

SURVEILLANCE PERINATAL INDICATORS: QUARTERLY REPORT

Indicator	2011/12	2012/13	2013/14	2014/15	2015/16					2016/17*			
	YTD	YTD	YTD	YTD	Q1	Q2	Q3	Q4	YTD	Q1	Q2	Q3	YTD
Deliveries (Mothers): Number	43,595	43,906	43,148	43,663	11,061	11,555	10,597	10,697	43,910	11,149	11,758	10,786	33,693
Labour Induction (rate per 100 deliveries)	21.2	20.4	21.2	21.3	21.7	22.6	23.1	23.1	22.6	22.8	22.9	23.5	23.1
Cesarean Delivery (rate per 100 deliveries)	30.9	31.2	31.5	32.2	31.8	32.0	32.5	33.9	32.5	33.2	34.4	34.2	34.0
Pre-Pregnancy Body Mass Index Category (rate per 100 mothers with known BMI)													
Underweight	5.7	6.1	5.7	6.0	5.5	6.0	5.2	5.7	5.6	5.0	6.1	6.4	5.8
Normal	60.1	60.5	60.0	60.4	59.2	59.1	60.0	59.1	59.4	59.5	57.9	58.8	58.7
Overweight	21.2	20.1	20.7	20.5	21.0	20.7	20.9	21.5	21.0	21.2	21.6	21.0	21.2
Obese	12.9	13.0	13.7	13.1	14.3	14.2	13.9	13.8	14.0	14.4	14.4	13.8	14.2
Pre-Pregnancy Body Mass Index Unknown (rate per 100 mothers)	26.8	24.8	24.1	23.8	22.9	23.0	23.1	23.2	23.0	23.3	23.3	22.1	22.9
Maternal Transfers to Higher Level of Care Following Delivery [§] (rate per 1,000 deliveries)	5.7	5.2	5.9	7.5	8.1	8.7	9.2	7.6	8.4	8.6	8.9	7.5	8.4
Births (Babies)[†]: Number	44,340	44,633	43,892	44,425	11,128	11,632	10,658	10,718	44,638	11,215	11,826	10,817	34,247
Stillbirth Rate (rate per 1,000 total births)	9.8	9.4	10.5	11.3	10.5	10.1	11.6	12.9	11.2	10.9	11.0	12.1	11.4
Antepartum	8.1	7.9	9.2	9.8	8.9	8.6	10.6	12.0	10.0	9.4	9.3	10.9	9.8
Intrapartum	0.6	0.5	0.4	0.5	0.7	0.9	0.4	0.5	0.6	0.4	0.4	0.4	0.4
Unknown	1.1	1.0	0.8	1.1	0.9	0.7	0.6	0.5	0.7	1.1	1.3	0.9	1.1
Live Births by Gestational Age, Weeks (%) [¶]													
<34	2.4	2.4	2.4	2.4	2.4	2.5	2.3	2.2	2.3	2.3	2.3	2.3	2.3
34-36	7.2	7.6	7.7	7.8	7.7	7.7	8.6	8.0	8.0	8.3	8.7	8.2	8.4
37-40	80.1	80.2	80.6	80.7	81.3	81.1	81.1	81.8	81.3	81.7	80.8	82.2	81.5
41+	10.3	9.7	9.3	9.0	8.7	8.7	8.0	8.1	8.4	7.8	8.2	7.4	7.8
Unknown	0.04	0.01	0.02	0.01	0.03	0.02	0.00	0.02	0.02	0.03	0.03	0.04	0.03
Preterm Neonatal Intensive Care Use [†] (rate per 1,000 live births)	34.2	35.7	35.0	36.8	36.1	37.7	40.5	36.7	37.7	39.1	40.8	39.2	39.7
>2 days	25.5	25.6	21.0	28.5	28.3	29.8	31.2	28.6	29.5	30.5	32.2	31.6	31.5
Sepsis	1.0	1.4	1.7	2.0	2.2	2.1	2.3	1.3	2.0	1.2	1.7	2.4	1.7
Ventilatory Support	6.8	6.7	7.4	6.7	7.1	6.4	7.1	6.0	6.6	6.9	6.1	7.0	6.6
Term Neonatal Intensive Care Use [†] (rate per 1,000 live births)	23.1	24.6	26.7	30.1	34.5	33.0	29.8	34.1	32.9	30.7	30.0	30.2	30.3
>2 days	6.3	6.1	8.0	11.9	13.7	14.3	12.3	13.9	13.5	12.6	12.7	11.3	12.2
Sepsis	0.6	0.3	1.1	1.0	0.9	0.7	0.7	1.4	0.9	1.1	0.9	0.8	0.9
Ventilatory Support	1.9	2.4	2.4	2.7	3.1	3.5	2.2	3.0	3.0	2.3	2.2	2.3	2.3
Term Infants Receiving Exclusive Breast Milk During Birth Admission (rate per 100 live term births)	72.7	72.3	73.0	72.9	73.5	73.7	72.6	72.4	73.1	73.3	72.8	71.0	72.4
Neonatal Transfers to Higher Level of Care Following Birth (rate per 1,000 live births)	11.4	11.2	11.2	13.5	14.4	13.2	13.9	13.4	13.7	13.5	14.5	12.2	13.4
Neonatal Deaths (rate per 1,000 live births)	3.0	2.8	2.7	2.5	2.2	2.5	2.1	2.0	2.2	2.9	1.9	2.3	2.8

