



PerinatalNB

NB Perinatal Health Program  
Report of Indicators | 2016–2021

Suggested Citation:

Report of Indicators 2016-2021. New Brunswick Perinatal Health Program. Moncton, NB, 2021.



## List of Indicators

Introduction .....	3
Notes and Limitations .....	5
List of Acronyms .....	7
List of New Brunswick Birthing Hospitals .....	7
Chapter 1 Maternal Health.....	8
Total Deliveries .....	8
Total Deliveries by Birthing Hospital.....	9
Caregiver – Antenatally and at delivery.....	11
Midwifery Deliveries by Delivery Location .....	13
Maternal Age at Delivery.....	14
Diabetes Mellitus in Pregnancy.....	15
Hypertension in Pregnancy .....	16
Smoking during Pregnancy.....	17
Smoking during Pregnancy by Health Zone.....	18
Alcohol Use during Pregnancy .....	19
Alcohol Use prior to Pregnancy by Health Zone .....	21
Cannabis use during Pregnancy .....	23
Cannabis use during Pregnancy by Health Zone .....	24
Pre-pregnancy BMI .....	25
Pre-pregnancy BMI > =30 by Health Zone.....	26
Pre-pregnancy BMI > =40 by Health Zone.....	27
Chapter 2 Labour and Delivery .....	28
C-Section Rate by Birthing Hospital.....	28
Primary and Repeat C-Section Rate.....	29
Vaginal Birth after C-Section (VBAC) .....	30

Low-Risk Term Repeat C-sections Between 37 and 39 Weeks Gestation .....	31
Low-Risk Term Repeat C-Sections Between 37 and 39 Weeks Gestation by Birthing Hospital .....	33
Episiotomy Rate in Singleton Vaginal Deliveries .....	34
Episiotomy Rate in Singleton Vaginal Deliveries by Birthing Hospital .....	35
Operative Vaginal Delivery in Singleton Deliveries .....	36
Operative Vaginal Delivery Rate in Singleton Deliveries by Birthing Hospital .....	37
Induction Rate.....	38
Induction Rate by Birthing Hospital.....	39
Indications for Induction .....	40
Non-medical reason for Induction by Birthing Hospital .....	41
Chapter 3 Newborn Health .....	42
Total Births .....	42
Pre-Term Birth Rate.....	43
Birth Weight Percentile for Gestational Age .....	44
Primary SCU/NICU Admission by Regional Health Authority .....	45
Primary SCU/NICU Admissions by Birthing Hospital .....	46
Most Responsible Diagnosis for SCU/NICU Admission.....	48
Term and Pre-term Newborns in NICU/SCU Admissions .....	50
Neonatal Mortality Rate.....	51
Exclusive Breastfeeding Rate at Discharge.....	52
Breastfeeding Initiation .....	54

## Introduction

### Administrative Program Director's Message

The NB Perinatal Health Program works has continuously increased the availability of relevant provincial data on maternal and neonatal health. We are pleased to provide our third report of indicators which includes data on more than 20 indicators: highlighting trends, improvements, and challenges. These indicators continue to help stakeholders and decisions makers recognise the variability in maternal and neonatal care across the province and we remain hopeful that healthcare professionals and administrators will use this information to guide their efforts in quality improvement initiatives.

With the addition of risk factor indicators such as diabetes, hypertension and body mass index, the data included in this report not only provides insight on maternal and neonatal health outcomes, but also increases the data-informed knowledge of chronic health conditions in New Brunswick.

More than ever, healthcare leaders, administrators, clinicians, and researchers have reaped the benefits of our Program's success in establishing sound information management and data analysis processes. During the past six years, we have provided a wealth of information to support our stakeholders' work and we will continue to assist all by providing more in-depth data through our data request process.

Finally, PerinatalNB continues to strive to achieve optimal pregnancy, birth and neonatal outcomes through leadership, collaboration, data-driven and evidence-based recommendations, education, and knowledge exchange. We strongly believe data contributes greatly to our vision to strive for optimal health outcomes across the continuum of care of expectant mothers, babies and their families in New Brunswick.

Perinatal NB Administrative Program Director

Gaetane Leblanc-Cormier



## Medical Director's Message

Perinatal NB is pleased to release our most recent report of perinatal indicators for New Brunswick. This is the third report of indicators since inception of the program in 2015. The report highlights areas of focus for improvement as well as new indicators with respect to maternal alcohol and cannabis use and maternal BMI.

Although the birth rate in New Brunswick has stabilised for 2020/21, there has been a continual decline in the yearly birth rate with 400 less births for 2020/21 than in 2016/17 and approximately 1000 less births now when compared to 10 years ago. Although there has been a decrease in births provincially, there has been no restructuring of services or resource re-allocation. In fact, there continues to be increases in resources such as neonatal intensive care beds and health care providers. With the data presented, questions should be asked with respect to where and how New Brunswick offers its' maternal and neonatal services and whether our current model of delivery of care is best meeting the needs of women, neonates and families.

This report also highlights the increase in complexity of medical care required by childbearing women in NB due to a continuing rise in rates of diabetes, hypertension and obesity.

Neonatal intensive care and special care nursery admission rates continue to be above the national average with increasing variability in admission rates of 15 to 37 percent amongst the three level 3 neonatal intensive care units and special care nurseries. This should raise concerns and warrant a closer look to determine the reason for these differences in admission rates and why we have the second highest rate of admission in the country. Separation of mother and baby should be avoided if at all possible as mothers and babies need to bond and establish breastfeeding. Breastfeeding rates remain low and have not changed over the last five years despite concerted efforts and increasing resources by Health Authorities to increase the rates.

I encourage government, health authorities and other decision makers to take a close, critical look at this report and move forward with meaningful change that will improve the quality of care to mothers and babies in New Brunswick. We cannot continue the same model of delivery of care and expect concerning results and outcomes to improve. As a province we also need to look toward a fiscally responsible delivery of care that improves outcomes.

In closing, I look forward to continuing to work with stakeholders to improve perinatal care in NB and your feedback on the report.

Perinatal NB Medical Director

Dr. Lynn Murphy-Kaulbeck



## Notes and Limitations

Data for this report was retrieved from the 3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016/17-2020/21. Please see “Data Source” for each indicator for more information.

Each fiscal year begins April 1<sup>st</sup> and ends March 31<sup>st</sup> of the following year. In this report, data within each fiscal year is based on the mother’s delivery date, newborn’s birth date, and mother’s hospital discharge date for termination of pregnancy.

The term “birth” is different from “delivery”. A delivery is a maternal indicator which refers to a completed pregnancy, regardless of the number of infants born. A birth is a newborn indicator which refers to a live or stillborn infant.

The term “live births” excludes all stillbirths and any births resulting from a therapeutic abortion.

Gestational age of a fetus or newborn is determined by Last Menstrual Period (LMP) or by Early Ultrasound (US), depending on whether or not an early ultrasound was completed. Pre-term delivery is a newborn delivered prior to 37 weeks gestation, term is a newborn delivered between 37 and 42 weeks gestation and post-term is a newborn delivered after 42 weeks gestation.

Exclusive Breastfeeding at Discharge is defined as provided by the Breastfeeding Committee of Canada. This includes all newborns that received only breast milk from birth to hospital discharge, as well as any newborns that were supplemented for a medical reason.

Size for Gestational Age is defined according to the Canadian Perinatal Surveillance System Birth Weight growth chart published by the Public Health Agency of Canada (2001). Newborns are categorized as Intrauterine Growth Restriction ( $\leq 3\%$ ile), Small for Gestational Age ( $\leq 10\%$ ile), or Large for Gestational Age ( $\geq 90\%$ ile,  $\geq 97\%$ ile) according to gestational age, sex and birth weight.

Low Birth Weight is defined as a birth weight at any gestational age under 2,500 grams, Normal Birth Weight a birth weight at any gestational age between 2,500 grams and 4,500 grams, and High Birth Weight is a birth weight at any gestational age above 4,500 grams.

*Neonatal Intensive Care Unit (NICU)*: Three birthing hospitals in the province are NICUs providing a higher level of care, these are designated as Level 3: The Moncton Hospital, Dr Everett Chalmers Regional Hospital, and the St John Regional Hospital.

*Special Care Unit (SCU)*: Most birthing hospitals in the province can offer some level of special care to newborns, these are designated as Level 2B and Level 2A. Dr. Georges-L.-Dumont University Hospital Centre is a Level 2B facility. Campbellton Regional Hospital, Chaleur Regional Hospital, Edmundston Regional Hospital, and Miramichi Regional Hospital are Level 2A facilities.

Neonate is defined as any live born infant between birth and 28 days of age.

Rates derived from fewer than six reported cases are not reportable and are thereby shown as “NR” in this report.

Health Zone Map: (Retrieved from New Brunswick Health Council Website – Maps of health zones and NBHC communities <https://nbhc.ca/maps-health-zones-and-nbhc-communities>)



Health Zone 1 – Moncton and South-East Area

Health Zone 2 – Fundy Shore and Saint John Area

Health Zone 3 – Fredericton and River Valley Area

Health Zone 4 – Madawaska and North-West Area

Health Zone 5 – Restigouche Area

Health Zone 6 – Bathurst and Acadian Peninsula Area

Health Zone 7 – Miramichi Area



## List of Acronyms

**CIHI:** Canadian Institute for Health Information

**C-Section:** Caesarean Section

**MIS designated:** Management Information System designated

**NB:** New Brunswick

**NICU:** Neonatal Intensive Care Unit

**NR:** Not reportable (due to  $\leq 5$  reported cases)

**PHAC:** Public Health Agency of Canada

**RHA:** Regional Health Authority

**SCU:** Special Care Unit

**VBAC:** Vaginal Birth after Caesarean Section

**BMI:** Body Mass Index

**SOGC:** Society of Obstetricians and Gynaecologists of Canada

## List of New Brunswick Birthing Hospitals

**Campbellton:** Campbellton Regional Hospital

**CHU Dumont:** Centre hospitalier universitaire Dr-Georges-L.-Dumont (University Hospital Centre)

**Chaleur:** Chaleur Regional Hospital

**DECH:** Dr. Everett Chalmers Regional Hospital

**Edmundston:** Edmundston Regional Hospital

**Miramichi:** Miramichi Regional Hospital

**SJRH:** Saint John Regional Hospital

**TMH:** The Moncton Hospital

**URVH:** Upper River Valley Hospital

## Chapter 1 Maternal Health

### Total Deliveries

The number of deliveries performed in New Brunswick has steadily decreased over the past five years, from 6552 to 6156 per year. This represents a decrease of 6.5% between 2016/17 and 2020/21. This decrease has steadied off in the past 2 years, with the number of deliveries in 2019/20 and 2020/21 being similar. Across Canada, there was a decrease of almost 12,000 births in 2020/21, from 282,940 in 2019/20 to 270,324 in 2020/21<sup>1</sup>.

#### Definition

The total number of deliveries performed at each Regional Health Authority (RHA) and in New Brunswick. Multiple births are counted as one delivery.

#### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

#### Reference:

1. Number of Newborns by Province, CIHI Portal (DAD). Data Extracted: October 22, 2021.

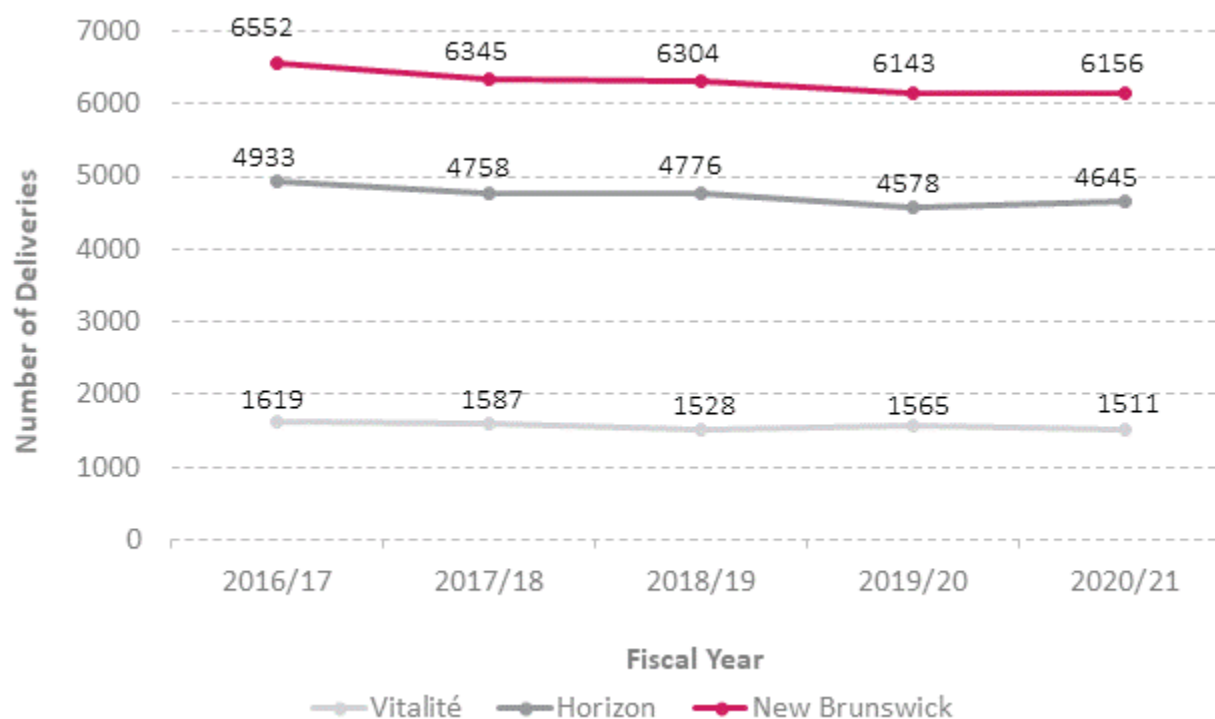


Figure 1.1: Number of deliveries, by location, 2016/17 to 2020/21

## Total Deliveries by Birthing Hospital

In 2020/21, 75.4% of New Brunswick deliveries occurred in a Horizon Health Network birthing hospital and 30.3% of New Brunswick deliveries occurred in the Moncton area (Zone 1).

Note: In 2020/21, the Labour and Delivery Unit of the Campbellton Regional Hospital suspended services indefinitely. Women were diverted to deliver at Chaleur Regional Hospital. Almost all women who would have delivered at Campbellton Regional Hospital in 2020/21 delivered at Chaleur Regional Hospital. The drop in births at Chaleur Regional Hospital between 2016/17 and 2020/21 is due to fewer births to women who live in Health Zone 6 (Note: Campbellton Regional Hospital is located in Health Zone 5). The number of births in Health Zone 1 has remained steady, with an increase noted at Dr. Georges-L.-Dumont University Hospital Centre and a decrease at The Moncton Hospital between 2016/17 and 2020/21.

### Definition

Number of deliveries performed at each birthing hospital / Total number of deliveries in New Brunswick. Births of multiples are counted as one delivery.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

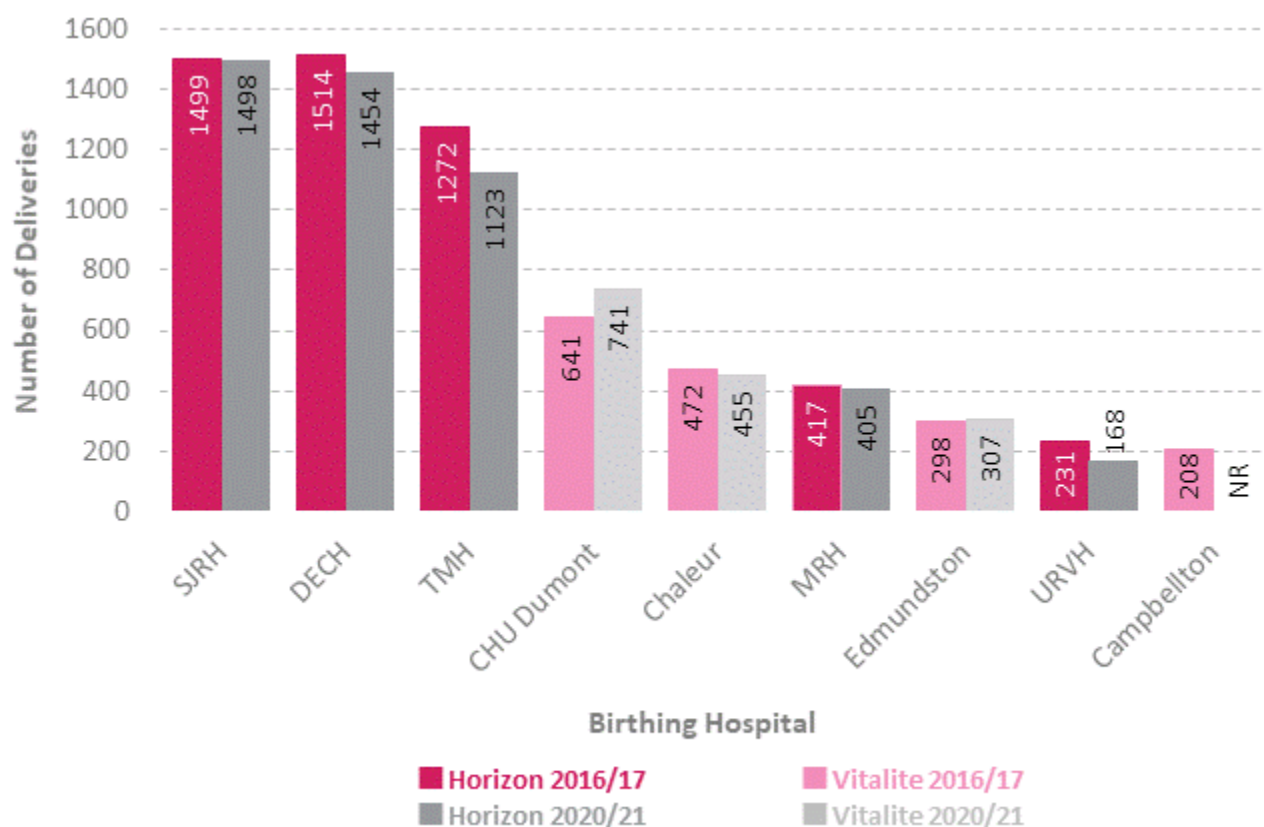


Figure 1.2: Number of deliveries, by birthing hospital, New Brunswick, 2016/17, 2020/21

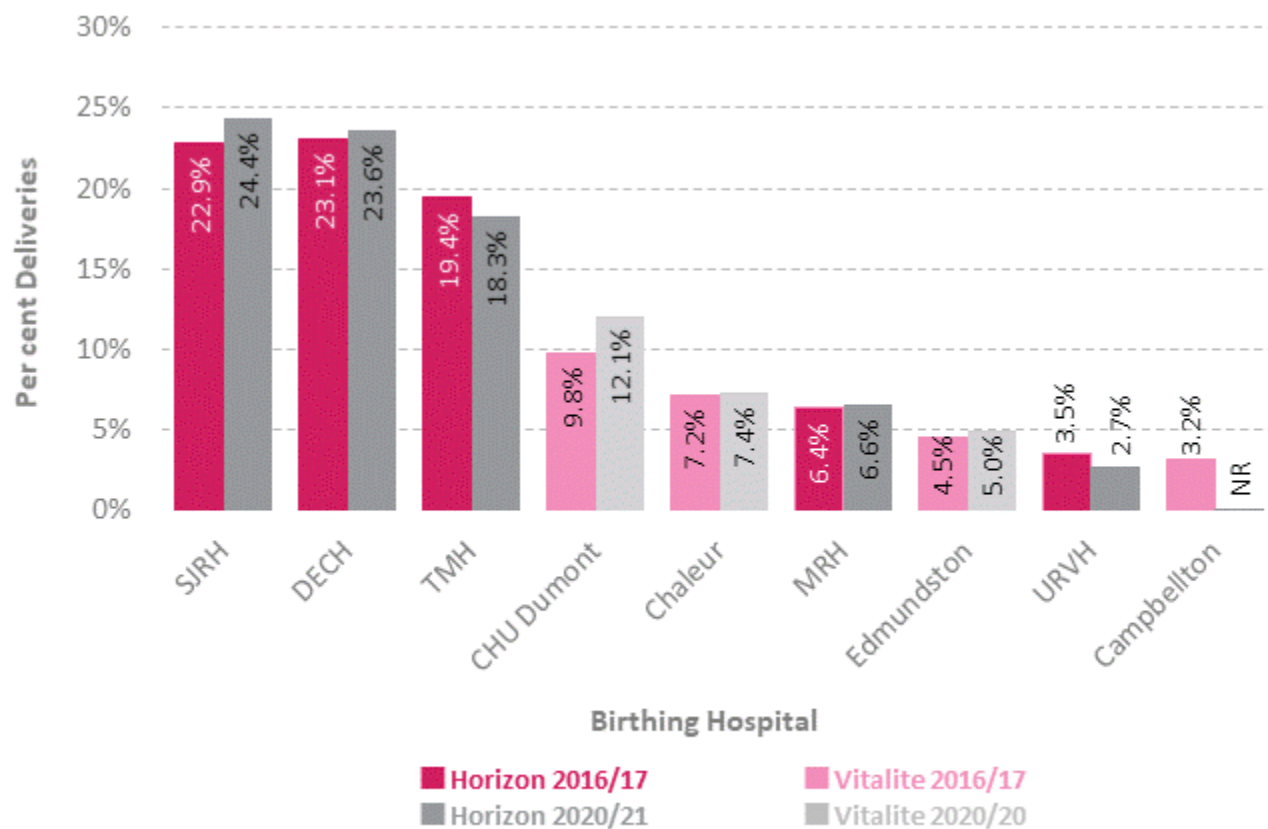


Figure 1.3: Percent of deliveries, by birthing hospital, New Brunswick, 2016/17, 2020/21

## Caregiver – Antenatally and at delivery

The primary provider delivering care to a woman can change between the antenatal period and at the time of delivery. The primary provider during the antenatal period is determined to be the person who provides the most care to a woman during her pregnancy, while the primary care provider at the time of delivery is determined to be the one who delivers the infant. Who delivers primary care in New Brunswick varies depending on region and the delivering facility. In rural northern communities most care is provided by family medicine, and in certain facilities there are obstetric clinics run by family medicine physicians. While in other locations, a woman may be followed by family medicine up to 32 weeks prior to being transferred to an obstetrician for the remainder of her pregnancy and her delivery.

