4
	Obese	7.0	76.2	16.9
2017/2018	Underweight	16.9	79.5	3.7
	Normal weight	10.6	82.7	6.7
	Overweight	8.0	80.8	11.2
	Obese	6.8	77.0	16.2
2018/2019	Underweight	17.1	79.0	3.9
	Normal weight	10.5	82.8	6.7
	Overweight	8.1	81.0	11.0
	Obese	6.5	77.0	16.5

2019/2020	Underweight	17.6	78.8	3.6
	Normal weight	10.6	82.6	6.7
	Overweight	7.9	81.4	10.7
	Obese	6.8	77.9	15.3
2020/2021	Underweight	17.6	78.9	3.5
	Normal weight	10.5	82.5	7.0
	Overweight	8.0	80.5	11.5
	Obese	6.4	76.9	16.7
2021/2022	Underweight	18.2	77.7	4.2
	Normal weight	10.3	82.8	6.9
	Overweight	8.1	80.8	11.1
	Obese	6.5	77.0	16.6
2022/2023	Underweight	18.5	78.4	3.1
	Normal weight	11	82.3	6.7
	Overweight	8.9	80.7	10.4
	Obese	7.0	77.6	15.4
2023/2024	Underweight	18.1	78.6	3.2
	Normal weight	11.4	82.2	6.3
	Overweight	9.0	81.1	9.8
	Obese	7.4	77.9	14.7

Numerator: Size for gestational age singleton births by pre-pregnancy body mass index (BMI) grouping.
Denominator: Singleton newborns (live or stillbirth) in Ontario between 22 weeks and 43 weeks gestation.

Technical Notes: SGA: Small for gestation age; AGA: Appropriate for gestational age; LGA: Large for gestational age.

SGA is defined as birthweight <10th percentile for sex-specific birthweight distribution for gestational age based on a Canadian reference standard.

AGA is defined as birthweight ≥10th percentile and ≤90th percentile of the sex-specific birthweight distribution for gestational age based on a Canadian reference standard.

LGA is defined as birthweight >90th percentile for sex-specific birthweight distribution for gestational age based on a Canadian reference standard.

SGA, AGA and LGA are based on *Kramer M. et al (2001)* A new and improved population-based Canadian reference for birth weight for gestational age. Pediatrics, 108(2):E35. DOI: 10.1542/peds.108.2.e35

Pre-pregnancy BMI is calculated by dividing pre-pregnancy weight (in kilograms) by the square of the pregnant individual's height (in metres). Pre-pregnancy weight is estimated using (1) the meaured weight in the first trimester at the time of Multiple Marker Screening (MMS) minus 1.64 kg; or (2) self-reported pre-pregnancy weight at the time of admission to labour and birth, if measured first-trimester weight at MMS is missing.

Maternal weight prior to pregnancy is categorised into 4 groups based on the World Health Organization (WHO) definition using pre-pregnancy BMI is: Under weight: BMI <18.5 kg/m2; Normal weight: BMI 18.5-24.9 kg/2; Overweight: BMI 25.0-29.9 kg/m2; Obese: BMI ≥30.0 kg/2.

FIGURE 5.2.2B

Distribution of size for gestational age, Ontario, 2012/2013 compared to 2023/2024 by gestational weight gain groupings, and fiscal year

To view a visual representation of Table 5.2.2B view graph **here**.

2012/2013	SGA	AGA	LGA
Inadequate GWG	14.4	80.0	5.6
Recommended GWG	10.1	83.2	6.7
Excessive GWG	6.6	79.6	13.8

2023/2024	SGA	AGA	LGA
Inadequate GWG	15.3	80.0	4.7
Recommended GWG	11.9	82.7	5.4
Excessive GWG	7.9	80.6	11.5

Technical Notes: SGA: Small for gestation age; AGA: Appropriate for gestational age; LGA: Large for gestational age.

SGA is defined as birthweight <10th percentile for sex-specific birthweight distribution for gestational age based on a Canadian reference standard.

AGA is defined as birthweight ≥10th percentile and ≤90th percentile of the sex-specific birthweight distribution for gestational age based on a Canadian reference standard.

LGA is defined as birthweight >90th percentile for sex-specific birthweight distribution for gestational age based on a Canadian reference standard.

SGA, AGA and LGA are based on *Kramer M. et al (2001)* A new and improved population-based Canadian reference for birth weight for gestational age. Pediatrics, 108(2):E35. DOI: 10.1542/peds.108.2.e35

TABLE 5.2.2B EXPANDED TO INCLUDE ALL YEARS

Size for gestational age by gestational weight gain grouping, 2012/13 to 2023/24

Fiscal Year	Gestational weight gain grouping	SGA	AGA	LGA
2012/2013	Inadequate GWG	14.4	80.0	5.6
	Recommended GWG	10.1	83.2	6.7
	Excessive GWG	6.6	79.6	13.8
2013/2014	Inadequate GWG	14.9	79.6	5.6
	Recommended GWG	10.6	83.1	6.3
	Excessive GWG	6.6	79.7	13.6
2014/2015	Inadequate GWG	15.1	79.9	5.0
	Recommended GWG	10.8	83.0	6.2
	Excessive GWG	6.8	80.0	13.2
2015/2016	Inadequate GWG	14.6	80.2	5.2
	Recommended GWG	11.2	82.9	6.0
	Excessive GWG	6.8	80.3	13.0
2016/2017	Inadequate GWG	15.0	79.7	5.3
	Recommended GWG	10.8	83.0	6.2
	Excessive GWG	7.1	80.1	12.8
2017/2018	Inadequate GWG	14.9	79.8	5.2
	Recommended GWG	10.9	83.3	5.8
	Excessive GWG	7.0	80.5	12.5
2018/2019	Inadequate GWG	15.0	79.6	5.3
	Recommended GWG	10.8	83.1	6.1
	Excessive GWG	6.9	80.7	12.4
2019/2020	Inadequate GWG	14.9	80.1	5.1
	Recommended GWG	11.2	83.1	5.8
	Excessive GWG	7.0	80.8	12.1
2020/2021	Inadequate GWG	15.2	79.6	5.2
	Recommended GWG	11.2	83.1	5.7
	Excessive GWG	7.0	80.0	13.0

2021/2022	Inadequate GWG	14.8	80.1	5.2
	Recommended GWG	11.0	83.0	6.0
	Excessive GWG	6.8	80.3	12.9
2022/2023	Inadequate GWG	14.9	79.9	5.2
	Recommended GWG	11.7	82.5	5.8
	Excessive GWG	7.5	80.4	12.1
2023/2024	Inadequate GWG	15.3	80.0	4.7
	Recommended GWG	11.9	82.7	5.4
	Excessive GWG	7.9	80.6	11.5

Numerator: Size for gestational age singleton births by gestational weight gain (GWG) grouping.
Denominator: Singleton newborns (live or stillbirth) in Ontario between 22 weeks and 43 weeks gestation.

Technical Notes: SGA: Small for gestation age; AGA: Appropriate for gestational age; LGA: Large for gestational age; GWG: Gestational weight gain.

SGA is defined as birthweight <10th percentile for sex-specific birthweight distribution for gestational age based on a Canadian reference standard.

AGA is defined as birthweight ≥10th percentile and ≤90th percentile of the sex-specific birthweight distribution for gestational age based on a Canadian reference standard.

LGA is defined as birthweight >90th percentile for sex-specific birthweight distribution for gestational age based on a Canadian reference standard.

SGA, AGA and LGA are based on *Kramer M. et al (2001)* A new and improved population-based Canadian reference for birth weight for gestational age. Pediatrics, 108(2):E35. DOI: 10.1542/peds.108.2.e35

Actual total gestational weight change is calculated from the difference between maternal weight at delivery and pre-pregnancy weight in the BIS. Maternal weight at delivery was measured or self-reported at delivery, and, if not available, the weight at the last prenatal visit was used.

Total GWG recommendations from the 2009 Institute of Medicine IOM (2009) guidelines for singleton pregnancies (which were adopted by Health Canada in 2010) are used to classify GWG according to pre-pregnancy BMI categories as inadequate, adequate, and excessive GWG.

Because GWG is associated with gestational length, the duration of gestation is accounted for in the calculation of expected GWG by using the recommended amount of weight gain during the first trimester according to the pre-pregnancy BMI categories (underweight, 2 kg; normal weight, 2 kg; overweight, 1 kg; obese, 0.5 kg) and weight gain during the second and third trimester. Subsequently, the expected GWG is then calculated as the recommended first trimester gain + (weekly recommended gain in the second and third trimesters) × (number of gestational weeks beyond the first trimester). If the actual total gestational weight change falls into the recommended range, then the pregnant individual is classified as adequate GWG group. If the actual total gestational weight change falls above or below these recommended ranges, then total gestational weight change was considered to be excessive or inadequate GWG, respectively. Among inadequate GWG, gestional weight loss is defined as negative gestational weight change.

TABLE FOR FIGURE 5.3.1

Rate of stillbirths, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 5.3.1 view graph **here**.

	Stillbirth	
Fiscal Year	**(n)**	**Rate per 1,000 births**
2012/2013	664	4.6
2013/2014	663	4.7
2014/2015	668	4.7
2015/2016	682	4.8
2016/2017	677	4.7
2017/2018	699	4.9
2018/2019	650	4.5
2019/2020	676	4.7
2020/2021	660	4.8
2021/2022	701	4.9
2022/2023	675	4.9
2023/2024	681	4.8

Technical Notes: Stillbirth includes any spontaneous stillbirths at ≥20 weeks or ≥ 500 grams that occur during the antepartum or intrapartum period. Stillbirths resulting from an intentional termination are excluded.

5.4 PRETERM BIRTHS

TABLE FOR FIGURE 5.4.1

Prevalence of preterm birth (<37 weeks) among live hospital-born newborns, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 5.4.1 view graph **here**.

Fiscal Year	Preterm birth (n)	Preterm birth (%)
2012/2013	11,558	8.3
2013/2014	11,172	8.1
2014/2015	11,083	8.0
2015/2016	11,145	8.1
2016/2017	11,158	8.1
2017/2018	11,441	8.2
2018/2019	11,434	8.3
2019/2020	11,551	8.3
2020/2021	10,879	8.2
2021/2022	11,375	8.2
2022/2023	11,406	8.5
2023/2024	11,881	8.5

Technical Notes: None to report.

TABLE FOR FIGURE 5.4.2

Prevalence of pregnancies with a birth of *less than 28 weeks' gestation* born at an institution out of the scope of practice for care requirements, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 5.4.2 view graph **here**.

Fiscal Year	Out of scope newborns (n)	Out of scope newborns (%)	Total newborns (N)
2012/2013	177	30.5	580
2013/2014	151	27.7	545
2014/2015	129	23.7	545
2015/2016	136	25.3	537
2016/2017	120	20.0	599
2017/2018	118	21.1	558
2018/2019	118	19.8	595
2019/2020	98	17.9	547
2020/2021	85	16.4	518
2021/2022	94	16.0	586
2022/2023	104	19.3	538
2023/2024	101	18.7	540

Technical Notes: Out of scope in terms of gestational age is defined using Provincial Council for Maternal and Child Health perinatal, birthing and newborn level of care definitions. Births at less than 28 weeks of gestation were out of scope if delivery occurred at a hospital with level of care below Level III (3).

TABLE FOR FIGURE 5.4.3

Prevalence of pregnancies with a birth of *less than 32 weeks' gestation* born at an institution out of the scope of practice for care requirements, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 5.4.3 view graph here.