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Data Source: BC Perinatal Data Registry

*Data for 2016/17 are preliminary.

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§Maternal transfers to higher level of care - added Surrey Memorial Hospital to 2nd Tier Hospitals effective April 1, 2013 discharges.

¶Gestational Age Calculation - revised effective April 1, 2013.

†Neonatal Intensive Care Use - During the Birth Episode of Care, baby required Level 2a, 2b, 3a, OR 3b care (as defined by the PSBC Neonatal Daily Classification Tool) for at least one day.

Surveillance Perinatal Indicators: Quarterly Report 2016/17

Summary of Changes

August 28, 2017

The PSBC Surveillance Team reviewed the Quarterly Report indicators that were introduced in the 2011/12 fiscal year. Some changes and/or modifications have been made to update the indicators for future years, beginning with the 2014/15 fiscal year.

The changes/modifications are as follows:

1. Deliveries (Mothers)

Indicators removed due to low incidences

- Postpartum Hemorrhage + Transfusion (rate per 1,000 deliveries)
- Postpartum Hemorrhage + Hysterectomy (rate per 1,000 deliveries)
- Eclampsia (rate per 1,000 deliveries)
- Puerperal Sepsis (rate per 1,000 deliveries)

These indicators have been added to the Annual Perinatal Health Report.

Indicators added:

- Pre-Pregnancy Body Mass Index (BMI) Category (rate per 100 mothers with known BMI)
- Pre-Pregnancy Body Mass Index (BMI) Unknown (rate per 100 mothers)

2. Births (Babies)

Indicator categories modified:

- Live births by Gestational Age (Weeks)
From: <30, 30-31, 32-33, 34-36, >=37, Unknown
To: <34, 34-36, 37-40, 41+, Unknown

Indicator added:

- Term infants receiving exclusive breast milk during birth admission (rate per 100 live term births)

Beginning with the 2015/16 fiscal year, following Indicators were renamed due to data scope change since 2010/2011 fiscal year:

- Preterm NICU Admission: changed into Preterm Neonatal Intensive Care Use
- Term NICU Admission: changed into Term Neonatal Intensive Care Use

Please feel free to contact the Surveillance Team at Perinatal Services BC if you have any questions or comments.

Technical Notes

The Surveillance Perinatal Indicators: Quarterly Report includes perinatal data for BC residents for six fiscal years (April 1 to March 31): 2011/12 to 2016/17. The focus of this report is to provide a summary of selected indicators on maternal and neonatal morbidity for British Columbia overall. The appendix lists the description of indicators and calculation methods used in this report.

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Quarters and Date Range

Q1: April 1 to June 30

Q2: July 1 to September 30

Q3: October 1 to December 31

Q4: January 1 to March 31

Methodology and Limitations

Inclusions

- Data on all births (singletons, twins, and multiples) for BC residents only.
- Linked mothers and newborns for each fiscal year (<0.02% of records are not linked).