In the past 5 years, antenatal care has remained steady with slightly more women receiving antenatal care from obstetricians than family medicine, while, most deliveries were done by Obstetricians. In 2017/18, a midwifery clinic in Fredericton opened with the first delivery done in November of 2017. By 2020/21, almost one percent of all deliveries in the province were done by a midwife. This is a new indicator as midwifery services has only been available in New Brunswick for less than 5 years.

### Definition

Number of deliveries by antenatal care provider/  
Total number of deliveries  
Number of deliveries by care provider at  
delivery/ Total number of deliveries

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

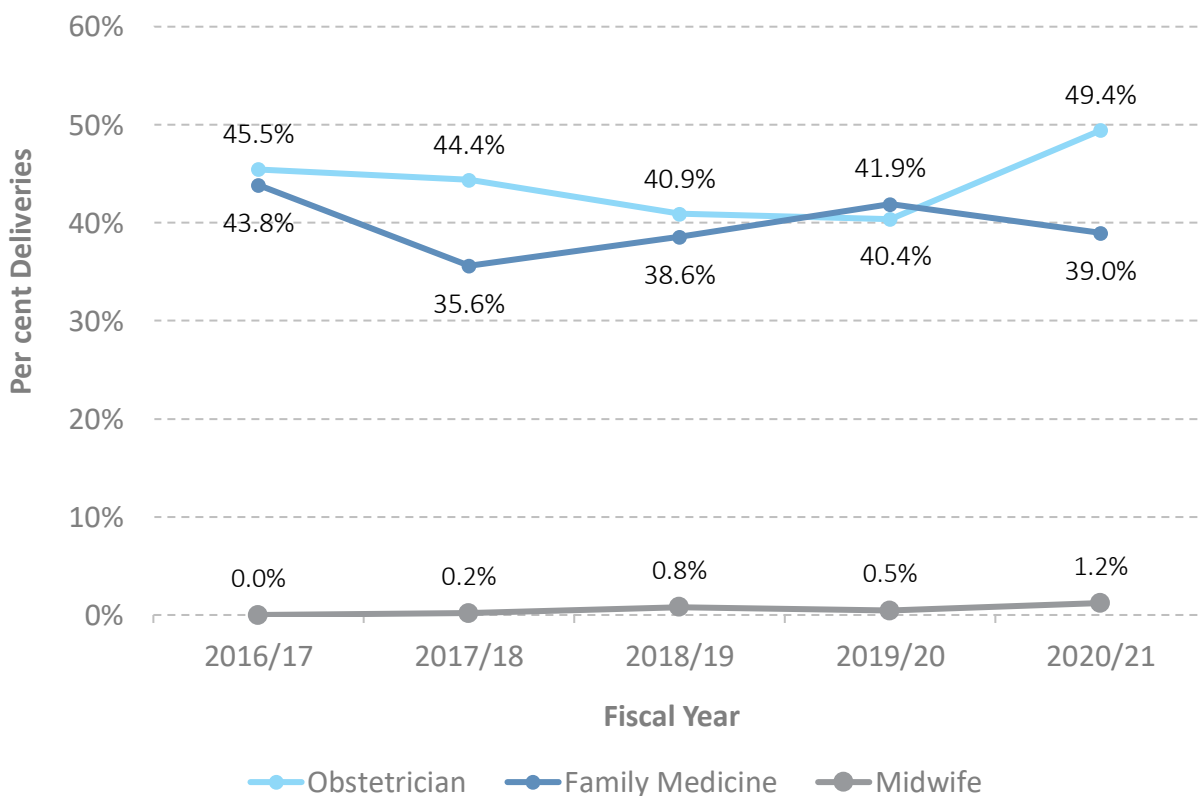


Figure 1.4: Proportion of deliveries by antenatal care provider, New Brunswick, 2016/17 to 2020/21

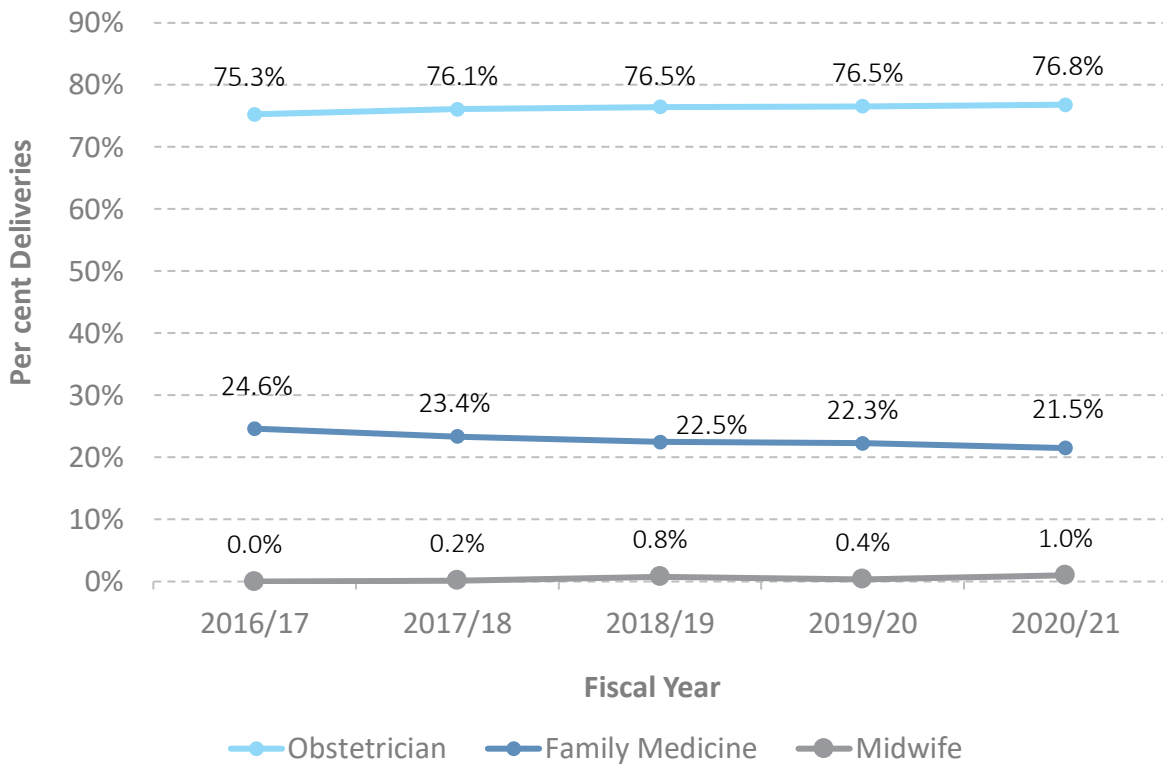


Figure 1.5: Proportion of deliveries by caregiver at delivery, New Brunswick, 2016/17 to 2020/21

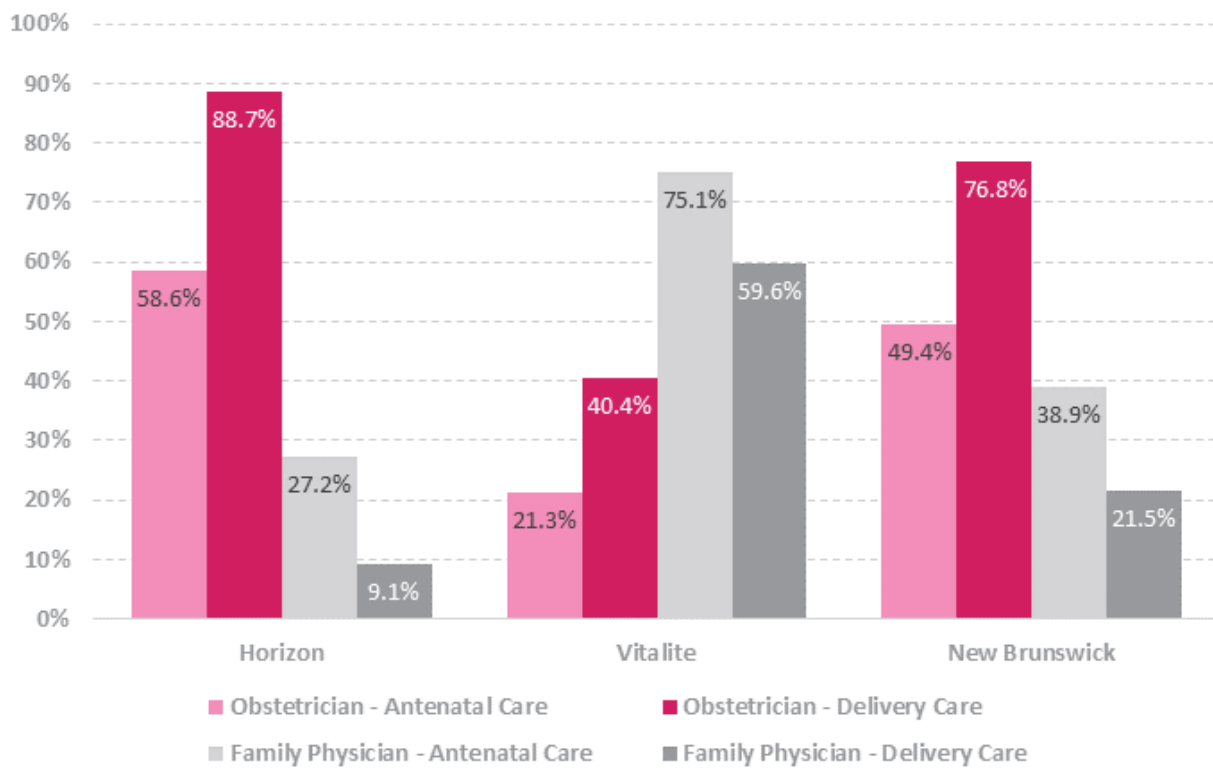


Figure 1.6: Proportion of deliveries by caregiver at delivery and antenatal care provider, by location, New Brunswick, 2020/21

## Midwifery Deliveries by Delivery Location

In late 2017/18 a midwifery practice opened in Fredericton. This practice allowed for home births as well as hospital births with a midwife for a care provider. In 2020/21, there were 74 midwife attended hospital births, and 32 midwifery attended home births.

Note: The significant decrease seen in 2019/20 was due staffing shortage.

### Definition

Number of midwifery deliveries by location of birth.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

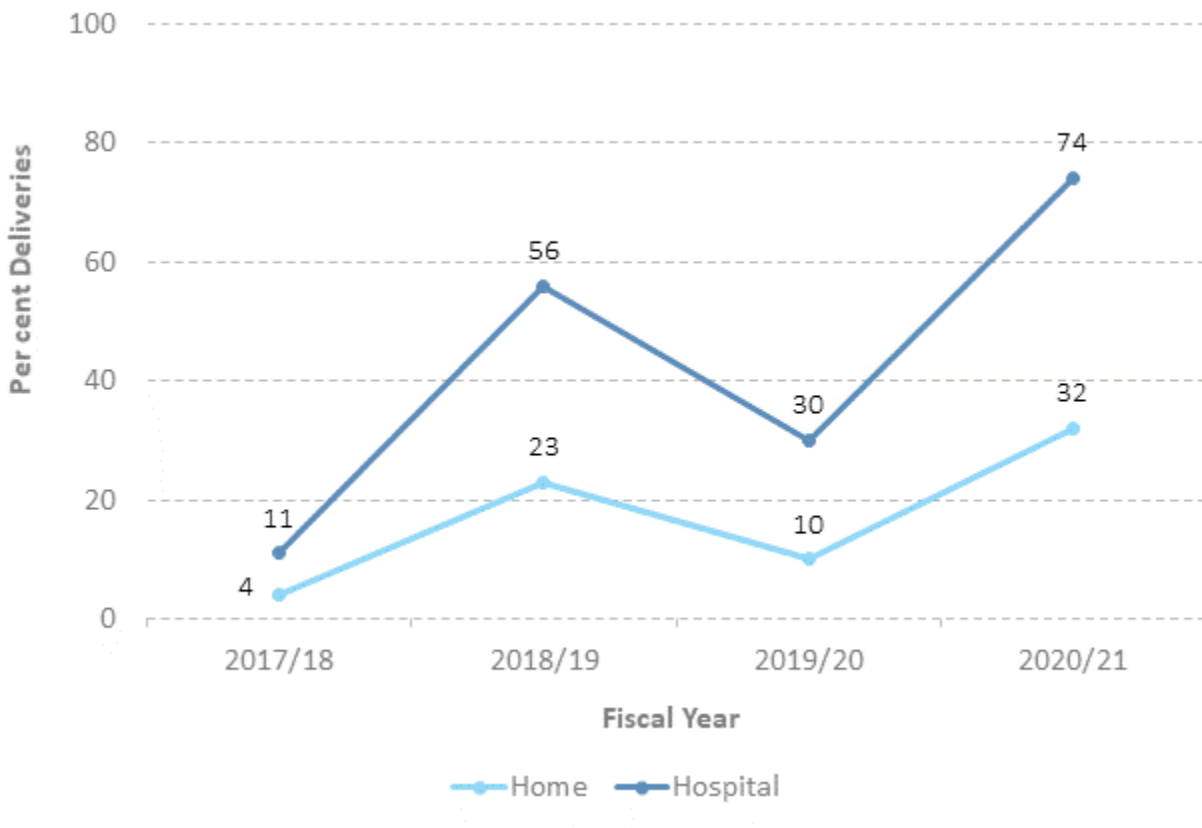


Figure 1.7: Midwifery Deliveries, by delivery location, New Brunswick, 2017/18 to 2020/21

## Maternal Age at Delivery

Between 2016/17 and 2020/21 there was a significant decrease in the per cent of deliveries to younger women (aged 20 to 24) from 19.7% (95% CI: 18.7-20.7%) in 2016/17 to 16.3% (95% CI: 15.4-17.2%). There was also an increase in the per cent of deliveries to older women (aged  $\geq 35$  years old) from 14.1% (95% CI: 13.3-15.0) in 2016/17 to 16.1% (95% CI: 15.2-17.0%) in 2020/21.

The rate of delivery to teens saw a decrease from 3.8% (95% CI: 3.3-4.3%) in 2016/17 to 2.8% (95% CI: 2.4-3.2%) in 2020/21. In Canada in 2017, the per cent of deliveries to teenage mothers aged 10-19 was 2.3%<sup>1</sup>.

### Definition

Number of deliveries to women within each age category at time of delivery / Total number of deliveries.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

### Reference

1. Centre for Surveillance and Applied Research, Public Health Agency of Canada. Perinatal Health Indicators, 2020 Edition. Public Health Infobase. Ottawa (ON): Public Health Agency of Canada, 2020.

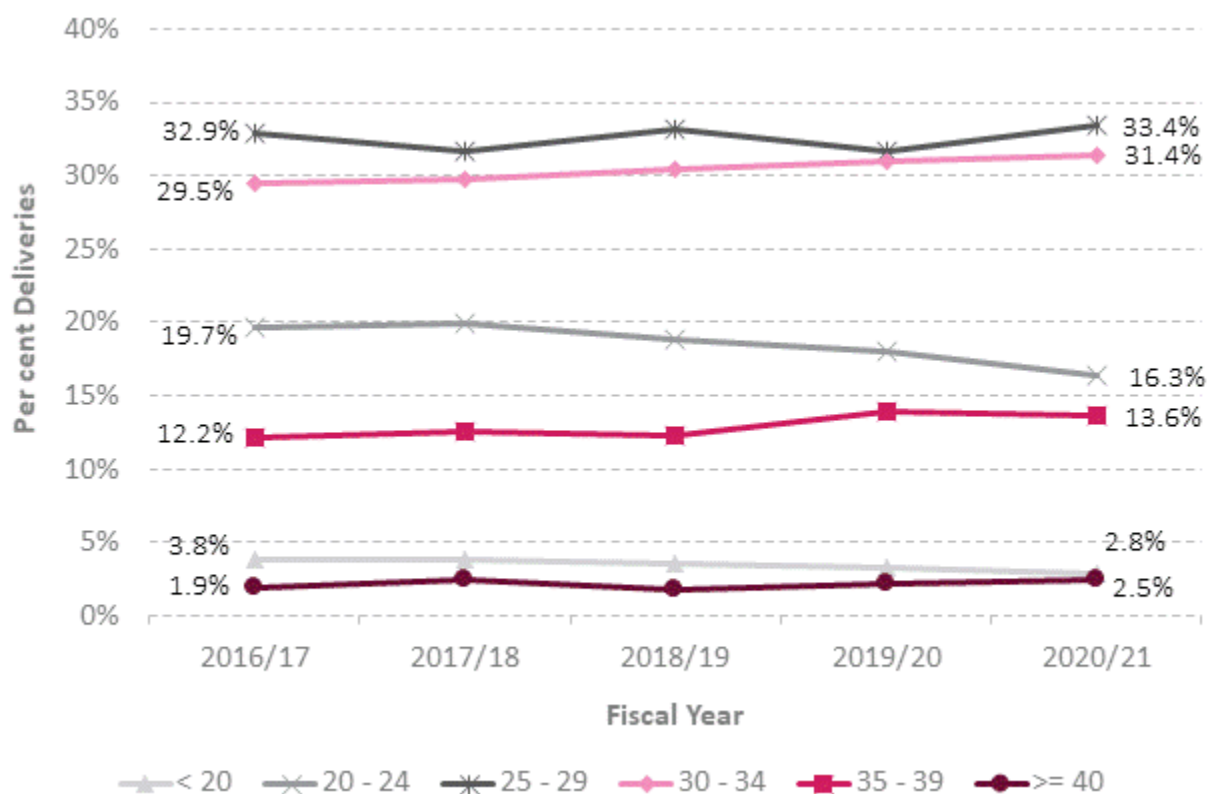


Figure 1.8: Maternal age at delivery, by age group, New Brunswick, 2016/17 to 2020/21



## Diabetes Mellitus in Pregnancy

The rate of pre-existing diabetes (Type 1 and Type 2) to delivering mothers increased slightly in the last five years from 0.88% (95% CI: 0.66-1.11%) in 2016/17 to 1.43% (95% CI: 1.13-1.73%) in 2020/21. The rate of gestational diabetes increased significantly from 6.90% (95% CI: 6.29-7.51%) in 2016/17 to 9.61% (95% CI: 8.87-10.34%) in 2020/21. In 2020/21 in NB, approximately 45% of women with gestational diabetes required insulin to help control their diabetes.

Women who experience gestational diabetes are at an increased risk of developing type 2 diabetes later in life<sup>1</sup>. As well, diabetes in pregnancy can cause newborns to be born with hypoglycemia and be large-for-gestational age<sup>1</sup>.

### Definition

Number of deliveries to women with pre-existing or gestational diabetes / Total number of deliveries.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

### Reference

1. Berger, H., Gagnon, R., Sermer, M. *Diabetes in Pregnancy*. Journal of Obstetrics and Gynaecology Canada, 38(7) p 667-679.

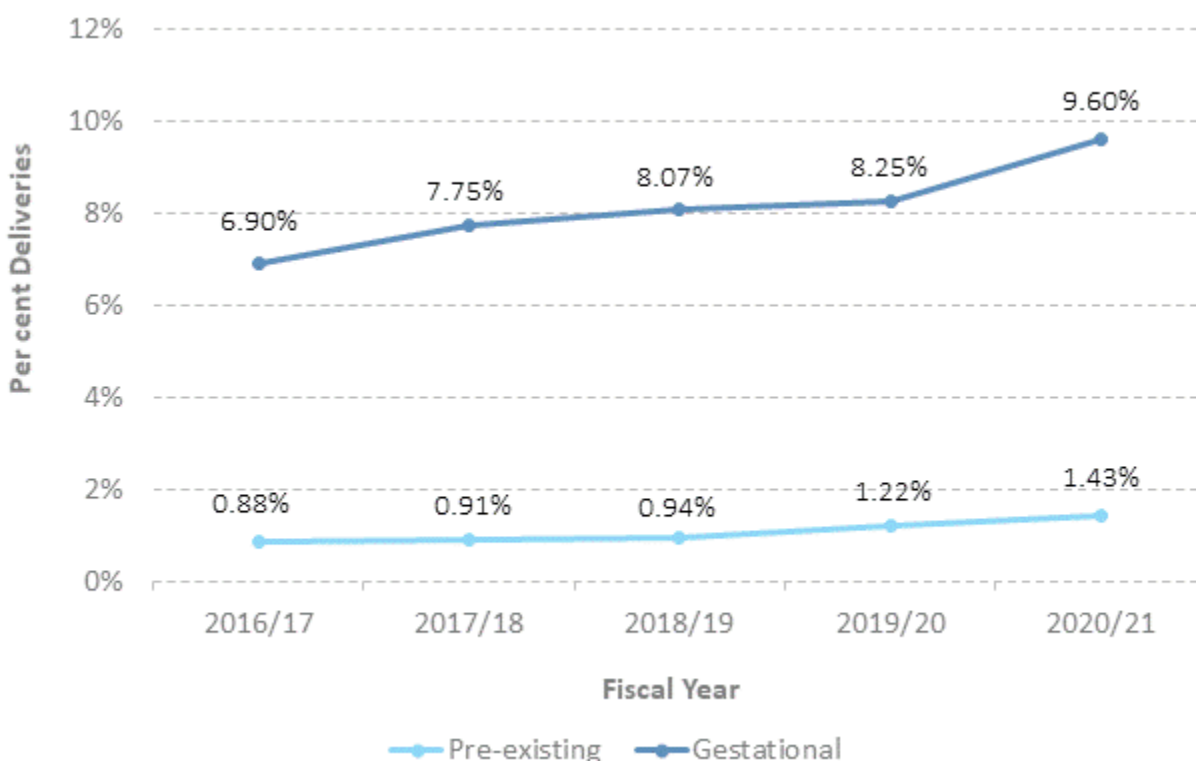


Figure 1.9: Per cent of women with diabetes during pregnancy, by type, New Brunswick, 2016/17 to 2020/21

## Hypertension in Pregnancy

Over the last five years there has been an increase in pre-existing hypertension, gestational hypertension and pre-eclampsia in pregnancy. There was a significant increase in the proportion of women who had gestational hypertension between 2016/17 and 2020/21 from 4.37% (95% CI: 3.87-4.86%) to 7.25% (95% CI: 6.60-7.89%). There has also been a significant increase in the proportion of women who had pre-eclampsia in pregnancy from 2.84% (95% CI: 2.44-3.24%) in 2016/17 to 3.78% (95% CI: 3.31-4.26%) in 2020/21. Note that a woman can have pre-eclampsia with either pre-existing and gestational hypertension.