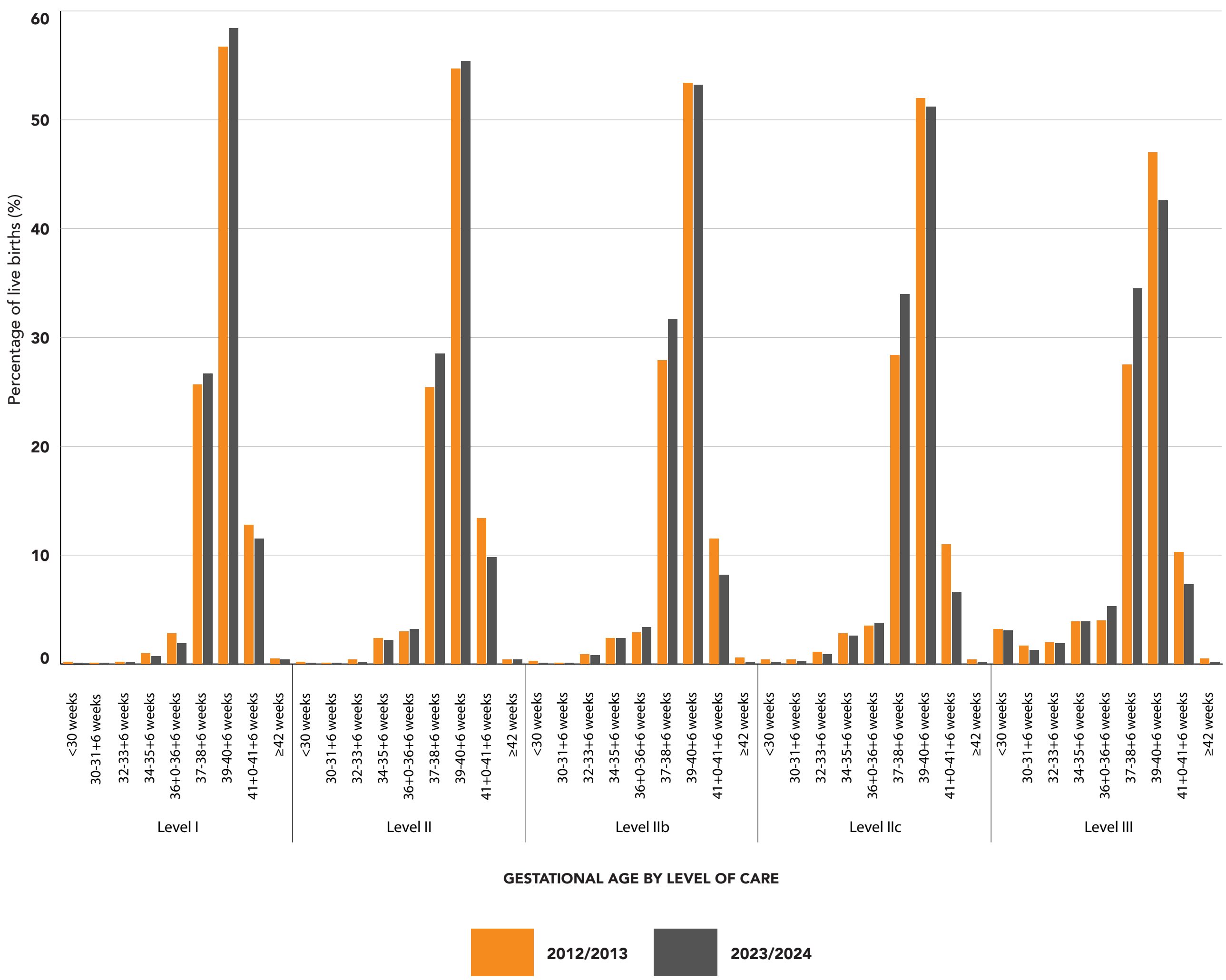
Fiscal Year	Out of scope newborns (n)	Out of scope newborns (%)	Total newborns (n)
2012/2013	341	23.3	1,466
2013/2014	276	20.5	1,347
2014/2015	267	19.3	1,384
2015/2016	266	19.9	1,339
2016/2017	276	19.2	1,438
2017/2018	258	18.5	1,394
2018/2019	265	18.4	1,438
2019/2020	205	15.1	1,358
2020/2021	214	16.4	1,308
2021/2022	209	15.2	1,376
2022/2023	220	16.0	1,379
2023/2024	198	14.6	1,355

Technical Notes: Out of scope in terms of gestational age is defined using the Provincial Council for Maternal and Child Health perinatal, birthing and newborn level of care definitions. Births at less than 30 weeks of gestation were out of scope if delivery occurred at a hospital with level of care below Level III (3). Births at 30 or 31 weeks of gestation were out of scope if delivery occurred at a hospital with level of care below Level IIc (2c).

FIGURE 5.4.4

Distribution of gestational age at birth among live hospital births by level of care, Ontario, 2012/2013 compared to 2023/2024

To view an alternate to this graph see **Table 5.4.4** option of data points on the next page.



Numerator: Babies born at each gestational age in each level of care.

Denominator: All live hospital births in Ontario by levels of care and gestational age at birth.

TABLE FOR FIGURE 5.4.4

Distribution of gestational age at birth among live hospital births by level of care, Ontario, 2012/2013 compared to 2023/2024

To view a visual representation of Table 5.4.4 view graph here.

Level of care (LOC)	Gestational age (GA)	2012/2013 (%)	2023/2024 (%)
Level I	<30 weeks	0.2	0.1
	30-31+6 weeks	0.1	0.1
	32-33+6 weeks	0.2	0.2
	34-35+6 weeks	1.0	0.7
	36+0-36+6 weeks	2.8	1.9
	37-38+6 weeks	25.7	26.7
	39-40+6 weeks	56.7	58.4
	41+0-41+6 weeks	12.8	11.5
	≥42 weeks	0.5	0.4
Level IIa	<30 weeks	0.2	0.1
	30-31+6 weeks	0.1	0.1
	32-33+6 weeks	0.4	0.2
	34-35+6 weeks	2.4	2.2
	36+0-36+6 weeks	3.0	3.2
	37-38+6 weeks	25.4	28.5
	39-40+6 weeks	54.7	55.4
	41+0-41+6 weeks	13.4	9.8
	≥42 weeks	0.4	0.4

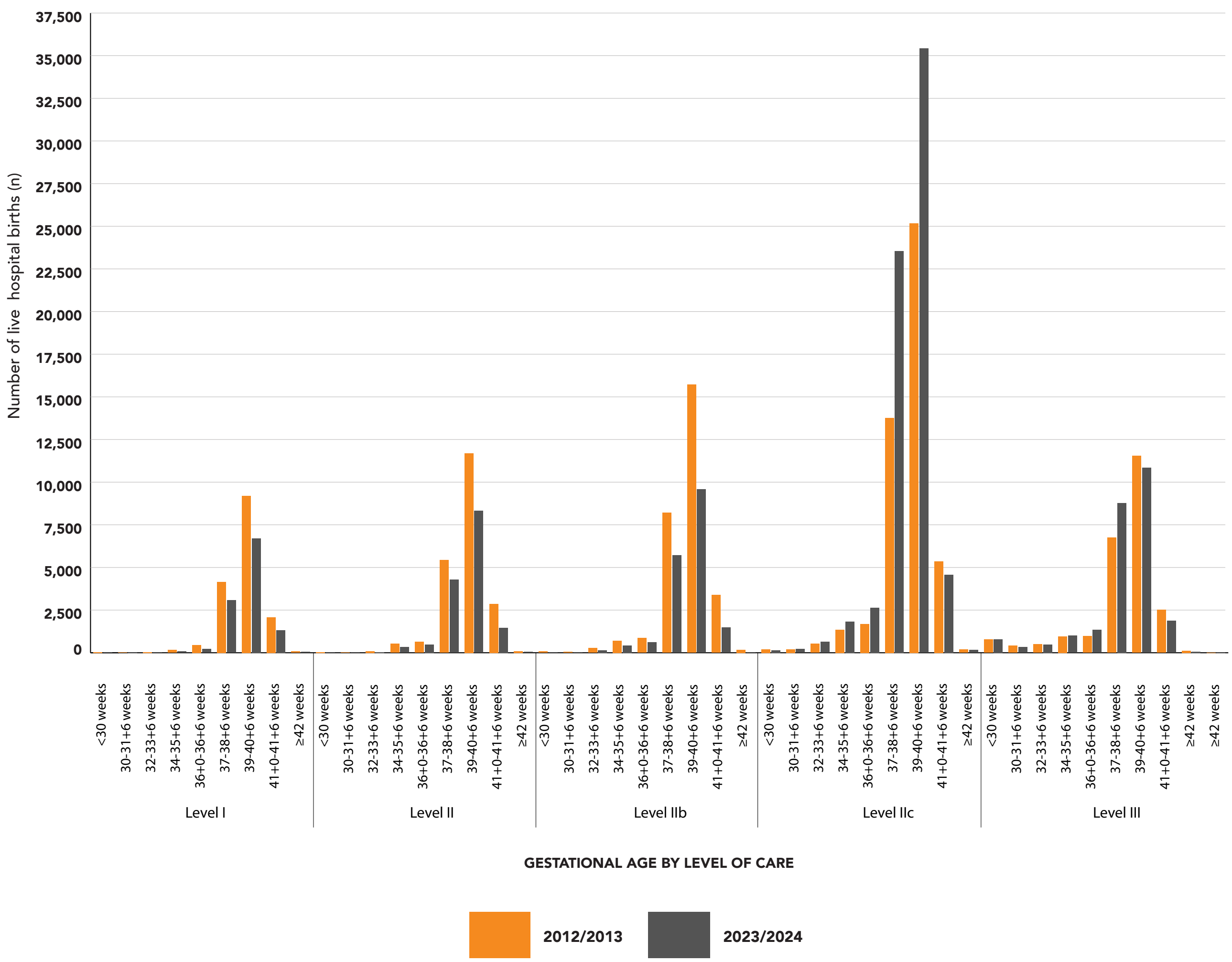
Level IIb	<30 weeks	0.3	0.1
	30-31+6 weeks	0.1	0.1
	32-33+6 weeks	0.9	0.8
	34-35+6 weeks	2.4	2.4
	36+0-36+6 weeks	2.9	3.4
	37-38+6 weeks	27.9	31.7
	39-40+6 weeks	53.4	53.2
	41+0-41+6 weeks	11.5	8.2
	≥42 weeks	0.6	0.2
Level IIc	<30 weeks	0.4	0.2
	30-31+6 weeks	0.4	0.3
	32-33+6 weeks	1.1	0.9
	34-35+6 weeks	2.8	2.6
	36+0-36+6 weeks	3.5	3.8
	37-38+6 weeks	28.4	34.0
	39-40+6 weeks	52.0	51.2
	41+0-41+6 weeks	11.0	6.6
	≥42 weeks	0.4	0.2
Level III	<30 weeks	3.2	3.1
	30-31+6 weeks	1.7	1.3
	32-33+6 weeks	2.0	1.9
	34-35+6 weeks	3.9	3.9
	36+0-36+6 weeks	4.0	5.3
	37-38+6 weeks	27.5	34.5
	39-40+6 weeks	47.0	42.6
	41+0-41+6 weeks	10.3	7.3
	≥42 weeks	0.5	0.2

Technical Notes: Hopital levels of care refer to neonatal levels of care.

FIGURE 5.4.5

Frequency of live hospital births, Ontario, 2012/2013 compared to 2023/2024, by level of care

To view an alternate to this graph see **Table 5.4.5** option of data points on the next page.



Numerator: Babies born at each gestational age in each level of care.

Denominator: All live hospital births in Ontario by level of care and gestational age at birth.

TABLE FOR FIGURE 5.4.5

Frequency of live hospital births, Ontario, 2012/2013 compared to 2023/2024, by level of care

To view a visual representation of Table 5.4.5 view graph here.