Exclusions

- Deliveries and births of BC residents occurring outside of BC.

Notes

- Mother-newborn assigned fiscal year is based on maternal discharge date.
- Resident level of geography is based on the postal code recorded during the delivery admission.
- The reader should use caution when interpreting rates of neonatal and maternal adverse outcomes because these rates are based on a very small number of events.
- 2016/17 is provisional data and subject to revision.
- Maternal Transfer to Higher Level of Care: Surrey Memorial Hospital has been added to the 2nd Tier hospital group, effective April 1, 2013 discharges.
- Until April 1, 2014 discharges, if a woman who delivered at home attended by a registered midwife was admitted to acute care within 24 hours of delivery, the acute care admission will be her delivery record and no transfer will be recorded. Effective April 1, 2014 discharges, all deliveries at home attended by a registered midwife are counted as deliveries at home and admissions to acute care within 24 hours of delivery are considered transfers.

Appendix

Table 1. Definitions

Indicator	Description
Labour Induction	Instrumental or pharmacological assistance to initiate labour, prior to the onset of the first stage of labour.
Cesarean Delivery	A delivery involving the surgical incision of the abdomen and uterine walls.
Last Menstrual Period (LMP)	The first day of a woman's last menses before conception. Used to calculate gestational age and duration of pregnancy.
Body Mass Index (BMI)	Ratio of weight to height, as measured pre-pregnancy or up to 12 weeks gestation. Formula: $BMI = \text{pre-pregnancy weight (kg)} / (\text{height (m)})^2$.
Body Mass Index (BMI) Group	Pre-pregnancy BMI categorized according to the Canadian Guidelines for Body Weight Classification. Underweight = < 18.50 Normal Weight = 18.50 - 24.99 Overweight = 25.00 - 29.99 Obese = >= 30.00 Unknown = pre-pregnancy weight and/or height are missing
Mother Transferred to Higher Level of Care Following Delivery	Maternal transfer to a hospital with higher level of care following delivery. Transfers from 1 st tier to 2 nd , or 2 nd to 3 rd , or 1 st to 3 rd are included. Criteria for higher level of care: 3 rd tier: BC Women's Hospital & Health Centre Royal Columbian Hospital Victoria General Hospital St Paul's Hospital 2 nd tier: Kelowna General Hospital Royal Inland Hospital University Hospital of Northern BC Nanaimo Regional General Hospital Surrey Memorial Hospital (added April 1, 2013) 1 st tier: Hospitals not identified as 3 rd or 2 nd tier. Excludes: Transfers to lower level of care facilities (3 rd to 2 nd or 2 nd to 1 st).
Stillbirth	The complete expulsion or extraction from the maternal body after at least 20 weeks gestation, or after attaining a weight of at least 500 grams, of a fetus, in which at birth there is no breathing, beating heart, pulsation of the umbilical cord, or unmistakable movement of voluntary muscle (ref: BC Vital Statistics).
Stillbirth Type	Stillbirth can occur: <ul style="list-style-type: none"> • Antepartum: stillbirth or intrauterine death reported prior to onset of first stage of labour. • Intrapartum: stillbirth or intrauterine death reported after onset of first stage of labour. • Unknown: stillbirth or intrauterine death reported, but unknown if prior to or after onset of first stage of labour.
Gestational Age	The number of completed weeks a fetus has developed since the beginning of the pregnancy.
Live Births by Gestational Age	Live born categorized into gestational age groups.
Term Infants Receiving Exclusive Breast Milk	Term Infants (≥ 37 completed weeks gestation) receiving exclusive breast milk (including expressed breast milk) during birth admission. No food or liquid (not even water) was given. Undiluted drops of syrup consisting of vitamins, mineral supplements or medicine may have been given to the baby.