Across Canada the incidence of hypertension (pre-existing, gestational and eclampsia) in pregnancy is around 7%<sup>1</sup>. The overall proportion of hypertension during pregnancy in New Brunswick is over 12% which is higher than the national proportion. Hypertension in pregnancy can cause pre-term delivery, fetal growth restriction and can impact neonatal morbidity and mortality<sup>1</sup>. There is also evidence that women who experience hypertension in pregnancy are at a higher risk for developing cardiovascular risk factors after pregnancy<sup>1</sup>.

### Definition

Number of deliveries to women with pre-existing or gestational hypertension or pre-eclampsia/  
Total number of deliveries.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

### Reference

1. Butalia, et al. *Hypertension Canada's 2018 Guidelines for the Management of Hypertension in Pregnancy*. Canadian Journal of Cardiology; (34): 526-531.

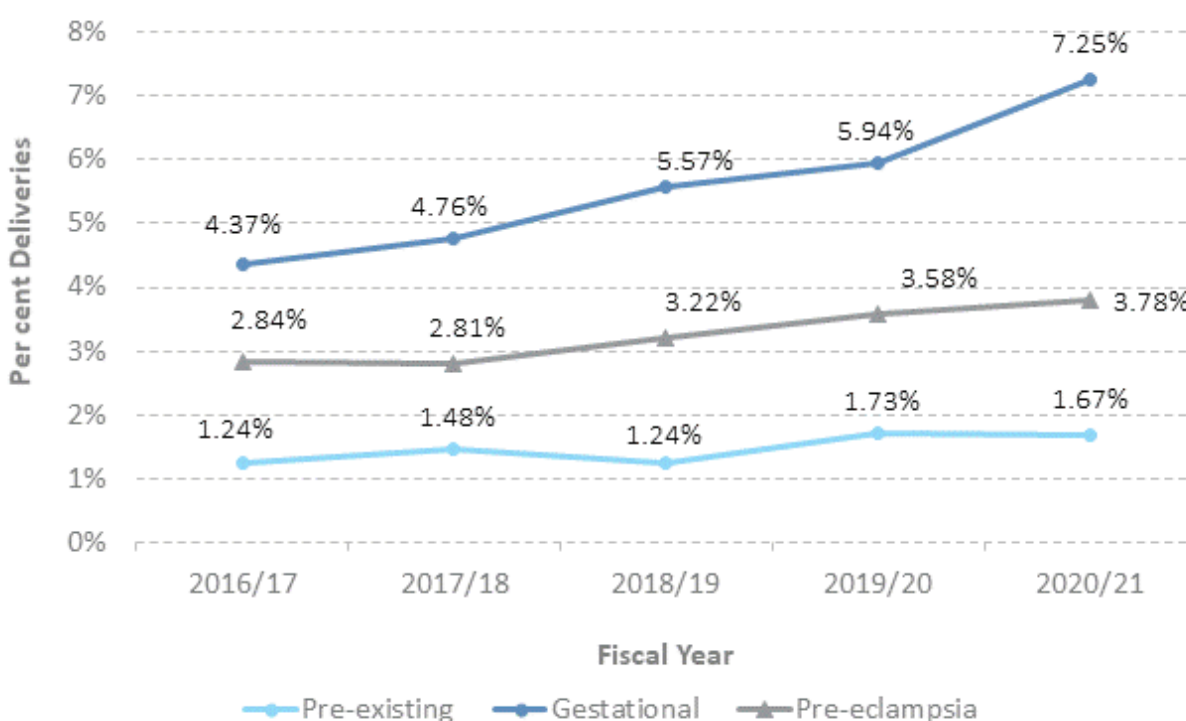


Figure 1.10: Per cent of women with hypertension during pregnancy, by type, New Brunswick, 2016/17 to 2020/21

## Smoking during Pregnancy

The proportion of smoking prior to pregnancy has remained steady, while the proportion of women who smoke during pregnancy has decreased slightly from 14.7% in 2016/17 (95% CI: 13.8-15.5%) to 12.7% in 2020/21 (95% CI: 11.9-13.6%). In 2012, the rate of smoking during pregnancy in Canada was 6.3% (95% CI: 3.8-8.8%)<sup>1</sup>.

It has been known for a number of years that smoking while pregnant can have a number of detrimental effects on infants. It has been shown to increase the risk of stillbirth and pre-term delivery, as well as an increased risk of infants born with a low birth weight<sup>2</sup>. Often women will stop smoking when they become pregnant, as is shown below. In 2020/21, 19.6% (95% CI: 18.6-20.6%) of women smoked prior to their pregnancy, while 12.7% (95% CI: 11.9-13.6%) of women continued to smoke while pregnant. Of the women who smoked prior to pregnancy approximately 35% stopped smoking when they became pregnant.

### Definition

Number of women who smoked prior to or during pregnancy / Total number of deliveries.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

### Reference

1. Canadian Tobacco Use Monitoring Survey (CTUMS) 2012: supplementary tables. Table 7: Smoking and pregnancy. Accessed from: <https://www.canada.ca/en/health-canada/services/publications/healthy-living/canadian-tobacco-use-monitoring-survey-2012-supplementary-tables.html#t7>. Accessed on: September 20, 2019.
2. Public Health Agency of Canada. Smoking cessation during pregnancy and relapse after childbirth in Canada Fact Sheet, 2016.

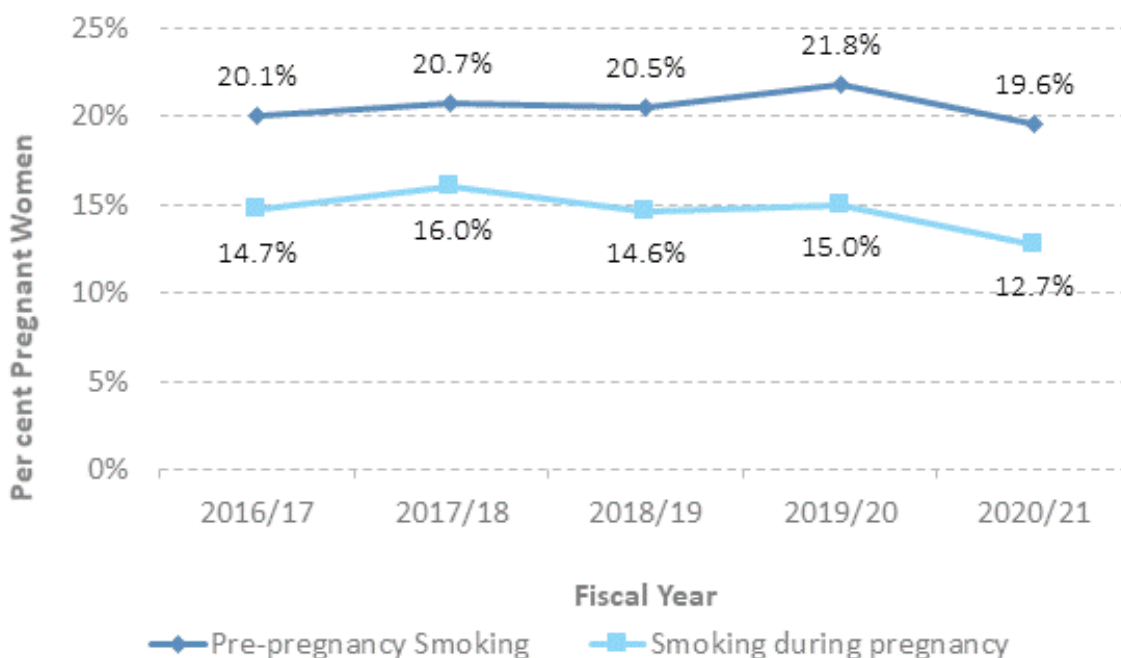


Figure 1.11: Per cent of women who smoked prior to pregnancy and during pregnancy, New Brunswick, 2016/17 to 2020/21

## Smoking during Pregnancy by Health Zone

In 2020/21, Health Zone 7 (Miramichi Area) had the highest proportion of women who smoked while pregnant at 16.9% (95% CI: 12.7-21.2%) and Health Zone 1 (Moncton Area) had the lowest proportion of women at 11.1% (95% CI: 9.6-12.6%).

### Definition

Number of women who smoked during pregnancy / Total number of deliveries.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

Table 1.1: Per cent of women who smoked during pregnancy, by Health Zone, New Brunswick, 2016/17 to 2020/21

Health Zone	Smoking During Pregnancy				
	2016/17	2017/18	2018/19	2019/20	2020/21
Health Zone 1 - Moncton and South-East	12.0%	11.0%	11.0%	12.7%	11.1%
Health Zone 2 - Fundy Shore and Saint John	14.9%	19.5%	16.0%	16.2%	12.6%
Health Zone 3 - Fredericton and River Valley	14.1%	14.1%	13.8%	14.1%	12.7%
Health Zone 4 - Madawaska and North-West	14.0%	17.4%	19.5%	18.7%	15.7%
Health Zone 5 - Restigouche	20.9%	21.9%	16.7%	19.9%	14.1%
Health Zone 6 - Bathurst and Acadian Peninsula	16.4%	22.0%	15.1%	15.9%	15.5%
Health Zone 7 - Miramichi	24.4%	21.9%	23.6%	18.7%	16.9%

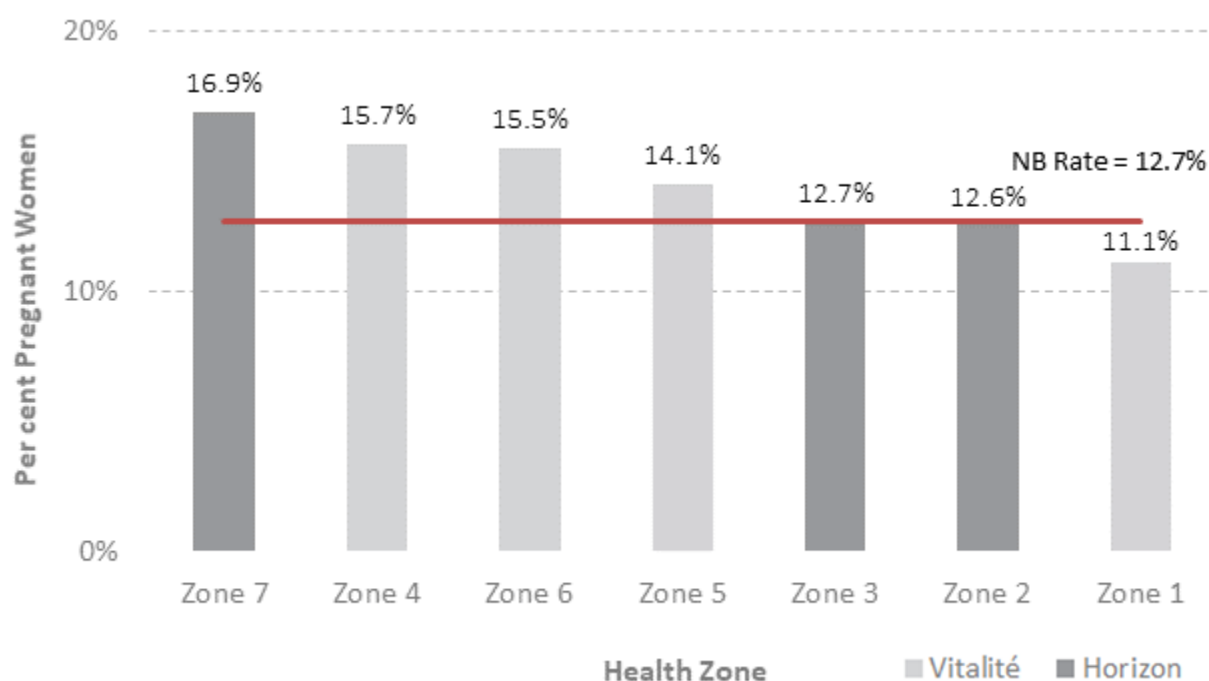


Figure 1.12: Per cent of women who smoked during pregnancy, by Health Zone, New Brunswick, 2020/21

## Alcohol Use during Pregnancy

Alcohol use during pregnancy can have serious effects upon the developing infant. Fetal Alcohol Spectrum Disorder is a well known disorder that effects the development of an infant's brain and body when exposed to alcohol while in the womb<sup>1</sup>. Obtaining a diagnosis for FASD can be difficult especially if it is unknown if the mother consumed alcohol during her pregnancy.

The rates of alcohol use in pregnancy across NB are quite low; less than 1% of women in NB reported consuming alcohol during their pregnancy. The national rate between 2003 and 2010 was 9.9% of women had consumed alcohol during pregnancy<sup>2</sup>. The potential reason for the low rates in the province could be due to how this question is being addressed in the antenatal period. Discussing alcohol use in pregnancy can be a very sensitive topic, and must be approached carefully to not cause shame, guilt or stigma<sup>3</sup>. The data in this field is well completed, but the follow-up questions of the amount of alcohol consumed are not. We encourage providers to discuss alcohol use and consumption in pregnancy with all pregnant women in their care.

The number of women who are drinking alcohol prior to pregnancy has increased significantly over the past 3 years. This is of note, as there is no safe time to consume alcohol in pregnancy, including in the first few weeks or months when a woman may not be aware that she is pregnant<sup>3</sup>.

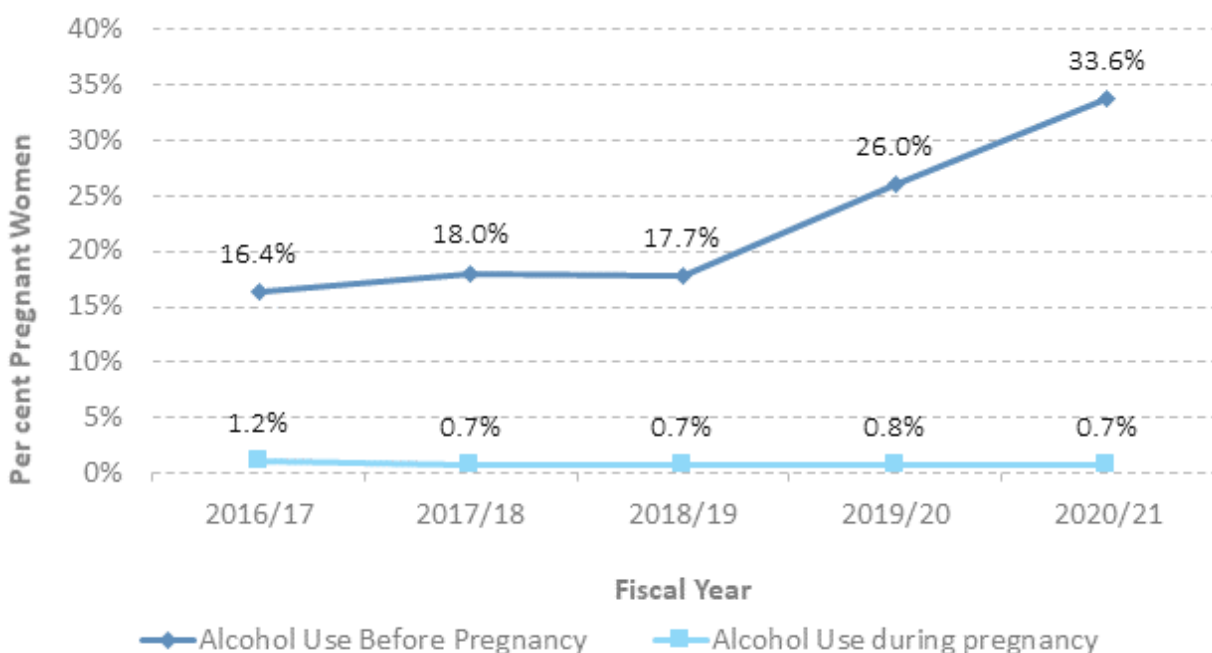


Figure 1.13: Per cent of women who drank alcohol prior to pregnancy and during pregnancy, New Brunswick, 2016/17 to 2020/21

### Definition

Number of women who drank alcohol prior to or during pregnancy / Total number of deliveries.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

### Reference

1. Canada FASD Research Network, <https://canfasd.ca/what-is-fasd/>. Accessed: October 4, 2021
2. Lang S, Quere M, Shield K, Rehm J, Popova S. Alcohol use and self-perceived mental health status among pregnant and breastfeeding women in Canada: a secondary data analysis. *BJOG* 2016;**123**:900-909.
3. Canada FASD Research Network. <https://canfasd.ca/wp-content/uploads/2018/01/Determining-Prenatal-Alcohol-Exposure-for-a-FASD-Diagnostic-Clinic.pdf>. Accessed: October 4, 2021

## Alcohol Use prior to Pregnancy by Health Zone

Alcohol use prior to pregnancy can be useful to look at, as approximately 27% of all Canadian women have an unplanned pregnancy<sup>1</sup>. These women may continue to consume alcohol during the early weeks of their pregnancy before they are aware that they are pregnant.

In 2020/21, the proportion of women across New Brunswick who drank alcohol prior pregnancy showed a significant increase from 2016/17, from 16.4% (95% CI:15.5-17.3%) to 33.6% (95% CI: 32.5-34.8%). The health zone with the highest rate of alcohol consumption prior to pregnancy was Zone 3, the Fredericton and River Valley area at 61.3% (95% CI: 58.9-63.7%), while the health zone with the lowest rate of alcohol use before pregnancy was Zone 2, the Fundy Shore and Saint John area at 9.8% (95% CI: 8.3-11.4%).

### Definition

Number of women who drank alcohol prior to pregnancy / Total number of deliveries.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

### References:

1. Oulman, E., Kim, T.H.M., Yunis, K. et al. Prevalence and predictors of unintended pregnancy among women: an analysis of the Canadian Maternity Experiences Survey. BMC Pregnancy Childbirth 15, 260 (2015).

Table 1.2: Per cent of women who drank alcohol prior to pregnancy, by Health Zone, New Brunswick, 2016/17 to 2020/21

Health Zone	Alcohol Use Before Pregnancy				
	2016/17	2017/18	2018/19	2019/20	2020/21
Health Zone 1 - Moncton and South-East	13.5%	11.2%	11.8%	22.9%	30.3%
Health Zone 2 - Fundy Shore and Saint John	8.0%	8.3%	7.5%	8.3%	9.8%
Health Zone 3 - Fredericton and River Valley	31.5%	36.0%	36.1%	46.2%	61.3%
Health Zone 4 - Madawaska and North-West	17.0%	41.3%	28.3%	NR	NR
Health Zone 5 - Restigouche	8.4%	15.1%	10.0%	33.8%	39.6%
Health Zone 6 - Bathurst and Acadian Peninsula	11.1%	9.2%	15.3%	29.4%	41.7%
Health Zone 7 - Miramichi	5.5%	2.6%	3.9%	6.9%	14.7%

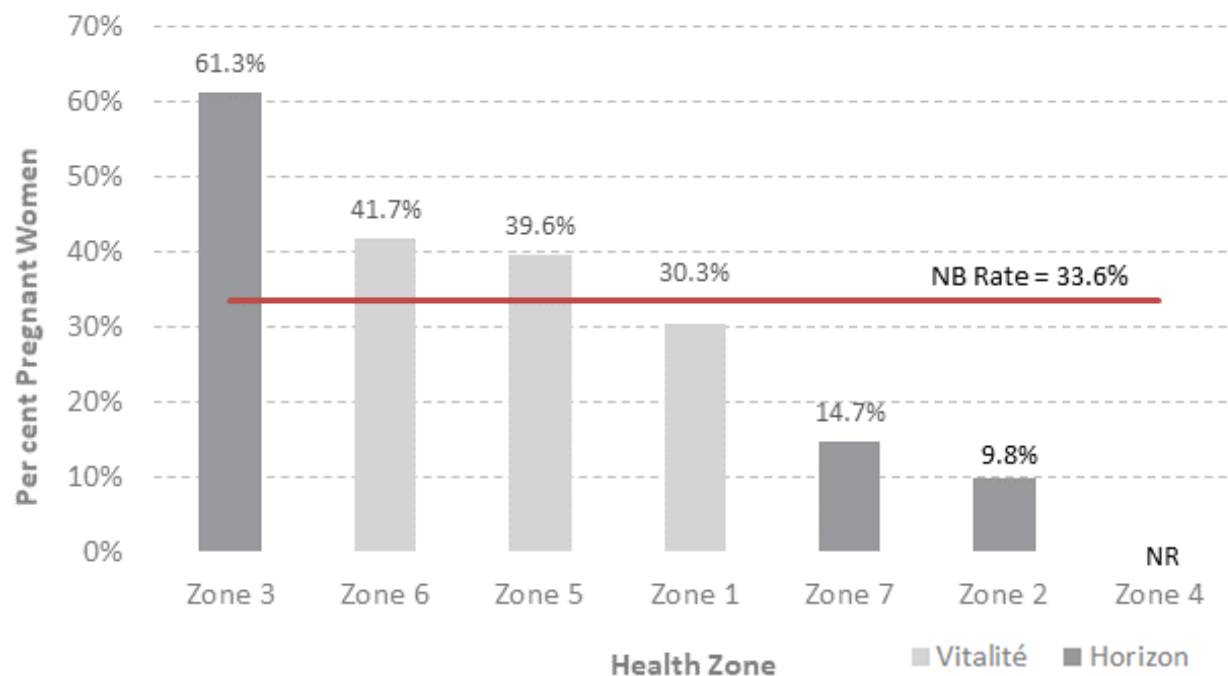


Figure 1.14: Per cent of women who drank alcohol prior to pregnancy, by Health Zone, New Brunswick, 2020/21



## Cannabis use during Pregnancy

The rate of women using cannabis while pregnant in New Brunswick significantly increased between 2016/17 and 2020/21, from 5.0% (95% CI: 4.5-5.6%) to 7.7% (95% CI: 7.1-8.4%).

Growing research looking at cannabis use in pregnancy has shown that the use of cannabis while pregnant could be associated with a risk of low birth weight, preterm labour and stillbirth<sup>1</sup>. With the legalization of cannabis in Canada in October 2018, it is very important to communicate this with pregnant women as there are risks of using cannabis while pregnant.