All liveborn hospital births in Ontario by level of care and gestational age at birth-with NSO supplementation		2012/2013 (n)	2023/2024 (n)
Level I	<30 weeks	30	14
	30-31+6 weeks	15	11
	32-33+6 weeks	36	24
	34-35+6 weeks	161	77
	36+0-36+6 weeks	453	217
	37-38+6 weeks	4,159	3,068
	39-40+6 weeks	9,195	6,704
	41+0-41+6 weeks	2,082	1,319
	≥42 weeks	81	44
Level IIa	<30 weeks	40	22
	30-31+6 weeks	24	14
	32-33+6 weeks	89	37
	34-35+6 weeks	517	333
	36+0-36+6 weeks	632	484
	37-38+6 weeks	5,432	4,275
	39-40+6 weeks	11,692	8,310
	41+0-41+6 weeks	2,864	1,469
	≥42 weeks	95	55

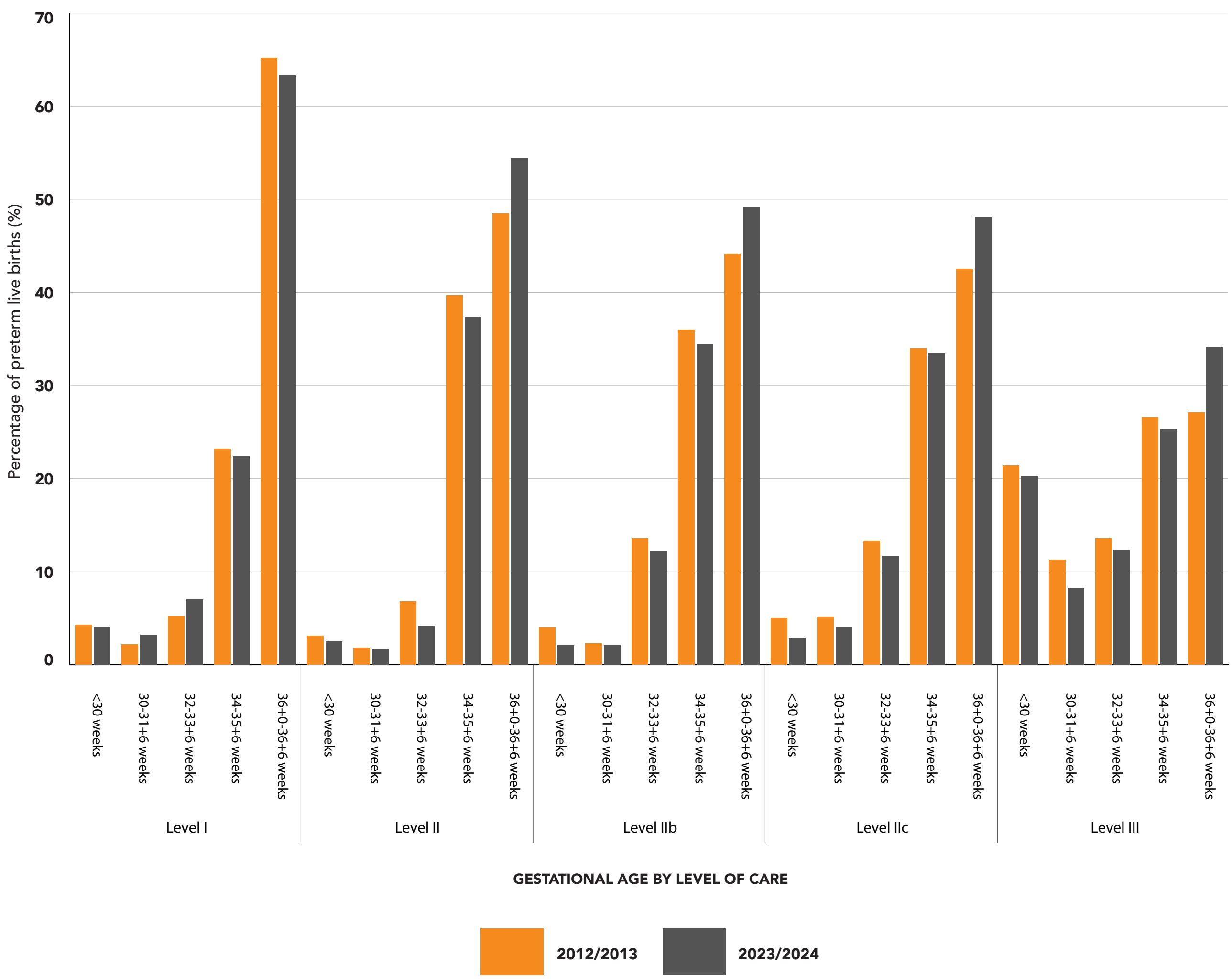
Level IIb	<30 weeks	78	26
	30-31+6 weeks	44	26
	32-33+6 weeks	265	151
	34-35+6 weeks	703	426
	36+0-36+6 weeks	861	610
	37-38+6 weeks	8,199	5,709
	39-40+6 weeks	15,711	9,582
	41+0-41+6 weeks	3,391	1,470
	≥42 weeks	172	28
Level IIc	<30 weeks	201	151
	30-31+6 weeks	203	221
	32-33+6 weeks	532	638
	34-35+6 weeks	1,357	1,828
	36+0-36+6 weeks	1,693	2,635
	37-38+6 weeks	13,763	23,553
	39-40+6 weeks	25,179	35,420
	41+0-41+6 weeks	5,355	4,577
	≥42 weeks	183	165
Level III	<30 weeks	775	795
	30-31+6 weeks	408	322
	32-33+6 weeks	491	483
	34-35+6 weeks	964	993
	36+0-36+6 weeks	980	1,339
	37-38+6 weeks	6,744	8,784
	39-40+6 weeks	11,535	10,846
	41+0-41+6 weeks	2,517	1,863
	≥42 weeks	122	63

Technical Notes: None to report.

FIGURE 5.4.6

Distribution of preterm births among live hospital-born newborns, Ontario, 2012/2013 compared to 2023/2024

To view an alternate to this graph see [Table 5.4.6](#) option of data points on the next page.



Numerator: Newborns in each gestational age and level of care.

Denominator: All live hospital preterm births (less than 37 weeks of gestation) in Ontario.

TABLE FOR FIGURE 5.4.6

Distribution of preterm births among live hospital-born newborns, Ontario, 2012/2013 compared to 2023/2024

To view a visual representation of Table 5.4.6 view graph **here**.

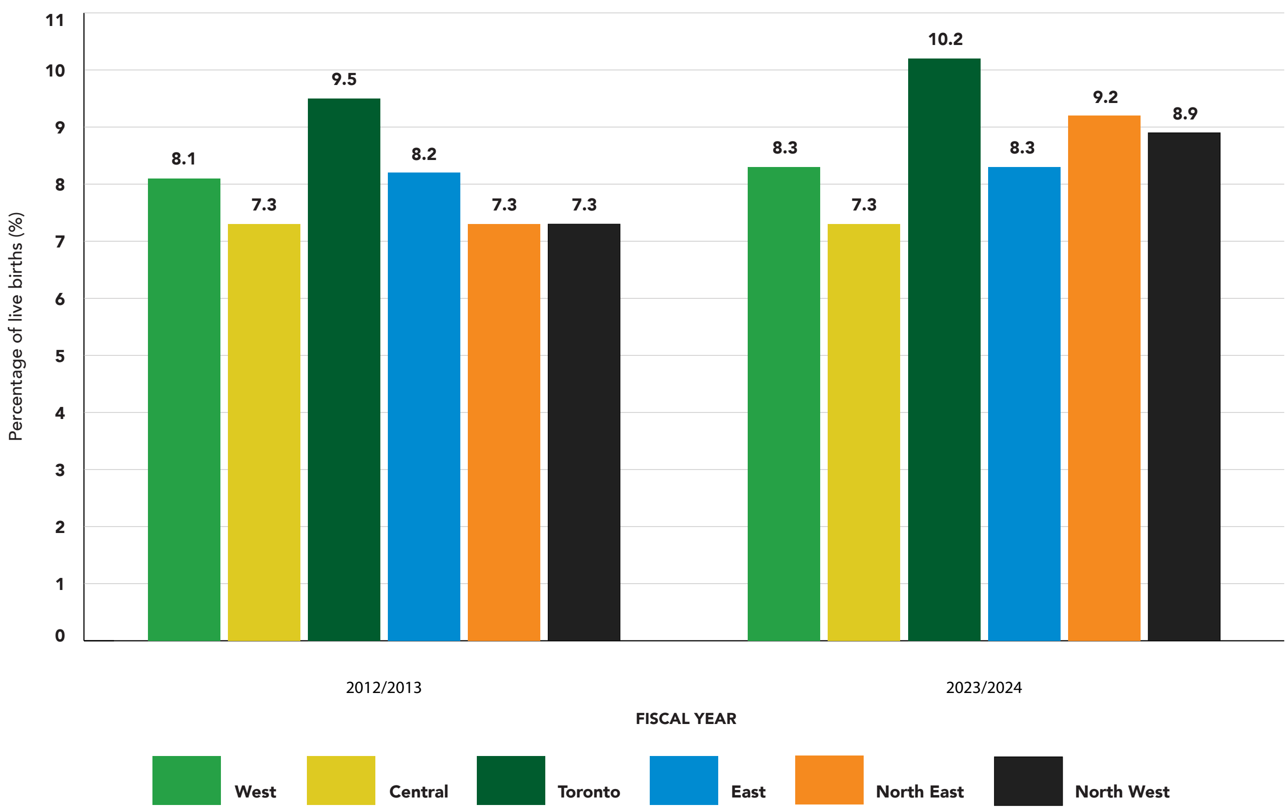
Level of care (LOC)	Gestational age (GA)	2012/2013 (%)	2023/2024 (%)
Level I	<30 weeks	4.3	4.1
	30-31+6 weeks	2.2	3.2
	32-33+6 weeks	5.2	7.0
	34-35+6 weeks	23.2	22.4
	36+0-36+6 weeks	65.2	63.3
Level IIa	<30 weeks	3.1	2.5
	30-31+6 weeks	1.8	1.6
	32-33+6 weeks	6.8	4.2
	34-35+6 weeks	39.7	37.4
	36+0-36+6 weeks	48.5	54.4
Level IIb	<30 weeks	4.0	2.1
	30-31+6 weeks	2.3	2.1
	32-33+6 weeks	13.6	12.2
	34-35+6 weeks	36.0	34.4
	36+0-36+6 weeks	44.1	49.2
Level IIc	<30 weeks	5.0	2.8
	30-31+6 weeks	5.1	4.0
	32-33+6 weeks	13.3	11.7
	34-35+6 weeks	34.0	33.4
	36+0-36+6 weeks	42.5	48.1
Level III	<30 weeks	21.4	20.2
	30-31+6 weeks	11.3	8.2
	32-33+6 weeks	13.6	12.3
	34-35+6 weeks	26.6	25.3
	36+0-36+6 weeks	27.1	34.1

Technical Notes: Hospital levels of care based upon level of care assignment for newborn requirements.

FIGURE 5.4.7

Prevalence of preterm births among live, hospital-born newborns, Ontario Health Region (OHR), 2012/2013 compared to 2023/2024

To view an alternate to this graph see **Table 5.4.7** option of data points on the next page.



Numerator: Births before 37 weeks' gestation.
Denominator: All live hospital births in Ontario.

TABLE FOR FIGURE 5.4.7

Prevalence of preterm births among live, hospital-born newborns, Ontario Health Region (OHR), 2012/2013 compared to 2023/2024

To view a visual representation of Table 5.4.7 view graph **here**.