Indicator	Description
Newborn Transferred to Higher Level of Care	<p>Live born transferred to a hospital with higher level of care. Transfers from nursery to a Level II NICU and transfers from Level II to Level III NICU are included.</p> <p>Criteria for higher level of care:</p> <p>NICU 2 & 3: BC Women's Hospital & Health Centre Royal Columbian Hospital Victoria General Hospital Surrey Memorial Hospital</p> <p>NICU 2: St. Paul's Hospital Burnaby General Hospital The Richmond Hospital Lions Gate Hospital Abbotsford Regional Hospital Kelowna General Hospital Royal Inland Hospital University Hospital of Northern BC Nanaimo Regional General Hospital</p> <p>Excludes: Transfers to hospital not identified as Level 2 or Level 3.</p>
Neonatal Deaths	<p>In-hospital baby deaths.</p> <p>Excludes: Transfers out-of-province and transfers out-of-country.</p>
Term Infants (A birth >= 37 completed weeks gestation.)	
Neonatal Intensive Care Use	2010/11 forward: During the Birth Episode of Care, term infants require Level 2a, 2b, 3a, OR 3b care (as defined by the PSBC Neonatal Daily Classification Tool) for at least one day.
Neonatal Intensive Care Use >2 days	Term infants require Level 2a, 2b, 3a, OR 3b care (as defined by the PSBC Neonatal Daily Classification Tool) for more than 2 days.
Neonatal Intensive Care Use with Sepsis	Term infants require Level 2a, 2b, 3a, OR 3b care (as defined by the PSBC Neonatal Daily Classification Tool) with a diagnosis of sepsis. See Table 4 for list of codes.
Neonatal Intensive Care Use with Ventilatory Support	Term infants require Level 2a, 2b, 3a, OR 3b care (as defined by the PSBC Neonatal Daily Classification Tool) with ventilatory support. See Table 4 for list of procedures that indicate ventilatory support.
Preterm Infants (A birth < 37 completed weeks gestation.)	
Neonatal Intensive Care Use	2010/11 forward: During the Birth Episode of Care, preterm infants require Level 2a, 2b, 3a, OR 3b care (as defined by the PSBC Neonatal Daily Classification Tool) for at least one day.
Neonatal Intensive Care Use >2 days	Preterm infants require Level 2a, 2b, 3a, OR 3b care (as defined by the PSBC Neonatal Daily Classification Tool) for more than 2 days.
Neonatal Intensive Care Use with Sepsis	Preterm infants require Level 2a, 2b, 3a, OR 3b care (as defined by the PSBC Neonatal Daily Classification Tool) with a diagnosis of sepsis. See Table 4 for list of codes.
Neonatal Intensive Care Use with Ventilatory Support	Preterm infants require Level 2a, 2b, 3a, OR 3b care (as defined by the PSBC Neonatal Daily Classification Tool) with ventilatory support. See Table 4 for list of procedures that indicate ventilatory support.