### Definition

Number of women who used cannabis during pregnancy / Total number of deliveries.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

### References

1. SOGC Legal Cannabis Not Worth Risk for Pregnancy Women  
<https://www.sogc.org/en/content/feature-news/legal-cannabis-not-work-risk.aspx>. Accessed on: October 4, 2021

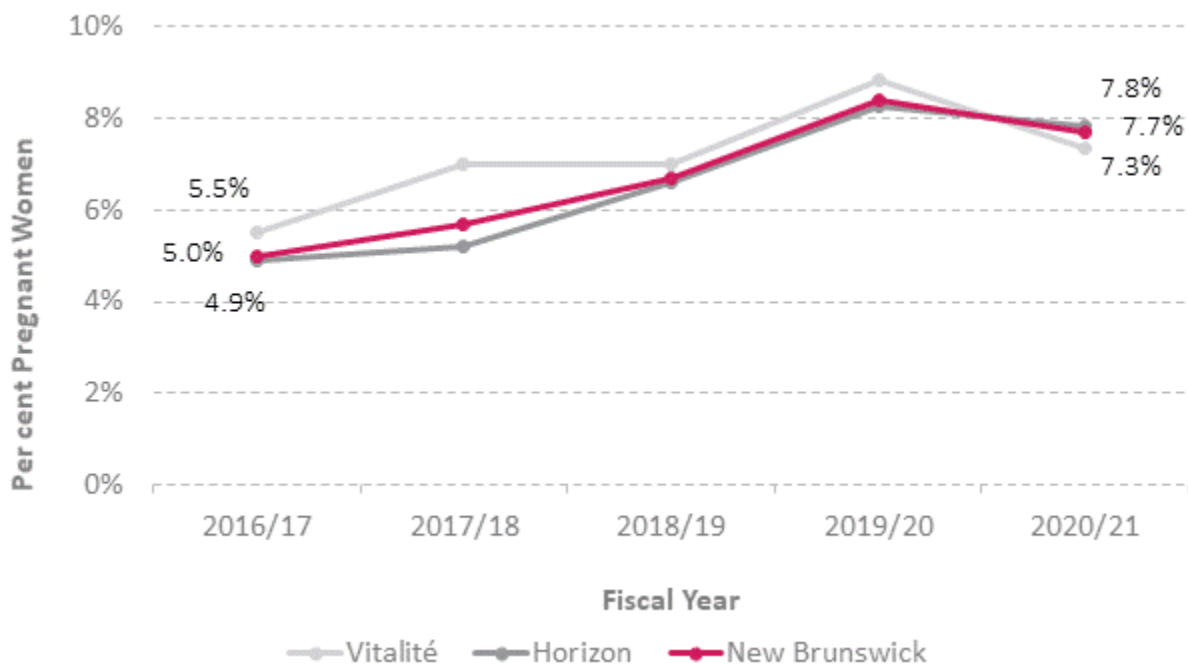


Figure 1.15: Per cent of mothers who used cannabis during pregnancy, by location, New Brunswick, 2016/17 to 2020/21

## Cannabis use during Pregnancy by Health Zone

In 2020/21, Health Zone 7 had the highest rate of cannabis use in pregnant at 9.0% (95% CI: 6.0-12.8%), while Health Zone 6 had the lowest rate at 4.5% (95% CI: 2.6-7.4%).

### Definition

Number of women who used cannabis during pregnancy / Total number of deliveries.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

Table 1.3: Per cent of women who used cannabis during pregnancy, by Health Zone, New Brunswick, 2016/17 to 2020/21

Health Zone	Cannabis Use				
	2016/17	2017/18	2018/19	2019/20	2020/21
Health Zone 1 - Moncton and South-East	5.4%	5.6%	7.1%	7.8%	7.9%
Health Zone 2 - Fundy Shore and Saint John	5.3%	6.9%	7.4%	9.2%	8.6%
Health Zone 3 - Fredericton and River Valley	4.8%	4.2%	6.7%	8.0%	7.3%
Health Zone 4 - Madawaska and North-West	3.4%	4.6%	5.5%	8.3%	8.6%
Health Zone 5 - Restigouche	5.1%	5.6%	8.3%	15.3%	6.0%
Health Zone 6 - Bathurst and Acadian Peninsula	4.0%	7.1%	3.8%	6.2%	4.5%
Health Zone 7 - Miramichi	5.5%	7.8%	6.0%	7.6%	9.0%

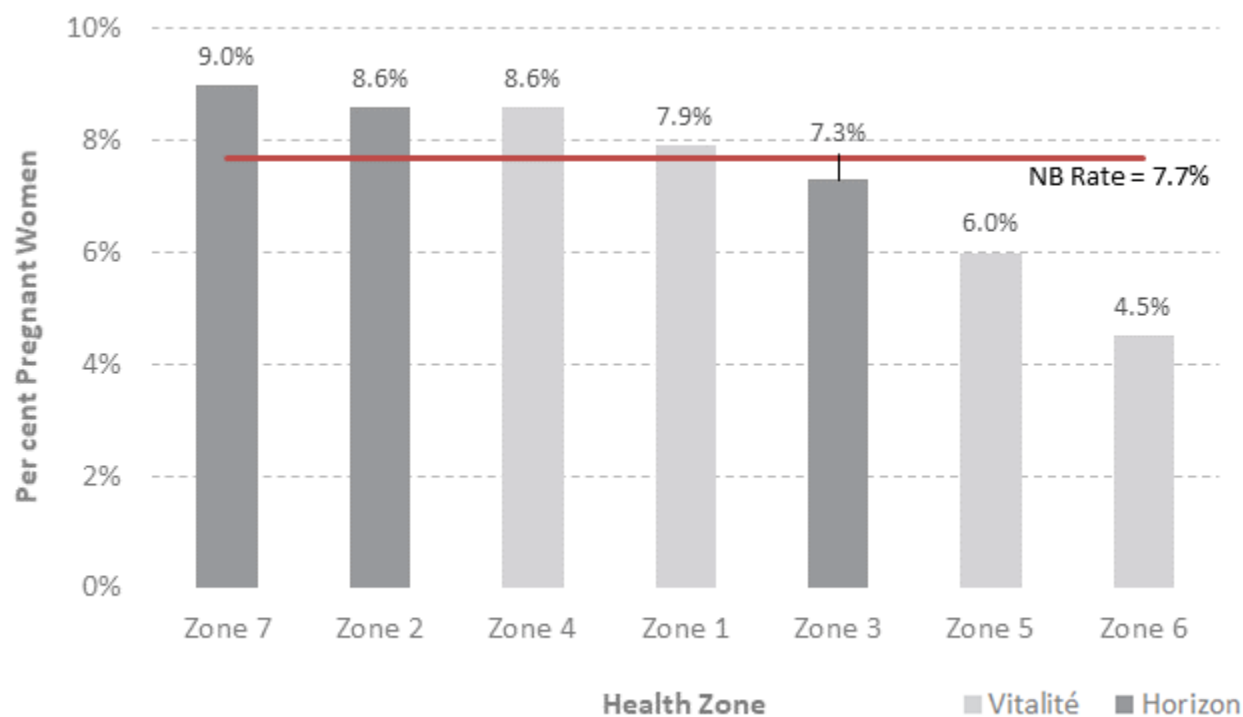


Figure 1.16: Per cent of women who used cannabis during pregnancy, by Health Zone, New Brunswick, 2020/21

## Pre-pregnancy BMI

The proportion of women who are obese (BMI  $\geq 30$ ) prior to becoming pregnant in New Brunswick is 26.5% (95% CI: 25.4-27.7%), which is significantly higher than in 2016/17 (23.7% (95% CI: 22.6-24.7%). As well, the proportion of women who are overweight (BMI between 25.0-29.9) before their pregnancy significantly increased from 20.6% (95% CI: 19.6-21.6%) in 2016/17 to 23.8% (95% CI: 22.7-24.9%) in 2020/21.

Women who are obese are at a greater risk of developing diabetes or hypertension during their pregnancy<sup>1</sup>. Obesity per the WHO BMI categorization is anyone with a Body Mass Index greater than or equal to 30. Whereas, clinically it may be more relevant to look at women with a BMI greater than or equal to 40 when assessing risks to the fetus.

### Definition

Number of women who had a BMI <18.5, 18.5-24.5, 25.0-29.9,  $\geq 30$  before becoming pregnant / Total number of deliveries.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

### References

1. Catalano, P.M., *The impact of gestational diabetes and maternal obesity on the mother and her offspring*. J Dev Orig Health Dis. 2010 Aug; 1 (4): 208-215.

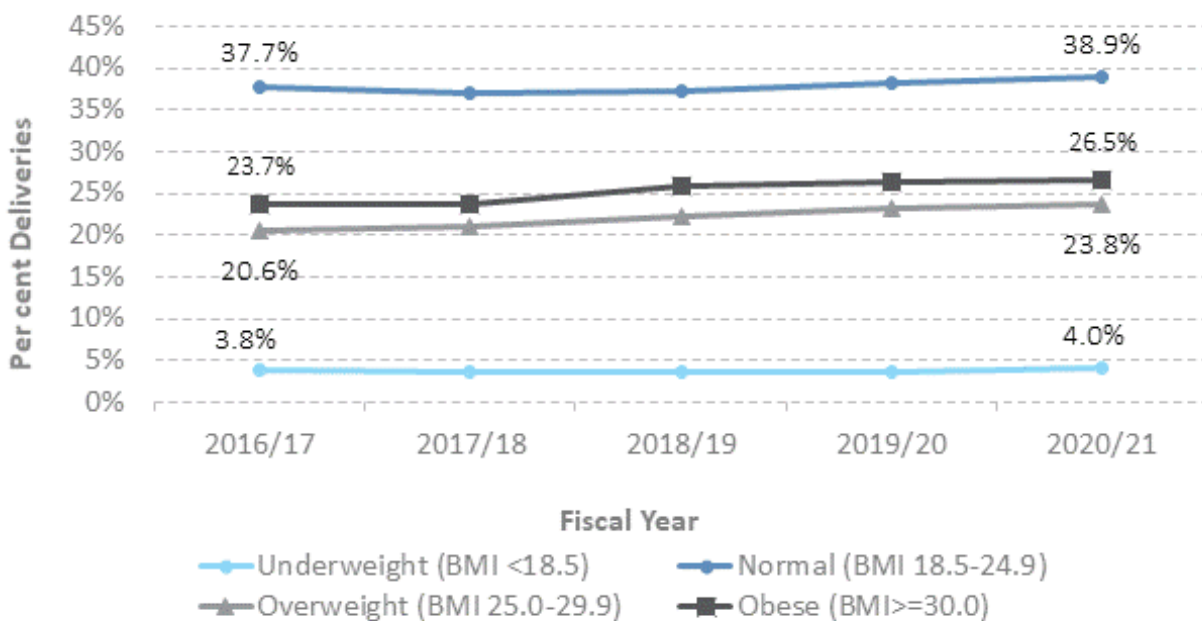


Figure 1.17: Pre-pregnancy BMI, by category, New Brunswick, 2016/17 to 2020/21

## Pre-pregnancy BMI $\geq 30$ by Health Zone

In 2020/21, Health Zone 6 had the highest proportion of women who a pre-pregnancy BMI greater than or equal to 30 at 30.8%, while Health Zone 4 had the lowest proportion at 22.0%.

### Definition

Number of women who had a BMI  $\geq 30.0$  before becoming pregnant / Total number of deliveries.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

Table 1.4: Per cent of women with a pre-pregnancy BMI  $\geq 30$ , by Health Zone, New Brunswick, 2016/17 to 2020/21

Health Zone	Pre-pregnancy BMI $\geq 30$				
	2016/17	2017/18	2018/19	2019/20	2020/21
Health Zone 1 - Moncton and South-East	20.5%	22.0%	23.3%	24.4%	23.6%
Health Zone 2 - Fundy Shore and Saint John	24.8%	21.0%	25.8%	27.1%	28.9%
Health Zone 3 - Fredericton and River Valley	25.2%	26.2%	28.7%	26.7%	27.8%
Health Zone 4 - Madawaska and North-West	22.6%	24.6%	22.5%	29.0%	22.0%
Health Zone 5 - Restigouche	15.2%	24.0%	25.6%	24.2%	24.2%
Health Zone 6 - Bathurst and Acadian Peninsula	28.9%	26.1%	27.4%	31.6%	30.8%
Health Zone 7 - Miramichi	27.7%	30.6%	23.8%	23.3%	24.7%

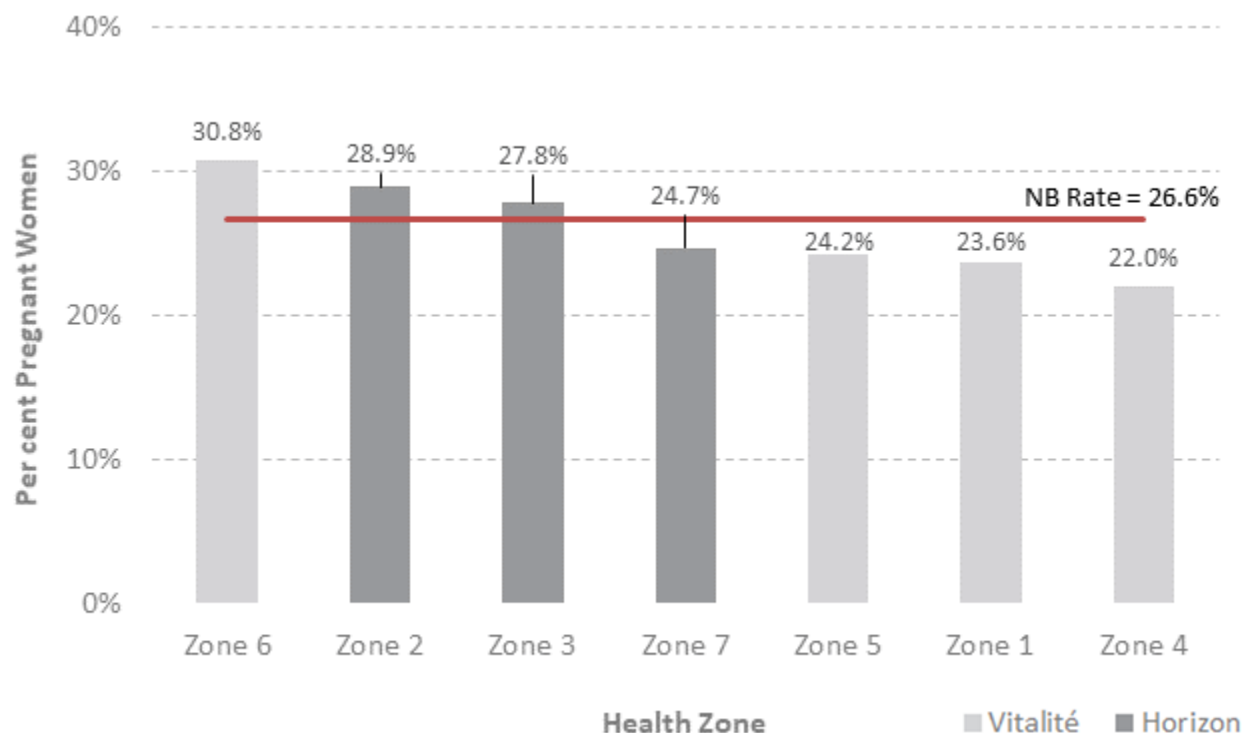


Figure 1.18: Per cent of women with a pre-pregnancy BMI  $\geq 30$ , by Health Zone, New Brunswick, 2020/21

## Pre-pregnancy BMI $\geq 40$ by Health Zone

In 2020/21, Health Zone 6 had the highest proportion of women with a pre-pregnancy BMI greater than or equal to 40 at 6.3%, while Health Zone 7 had the lowest proportion with 4.3%.

### Definition

Number of women who had a BMI  $\geq 40.0$  before becoming pregnant / Total number of deliveries.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

Table 1.5: Per cent of women with a pre-pregnancy BMI  $\geq 40$ , by Health Zone, New Brunswick, 2016/17 to 2020/21

Health Zone	Pre-pregnancy BMI $\geq 40$				
	2016/17	2017/18	2018/19	2019/20	2020/21
Health Zone 1 - Moncton and South-East	4.6%	4.9%	5.5%	5.7%	4.9%
Health Zone 2 - Fundy Shore and Saint John	5.4%	4.4%	5.8%	6.1%	6.2%
Health Zone 3 - Fredericton and River Valley	4.8%	5.7%	4.8%	5.3%	5.2%
Health Zone 4 - Madawaska and North-West	5.3%	4.9%	3.7%	7.9%	4.5%
Health Zone 5 - Restigouche	4.5%	8.4%	5.0%	8.9%	NR
Health Zone 6 - Bathurst and Acadian Peninsula	7.5%	6.7%	8.2%	9.6%	6.3%
Health Zone 7 - Miramichi	6.9%	9.8%	5.7%	5.3%	4.3%

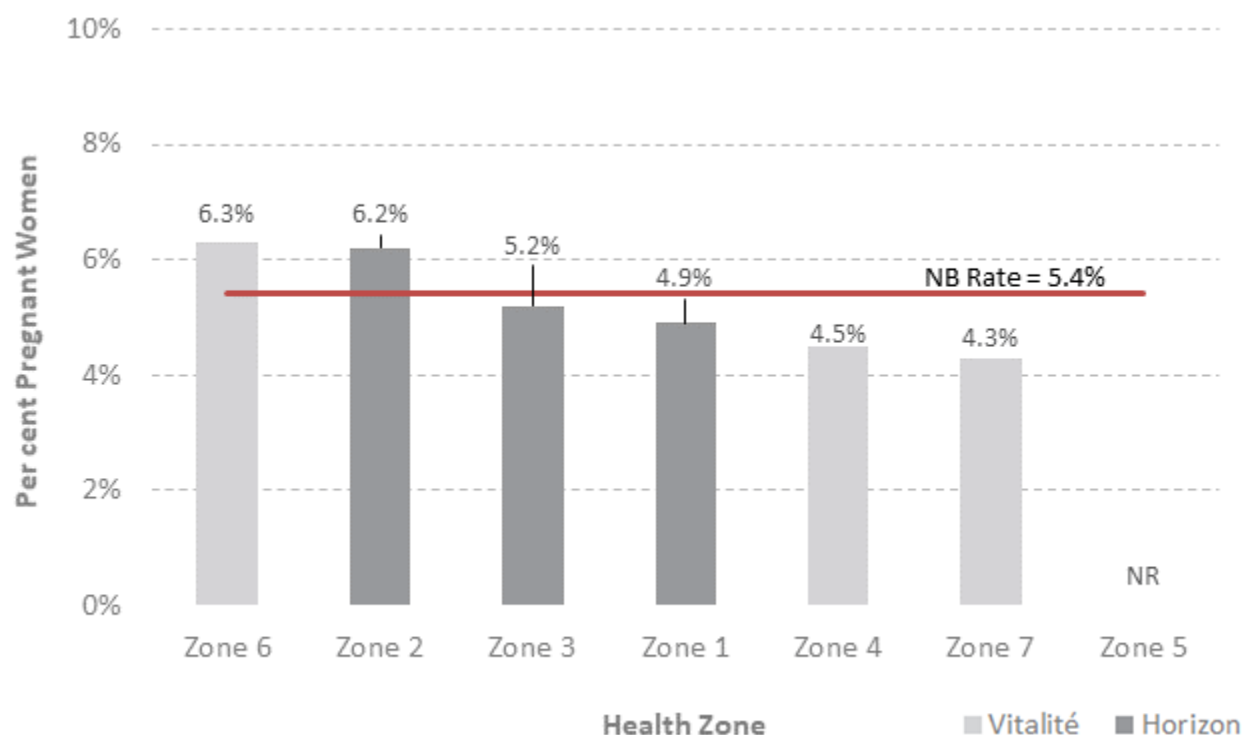


Figure 1.19: Per cent of women with a pre-pregnancy BMI  $\geq 40$ , by Health Zone, New Brunswick, 2020/21

## Chapter 2 Labour and Delivery

### C-Section Rate by Birthing Hospital

In 2020/21, the c-section rate in New Brunswick was 29.2% (95% CI: 28.0-30.3%). The hospital with the highest c-section rate was Dr. Everett Chalmers Regional Hospital at 37.0% (95% CI: 34.4-39.4%), and the hospital with the lowest rate was Saint John Regional Hospital at 20.3% (95% CI: 18.3-22.4%). Between 2017/18 and 2020/21, Chaleur Regional Hospital has seen a significant decrease in their C-Section Rate, from 39.1% (95% CI: 34.4-44.0%) in 2017/18 to 27.3% (95% CI: 23.2-31.3%) in 2020/21.

#### Definition

Number of C-section deliveries performed at each birthing hospital / Total number of deliveries performed at each birthing hospital.