Fiscal Year	West (%)	Central (%)	Toronto (%)	East (%)	North East (%)	North West (%)
2012/2013	8.1	7.3	9.5	8.2	7.3	7.3
2013/2014	7.8	7.1	9.3	8.3	7.2	7.6
2014/2015	7.6	6.9	9.9	7.7	7.3	7.7
2015/2016	7.8	6.9	9.7	7.9	8.7	6.7
2016/2017	7.8	6.6	9.8	8.1	7.9	6.5
2017/2018	7.8	6.8	10.2	8.2	8.0	8.0
2018/2019	8.1	6.7	10.1	8.0	8.2	7.9
2019/2020	8.1	7.0	9.9	8.0	8.1	8.1
2020/2021	8.2	7.0	9.5	8.0	7.7	9.1
2021/2022	8.2	6.9	9.9	8.1	6.9	8.9
2022/2023	8.3	7.2	10.5	8.2	8.1	8.3
2023/2024	8.3	7.3	10.2	8.3	9.2	8.9

Technical Notes: None to report.

5.5 NEONATAL MORBIDITY AND MORTALITY

TABLE FOR FIGURE 5.5.1

Prevalence of adverse neonatal outcomes among hospital-born live births, Ontario, 2012/2013 compared to 2023/2024

To view a visual representation of Table 5.5.1 view graph **here**.

Adverse neonatal outcome	2012/2013 (%)	2023/2024 (%)
Respiratory distress syndrome	1.55	1.98
Sepsis/septicaemia	1.13	0.72
Arterial cord blood pH <7.0	0.60	0.56
5-minute Apgar <5	0.58	0.59
Seizure	0.46	0.28
Bronchopulmonary dysplasia	0.17	0.12
Hypoxic ischemic encephalopathy	0.15	0.24
Intraventricular hemorrhage (grades 2,3,4)	0.12	0.11

Technical Notes: Apgar <5 at 5 minutes and arterial cord blood pH <7 are derived exclusively from BIS data. For considerations in interpreting Apgar scores, please see **Appendix B: Notes for Interpretation**.

All other outcomes are derived exclusively from CIHI-DAD records.

The following ICD-10 codes were used:

- Respiratory distress syndrome: P220
- Sepsis/septicaemia: P36
- Seizure: P90, R56
- Bronchopulmonary dysplasia: P271
- Hypoxic ischemic encephalopathy: P915, P9181, P916
- Intraventricular hemorrhage (grades 2,3,4): P521, P522

TABLE FOR FIGURE 5.5.2

Prevalence of newborns with a normal body temperature (36.5°-37.5°) on first admission to the NICU in the birth hospital, Ontario, 2014/2015 to 2023/2024

To view a visual representation of Table 5.5.2 view graph **here**.

Fiscal Year	Number of newborns (n)	Percent of newborns (%)
2014/2015	9,968	75.2
2015/2016	10,233	76.1
2016/2017	10,051	75.7
2017/2018	10,368	75.9
2018/2019	10,256	75.9
2019/2020	10,159	74.5
2020/2021	10,343	74.4
2021/2022	10,478	74.3
2022/2023	10,123	76.1
2023/2024	10,972	77.7

Technical Notes: Limited to newborns with BIS NICU data submission and non-missing admission temperature data. Infants that received therapeutic hypothermia were excluded. Neonatal therapies data element was added to the BIS in 2014.

The first NICU encounter is used for newborns with multiple NICU admissions.

Note, there are limitations to NICU data capture in the BIS over time. All level II (2) NICUs in Ontario submit data to the BIS. BORN has received complete data from 5 of 8 level III (3) NICU sites prior to January 2021, 6 of 8 level III (3) NICUs in 2021 (calendar year), and 7 of 8 level III (3) NICUs from September 2022 to 2024.

TABLE FOR FIGURE 5.5.3

Average NICU length of stay (days), Ontario, 2012/2013 to 2023/2024 by gestational age at birth and fiscal year

To view a visual representation of Table 5.5.3 view graph here.

Fiscal Year	20-24 weeks, extremely premature	25-31 weeks, very premature	32-36 weeks, moderately or slightly premature	37-41 weeks, term	42+ weeks, post-term
2012/2013	61.7	52.6	12.5	4.1	2.1
2013/2014	62.1	52.4	12.3	4.1	5.0
2014/2015	75.3	55.0	12.6	4.1	4.0
2015/2016	73.3	56.5	12.8	4.3	3.8
2016/2017	85.9	56.9	12.6	4.1	5.4
2017/2018	83.3	57.4	12.6	4.2	3.2
2018/2019	81.0	59.4	12.9	4.3	2.6
2019/2020	83.3	58.6	12.5	4.6	4.2
2020/2021	74.6	52.2	11.4	3.9	5.0
2021/2022	88.7	57.9	13.0	4.1	3.2
2022/2023	86.2	57.1	12.9	4.3	2.3
2023/2024	82.3	54.2	13.0	4.1	3.8

Technical Notes: Includes newborns admitted to the NICU. Length of stay was derived using BIS data and supplemented with CIHI-DAD data for sites that did not submit NICU data to BORN.

TABLE FOR FIGURE 5.5.4

Prevalence of neonatal death in hospital, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 5.5.4 view graph **here**.

Fiscal Year	Neonatal deaths (n)	Neonatal deaths (%)
2012/2013	414	0.29
2013/2014	452	0.32
2014/2015	422	0.30
2015/2016	441	0.31
2016/2017	413	0.29
2017/2018	423	0.30
2018/2019	409	0.29
2019/2020	401	0.28
2020/2021	363	0.26
2021/2022	391	0.27
2022/2023	375	0.27
2023/2024	365	0.25

Technical Notes: Neonatal death was derived using BIS data and supplemented with CIHI-DAD data for sites that did not submit NICU data to BORN.

Neonatal death is defined as a death that occurs ≤28 days following live birth.

5.6 CONGENITAL ANOMALIES

TABLE FOR FIGURE 5.6.1

Rate of gastroschisis per 10,000 births, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 5.6.1 view graph **here**.

Fiscal Year	Cases (n)	Rate per 10,000 births
2012/2013	37	2.6
2013/2014	41	2.9
2014/2015	39	2.7
2015/2016	37	2.6
2016/2017	26	1.8
2017/2018	31	2.0
2018/2019	37	2.6
2019/2020	21	1.4
2020/2021	22	1.6
2021/2022	23	1.7
2022/2023	16	1.1
2023/2024	31	2.1

Technical Notes: Gastrochisis anomalies are identified exclusively from postnatal encounters in BIS.

Reference: https://health-infobase.canada.ca/congenital-anomalies/

TABLE FOR FIGURE 5.6.2

Rate of selected congenital heart defects per 10,000 births, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 5.6.2 view graph **here**.

Fiscal Year	Cases (n)	Rate per 10,000 births
2012/2013	210	14.7
2013/2014	208	14.7
2014/2015	201	14.2
2015/2016	254	17.9
2016/2017	236	16.6
2017/2018	237	16.6
2018/2019	247	17.4
2019/2020	248	17.4
2020/2021	246	17.8
2021/2022	257	18.0
2022/2023	252	18.3
2023/2024	220	15.4

Technical Notes: Congenital heart defects (CHD) cases consist of transposition of great vessels, endocardial cushion defects/Atrioventricular Septal Defect (AVSD), tetralogy of Fallot, hypoplastic left heart syndrome, coarctation of aorta, and common truncus.

Reference: https://health-infobase.canada.ca/congenital-anomalies/

5.7 NEWBORN FEEDING

TABLE FOR FIGURE 5.7.1

Prevalence of newborn feeding type for hospital births, Ontario, 2012/2013 to 2023/2024 by breastfeeding indicator and fiscal year

To view a visual representation of Table 5.7.1 view graph **here**.

	Breastfeeding indicators			
Fiscal Year	**Breastfeeding (BF) initiation (%)**	**Exclusive breastfeeding (BF) (%)**	**Supplementation for medical reasons (%)**	**Adjusted breastfeeding (BF) rate (%)**
2012/2013	87.7	58.5	4.2	64.9
2013/2014	88.6	58.9	4.2	64.7
2014/2015	89.4	56.8	7.7	65.5
2015/2016	90.2	58.2	7.9	67.4
2016/2017	91.0	57.9	8.3	66.8
2017/2018	90.9	56.4	8.3	65.2
2018/2019	91.0	55.0	8.6	64.3
2019/2020	91.3	52.8	13.0	66.7
2020/2021	91.1	49.0	12.8	62.8
2021/2022	91.0	47.9	14.2	63.5
2022/2023	91.5	45.1	15.0	61.3
2023/2024	91.8	43.3	15.5	60.0

Technical Notes: This table represents newborn feeding from birth to discharge from the hospital or NICU among all hospital live births.Breastfeeding initiation refers to newborns who receive at least one breastfeed.

Exclusive breastfeeding refers to newborns exclusively breastfed (or fed human milk - maternal or donor milk) from birth to discharge.

Breastfeeding initiation and exclusive breastfeeding are calculated among all live hospital births with feeding data.

Supplementation for medical reasons refers to breastfed newborns who have received at least one feed other than human milk (human milk substitute, water, or other fluids with the exception of medications, or vitamins or mineral drops) in the hospital because of documented medical reason(s).

Supplementation for medical reasons includes the following:

- Birth mother not involved in care
- Infant hypoglycemia
- Inborn Errors of Metabolism
- Preterm infant (<32 weeks) (Prior to April 2019)
- Very low birth weight (<1500gms) (Prior to April 2019)
- Other clinical indications
- Significant infant weight loss in the presence of clinical indications
- Maternal / Active herpes on breast
- Additional Maternal Health Concerns
- Contraindicated maternal medication
- Maternal HIV infection
- Severe maternal illness
- Inadequate Infant Weight Gain
- Insufficient maternal milk supply
- Donor milk not available
- Not eligible for donor milk

It is calculated among all live hospital births with non-missing reason for supplementation.

Adjusted breastfeeding refers to newborns who are exclusively breastfed or fed human milk from birth to discharge, or if they receive any feeds other than human milk due to documented medical reasons. It is calculated among all live hospital births without missing data for feeding or supplementation reason.

TABLE FOR FIGURE 5.7.2

Prevalence of breastfeeding at 3 days among term newborns of midwifery clients, Ontario, 2012/2013 to 2023/2024 by breastfeeding indicator and fiscal year

To view a visual representation of Table 5.7.2 view graph **here**.

Fiscal Year	Breastfeeding initiation (%)	Exclusive breastfeeding (%)
2012/2013	97.3	84.1
2013/2014	97.5	84.3
2014/2015	97.3	83.8
2015/2016	97.8	83.9
2016/2017	97.4	82.8
2017/2018	97.4	81.1
2018/2019	97.2	79.8
2019/2020	97.1	77.2
2020/2021	96.8	72.5
2021/2022	96.5	70.9
2022/2023	96.7	68.4
2023/2024	96.6	66.7

Technical Notes: Exclusive breastfeeding indicates newborns exclusively breastfed (or fed human milk – maternal or donor milk) at 3 days following birth.

Term newborns defined as born 37 – 41 weeks GA.

Breastfeeding initiation includes exclusive breastfeeding and combination feeding (breast milk and breast milk substitute) at 3 days following birth.

TABLE FOR FIGURE 5.7.3

Prevalence of newborn feeding type for low-risk, term, hospital births to nulliparous pregnant individuals, Ontario, 2012/2013 compared to 2023/2024 by midwifery client status and fiscal year

To view a visual representation of Table 5.7.3 view graph **here**.