Table 2. Methods of Calculation for Selected Indicators

Indicator	Method
Labour Induction	$\frac{\text{Number of mothers with labour induction}}{\text{Total deliveries}} \times 100$
Cesarean Delivery	$\frac{\text{Number of mothers with cesarean delivery}}{\text{Total deliveries}} \times 100$
Pre-Pregnancy Body Mass Index (BMI)	$\frac{\text{Weight (kg)}}{\text{height (m)}^2}$
Body Mass Index (BMI) Group	$\frac{\text{Number of mothers by pre-pregnancy BMI group}}{\text{Total deliveries with known pre-pregnancy BMI}} \times 100$
Body Mass Index (BMI) Unknown	$\frac{\text{Number of mothers with unknown BMI}}{\text{Total deliveries}} \times 100$
Mothers Transferred to Higher Level of Care Following Delivery	$\frac{\text{Number of mothers transferred to higher level of care following delivery}}{\text{Total deliveries}} \times 1,000$
Stillbirth Rate	$\frac{\text{Number of stillbirths}}{\text{Total births}} \times 1,000$
Stillbirth Rate by Type	$\frac{\text{Number of stillbirths by type}}{\text{Total number of births}} \times 1,000$
Live Births by Gestational Age	$\frac{\text{Number of live births by gestational age group}}{\text{Total live births}} \times 1,000$
Term Infants Receiving Exclusive Breast Milk	$\frac{\text{Number of live term newborns with exclusive breast milk}}{\text{Total term live births}} \times 100$
Newborn Transferred to Higher Level of Care	$\frac{\text{Number of live newborns transferred to higher level of care hospital}}{\text{Total live births}} \times 1,000$
Neonatal Deaths	$\frac{\text{Number of live newborn deaths + baby transfer deaths}}{\text{Total live births}} \times 1,000$
Term Infants (A birth \geq 37 completed weeks gestation.)	
Neonatal Intensive Care Use	$\frac{\text{Number of term births with Neonatal Intensive Care Use}}{\text{Total live births}} \times 1,000$
Neonatal Intensive Care Use >2 days	$\frac{\text{Number of term births with Neonatal Intensive Care Use >2 days}}{\text{Total live births}} \times 1,000$
Neonatal Intensive Care Use with Sepsis	$\frac{\text{Number of term births with Neonatal Intensive Care Use with sepsis}}{\text{Total live births}} \times 1,000$
Neonatal Intensive Care Use with Ventilatory Support	$\frac{\text{Number of term births with Neonatal Intensive Care Use with ventilatory support}}{\text{Total live births}} \times 1,000$
Preterm Infants (A birth before 37 completed weeks gestation.)	
Neonatal Intensive Care Use >2 days	$\frac{\text{Number of preterm births with Neonatal Intensive Care Use >2 days}}{\text{Total live births}} \times 1,000$
Neonatal Intensive Care Use with Sepsis	$\frac{\text{Number of preterm births with Neonatal Intensive Care Use with sepsis}}{\text{Total live births}} \times 1,000$
Neonatal Intensive Care Use with Ventilatory Support	$\frac{\text{Number of preterm births with Neonatal Intensive Care Use with ventilatory support}}{\text{Total live births}} \times 1,000$

Table 3. Final Gestational Age (GA)

Hierarchy used for calculating the final gestational age is determined by the following preferential order:
Use the GA calculated from the last menstrual period (LMP)
Exception: Use the GA based on the first ultrasound if: GA based on menstrual dating differs from GA at first ultrasound by ≥ 2 weeks GA based on menstrual dating differs from GA at first ultrasound (done at <14 weeks gestation) by 1 week
Use GA from first ultrasound if GA from LMP is not available.
Use newborn clinical estimate from physical examination if GA from LMP and GA from first ultrasound are unavailable. Use newborn clinical estimate from physical examination if GA from LMP is ≥ 3 weeks different and no GA at first ultrasound is unavailable.
Use obstetrical clinical estimate of gestational age if GA from LMP, GA at first ultrasound and GA from newborn clinical estimate are not available.

Table 4. Codes for Selected Indicators

Indicator	ICD-10 and/or CCI Codes
Neonatal Intensive Care Use with Sepsis	<p>P36 Bacterial sepsis of newborn Includes: congenital septicaemia P36.0 Sepsis of newborn due to streptococcus, group B P36.1 Sepsis of newborn due to other and unspecified streptococci P36.2 Sepsis of newborn due to Staphylococcus aureus P36.3 Sepsis of newborn due to other and unspecified staphylococci P36.4 Sepsis of newborn due to Escherichia coli P36.5 Sepsis of newborn due to anaerobes P36.8 Other bacterial sepsis of newborn P36.9 Bacterial sepsis of newborn, unspecified</p> <p>Includes: Diagnosis codes with a prefix of (Q) – query diagnoses</p> <p>And nicu_ii>0 and/or nicu_iii>0</p>
Neonatal Intensive Care Use with Ventilatory Support	<p>1.GZ.31.^ Ventilation, respiratory system NEC positive pressure (e.g. CPAP, BIPAP) 1.GZ.31.CB.ND Non-invasive approach positive pressure (e.g., CPAP, BIPAP) 1.GZ.31.CA-ND Invasive per orifice approach by endotracheal intubation positive pressure (e.g., CPAP, BIPAP) 1.GZ.31.CR-ND Invasive per orifice with incision approach for intubation through tracheostomy</p> <p>AND/OR</p> <p>BCPDR Ventilator Days field ≥1: Total number of days recorded in field.</p> <p>And nicu_ii>0 and/or nicu_iii>0</p>