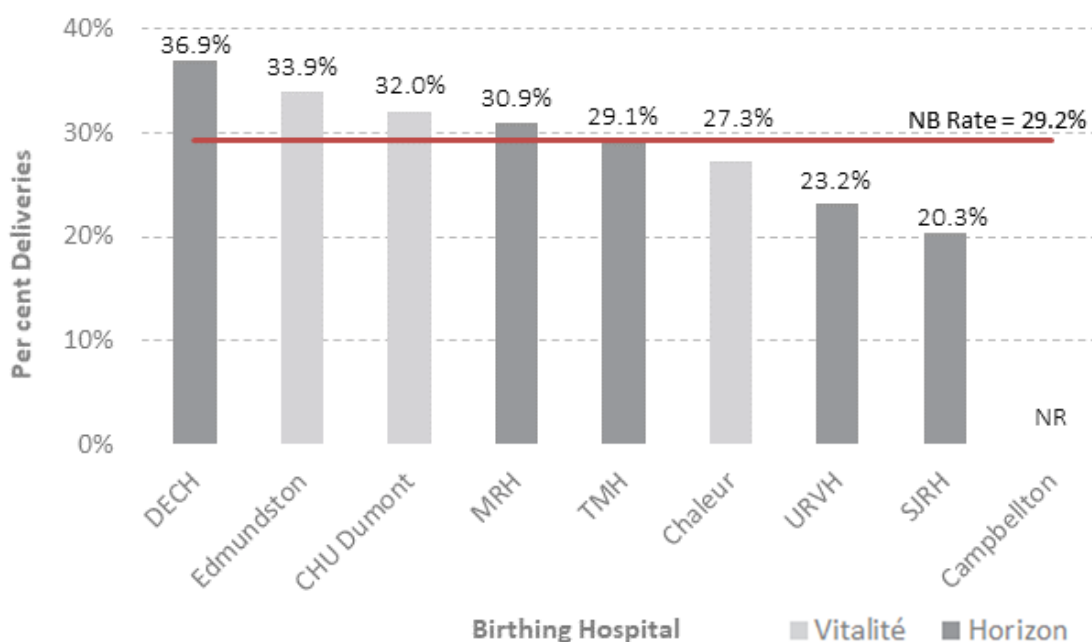
#### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

Table 2.1: Percent of deliveries by C-section, by birthing hospital, New Brunswick, 2016/17 to 2020/21

Birthing Facility	C-Section Rate				
	2016/17	2017/18	2018/19	2019/20	2020/21
Campbellton Regional Hospital	29.3%	30.3%	32.9%	29.1%	NR
Chaleur Regional Hospital	33.7%	39.1%	33.8%	32.5%	27.3%
Dr. Everett Chalmers Regional Hospital	28.9%	32.2%	31.9%	33.0%	36.9%
Dr. Georges-L.-Dumont University Hospital Centre	34.5%	28.5%	31.4%	29.8%	32.0%
Edmundston Regional Hospital	28.9%	32.7%	28.0%	29.1%	33.9%
Miramichi Regional Hospital	31.9%	32.3%	34.2%	34.0%	30.9%
The Moncton Hospital	28.6%	32.2%	31.8%	28.2%	29.1%
Saint John Regional Hospital	19.9%	19.5%	18.4%	22.1%	20.3%
Upper River Valley Hospital	24.2%	26.5%	26.0%	21.5%	23.2%

Figure 2.1: Per cent of deliveries by C-section, by birthing hospital, New Brunswick, 2020/21



## Primary and Repeat C-Section Rate

The rate of primary c-section across New Brunswick has seen a slight increase between 2016/17 and 2020/21 from 18.1% (95% CI: 17.1-19.2%) to 20.1% (95% CI: 19.0-21.2%). While the rate of repeat c-section has seen a slight decrease between 2016/17 and 2020/21 from 84.1% (95% CI: 81.6-86.4%) to 80.6% (95% CI: 77.9-83.1%). Nationally, in 2019/20 the primary c-section rate was 20.2% (20.0-20.3%), and the repeat c-section rate is 82.2% (95% CI: 81.9-82.5%)<sup>1</sup>.

### Definition

**Primary C-Section Rate:** Number of primary C-sections / Number of deliveries to women who have not had a previous C-section.

**Repeat C-section Rate:** Number of repeat C-sections / Number of deliveries to women who have had at least one previous C-section.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

### Reference

1. Canadian Institute for Health Information. Hospitalization and Childbirth, 1995–1996 to 2019–2020 — Supplementary Statistics. Ottawa, ON: CIHI; 2021.

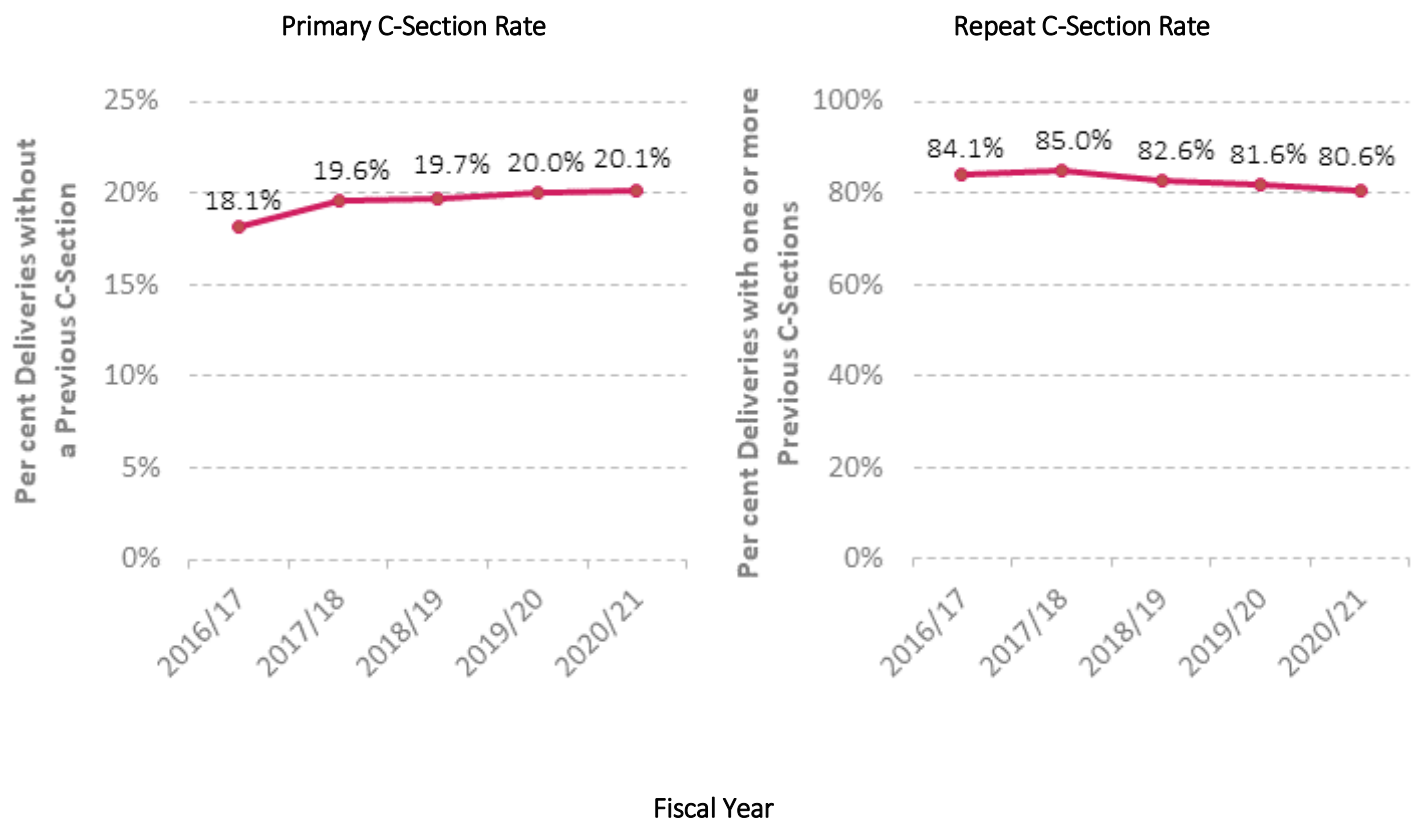


Figure 2.2: Percent of Primary and Repeat C-sections, New Brunswick, 2016/17 to 2020/21

## Vaginal Birth after C-Section (VBAC)

The proportion of women attempting a vaginal birth after a c-section has increased slightly from 19.3% (95% CI: 16.8-21.9%) in 2016/17 to 23.9% (95% CI: 21.2-26.7%) in 2020/21. The VBAC success rate has remained steady at 82.5% (95% CI: 76.2-87.7%) in 2016/17 and 80.6% (95% CI: 74.8-85.6%) in 2020/21. In 2020/21, Saint John Regional Hospital had the highest VBAC attempt rate at 40.7% (95% CI: 33.5-48.2%), and the second highest VBAC success rate at 86.5% (95% CI: 76.6-94.3%).

SOGC recommends that a trial of labour after caesarean (TOLAC) be offered to all women with 1 previous caesarean if there are no contraindications (including the type of previous caesarean incision, previous major uterine reconstruction, and previous uterine rupture)<sup>1</sup>.

### Definition

**Crude VBAC Rate:** Number of VBAC deliveries / Number of deliveries with a previous C-section.

**Attempted VBAC Rate:** Number of attempted (failed or successful) VBAC deliveries / Number of deliveries with a previous C-section.

**VBAC Success Rate:** Number of VBAC deliveries / Number of attempted VBAC deliveries.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

### Reference:

1. Dy, J., DeMeester, S., Lipworth, H., Barrett, J. No. 382-Trial of Labour After Caesarean. J Obstet Gynaecol Can 2019; 41(7): 992-1011.

Table 2.2: VBAC crude rate, VBAC attempt rate, and VBAC success rate, New Brunswick, 2016/17 to 2020/21

Measure	VBAC Deliveries				
	2016/17	2017/18	2018/19	2019/20	2020/21
Crude VBAC Rate	15.9%	14.9%	17.3%	18.4%	19.3%
VBAC Attempt Rate	19.3%	17.4%	21.2%	23.1%	23.9%
VBAC Success Rate	82.5%	85.5%	82.0%	79.6%	80.6%

Table 2.3: VBAC crude rate, VBAC attempt rate, and VBAC success rate, by birthing hospital, New Brunswick, 2020/21

Birthing Facility	VBAC Deliveries by Birthing Hospital		
	Crude VBAC Rate	VBAC Attempt Rate	VBAC Success Rate
Campbellton Regional Hospital	0.0%	0.0%	0.0%
Chaleur Regional Hospital	10.9%	16.4%	66.7%
Dr. Everett Chalmers Regional Hospital	10.6%	14.4%	73.7%
Dr. Georges-L. Dumont University Centre Hospital	25.6%	28.2%	90.9%
Edmundston Regional Hospital	NR	14.9%	NR
Miramichi Regional Hospital	16.1%	25.8%	22.2%
The Moncton Hospital	20.0%	24.3%	82.2%
Saint John Regional Hospital	35.2%	40.7%	86.5%
Upper River Valley Hospital	0.0%	0.0%	0.0%



## Low-Risk Term Repeat C-sections Between 37 and 39 Weeks Gestation

A low risk term repeat c-section is defined as any repeat c-section (i.e. no attempt at a trial of labour) in low risk pregnancies at term prior to 39 weeks gestation. 'Low Risk' is defined singleton deliveries to mothers without any obstetrical or maternal complications in pregnancy, including placenta previa, malpresentation of fetus or abnormal lie, hypertension, pre-eclampsia, eclampsia, diabetes mellitus, disproportion or abnormality of maternal pelvic organs, fetal abnormalities or problems, and decreased fetal movements.

This rate has remained steady in New Brunswick between 2016/17 at 28.7% (95% CI: 24.6-33.2%) and 2020/21 at 28.8% (95% CI: 24.4-33.5%). This rate should hypothetically be 0 as there is no medical reason to perform a low-risk repeat c-section prior to 39 weeks.

It is recommended that low-risk repeat c-sections not be completed prior to 39 weeks gestation as there can be an increased risk of adverse outcomes, such as increased rate of mechanical ventilation, newborn sepsis, hypoglycemia, and admission to neonatal ICU<sup>1</sup>.

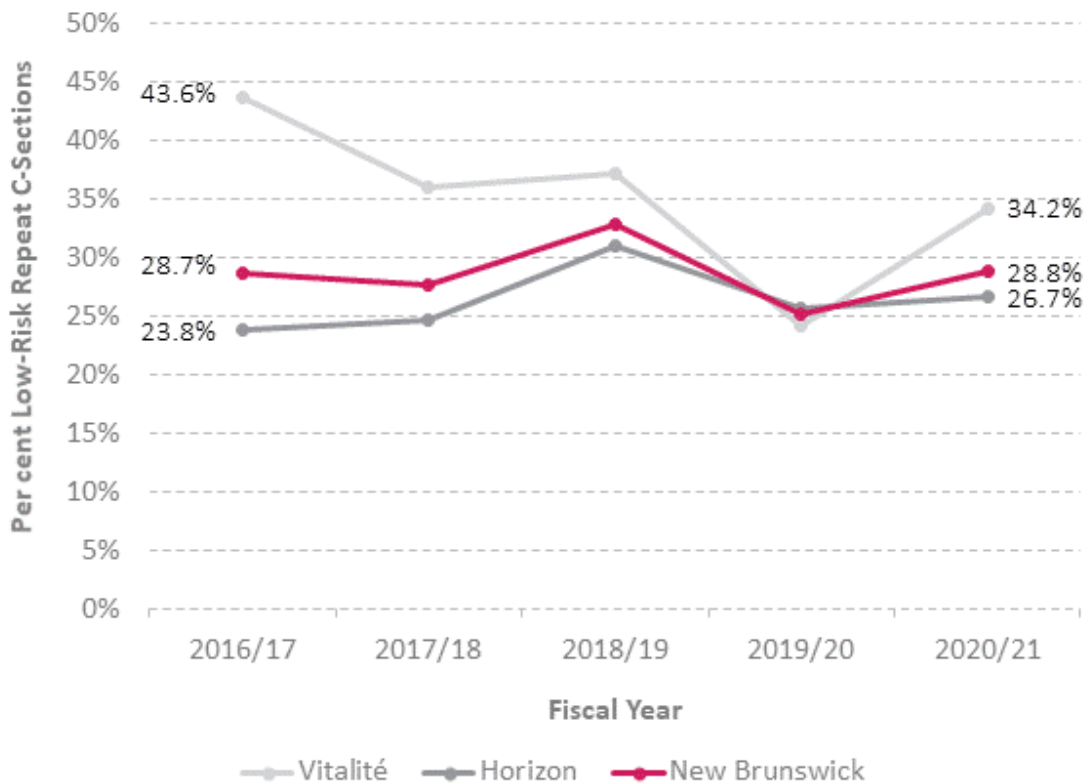


Figure 2.3: Percent of term low-risk repeat C-sections delivered between 37 and 39 weeks gestation, by location, 2016/17 to 2020/21

#### Definition

Number of low-risk elected repeat C-sections delivered between 37 and 39 weeks gestation (37+0 to 38+6) / Total number of low-risk elected repeat C-sections delivered at term ( $\geq 37$  weeks gestation).

#### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

#### Reference

1. Tita, et al. *Timing of Elective Repeat Cesarean Delivery at Term and Neonatal Outcomes*. The New England Journal of Medicine; 360(2).

## Low-Risk Term Repeat C-Sections Between 37 and 39 Weeks Gestation by Birthing Hospital

Table 2.4: Per cent of term low-risk repeat c-sections delivered between 37 and 39 weeks gestation, by birthing hospital, 2016/17 to 2020/21

Birthing Facility	Low-Risk Term Repeat C-Sections 37-39 Weeks				
	2016/17	2017/18	2018/19	2019/20	2020/21
Campbellton Regional Hospital	NR	NR	NR	NR	0.0%
Chaleur Regional Hospital	51.6%	39.0%	50.0%	34.5%	34.6%
Dr. Everett Chalmers Regional Hospital	21.0%	23.0%	28.2%	18.0%	20.0%
Dr. Georges-L.-Dumont University Hospital Centre	44.0%	44.1%	37.0%	28.9%	34.4%
Edmundston Regional Hospital	50.0%	31.8%	NR	0.0%	33.3%
Miramichi Regional Hospital	56.4%	50.0%	55.0%	66.7%	40.7%
The Moncton Hospital	25.9%	27.7%	30.0%	25.4%	27.1%
Saint John Regional Hospital	11.9%	20.0%	19.5%	25.9%	38.3%
Upper River Valley Hospital	NR	NR	NR	NR	0.0%

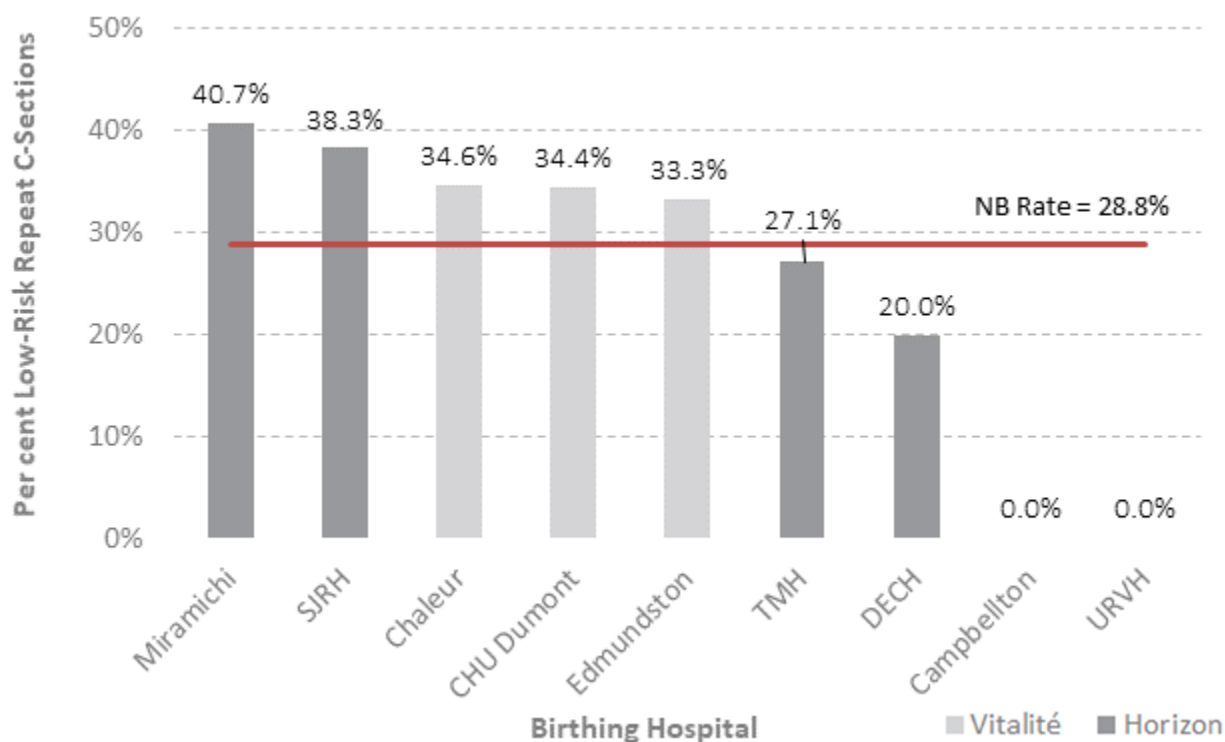


Figure 2.4: Per cent of term low-risk repeat c-sections delivered between 37 and 39 weeks gestation, by birthing hospital, 2020/21

## Episiotomy Rate in Singleton Vaginal Deliveries

The rate of episiotomy in singleton vaginal deliveries has significantly decreased between 2016/17 and 2020/21, from 11.1% (95% CI: 1.2-12.0%) to 8.8% (95% CI: 8.0-9.7%). The hospital with the highest episiotomy rate in SVD in 2020/21 was Edmundston Regional Hospital at 23.2% (95% CI: 17.5-29.6%). The hospital with the lowest rate was Saint John Regional Hospital at 4.6% (95% CI: 3.4-5.9%).

An episiotomy is an incision made in the perineum during childbirth, often used during an operative vaginal delivery such as the use of forceps or vacuum. Research has shown that there is no evidence supporting routine use of episiotomy<sup>1</sup>.

### Definition

Number of singleton vaginal deliveries that received an episiotomy / Total number of singleton vaginal deliveries.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

### References

1. SOGC joint policy statement on normal childbirth, 2008; Carroli G, Mignini L. *Episiotomy for vaginal birth*. Cochrane Database Syst Rev 2009; (1): CD000081

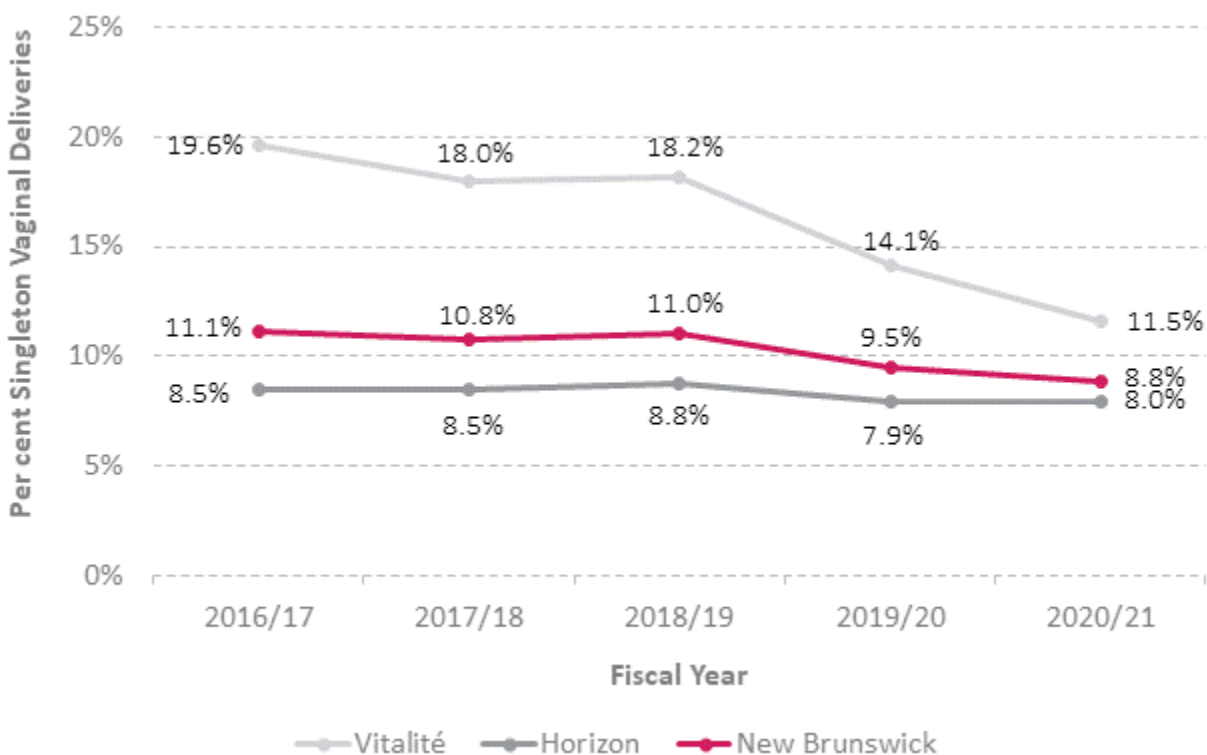


Figure 2.5: Rate of episiotomy in singleton vaginal deliveries, by location, 2016/17 to 2020/21

## Episiotomy Rate in Singleton Vaginal Deliveries by Birthing Hospital

Table 2.5: Episiotomy rate in singleton vaginal deliveries, by birthing hospital, 2016/17 to 2020/21