Fiscal Year	Midwifery client status	Breastfeeding Initiation (%)	Exclusive Breastfeeding (%)	Supplemented for medical reason(s) (%)	Adjusted Breastfeeding Initiation (%)
2012/2013	Midwifery clients	97.3	85.0	1.8	88.3
	Non-midwifery clients	90.9	63.0	3.5	68.4
2013/2014	Midwifery clients	97.3	85.0	1.8	88.3
	Non-midwifery clients	90.9	63.0	3.5	68.4
2014/2015	Midwifery clients	97.7	84.7	3.9	89.2
	Non-midwifery clients	91.8	62.0	5.6	68.5
2015/2016	Midwifery clients	97.4	84.8	4.1	89.4
	Non-midwifery clients	93.0	63.3	6.0	70.8
2016/2017	Midwifery clients	98.2	84.2	4.5	89.0
	Non-midwifery clients	94.1	63.2	6.4	70.2
2017/2018	Midwifery clients	97.6	82.1	5.0	87.3
	Non-midwifery clients	93.9	60.8	6.6	68.0
2018/2019	Midwifery clients	97.8	81.8	5.0	87.2
	Non-midwifery clients	93.8	58.7	6.9	66.3

2019/2020	Midwifery clients	97.7	77.4	7.7	85.9
	Non-midwifery clients	94.2	56.4	10.5	67.9
2020/2021	Midwifery clients	97.3	74.0	8.5	83.3
	Non-midwifery clients	93.4	50.4	10.5	61.8
2021/2022	Midwifery clients	97.4	71.4	8.8	81.0
	Non-midwifery clients	93.0	49.5	11.3	62.2
2022/2023	Midwifery clients	96.9	68.3	9.5	78.6
	Non-midwifery clients	93.6	43.6	11.8	56.6
2023/2024	Midwifery clients	96.9	67.2	9.4	77.2
	Non-midwifery clients	93.7	42.1	12.7	55.9

Technical Notes: The BORN Maternal Newborn Outcomes Committee (MNOC), a multi-disciplinary group of care providers who provide advice and clinical direction to the organization agreed to standardize the definition of low-risk pregnancies for consistency. This definition was last revised in June 2023. MNOC approved the following inclusion/exclusion criteria for the definition of low-risk birth and primary cesarean birth rates:

Inclusions:

- Nulliparous
- ≥37 weeks' gestation
- Cephalic
- Singleton
- Spontaneous labour
- Maternal pre-pregnancy BMI <40 kg/m^2

Exclusions:

Classification of Disorders or Condition	Specific Condition Excluded
Maternal Health Conditions [added June 2023]	
Autoimmune	Lupus; Rheumatoid Arthritis; Autoimmune Other
Cancer	Diagnosed in Pregnancy; Medication exposure in pregnancy – Chemotherapeutic Agents
Cardiovascular – 2	Acquired Heart Disease; Antihypertensive Therapy Outside of Pregnancy; Cardiovascular Disease; Congenital Heart Defect; Congenital Heart Disease; Pre-existing Hypertension; Renal Disease; Cardiovascular Other
Endocrine	Diabetes and Pregnancy; [Hyperthyroidism (Unmanaged); Hypothyroidism (Unmanaged); Hyper/Hypothyroidism Management unknown]
Gastrointestinal	Liver/ Gallbladder -Cholecystitis; Colitis; Crohn's; Hepatitis; Liver/ Gallbladder -Intrahepatic Cholestasis of Pregnancy
Genitourinary	Acquired Renal (Insufficiency -Chronic Infections); Congenital/ Genetic Renal (Renal Agenesis – Pelvic Kidney); Renal Disease; Uterine Anomalies; Genitourinary other
Infections	[Sexually Transmitted Infections (Chlamydia; Gonorrhea; Active Herpes Simplex Virus (HSV); Human Immunodeficiency Virus (HIV); Viruses; Other]
Hematology	Gestational Thrombocytopenia; Hemophilia (A and B Von Willebrand); Idiopathic Thrombocytopenia; Sickle Cell Disease; Thalassemia; Thrombophilia; Hematology Other
Hypertensive Disorders in Pregnancy	Gestational Hypertension; Eclampsia; HELLP; Preeclampsia; Preeclampsia Requiring Magnesium Sulfate; Pre-existing Hypertension with Superimposed Preeclampsia; Maternal Unknown
Musculoskeletal	Achondroplasia; Muscular Dystrophy/ Neuromuscular Disorder; Myotonic Dystrophy; Osteogenesis Imperfecta; Musculoskeletal Other
Neurology	Cerebral Palsy; Multiple Sclerosis; Myasthenia Gravis; Spina Bifida/ Neural Tube Defect; Neurology Other; [Epilepsy/Seizures/Seizure occurred in current pregnancy]
Pulmonary	Cystic Fibrosis; Previous Pulmonary Embolism/ Deep Vein Thrombosis; Pulmonary Hypertension; Pulmonary
Other	Maternal health conditions other
Complications of Pregnancy	
Maternal	[Preterm labour prior to this admission; antepartum bleeding (persistent and unexplained); Preterm prelabour rupture of membranes (PPROM); pregnant individuals age greater than 40 years]
Fetal	Anomalies; Isoimmunization/ Alloimmunization; Intrauterine Growth Restriction; Oligohydramnios; Fetal therapy – Fetal surgery; [Polyhydramnios; Fetal other]
Placental	Placenta Accreta; Placenta Increta; Placenta Percreta; Placenta Previa; Placental Abruption; Placental Other,
Other criteria not classified	Multiparous • Excluded as they have already proven their ability to give birth • Induction of labour: – Higher rate of labour and birth maternal/neonatal complications with induction

6.0 ACCESS TO CARE

6.1 DISTANCE TO CARE

TABLE FOR FIGURE 6.1.1

Prevalence of hospital births requiring at least 100 km of travel, Ontario, 2012/2013 to 2023/2024 by Ontario Health region and fiscal year

To view a visual representation of Table 6.1.1 view graph **here**.

Ontario Health Region	2012/2013 (%)	2023/2024 (%)
West	0.9	1.1
Central	0.2	0.4
Toronto	0.2	0.2
East	1.2	1.2
North East	9.3	13.6
North West	27.3	28.6

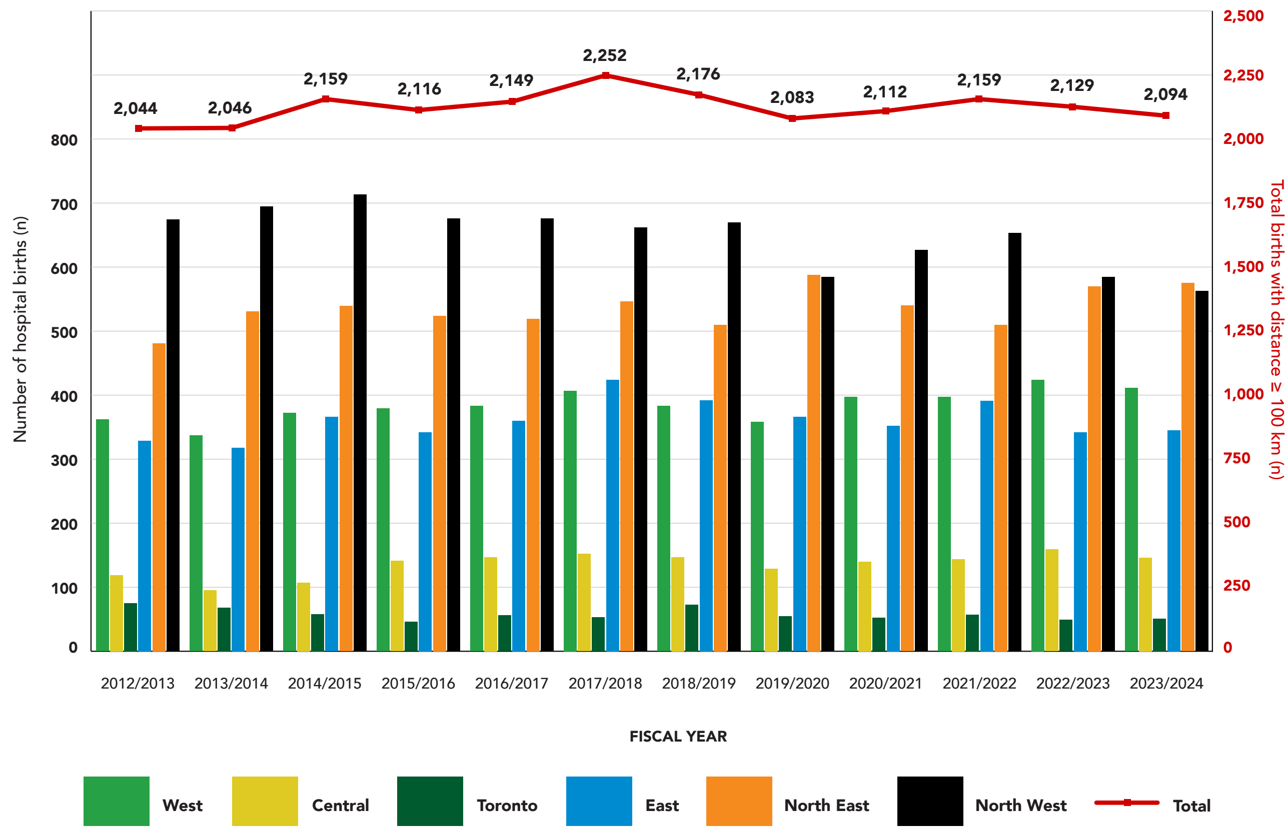
Technical Notes: Straight line distances were used to estimate travel distances, and likely underestimate the true distance travelled.

Ontario Health region is based on location of birth hospital.

FIGURE 6.1.2

Frequency of hospital births requiring at least 100 km of travel, Ontario, 2012/2013 to 2023/2024

To view an alternate to this graph see **Table 6.1.2** option of data points on the next page.



Numerator: Straight line distances were used to estimate travel distances, and likely underestimate the true distance travelled.

TABLE FOR FIGURE 6.1.2

Frequency of hospital births requiring at least 100 km of travel, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 6.1.2 view graph **here**.

Fiscal Year	West (n)	Central (n)	Toronto (n)	East (n)	North East (n)	North West (n)	Total (N)
2012/2013	362	119	75	329	481	674	**2,044**
2013/2014	337	95	68	318	531	695	**2,046**
2014/2015	372	107	58	366	539	713	**2,159**
2015/2016	379	141	46	342	524	676	**2,116**
2016/2017	383	147	56	360	519	676	**2,149**
2017/2018	407	152	53	424	546	662	**2,252**
2018/2019	383	147	73	392	510	670	**2,176**
2019/2020	358	129	55	366	588	585	**2,083**
2020/2021	397	140	52	352	540	627	**2,112**
2021/2022	397	144	57	391	510	653	**2,159**
2022/2023	424	159	49	342	570	585	**2,129**
2023/2024	411	146	51	345	575	563	**2,094**

Technical Notes: Straight line distances were used to estimate travel distances, and likely underestimate the true distance travelled.

6.2 PRENATAL VISIT

TABLE FOR FIGURE 6.2.1

Prevalence of individuals with no first trimester prenatal visit, Ontario, 2012/2013 to 2023/2024

To view a visual representation of Table 6.2.1 view graph **here**.

	No prenatal visit in the first timester	
Fiscal Year	**Individuals with no first trimester prenatal visit (n)**	**Individuals with no first trimester prenatal visit (%)**
2012/2013	15,333	12.4
2013/2014	13,100	10.5
2014/2015	11,899	9.4
2015/2016	11,417	8.8
2016/2017	11,611	8.9
2017/2018	11,314	8.6
2018/2019	10,240	7.9
2019/2020	9,641	7.4
2020/2021	8,782	6.9
2021/2022	7,787	5.8
2022/2023	8,425	6.6
2023/2024	9,037	6.8

Technical Notes: None to report.