Birthing Facility	Episiotomy				
	2016/17	2017/18	2018/19	2019/20	2020/21
Campbellton Regional Hospital	47.6%	51.3%	46.1%	24.3%	NR
Chaleur Regional Hospital	18.4%	15.9%	15.1%	11.5%	7.0%
Dr. Everett Chalmers Regional Hospital	8.5%	8.0%	9.0%	8.4%	8.8%
Dr. Georges-L. Dumont Hospital	6.7%	6.5%	5.2%	9.7%	9.6%
Edmundston Regional Hospital	27.4%	21.2%	28.7%	22.3%	23.2%
Miramichi Regional Hospital	9.5%	8.6%	9.9%	13.6%	13.7%
The Moncton Hospital	12.9%	12.9%	12.8%	10.9%	10.0%
Saint John Regional Hospital	5.9%	6.7%	6.5%	5.0%	4.6%
Upper River Valley Hospital	NR	NR	NR	NR	9.3%

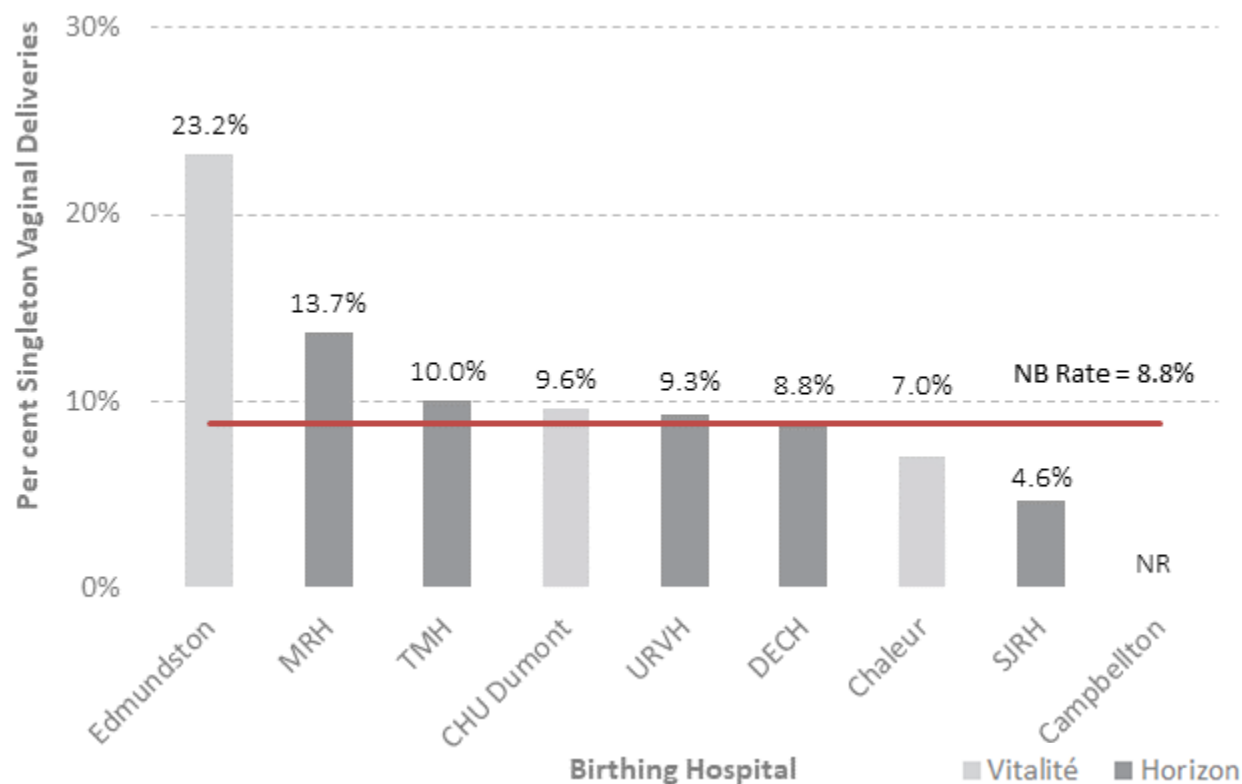


Figure 2.6: Episiotomy rate in singleton vaginal deliveries, by birthing hospital, 2020/21

## Operative Vaginal Delivery in Singleton Deliveries

The rate of operative vaginal delivery in New Brunswick has significantly increased from 10.9% (95% CI: 10.0-11.8%) in 2016/17 to 12.9% (95% CI: 12.0-14.0%) in 2020/21. The hospital with the highest rate of operative vaginal delivery in 2020/21 was Miramichi Regional Hospital at 36.8% (95% CI: 31.1-42.8%) of all singleton vaginal deliveries. The hospital with the lowest rate was Dr. Georges-L.-Dumont Hospital University Centre at 3.6% (95% CI: 2.1-5.6%). Nationally, in 2019/20 the operative vaginal delivery rate was 12.6% (95% CI: 12.5-12.8%).

An operative vaginal delivery is any vaginal delivery that uses forceps or vacuum to help deliver the baby. Operative vaginal deliveries can lead to higher rates of maternal birth trauma<sup>1</sup>.

### Definition

Number of singleton deliveries that received an operative delivery/ Total number of singleton vaginal deliveries.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

### References

1. Muraca, G., et al. *Ecological association between operative vaginal delivery and obstetric and birth trauma*. CMAJ: 190 (24).

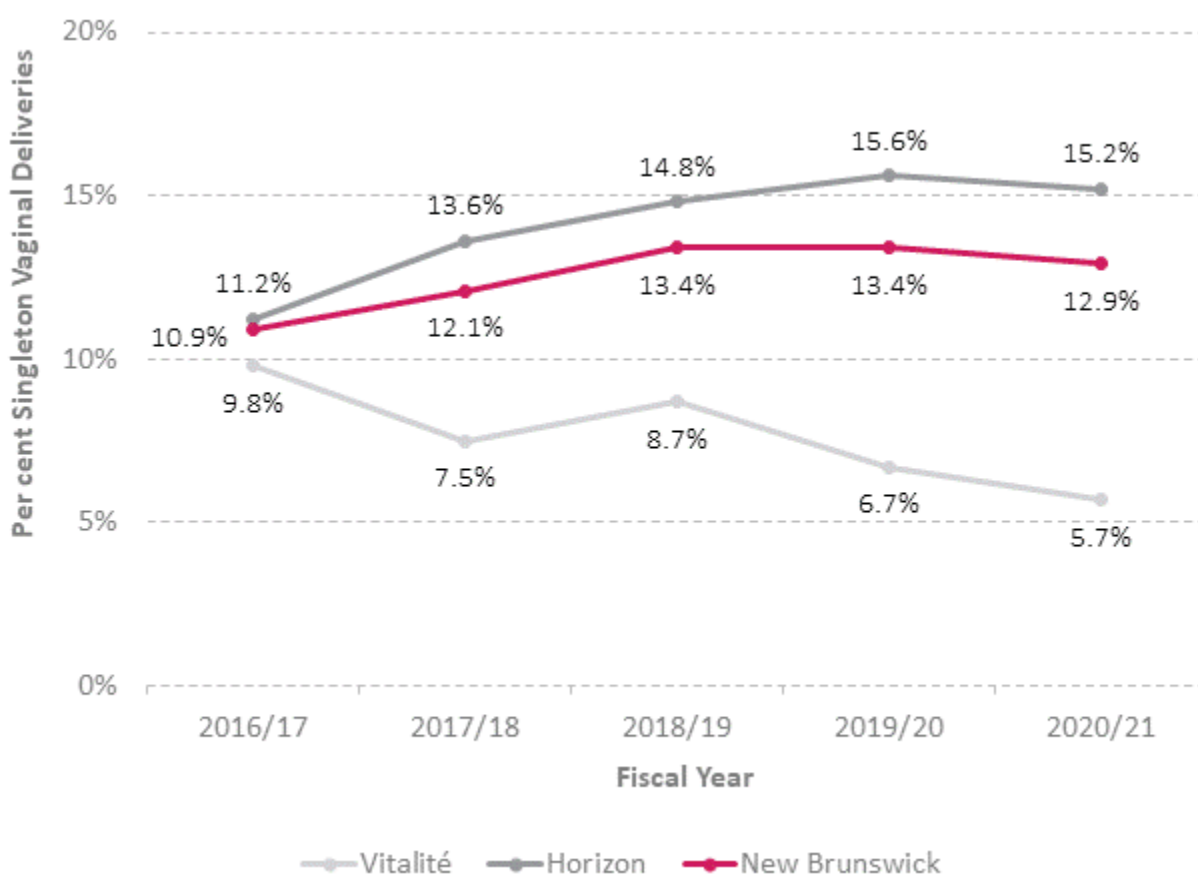


Figure 2.7: Rate of operative vaginal delivery in singleton deliveries, by location, 2016/17 to 2020/21

## Operative Vaginal Delivery Rate in Singleton Deliveries by Birthing Hospital

Table 2.6: Operative Vaginal Delivery rate in singleton deliveries, by birthing hospital, 2016/17 to 2020/21

Birthing Facility	Operative Vaginal Delivery				
	2016/17	2017/18	2018/19	2019/20	2020/21
Campbellton Regional Hospital	8.8%	5.8%	5.7%	13.0%	NR
Chaleur Regional Hospital	10.0%	11.5%	9.5%	5.2%	4.6%
Dr. Everett Chalmers Regional Hospital	6.5%	9.0%	8.5%	9.6%	9.0%
Dr. Georges-L.-Dumont University Hospital Centre	5.5%	3.7%	8.2%	4.2%	3.6%
Edmundston Regional Hospital	18.4%	12.3%	17.5%	11.2%	11.8%
Miramichi Regional Hospital	31.2%	27.9%	29.0%	36.8%	36.8%
The Moncton Hospital	15.5%	19.0%	23.0%	23.0%	21.4%
Saint John Regional Hospital	8.4%	11.7%	12.3%	12.3%	11.2%
Upper River Valley Hospital	4.6%	6.3%	5.4%	4.5%	10.9%

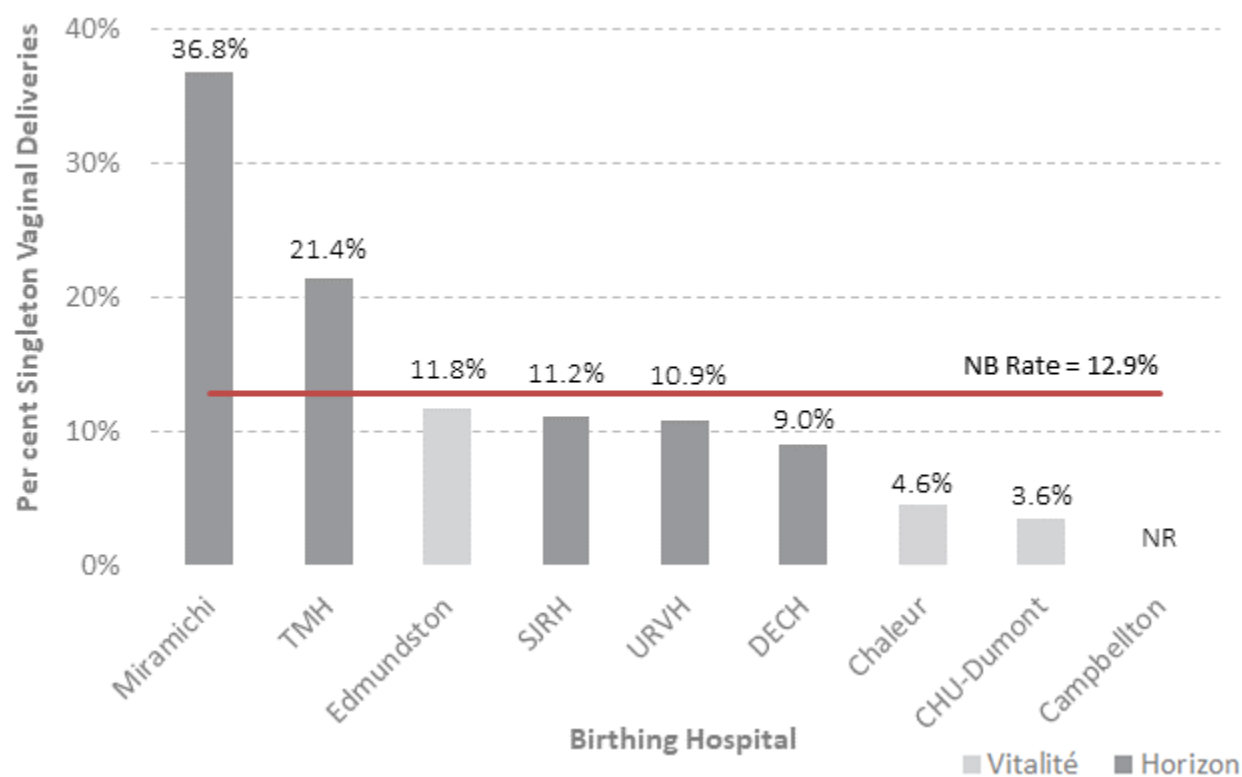


Figure 2.8: Operative Vaginal Delivery rate in singleton deliveries, by birthing hospital, 2020/21

## Induction Rate

The rate of induction in New Brunswick has significantly increased between 2016/17 and 2020/21 from 31.5% (95% CI: 30.4-32.6) to 38.1% (95% CI: 36.9-39.4). Dr. Everett Chalmers Regional Hospital had the highest induction rate in 2020/21 at 45.4% (95% CI: 42.8-48.0), while Upper River Valley Hospital had a lowest induction rate at 24.4% (95% CI: 18.1-31.6%).

Induction of labour is the use of artificial means to start the labour process<sup>1</sup>. There are risks associated with induction of labour, such as, bacterial infection of the uterus, birth of a preterm baby when dating is inaccurate, and in some cases caesarean section<sup>1</sup>.

### Definition

Number of women who are induced for delivery / Total number of deliveries.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

### References

1. Induction. SOGC Information website [www.pregnancyinfo.ca/birth/labor/induction](http://www.pregnancyinfo.ca/birth/labor/induction). Accessed on: September 11, 2019.

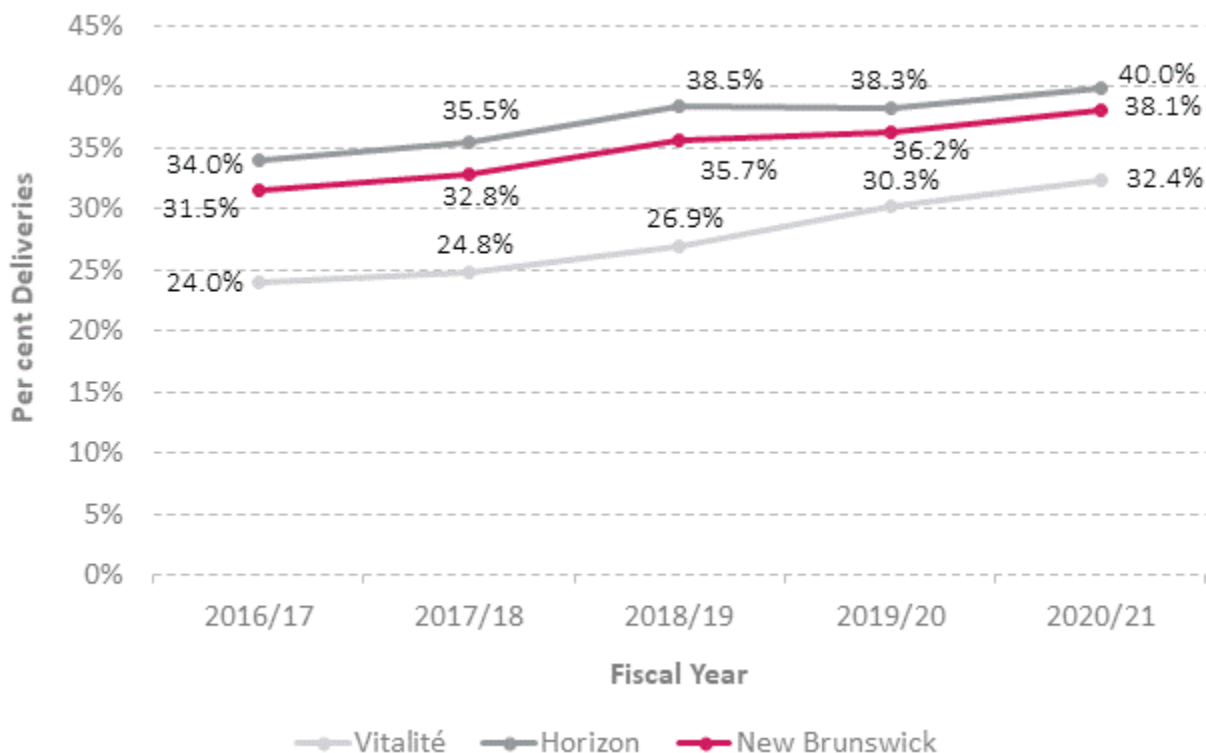


Figure 2.9: Rate of induction for delivery, by location, 2016/17 to 2020/21



## Induction Rate by Birthing Hospital

Table 2.7: Induction rate, by birthing hospital, 2016/17 to 2020/21

Birthing Facility	Induction Rate				
	2016/17	2017/18	2018/19	2019/20	2020/21
Campbellton Regional Hospital	11.5%	19.9%	20.9%	23.5%	0.0%
Chaleur Regional Hospital	30.5%	28.3%	29.5%	36.0%	33.2%
Dr. Everett Chalmers Regional Hospital	41.9%	42.8%	43.4%	42.8%	45.5%
Dr. Georges-L.-Dumont University Hospital Centre	22.2%	24.6%	29.9%	29.7%	34.7%
Edmundston Regional Hospital	26.5%	23.8%	22.2%	27.7%	26.7%
Miramichi Regional Hospital	40.3%	45.9%	44.6%	41.8%	34.6%
The Moncton Hospital	28.3%	28.4%	32.8%	33.4%	37.2%
Saint John Regional Hospital	30.7%	32.8%	37.9%	38.1%	39.9%
Upper River Valley Hospital	22.5%	29.4%	28.5%	29.5%	24.4%

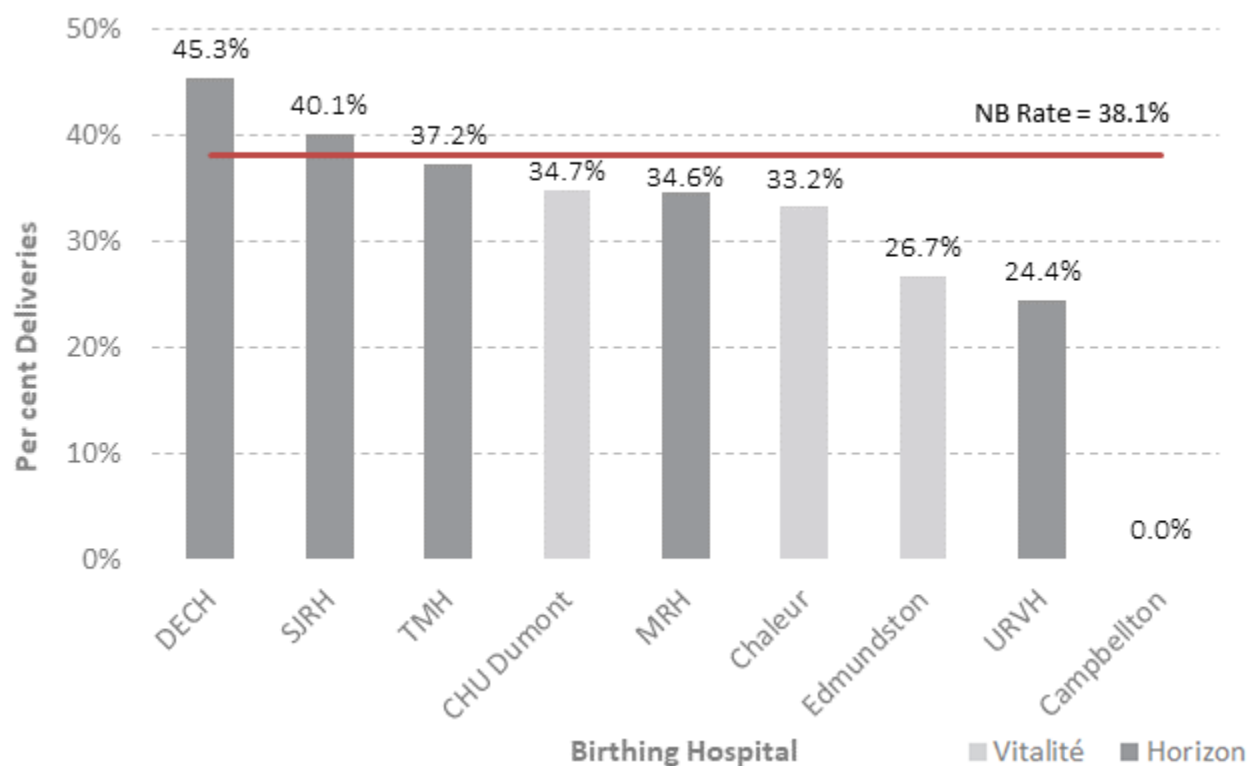


Figure 2.10: Induction rate, by birthing hospital, 2020/21

## Indications for Induction

The SOGC have provided guidelines on the induction of labour. As part of this guideline, they provide indications for induction broken down as High Priority, Other Indications, and unacceptable indications. High Priority indications for induction are defined as pre-eclampsia at 37 weeks or greater, significant maternal disease not responding to treatment, significant but stable antepartum hemorrhage, chorioamnionitis, suspected fetal compromise, and term pre-labour rupture of membranes with maternal GBS<sup>1</sup>. Other indications included other medical indications such as post-dates greater than 41 weeks, diabetes, IUGR, hypertension, history of rapid labour, etc. Unacceptable indications include care provider or patient convenience.

For the analysis below, indications have been grouped into medical – priority following the high priority indications defined by the SOGC guideline, medical – other following the other indications as defined by the SOGC guidelines, and non-medical, which includes social/geographic reasons, other indications, or if no indication was given.

The reasons for induction have remained steady over the past 5 years, with Medical – Other the most common reason for induction at 74.4% (95% CI: 72.6-76.2%), while 20.4% (95% CI: 18.8-22.1%) of all inductions being done for non-medical reasons.

### Definition

Number of women who are induced for delivery by reason for induction / Total number of induced deliveries.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

### References

1. Leduc, D., et al. *SOGC Clinical Practice Guideline: Induction of Labour*. J Obstet Gynaecol Can 2013; 35 (9): 840-857.

Table 2.11: Rates of indication for induction, New Brunswick, 2016/17 to 2020/21

Reason for Induction	All Inductions				
	2016/17	2017/18	2018/19	2019/20	2020/21
Medical - High Priority	4.8%	4.4%	4.9%	5.2%	5.2%
Medical - Other	75.2%	74.2%	71.1%	72.8%	74.4%
Non-Medical	20.0%	21.4%	24.0%	22.1%	20.4%

## Non-medical reason for Induction by Birthing Hospital

Table 2.8: Rate of induction for non-medical reasons, by birthing hospital, 2016/17 to 2020/21

Birthing Facility	Non-Medical Reason for Induction				
	2016/17	2017/18	2018/19	2019/20	2020/21
Campbellton Regional Hospital	8.3%	20.4%	22.4%	7.9%	0.0%
Chaleur Regional Hospital	6.2%	4.2%	14.4%	21.4%	20.5%
Dr. Everett Chalmers Regional Hospital	15.1%	14.6%	18.2%	14.7%	14.9%
Dr. Georges-L.-Dumont University Hospital Centre	33.8%	44.7%	41.4%	36.2%	27.6%
Edmundston Regional Hospital	13.9%	6.9%	2.9%	7.4%	4.9%
Miramichi Regional Hospital	48.2%	44.0%	51.3%	44.1%	30.7%
The Moncton Hospital	15.0%	21.8%	24.4%	25.5%	26.3%
Saint John Regional Hospital	23.3%	22.5%	21.2%	21.7%	19.2%
Upper River Valley Hospital	7.7%	10.0%	3.5%	5.1%	14.6%

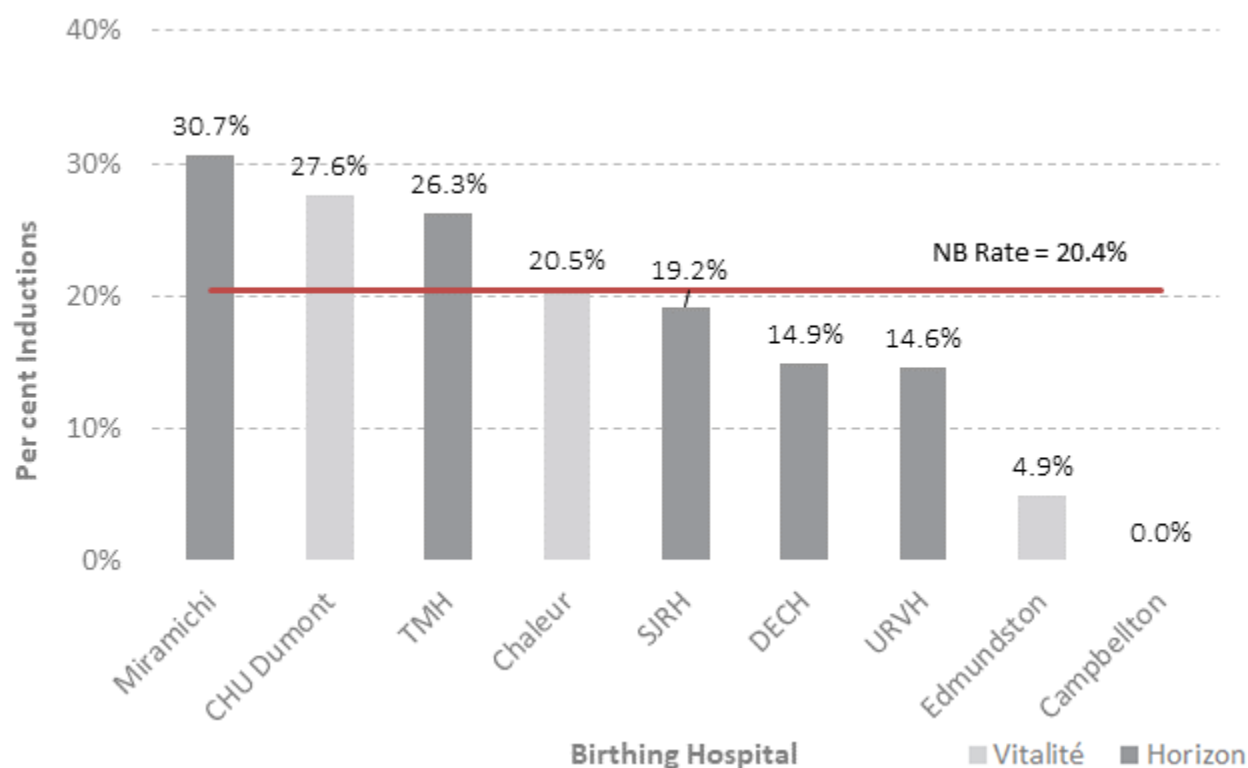


Figure 2.12: Rate of induction for non-medical reasons, by birthing hospital, 2020/21

## Chapter 3 Newborn Health

### Total Births

The number of live births has decreased between 2016/17 and 2020/21, from 6625 to 6219. The number of stillbirths has remained steady over the five year period. A stillbirth refers to an infant born at 20 weeks or greater without signs of life. Note, these numbers include stillbirths and livebirths that resulted from an interruption of pregnancy at 20 weeks or greater.

#### Definition

The total number of live births and stillbirths in New Brunswick.

#### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

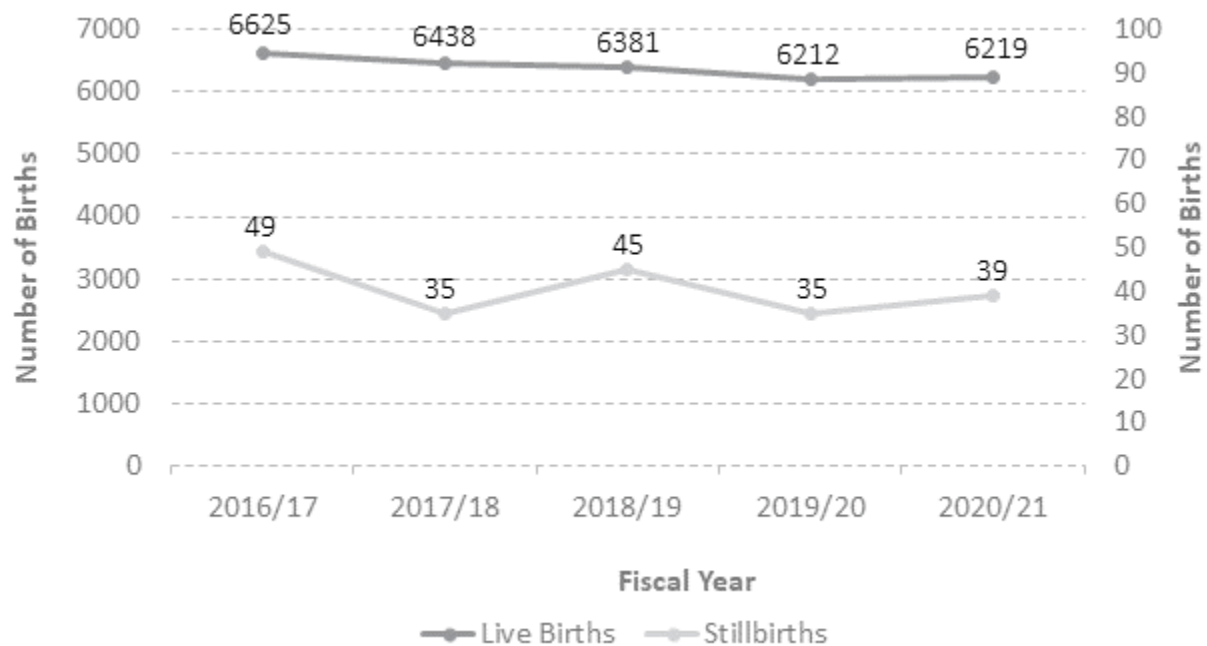


Figure 3.1: Total number of live births and stillbirths, New Brunswick, 2016/17 to 2020/21

## Pre-Term Birth Rate

The pre-term birth rate has remained stable over the past five years, ranging from 7.5% (95% CI: 6.9-8.2) in 2020/21 and a high of 8.4% (95% CI: 7.7-9.1) in 2017/18. The provincial rate is similar to the national rate in 2019/20 of 8.1% (95% CI: 8.1-8.2%)<sup>1</sup>.

### Definition

Number of live births that were born pre-term (prior to 32 and 37 weeks gestation) / Total number of live births.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

### Reference

1. Canadian Institute for Health Information. Hospitalization and Childbirth, 1995–1996 to 2019–2020 — Supplementary Statistics. Ottawa, ON: CIHI; 2021.

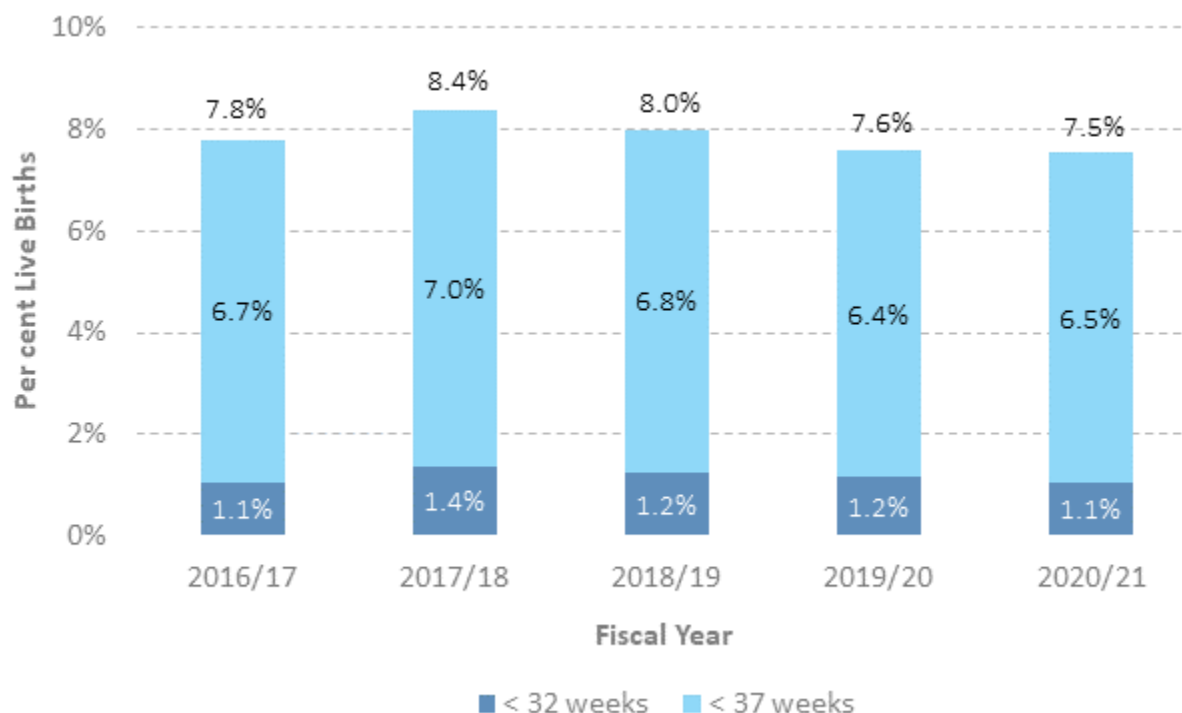


Figure 3.2: Per cent of babies born prior to 32 weeks gestation and 37 weeks gestation, New Brunswick, 2016/17 to 2020/21

## Birth Weight Percentile for Gestational Age

The rates of large-for-gestational age in New Brunswick have remained steady over the last five years. Any infant born in the 90<sup>th</sup> percentile is considered large for gestational age, with a rate of 11.4% this indicates that babies born in New Brunswick tend to be larger than in an average population. In fact, in 2014, the national rate for large for gestational age was 10.2%<sup>1</sup>.

### Definition

Number of births in the 3<sup>rd</sup>, 10<sup>th</sup>, 90<sup>th</sup>, and 97<sup>th</sup> percentiles for sex and birth weight (according to the Canadian Perinatal Surveillance System Birth Weight growth chart<sup>2</sup>) / Total number of live births.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

### References

1. Public Health Agency of Canada. Perinatal Health Report, 2017 edition. Ottawa, 2017.
2. Public Health Agency of Canada, 2001. *Birth Weight for Gestational Age*. Retrieved from [http://www.phac-aspc.gc.ca/rhs-ssg/bwga-pnag/pdf/bwga-pnag\\_e.pdf](http://www.phac-aspc.gc.ca/rhs-ssg/bwga-pnag/pdf/bwga-pnag_e.pdf) (accessed September 29<sup>th</sup>, 2016.).

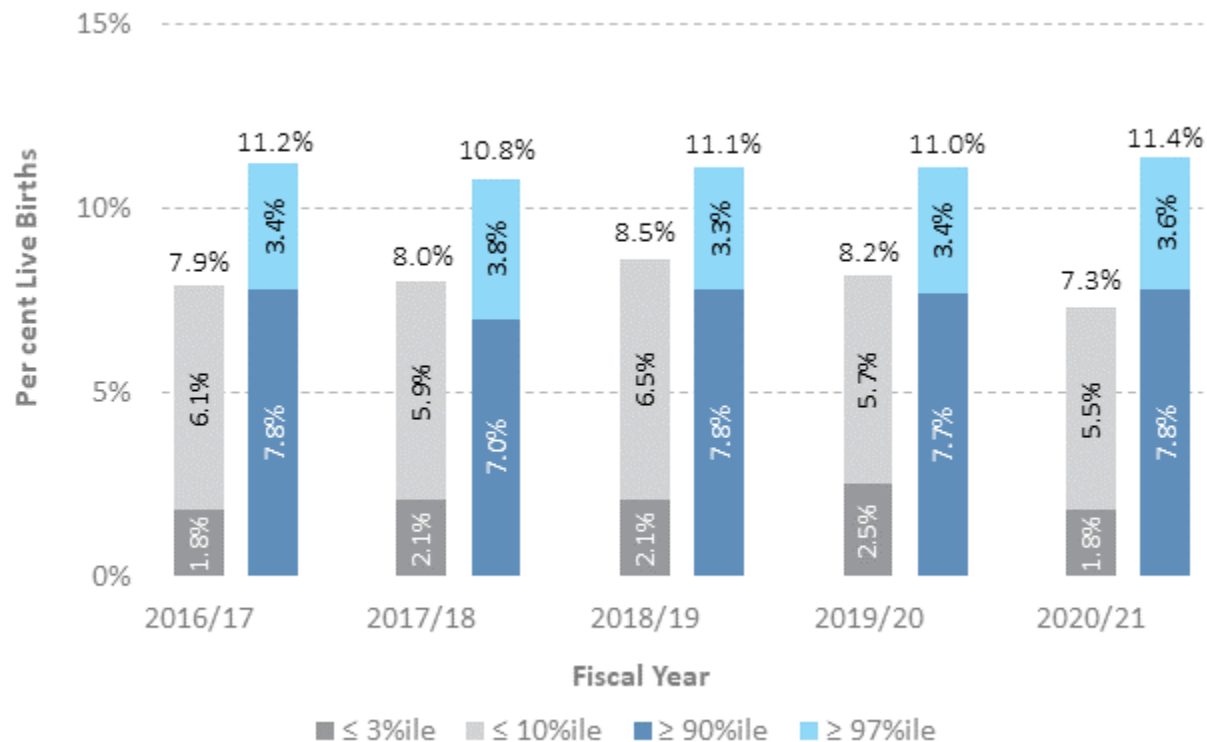


Figure 3.3: Size percentile for gestational age at time of delivery, New Brunswick, 2016/17 to 2020/21

## Primary SCU/NICU Admission by Regional Health Authority

The primary SCU/NICU admission rate in New Brunswick has decreased in the last five years from a high of 29.7% (95% CI: 28.6-30.1%) in 2016/17 down to 21.2% (95% CI: 20.2-22.2%) in 2020/21. This rate is still higher than the national rate of 17.4% and is the second highest rate in Canada.

The number of SCU/NICU admissions was counted differently at the provincial, RHA and hospital level. The provincial rate counted each infant as one SCU/NICU admission regardless of the number of transfers and is therefore the true rate of SCU/NICU admissions per live births in New Brunswick. At the RHA level, SCU/NICU admissions were counted only once if the infant was transferred within the same RHA, however they were counted once per RHA if they were transferred between Horizon and Vitalité.

### Definition

Number of neonates with at least one SCU/NICU admission / Total number of neonates. This includes all hospital births and any admissions to pediatrics, an SCU or a NICU.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

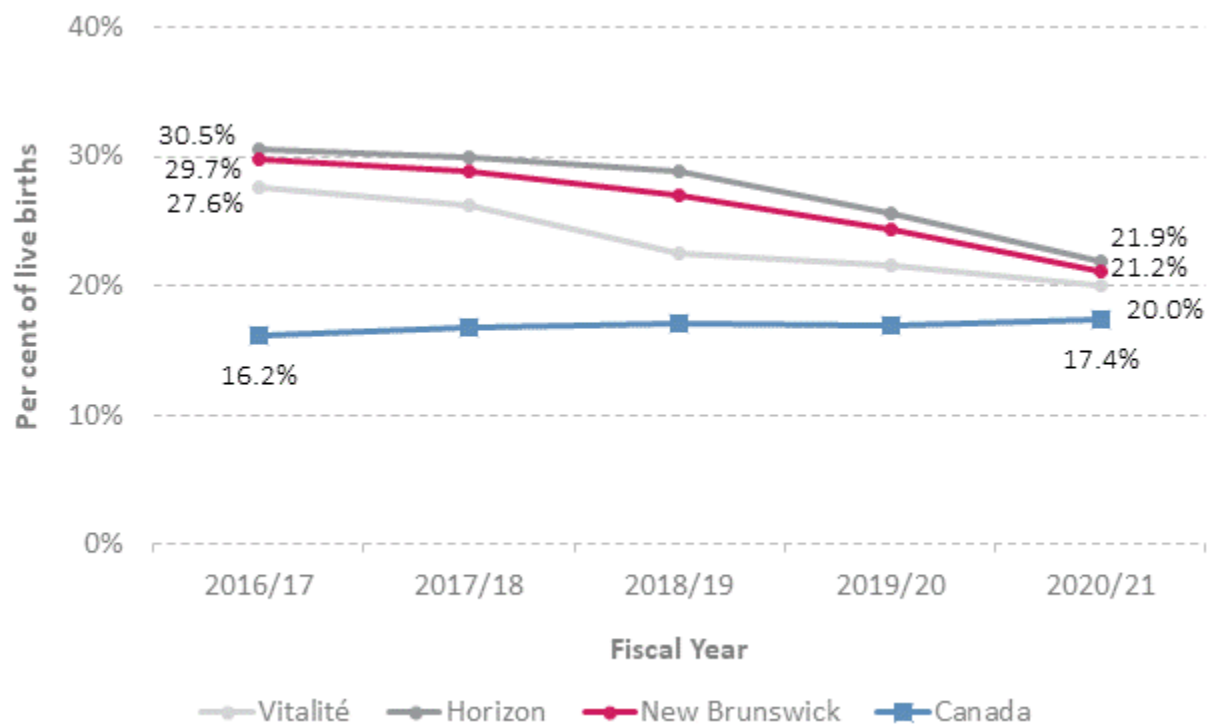


Figure 3.4: Per cent of neonates admitted to SCU/NICU, by location, New Brunswick and Canada, 2016/17 to 2020/21

## Primary SCU/NICU Admissions by Birthing Hospital

SCU/NICU admissions were counted once per hospital, even if a transfer occurred. The facilities are grouped based on the level of care that they can provide. The Moncton Hospital, Dr. Everett Chalmers Regional Hospital, and Saint John Regional Hospital can provide the highest level of care within New Brunswick are Level 3. Next, Dr. Georges-L.-Dumont University Hospital Centre is Level 2B. After is Campbellton Regional Hospital, Chaleur Regional Hospital, Edmundston Regional Hospital, and Miramichi Regional Hospital at Level 2A. Finally, Upper River Valley Hospital is a Level 1 and does not have a Special Care Unit. Note: there has been few deliveries at Campbellton Region Hospital due to the Labour and Delivery unit closure and so there has been no admissions to their SCU.

Primary SCU/NICU admission rates vary greatly across New Brunswick. Within the Level 3 facilities, Dr. Everett Chalmers Regional Hospital has the highest rate at 37.3% (95% CI: 34.8-39.8%), and The Moncton Hospital has the lowest rate at 15.9% (95% CI: 13.9-18.2%). Within the 2A facilities, Chaleur Regional Hospital has the highest rate at 32.3% (95% CI: 28.1-36.8%), while Miramichi Regional Hospital has the lowest rate at 10.6% (95% CI: 7.8-14.0%).