6.3 ON-MARG

TABLE FOR FIGURE 6.3.1

Distribution of 2016 ON-Marg material resource quintiles among pregnant individuals with no first trimester visit, Ontario, 2012/2013 compared to 2023/2024

To view a visual representation of Table 6.3.1 view graph **here**.

Fiscal Year	Quintile 1 – least marginalized (%)	Quintile 2 (%)	Quintile 3 (%)	Quintile 4 (%)	Quintile 5 – most marginalized (%)
2012/2013	11.8	14.3	17.3	21.2	35.4
2013/2014	12.2	14.1	17.2	21.4	35.1
2014/2015	13.7	15.0	17.1	20.1	34.1
2015/2016	13.9	15.9	17.0	20.7	32.5
2016/2017	14.2	15.7	17.3	20.5	32.3
2017/2018	14.6	15.7	17.5	20.1	32.1
2018/2019	15.0	16.2	17.2	20.4	31.3
2019/2020	14.3	16.6	17.2	20.6	31.3
2020/2021	15.7	16.2	17.1	20.3	30.7
2021/2022	16.5	17.4	18.3	19.7	28.0
2022/2023	16.4	16.1	19.0	19.9	28.6
2023/2024	17.7	16.3	18.5	19.9	27.7

Technical Notes: 2016 Ontario Marginalization (ON-Marg) data is used to best represent the span of years evaluated, as it was closest to the midpoint in time.

ON-Marg evaluation is based upon neighbourhood-level information, not individual level. "The material resources dimension is closely connected to poverty and refers to the inability for individuals and communities to access and attain basic material needs relating to housing, food, clothing, and education."

https://www.publichealthontario.ca/-/media/Documents/O/2017/on-marg-userguide.pdf?sc_lang=en&rev=06cc3a5e23d4448ab6851b528756c428&hash=6E2098165339B008502D273C397BC699

For more information, indicators used in this dimension include:

- Proportion of the population aged 25 to 64 without a high-school diploma
- Proportion of families who are lone parent families
- Proportion of total income from government transfer payments for population aged 15+
- Proportion of the population aged 15+ who are unemployed
- Proportion of the population considered low-income
- Proportion of households living in dwellings that are in need of major repair

Reference: Public Health Ontario. Ontario Marginalization Index: Updates and Uses. 2023.

TABLE FOR FIGURE 6.3.2

Distribution of 2016 ON-Marg racialized newcomer population quintiles among pregnant individuals with no first trimester visit, Ontario, 2012/2013 compared to 2023/2024

To view a visual representation of Table 6.3.2 view graph **here**.

Fiscal Year	Quintile 1 – least marginalized (%)	Quintile 2 (%)	Quintile 3 (%)	Quintile 4 (%)	Quintile 5 – most marginalized (%)
2012/2013	9.4	10.4	12.7	17.7	49.8
2013/2014	10.4	10.9	13.3	18.1	47.3
2014/2015	11.4	12.3	14.0	18.2	44.1
2015/2016	11.8	13.1	13.6	18.7	42.8
2016/2017	11.4	12.5	13.2	18.4	44.5
2017/2018	11.3	12.0	13.3	18.7	44.6
2018/2019	11.0	12.5	13.4	18.8	44.3
2019/2020	11.4	11.9	13.8	18.6	44.2
2020/2021	11.4	13.2	14.1	19.1	42.2
2021/2022	12.1	13.5	15.3	20.0	39.0
2022/2023	12.1	12.7	15.2	19.8	40.2
2023/2024	11.4	12.2	14.7	20.9	40.8

Technical Notes: 2016 Ontario Marginalization (ON-Marg) data is used to best represent the span of years evaluated, as it was closest to the midpoint in time.

ON-Marg evaluation is conducted at the neighbourhood level, not the individual level.

Indicators used in this dimension include:

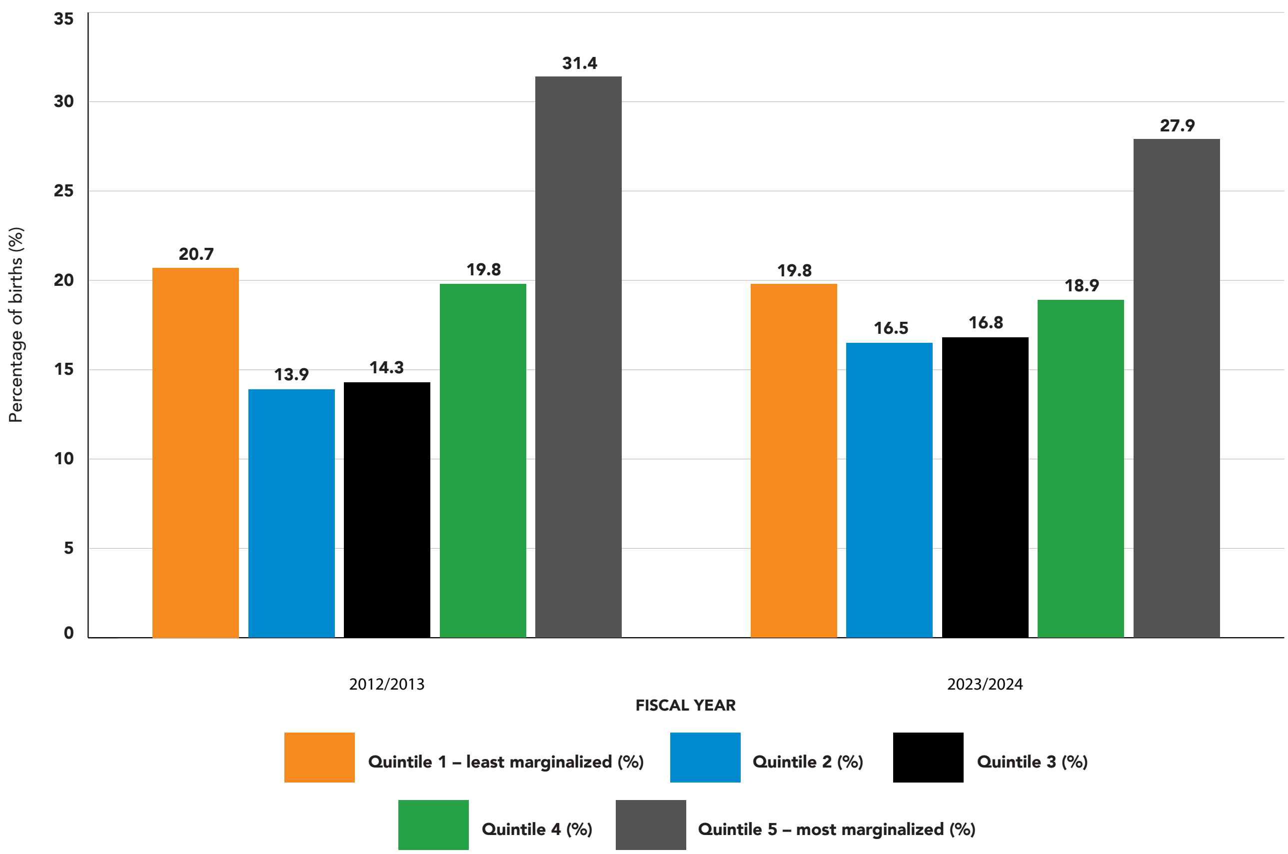
- Proportion of the population who are recent immigrants (arrived in the past 5 years)
- Proportion of the population who self-identify as a visible minority

Reference: Public Health Ontario. Ontario Marginalization Index: Updates and Uses. 2023.

FIGURE 6.3.3

Distribution of 2016 ON-Marg household and dwellings quintiles among pregnant individuals with no first trimester visit, Ontario, 2012/2013 compared to 2023/2024

To view an alternate to this graph see **Table 6.3.3** option of data points on the next page.



Numerator: Births in each age and labour force quintile.
Denominator: All pregnancies resulting in a live or stillbirth in Ontario with a valid Ontario postal code and no prenatal visit in first trimester.

TABLE FOR FIGURE 6.3.3

Distribution of 2016 ON-Marg household and dwellings quintiles among pregnant individuals with no first trimester visit, Ontario, 2012/2013 compared to 2023/2024

To view a visual representation of Table 6.3.3 view graph **here**.

Fiscal Year	Quintile 1 – least marginalized (%)	Quintile 2 (%)	Quintile 3 (%)	Quintile 4 (%)	Quintile 5 – most marginalized (%)
2012/2013	20.7	13.9	14.3	19.8	31.4
2013/2014	20.5	14.1	14.0	20.0	31.5
2014/2015	19.8	14.3	15.1	19.2	31.6
2015/2016	19.4	15.5	15.3	19.8	30.0
2016/2017	20.3	15.9	15.5	18.7	29.6
2017/2018	20.6	15.6	16.1	18.4	29.3
2018/2019	20.7	15.8	16.4	19.0	28.2
2019/2020	21.6	16.4	15.2	19.2	27.6
2020/2021	21.5	16.5	16.2	18.7	27.1
2021/2022	20.8	16.6	17.1	18.4	27.1
2022/2023	19.8	16.5	17.2	19.5	26.9
2023/2024	19.8	16.5	16.8	18.9	27.9

Technical Notes: 2016 Ontario Marginalization (ON-Marg) data is used.

Households and dwellings index relates to family and neighbourhood stability and cohesiveness.

Households and dwellings index is derived from 7 variables, measuring the types and density of residential accommodations, and certain characteristics of family structure.

Reference: Public Health Ontario. Ontario Marginalization Index: Updates and Uses. 2023.

7.0 ASSISTED REPRODUCTIVE TECHNOLOGIES (ART)

7.1 ART OUTCOME

TABLE FOR FIGURE 7.1.1

Prevalence of births conceived by ART procedures, Ontario, 2013/2014 to 2022/2023

To view a visual representation of Table 7.1.1 view graph **here**.

Fiscal Year	IVF births (n)	IVF births (%)
2013/2014	1,196	0.9
2014/2015	2,427	1.7
2015/2016	2,191	1.6
2016/2017	2,506	1.8
2017/2018	3,234	2.3
2018/2019	3,405	2.4
2019/2020	3,588	2.5
2020/2021	2,796	2.0
2021/2022	4,162	2.9
2022/2023	4,053	3.0

Technical Notes: IVF treatment data are available from 2013/2014 to 2022/2023.

TABLE FOR FIGURE 7.1.2

Frequency of patients, oocyte retrievals, embryo transfers, ongoing pregnancies, and live births following IVF, Ontario, 2013/2014 to 2022/2023

To view a visual representation of Table 7.1.2 view graph **here**.

Fiscal Year	Patients (n)	Oocyte retrievals (n)	Embryo transfers (n)	Ongoing pregnancies (n)	Live births (n)
2013/2014	7,364	6,331	8,635	3,216	2,486
2014/2015	7,305	6,088	8,346	3,282	2,486
2015/2016	8,052	6,773	8,595	3,314	2,477
2016/2017	11,257	9,391	12,091	4,572	3,415
2017/2018	12,124	9,596	12,777	4,993	3,707
2018/2019	12,504	9,581	12,926	5,192	3,853
2019/2020	11,990	8,925	11,606	4,466	3,450
2020/2021	12,647	9,781	11,770	4,767	3,664
2021/2022	14,733	11,085	14,274	5,718	4,383
2022/2023	15,137	11,475	14,284	5,737	–

Technical Notes: Patient: individual undergoing assisted reproductive technology treatments.

Oocyte retrieval: egg retrieval as part of the in vitro fertilisation.

Embryo transfer: the process of placing embryos into the uterus for implantation.

Ongoing pregnancy: pregnancy with ≥1 fetal heartbeat on ultrasound.

Live birth: one or more live births at any gestational age.

Birth information is available from 2013/2014 to 2021/2022.

IVF treatment data is available from 2013/2014 - 2022/2023.

TABLE FOR FIGURE 7.1.3A

Cumulative live birth rate for retrievals *without* preimplantation genetic testing for aneuploidy (PGT-A), Ontario, 2019/2020 to 2021/2022 by age at time of retrieval

To view a visual representation of Table 7.1.3A view graph **here**.

	<35 (%)	**35-37 (%)**	**38-40 (%)**	**41-42 (%)**	**43+ (%)**	**Total (%)**
Oocyte retrievals with no PGT-A testing	54.5	45.4	35.4	18.6	8.2	**43.3**

Technical Notes: Cumulative live birth rate: The number of retrievals resulting in at least one live birth within one year of the retrieval. Expressed as a percentage of all retrievals that had at least one ET (fresh or frozen) within one year.

Live birth: one or more live births at any gestational age.

TABLE FOR FIGURE 7.1.3B

Cumulative live birth rate for retrievals *with* preimplantation genetic testing for aneuploidy (PGT-A), Ontario, 2019/2020 to 2021/2022 by age at time of retrieval

To view a visual representation of Table 7.1.3B view graph **here**.

	<35 (%)	35-37 (%)	38-40 (%)	41-42 (%)	43+ (%)	Total (%)
Retrievals with PGT-A testing	56.6	49.9	41.8	36.6	–	**46.2**

Technical Notes: Cells suppressed due to unstable estimates in the 43+ age group.

Cumulative live birth rate: The number of retrievals resulting in at least one live birth within one year of the retrieval. Expressed as a percentage of all retrievals that had at least one ET (fresh or frozen) within one year.

FETs with an ambiguous PGT-A result were excluded.

Live birth: one or more live births at any gestational age.

TABLE FOR FIGURE 7.1.4A

Prevalence of birth outcomes among ongoing pregnancies, Ontario, 2021/2022 by embryo transfer protocols: Fresh embryo transfer with PGT-A

To view a visual representation of Table 7.1.4A view graph **here**.

	Fresh IVF (%)
Singleton live birth	68.4
Multiple live birth	5.3
Miscarriage	22.0
Stillbirth	2.0
Unknown	2.4

Technical Notes: Birth outcome data are available for cycles started in 2021/2022.

Singleton birth: one live birth at any gestational age.

Multiple live birth: at least one live birth from a multiple pregnancy.

Miscarriage: fetal loss occurred at <20 weeks' gestation.

Stillbirth: no fetus(es) was born alive and fetal loss occurred at ≥20 weeks' gestation.

TABLE FOR FIGURE 7.1.4B

Prevalence of birth outcomes among ongoing pregnancies, Ontario, 2021/2022 by embryo transfer protocols: Frozen embryo transfer with no PGT-A

To view a visual representation of Table 7.1.4B view graph **here**.

	FET (no PGT-A) (%)
Singleton live birth	70.5
Multiple live birth	3.6
Miscarriage	21.9
Stillbirth	0.8
Unknown	3.2

Technical Notes: Birth outcome data are available for cycles started in 2021/2022.

Singleton birth: one live birth at any gestational age.

Multiple live birth: at least one live birth from a multiple pregnancy.

Miscarriage: fetal loss occurred at <20 weeks' gestation.

Stillbirth: no fetus(es) was born alive and fetal loss occurred at ≥20 weeks' gestation.

TABLE FOR FIGURE 7.1.4C

Prevalence of birth outcomes among ongoing pregnancies, Ontario, 2021/2022 by embryo transfer protocols: Frozen embryo transfer with PGT-A

To view a visual representation of Table 7.1.4C view graph **here**.

	FET with PGT (%)
Singleton live birth	81.4
Multiple live birth	1.1
Miscarriage	11.7
Stillbirth	0.8
Unknown	5.0

Technical Notes: Birth outcome data are available for cycles started in 2021/2022.

Singleton birth: one live birth at any gestational age.

Multiple live birth: at least one live birth from a multiple pregnancy.

Miscarriage: fetal loss occurred at <20 weeks' gestation.

Stillbirth: no fetus(es) was born alive and fetal loss occurred at ≥20 weeks' gestation.

TABLE FOR FIGURE 7.1.5

Distribution of multiple live births following IVF, Ontario, 2013/14 to 2021/2022

To view a visual representation of Table 7.1.5 view graph **here**.

Fiscal year	Multiples (%)
2013/2014	17.3
2014/2015	13.4
2015/2016	10.7
2016/2017	5.8
2017/2018	5.3
2018/2019	4.5
2019/2020	4.4
2020/2021	4.1
2021/2022	3.7

Technical Notes: Multiple live birth: at least one live birth from a multiple pregnancy.

Birth information is available from 2013/2014 to 2021/2022

7.2 ONTARIO FERTILITY PROGRAM

TABLE FOR FIGURE 7.2.1

Frequency and prevalence of funding for IVF, Ontario, 2013/2014 to 2022/2023

To view a visual representation of Table 7.2.1 view graph **here**.

Fiscal year	Private pay cycles (n)	OFP funded cycles (n)	Cycles funded by the Ontario Fertility Program (OFP) (%)
2013/2014	6,823	—	—
2014/2015	6,426	—	—
2015/2016	5,774	1,551	21.2
2016/2017	4,895	6,155	55.7
2017/2018	5,529	5,963	51.9
2018/2019	5,956	5,908	49.8
2019/2020	6,195	4,852	43.9
2020/2021	6,414	5,468	46.0
2021/2022	8,640	5,343	38.2
2022/2023	6,309	4,463	41.4

Technical Notes: Ontario Fertility Program (OFP) started in 2015.

8.0 COMMUNICABLE DISEASES OF PUBLIC HEALTH INTEREST

8.1 SYPHILIS

TABLE FOR FIGURE 8.1.1

Frequency of births with syphilis exposure in pregnancy, Ontario, 2014/2015 to 2023/2024

To view a visual representation of Table 8.1.1 view graph **here**.

Fiscal year	Births with syphilis (n)
2014/2015	26
2015/2016	29
2016/2017	57
2017/2018	46
2018/2019	51
2019/2020	59
2020/2021	69
2021/2022	79
2022/2023	105
2023/2024	125

Technical Notes: Syphilis during pregnancy is derived from the data element "Infection and pregnancy", which is a multi-selection varibable. A pregnancy record can have more than one type of infection selected.

The collection of syphillis during pregnancy started in 2014/2015.

APPENDIX B | NOTES FOR INTERPRETATION

The following notes apply to data presented throughout the Perinatal Health in Ontario Report, inclusive of Appendix A, and should be considered when interpreting results.

HEALTH EQUITY

a. **Maternal Statement:** BORN recognizes that the terms 'women' and 'maternal' are gendered and do not encompass the experiences of all pregnant/birthing/parenting individuals. BORN is committed to using expansive language (e.g. 'pregnant women and individuals'), though there may be uses where gendered language remains to ensure clarity of messaging.

b. **Race Data Statement:** The race data in BORN is collected as part of prenatal screening by a healthcare provider or delegate. It is available for approximately 70% of pregnant individuals. It cannot be determined if race was self-reported (best practice) or ascribed. BORN recognizes that the limited race categories are not reflective of the diversity of the Ontario population. Internal analyses have shown that populations underrepresented in the race data at BORN are members of the Indigenous population, people from rural parts of Ontario, people experiencing higher levels of household and resource marginalization, lower household income, lower education levels, and those with slightly higher rates of substance use and mental illness in pregnancy.

c. **Reflection on Sociodemographics and Social Determinants of Health:** This report does not yet fully reflect the breadth and complexity of sociodemographics and social determinants of health that influence perinatal and child outcomes. While we include some measures — such as the ON-Marg index and geography — these are limited and do not capture the intersectional realities of identity and lived experience. Race, which we report in limited contexts, is only one determinant. It is sometimes used as a proxy for genetic ancestry or cultural practices, but this approach is incomplete and risks oversimplification.

   What is more important is to consider the broader social determinants of health — income, education, housing, food security, systemic racism, and other intersecting factors —and how they shape access to care and health outcomes. These determinants often interact in ways that profoundly influence perinatal and child health, yet they are not consistently or comprehensively represented in this report in ways that reflect this intersectionality.

   BORN is advancing opportunities for the discreet and secure collection and use of social determinants of health, not only within the registry but also in collaboration with our partners.

Our goal is to enable intersectional analyses that consider race alongside other identity factors and social determinants, so that future reports can provide a more complete and equity-informed understanding of perinatal, maternal, newborn, and child health in Ontario.

d. **Indigenous Data Governance: Our Commitment and Reflection**: This report reflects the experiences of people and families from across Ontario, including First Nations, Métis, and Inuit communities. We acknowledge, with humility, that at this time BORN does not collect self-identified or government-identified Indigenous identity within our registry. This is a significant shortcoming. Without this information, we are unable to answer critical questions about the health of Indigenous birthing people and children — questions that matter deeply to these communities and are recognized as essential by the Truth and Reconciliation Commission.

   We also recognize that data governance is about more than collection — it is about protection. BORN currently has practices in place to safeguard against the disclosure of information that could identify Indigenous communities, particularly when requests for data come without prior engagement, design, and consultation with those communities themselves. These protections reflect our commitment to ensuring that data is not used in ways that could cause harm or perpetuate inequities.

   Indigenous data sovereignty is not simply a technical issue; it is a matter of trust, respect, and reconciliation. BORN continues to take the time to build meaningful, trusting relationships with Indigenous communities, care providers, and leaders. We welcome every opportunity to collaborate with Indigenous organizations and communities to better understand and support maternal, newborn, and child health in ways that honor Indigenous knowledge systems and governance principles.

   Our commitment is clear: we will listen, learn, and act in partnership. We will work toward approaches that uphold the principles of **Ownership, Control, Access, and Possession (OCAP®)** and other frameworks that safeguard Indigenous data governance. We believe that data should serve as a tool for empowerment, not harm, and that Indigenous communities must lead decisions about how their data is collected, used, and shared.