### Definition

Number of neonates with at least one SCU/NICU admission / Total number of neonates.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

Table 3.1: Per cent of neonates admitted to SCU/NICU, by birthing hospital, New Brunswick, 2016/17 to 2020/21

Birthing Facility	Primary Special Care Nursery/NICU Admission				
	2016/17	2017/18	2018/19	2019/20	2020/21
<b>Level 3</b>					
Dr. Everett Chalmers Regional Hospital	40.9%	35.0%	39.6%	36.9%	37.3%
Saint John Regional Hospital	30.0%	31.0%	31.8%	26.7%	17.5%
The Moncton Hospital	32.9%	37.0%	26.0%	20.0%	15.9%
<b>Level 2B</b>					
Dr. Georges-L.-Dumont University Hospital Centre	14.8%	13.2%	14.1%	14.7%	14.4%
<b>Level 2A</b>					
Chaleur Regional Hospital	58.6%	51.3%	46.7%	41.0%	32.3%
Campbellton Regional Hospital	19.8%	26.6%	21.9%	18.3%	NR
Edmundston Regional Hospital	11.0%	18.6%	17.4%	12.6%	14.9%
Miramichi Regional Hospital	2.9%	4.3%	5.1%	12.4%	10.6%



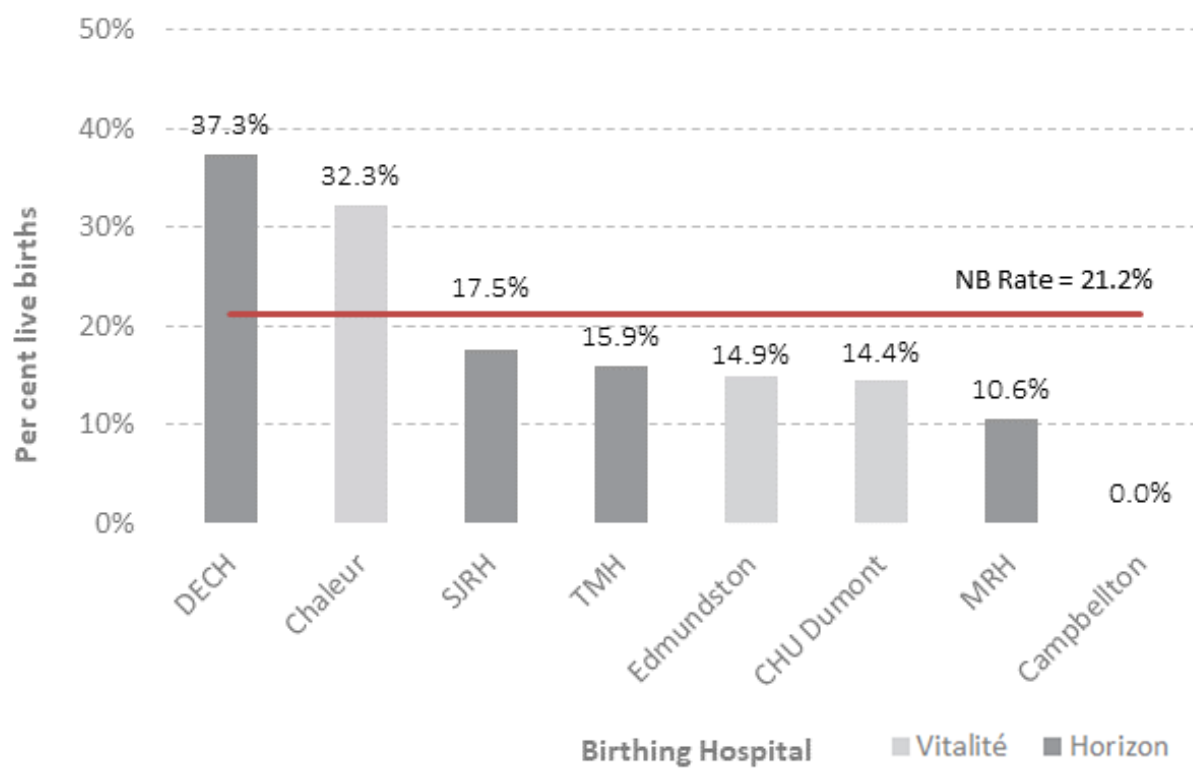


Figure 3.5: Per cent of neonates admitted to SCU/NICU, by birthing hospital, New Brunswick, 2020/21

## Most Responsible Diagnosis for SCU/NICU Admission

These diagnoses relate to specific ICD10 codes in the 3M Health Data Management System and are not intended to capture rates of neonatal health conditions in New Brunswick. These codes are reflective of the practices of New Brunswick hospitals and what health professionals record as the most responsible diagnosis for any SCU/NICU admission. Please note that these lists include only the top 15 and top 5 most frequently used “most responsible diagnosis” codes out of 138 codes used in 2020/21.

Infants with a most responsible diagnosis of Preterm Infant is the top reason for admission to SCU/NICU in 2020/21. Among the three Level 3 NICUs, the top 5 reasons for admission were similar although the rates varied. All three had Examination and Observation within the top 5 reasons, but the rates varied.

### Definition

Count of each primary diagnosis for SCU/NICU admission / Number of neonates with at least one SCU/NICU admission.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

Table 3.2: The top 15 most responsible diagnoses (defined by specific ICD-10 codes) for SCU/NICU admission, New Brunswick, 2020/21

Most Responsible Diagnosis for SCU/NICU Admission			
Rank	Diagnosis	Number	Rate
1	Preterm Infant	183	13.9%
2	Low birth weight	165	12.5%
3	Respiratory distress of newborn	153	11.6%
4	Examination and Observation	116	8.8%
5	Transient tachypnoea of newborn (TTN)	108	8.2%
6	Infant of mother with gestational diabetes	58	4.4%
7	Singleton born in hospital	53	4.0%
8	Neonatal hypoglycaemia (not associated with diabetic mother)	46	3.5%
9	Neonatal jaundice	40	3.0%
10	Condition originating in the perinatal period	31	2.4%
11	Fetus and newborn affected by chorioamnionitis	28	2.1%
12	Intrauterine growth restriction (IUGR)	24	1.8%
13	Neonatal withdrawal symptoms from maternal illicit drug use	23	1.7%
14	Heavy for gestational age infants (Birth weight >4000g)	21	1.6%
15	Bacterial sepsis of newborn	18	1.4%

Table 3.3: The top 5 most responsible diagnoses (defined by specific ICD-10 codes) for SCU/NICU admission, Dr. Everett Chalmers Regional Hospital, 2020/21

Most Responsible Diagnosis for SCU/NICU Admission			
Rank	Diagnosis	Number	Rate
1	Preterm Infant	62	11.3%
2	Examination and Observation	62	11.3%
3	Low birth weight	52	9.5%
4	Transient tachypnoea of newborn (TTN)	52	9.5%
5	Respiratory distress of newborn	45	8.2%

Table 3.4: The top 5 most responsible diagnoses (defined by specific ICD-10 codes) for SCU/NICU admission, Saint John Regional Hospital, 2020/21

Most Responsible Diagnosis for SCU/NICU Admission			
Rank	Diagnosis	Number	Rate
1	Preterm Infant	54	20.5%
2	Low birth weight	28	10.6%
3	Neonatal hypoglycaemia (not associated with diabetic mother)	23	8.7%
4	Infant of mother with gestational diabetes	19	7.2%
5	Examination and Observation	15	5.7%

Table 3.5: The top 5 most responsible diagnoses (defined by specific ICD-10 codes) for SCU/NICU admission, The Moncton Hospital, 2020/21

Most Responsible Diagnosis for SCU/NICU Admission			
Rank	Diagnosis	Number	Rate
1	Low birth weight	58	31.4%
2	Preterm Infant	42	22.7%
3	Transient tachypnoea of newborn (TTN)	18	9.7%
4	Respiratory distress of newborn	12	6.5%
5	Examination and Observation	7	3.8%

## Term and Pre-term Newborns in NICU/SCU Admissions

In 2020/21, 71.6% (95% CI: 69.1-74.0%) of all NICU admissions were term infants, this is a significant decrease from 2016/17 when 77.4% (95% CI: 75.5-79.2%) of all NICU admissions were term infants.

### Definition

Number of pre-term or term infants equal or less than 28 days of age with at least one SCU/NICU admission / Total number of SCU/NICU admissions.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

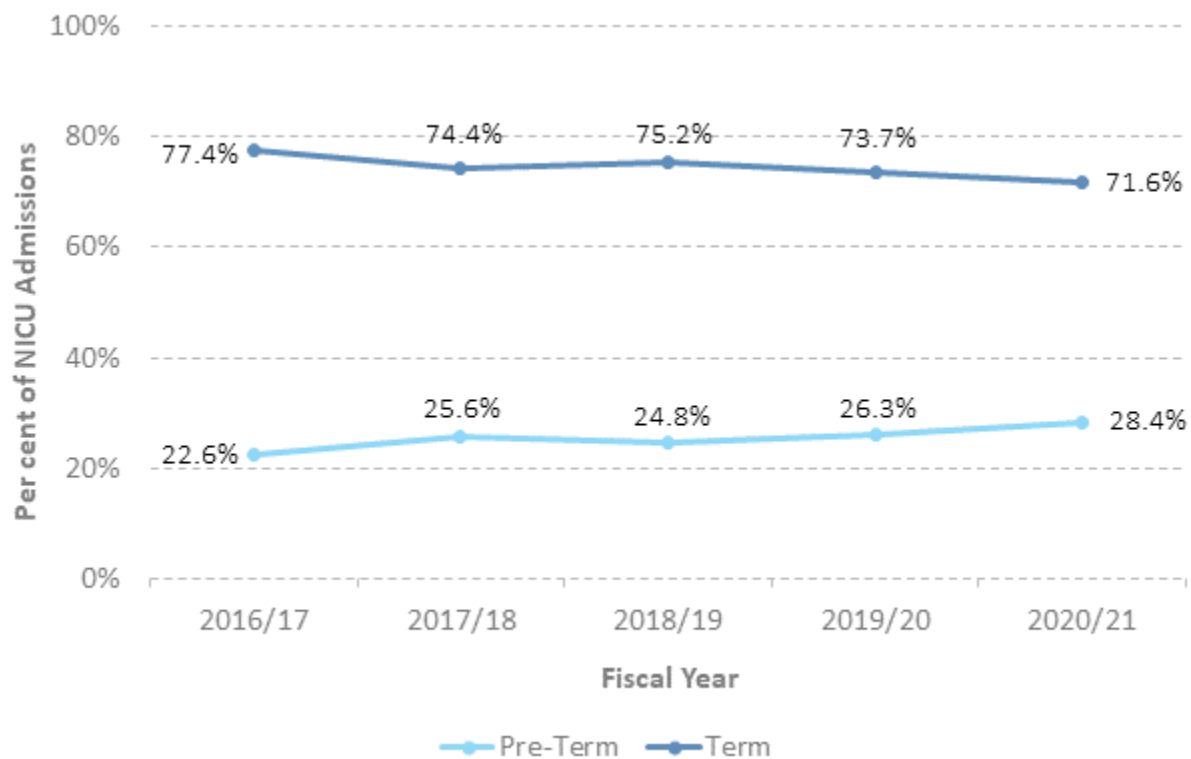


Figure 3.6: Per cent of NICU/SCU admissions, by gestational age, New Brunswick, 2016/17 to 2020/21

## Neonatal Mortality Rate

Rates of neonatal mortality have remained steady with between 0.12% to 0.32% over the past five years. Note this rate includes the deaths of live-born infants following late term terminations for congenital anomalies where they provided palliative care to the infant after delivery.

Please note that these rates do not include any infant deaths that occur outside of a New Brunswick hospital, specifically this rate does not include any infants born outside of the province because they required a higher level of care than could be provided by a New Brunswick hospital.

### Definition

Number of neonates who died / Total number of neonates. This includes all hospital births and any admissions to pediatrics, an SCU or a NICU.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

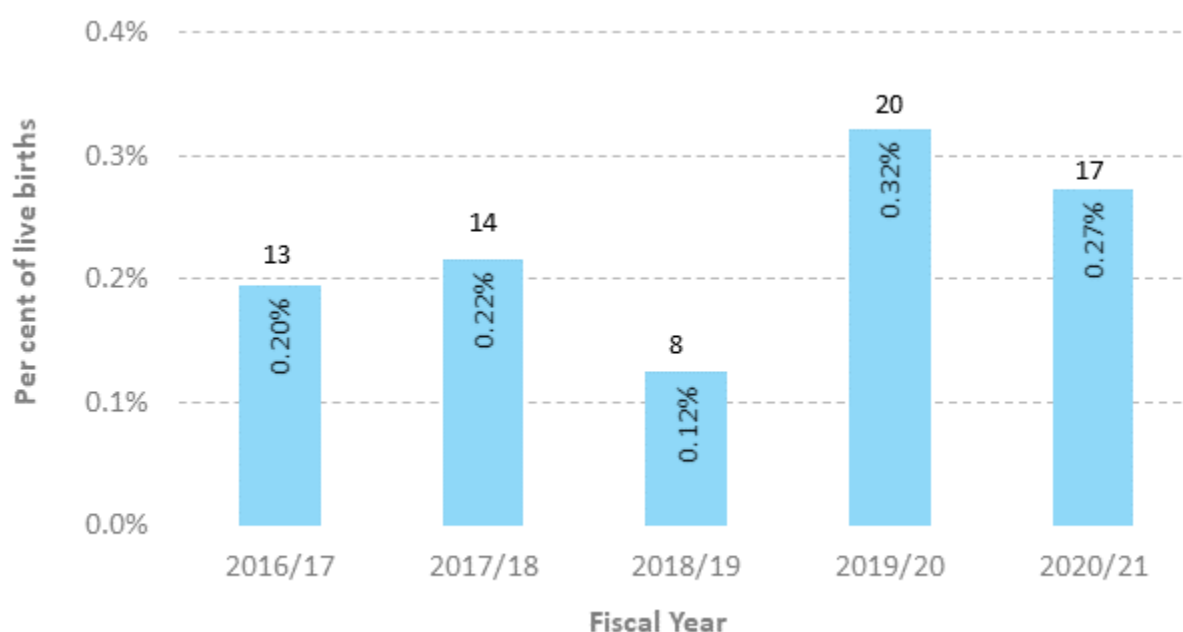


Figure 3.7: Number and per cent of neonatal deaths at 28 days of age or less, New Brunswick, 2016/17 to 2020/21

## Exclusive Breastfeeding Rate at Discharge

New Brunswick Public Health implemented a breastfeeding data collection form in 2006 to better evaluate breastfeeding rates for all newborns born in New Brunswick.

The government of New Brunswick has adopted the Baby-Friendly Initiative as a strategy to protect, promote and support breastfeeding. In this capacity, they have designated BFI Coordinators for both RHAs to help implement the BFI strategy within all birthing hospitals. The goal of this work is for each birthing hospital to become BFI accredited through the Breastfeeding Committee of Canada (BCC). One of the designation criteria as per the BCC is an exclusive breastfeeding rate at hospital discharge of 75% or more.

The rates of exclusive breastfeeding at hospital discharge have increased in some facilities, whereas it has decreased or remained steady at others. The facilities with the greatest increases in 2020/21 were Upper River Valley Hospital, Edmundston Regional Hospital, and Chaleur Regional Hospital. Saint John Regional Hospital, Dr. Everett Chalmers Regional Hospital, The Moncton Hospital and Miramichi Regional Hospital have all seen a decrease in exclusive breastfeeding rates between 2016/17 and 2020/21.

### Definition

Number of infants that were exclusively breastfed or were supplemented for a medical reason at time of discharge / Total number of live births.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

Table 3.6: Per cent of babies that were exclusively breastfed at time of discharge or were supplemented for a medical reason, by birthing hospital, New Brunswick, 2016/17 to 2020/21

Birthing Facility	Exclusive Breastfeeding Rate				
	2016/17	2017/18	2018/19	2019/20	2020/21
Campbellton Regional Hospital	50.5%	52.0%	52.3%	59.5%	NR
Chaleur Regional Hospital	52.2%	50.2%	57.0%	56.0%	56.0%
Dr. Everett Chalmers Regional Hospital	54.1%	47.6%	44.7%	44.0%	40.9%
Dr. Georges-L.-Dumont University Hospital Centre	56.8%	56.4%	64.8%	59.6%	57.3%
Edmundston Regional Hospital	47.8%	52.4%	56.2%	54.7%	55.8%
Miramichi Regional Hospital	51.9%	50.4%	52.9%	52.8%	45.3%
The Moncton Hospital	57.7%	56.6%	60.1%	57.7%	56.8%
Saint John Regional Hospital	52.8%	49.3%	46.8%	43.6%	43.9%
Upper River Valley Hospital	63.1%	52.3%	54.2%	71.0%	67.3%

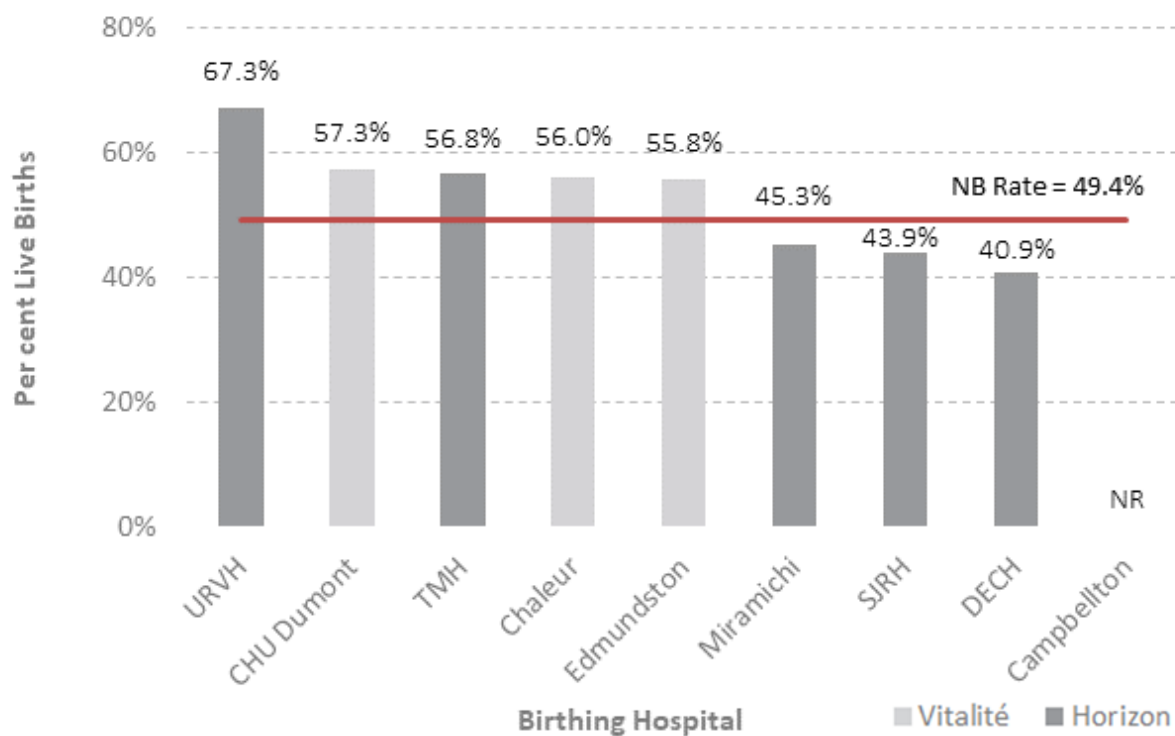


Figure 3.8: Per cent of babies that were exclusively breastfed at time of discharge or were supplemented for a medical reason, by birthing hospital, New Brunswick, 2020/21

## Breastfeeding Initiation

Breastfeeding Initiation is another important criterion for obtaining BFI designation, with a rate of 80% required. Most facilities in New Brunswick have met or surpassed the required initiation rate, while all others are close to achieving this rate. Given this high rate of initiation, it would be expected that more women would exclusively breastfeeding at hospital discharge, but as seen above this is not the case.

### Definition

Number of infants that attempted breastfeeding  
/ Total number of live births.

### Data Source

3M Health Data Management System, Horizon Health Network and Réseau de Santé Vitalité, 2016-2021. Data extracted July 6<sup>th</sup>, 2021.

Table 3.7: Per cent of babies that attempted breastfeeding, by birthing hospital, New Brunswick, 2016/17 to 2020/21

Birthing Facility	Breastfeeding Initiation Rate				
	2016/17	2017/18	2018/19	2019/20	2020/21
Campbellton Regional Hospital	69.0%	74.4%	69.0%	72.4%	NR
Chaleur Regional Hospital	77.1%	74.9%	82.8%	80.0%	78.0%
Dr. Everett Chalmers Regional Hospital	83.6%	81.2%	81.0%	81.6%	82.1%
Dr. Georges-L.-Dumont University Hospital Centre	75.0%	72.9%	86.9%	82.6%	83.5%
Edmundston Regional Hospital	71.9%	73.9%	73.5%	71.6%	75.6%
Miramichi Regional Hospital	71.6%	68.2%	72.7%	74.2%	69.9%
The Moncton Hospital	82.2%	81.9%	85.1%	83.5%	85.4%
Saint John Regional Hospital	79.3%	78.3%	80.2%	78.1%	78.2%
Upper River Valley Hospital	73.8%	66.5%	64.7%	84.5%	86.9%

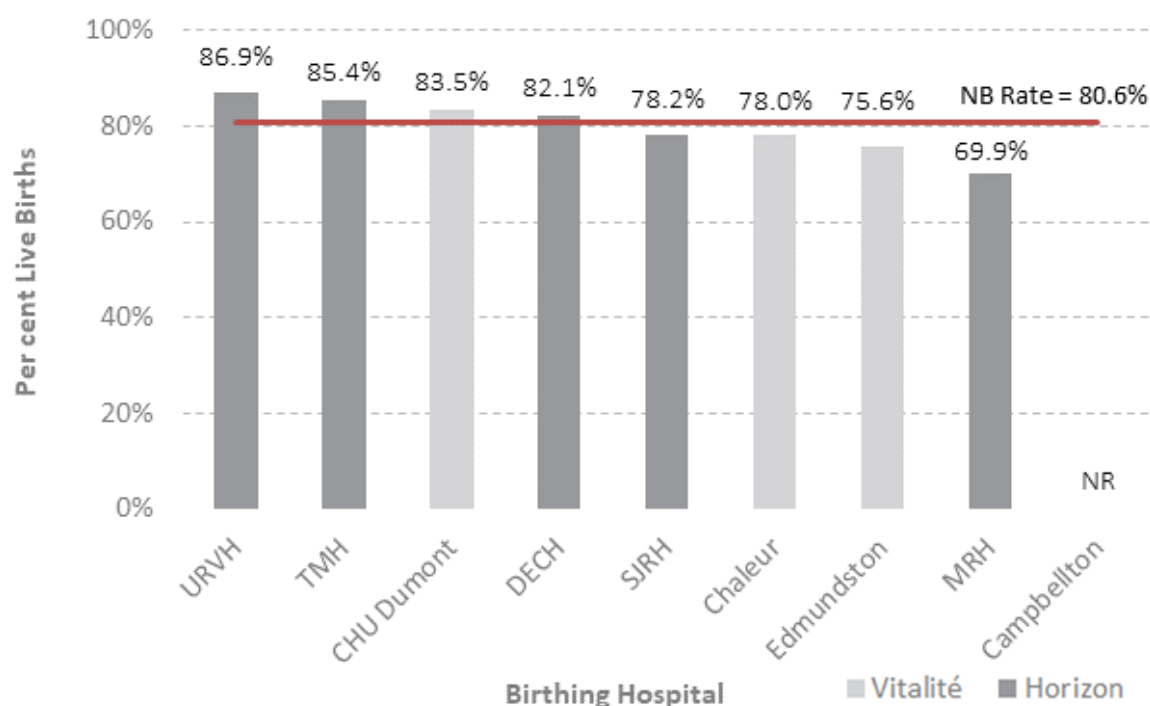


Figure 3.9: Per cent of babies that attempted breastfeeding, by birthing hospital, New Brunswick, 2020/21