   This is a journey, and we are committed to walking it together — with transparency, accountability, and respect — so that future reports can reflect not only the health of all Ontarians but also the voices and priorities of Indigenous peoples.

e. **Apgar Statement:** It was identified that Apgar score data has limitations due to subjectivity in various ways, particularly where it pertains to race, see academic journal reference here: Associations between provider-assigned Apgar scores and neonatal race (2023): *Edwards S et al. (2023)*. Associations betwen provider-assigned Apgar scores and neonatal race. American Journal of Obstetrics and Gynecology: PMID: 35932875 DOI: 10.1016/j.ajog.2022.07.055. *Data on Apgar scores should be interpreted with caution due to limitations around subjectivity of the scoring. For example, premature infants and those with darker skin tones may receive lower scores which may not accurately reflect their clinical condition.*

APPENDIX C | GLOSSARY

ACRONYMS, DATA SOURCES AND DEFINITIONS

ACRONYMS

Acronym	Full Name
AGA	Appropriate for gestational age
ART	Assisted reproductive technologies
AS	Antenatal specialty
BMI	Body mass index
BORN	Better Outcomes Registry and Network
CARTR Plus	Canadian Assisted Reproductive Technologies Register Plus
CHD	Congenital heart defect
CI	Confidence interval
DSD	Disorders of sex development
EDD	Estimated date of delivery
EFM	Electronic fetal monitoring
eHBHC	Electronic Healthy Babies Healthy Children
ET	Embryo transfer
FET	Frozen embyro transfer
FY	Fiscal year
GMFM	Genetics maternal fetal medicine encounter
GWG	Gestational weight gain
HELLP	Hemolysis, elevated liver enzymes, and low platelet count
ICU	Intensive care unit
IUGR	Intrauterine growth restriction
IVF	In vitro fertilization
LGA	Large for gestational age

MMS	Multiple marker screening
MNOC	Maternal Newborn Outcomes Committee
NIPT	Noninvasive prenatal testing
NPV	Negative predictive value
NSO	Newborn screening Ontario
OFP	Ontario Fertility Program
OH	Ontario Health
OHIP	Ontario health insurance program
PGT-A	Preimplantation genetic testing for aneuploidy
PPROM	Preterm prelabour rupture of membranes
PPV	Positive predictive value
PROM	Prelabor rupture of membranes
PSO	Prenatal screening Ontario
PSOF	Prenatal fluid screening
PTB	Preterm birth
SGA	Small for gestational age
VBAC	Vaginal birth after cesarean

DATA SOURCES

Acronym	**Name**
BIS	BORN Information System
CARTR	Canadian Assisted Reproductive Technologies Register Plus
Census	Census of Population
CIHI-DAD	Canadian Institute for Health Information - Discharge Abstract Database
eHBHC	Electronic Healthy Baby Healthy Child
ON - MARG	Ontario Marginalization Index
PCCF+	Postal Code Conversion File Plus
PSO	Prenatal Screening Ontario

DEFINITIONS

Indicator	Definition
Fiscal Year	Fiscal year is defined by infant date of birth. Each fiscal year ranges from April 1 of one year to March 31 of the next year, inclusive.
Amniotomy	Artificial rupture of the membranes (amniotic sac).
Augmentation	Interventions used to improve the quality and effectiveness of uterine contractions when labour start is spontaneous.
Auscultation	An intermittent technique of listening to and counting the fetal heart rate using a doppler or fetoscope.
Breech	A longitudinal lie with the lower pole of the fetus presenting first into the maternal pelvis. In all variations of the breech presentation, the sacrum is the landmark to be noted.
Cephalic presentation	A longitudinal lie with the fetal head presents first into the maternal pelvis.
Electronic Fetal Monitoring	A medical device used to monitor the fetal heart rate and contractions during labour and birth.
Fresh Embryo transfer	Embryo was not frozen.
Gestational age at birth	Infant's gestational age at the time of birth calculated using "Estimated Date of Birth" and "Newborn Date of Birth". Calculated as Newborn Date of Birth – (Estimated Date of Birth – 280), where the estimated date of birth is determined by dating scan or last menstrual period (LMP).
Gestational diabetes	Diabetes that develops during the second or third trimester of pregnancy.
Gestational hypertension	Hypertension develops for the first time at ≥20 weeks' gestation.
Gestational weight change	Weight gain or loss in pregnancy. Calculated as Maternal Weight at end of Pregnancy – Pre-pregnancy Weight.
Induction of labour	Medical or mechanical means to make the uterus contract prior to the onset of spontaneous labour. The BIS further defines IOL as interventions that occur prior to the onset of active labour (regular uterine contractions with cervical dilation ≥ 4 cm). The BIS has two categories for induction "type of labour" which include 1) Induced labour in latent phase and 2) Induced labour prior to onset of contractions (cold or elective induction).
Intrauterine growth restriction (IUGR)	Intrauterine growth restriction refers to fetal weight that is estimated below the 10th percentile for the gestational age.

Live birth	Signs of life detected after birth: By law, a product of conception, irrespective of the duration of the pregnancy, which after birth, breathes or shows any other evidence of life (e.g., beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles), whether or not the umbilical cord has been cut or the placenta is attached, is considered a live birth.
LOC	Perinatal, birthing, and newborn levels of care (LOC) describes the acuity and complexity of birthing patients, and the resources required to care for these individuals and their newborns that a hospital is equipped to manage. For precise LOC criteria, please see the PCMCH guidance document here: https://www.pcmch.on.ca/wp-content/uploads/Perinatal_Birthing_Newborn_Levels_of_Care_Guidance_Document.pdf
Low-risk pregnancy	The Society of Obstetricians and Gynaecologists of Canada (SOGC) defines low-risk pregnancies as singleton, cephalic, term (at least 37 weeks), with a spontaneous onset of labour, and with no pre-existing maternal or fetal health conditions.
Multiparous	Multiparous is defined as parity is more than 1.
NPV	Negative predictive value. Calculated as the number of true negatives divided by the number of true negatives and false negatives.
Nulliparous	Parity is defined as the total number of previous live or stillbirths at ≥20 weeks or ≥ 500 grams. Nulliparous is defined as parity is equal to 0.
Oocytes	The female gamete (egg).
Oxytocin	A hormone that is used to induce labour or strengthen uterine contractions or control bleeding after birth.
PPROM	Preterm prelabour rupture of membranes.
PPV	Positive Pressure Ventilation describes the process of either using a mask or a ventilator to deliver breaths and to decrease the work of breathing.
Prenatal Care	SOGC refers to prenatal care and the medical care received during pregnancy to support the health of both the pregnant person and their baby.
Primiparous	Primiparous is defined as parity is equal to 1.
PROM	Prelabour rupture of membranes.
Prostaglandin	A group of compounds used to induce cervical ripening. The most used prostaglandins for cervical ripening are prostaglandin E1 (Misoprostol) and prostaglandin E2.

Robson Criteria	A system to categorize pregnant individuals into ten mutually exclusive groups based on their obstetric history and is used as a global standard for assessing, monitoring and comparing cesarean birth rates. The system categories are based on parity, number of fetuses, previous cesarean birth, onset of labour, gestational age, and fetal presentation.
Robson Group 1	Nulliparous, singleton, cephalic, ≥37 weeks, spontaneous labour.
Robson Group 2	Nulliparous, singleton, cephalic, ≥37 weeks, induced labour or cesarean before labour; Group 2a subdivision of 2 who had labour induced.
Robson Group 3	Multiparous, singleton, cephalic, ≥37weeks, no previous cesarean, spontaneous labour.
Robson Group 4	Multiparous, singleton, cephalic, ≥37 weeks, no previous cesarean, induced labour or no labour.
Robson Group 5	Multiparous, singleton, cephalic, ≥37 weeks, previous cesarean.
Robson Group 6	Nulliparous, singleton, breech.
Robson Group 7	Multiparous, singleton, breech.
Robson Group 8	Multifetal pregnancy.
Robson Group 9	Singleton, transverse or oblique lie.
Robson Group 10	Singleton, cephalic, <37 weeks.
Sensitivity	The true positive rate. Calculated as the number of true positives divided by the number of true positives and false negatives.
Shoulder dystocia	An obstetric emergency in which normal traction of the fetal head does not lead to delivery of the fetal shoulders.
Specificity	The false positive rate. Calculated as the number of true negatives divided by the number of true negatives and false positives.
Stillbirth	A product of conception with no signs of life after birth/ expulsion and either a gestational age of ≥20 weeks or a birthweight of ≥500 grams is considered a stillbirth.
Transverse or oblique lie	The lie of the fetus being in the transverse (horizontal) or oblique (at an angle).
VBAC (eligible/attempt/successful)	Vaginal birth after cesarean.

ONTARIO HEALTH REGIONS

Ontario Health has six regions, the following figures have been referenced by documentation provided by Ontario Health.

North East Region

Ontario Health North East serves nearly 557,000 people who live in largely rural communities. The largest urban community in the region being Sudbury with a population of 165,958. This region covers 30.6% of Ontario's land mass.

A profile of the North East	• 13.6% residents identify as indigenous • Connecting care for 4% of Ontarians • 18.5% identify as Francophone

North West Region

Ontario Health North West serves over 232,299 people who live in largely rural communities. The largest urban centre in the region being Thunder Bay with a population of 113,000. The Northwest region covers 58% of Ontario's land mass.

A profile of the North West	• 26.4% of residents identify as indigenous • Connecting care for 1.6% of Ontarians • 2.1% of residents identify as Francophone

East Region

Ontario Health East serves nearly 3.7 million people who live in diverse urban and rural communities, from Pickering to Deep river to Hawkesbury.

A profile of the East region	• 7% of residents identify as Francophone • Connecting care for 26% of Ontarians • 31% of residents identify as a visible minority

Central region

Ontario Health Cental serves over five million people who reside in both fast-growing and diverse communities from Mississauga to Huntsville and Orangeville to Markham.

A profile of the Central Region	• 16% projected population growth over next decade • Connecting care for38% of Ontarians • 47% of residents identify as a visible minority.

Toronto Region

Ontario Health Toronto serves a diverse population of 1.4million residents, plus thousands of people from across the province who access specialized health care services within the City of Toronto.

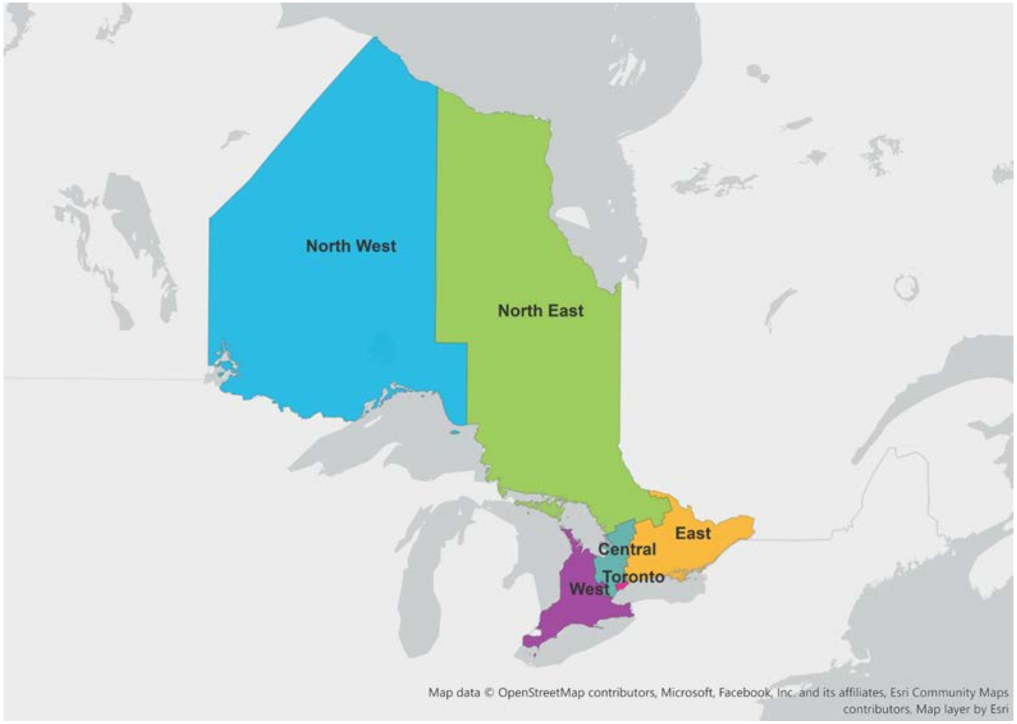
A profile of the Toronto Region	• 35.7% of residents identify as a visible minority • People 65+ make up 16.4% of the population • 36.4% of residents are immigrants

West Region

Ontario Health West serves over 4 million people who live in diverse urban and rural communities, from Waterloo to Windsor and Tobermory to Niagra Falls.

A profile of the West	• 18% of residents are immigrants • Connecting care for over 25% of Ontario • 13% of residents identify as a visible minority

Ontario Health Regions



Ontario Health regions work with local community and health care partners to	• Improve patient experience • Improve population health outcomes • Achieve better value • Improve front-line provider experienc
They do this through	• Implementing health system changes • Leading the health systems within each region • Funding health care providers • Monitoring health care performance

APPENDIX D | REFERENCES

1.0 PERINATAL OVERVIEW

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2.0 MATERNAL / PREGNANT INDIVIDUAL HEALTH

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3.0 LABOUR

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