MINISTRY OF HEALTH
MANATŪ HAUORA

New Zealand Government

New Zealand Maternity Clinical Indicators

2017

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Executive summary

The New Zealand Maternity Clinical Indicators provide information on a series of maternity outcomes which relate to optimal health outcomes for women and their babies. For this report, as with previous reports in this series, the 'standard primipara' definition is used to identify a group of women who are considered to be 'low risk', for whom rates of intervention and outcomes should be similar between units and regions. Of the 20 indicators covered in this report:

- one applies to women who registered with a lead maternity carer (LMC)
- eight apply to standard primiparae
- seven apply to all women giving birth in New Zealand
- four apply to all babies born in New Zealand.

This is the ninth report in the New Zealand Maternity Clinical Indicators series. It presents data on women giving birth, and babies born in the 2017 calendar year.

From 2009 to 2017, there was:

- an increase in the proportion of women who registered with an LMC in the first trimester of pregnancy, but variation between regions persists
- a decrease in the proportion of standard primiparae who had a spontaneous vaginal birth, and continued variation between regions
- an increase in the proportion of standard primiparae who had an instrumental birth or a caesarean section
- an increase in the proportion of standard primiparae who had an induction of labour
- a decrease in the proportion of standard primiparae who had an intact perineum and an increase in the proportion who had an episiotomy and/or a third- or fourth-degree tear, and continued variation between regions
- a decrease in the proportion of women who required a blood transfusion with a caesarean section, and an increase for women who required a blood transfusion with a vaginal birth
- a decrease in the proportion of women who smoked during the postnatal period
- a decrease in the proportion of term (37–42 weeks' gestation) babies who were born small
- a decrease in the proportion of small babies at term (37–42 weeks' gestation) who were born at 40–42 weeks' gestation
- an increase in the proportion of babies born at term who required respiratory support.

As the eight previous reports demonstrated, reported interventions and outcomes for women and babies vary between district health boards (DHBs) and between individual

secondary and tertiary facilities. These findings merit further investigation of data quality and integrity as well as variations in local clinical practice management.

Since 2012, DHBs and maternity stakeholders have used national benchmarked data in their local maternity quality and safety programmes to identify areas warranting further investigation at a local level. Using the data in this report, DHBs and local maternity stakeholders can expand the scope of their investigations and view trends over a nine-year period.

Introduction

What is a clinical indicator?

A clinical indicator is a measure of the clinical management and outcome of health care received by an individual. For each clinical indicator, there should be evidence that confirms the underlying causal relationship between a particular process or intervention and a health outcome (WHA 2007). Clinical indicators can enable the quality of care and services to be measured and compared, by describing a performance or health outcome that should occur, and then evaluating whether it has occurred, in a standardised format that enables comparison between services or sites (Mainz 2003).

What are the New Zealand Maternity Clinical Indicators?

The New Zealand Maternity Clinical Indicators show key maternity outcomes for each DHB region and maternity facility.

The purpose of the New Zealand Maternity Clinical Indicators is to:

- highlight areas where quality and safety could be improved at a national level
- support quality improvement by helping DHBs to identify focus areas for local clinical review of maternity services
- provide a broader picture of maternity outcomes in New Zealand than that obtainable from maternal and perinatal mortality data alone
- provide standardised (benchmarked) data allowing DHBs to evaluate their maternity services over time and against the national average
- improve national consistency and quality in maternity data reporting.

The New Zealand Maternity Clinical Indicators are evidence-based and cover a range of procedures and outcomes for women and their babies. Where possible, the New Zealand Maternity Clinical Indicators are aligned with international maternity indicators to enable international comparison.

The Ministry of Health develops and publishes the New Zealand Maternity Clinical Indicators with support from the National Maternity Monitoring Group and the New Zealand Maternity Clinical Indicators Expert Working Group.

It is an expectation of the New Zealand Maternity Standards that the New Zealand Maternity Clinical Indicators are reviewed approximately every three years. In the major review undertaken in 2016, the Expert Working Group recommended deletion of 'BMI over 35' (formerly Indicator 17) because it does not meet the description of a clinical indicator. 'BMI over 35' is a demographic descriptor, and is currently presented in the Report on Maternity series.

Background

In 2010 the Minister of Health directed the Ministry of Health to develop a national quality and safety programme for maternity services, encompassing standards and clinical indicators.

The New Zealand Maternity Clinical Indicators are the result of collaboration between the Ministry of Health and maternity stakeholders representing consumer, midwifery, obstetric, general practice, paediatric and anaesthetic perspectives. In 2011 an expert working group established a set of 12 maternity clinical indicators that the Ministry of Health could measure using the available data collections at that time.

Since then, data collections and data quality have improved. In 2013, the National Maternity Monitoring Group reviewed the original indicator set and recommended a range of changes to improve the quality, completeness and scope of the Maternity Clinical Indicators. The original expert working group further reviewed and developed these proposed changes to ensure the Maternity Clinical Indicators retained their objectives.

The Ministry of Health implemented the changes in two phases:

- improving the quality and completeness of the original 12 indicators and introducing three new indicators in *New Zealand Maternity Clinical Indicators 2012*
- expanding the methodology to count outcomes for women giving birth outside a maternity facility more accurately and introducing six new indicators in *New Zealand Clinical Indicators 2013*.

This report, *New Zealand Maternity Clinical Indicators 2017*, presents data on the 20 indicators included in the 2016 report. The report covers births in the 2017 calendar year.

In early 2015, the Minister of Health committed to the continuation of the Maternity Quality Initiative, under which the Ministry of Health has committed to continued annual publication of clinical indicators. The next review of the New Zealand Maternity Clinical Indicators will occur prior to the development of the report on 2018 data.

Overview

This report presents the fifth year of reporting on the revised indicators, and the ninth edition in the *New Zealand Maternity Clinical Indicators* series (see Table 1 for a list of indicators presented in this publication). The 20 indicators presented in this report are the same as those presented in the 2016 report, with no changes to criteria and methods. The Ministry of Health developed the indicators in partnership with the New Zealand Maternity Clinical Indicators Expert Working Group.

Table 1: New Zealand Maternity Clinical Indicators

Population	Indicator		Numerator	Denominator
Women registered with an LMC	1	Registration with an LMC in the first trimester of pregnancy	Total number of women who register with an LMC in the first trimester of their pregnancy	Total number of women who register with an LMC
Standard primiparae	2	Standard primiparae who have a spontaneous vaginal birth	Total number of standard primiparae who have a spontaneous vaginal birth at a maternity facility	Total number of standard primiparae
	3	Standard primiparae who undergo an instrumental vaginal birth	Total number of standard primiparae who undergo an instrumental vaginal birth	Total number of standard primiparae
	4	Standard primiparae who undergo caesarean section	Total number of standard primiparae who undergo caesarean section	Total number of standard primiparae
	5	Standard primiparae who undergo induction of labour	Total number of standard primiparae who undergo induction of labour	Total number of standard primiparae
	6	Standard primiparae with an intact lower genital tract (no 1st- to 4th-degree tear or episiotomy)	Total number of standard primiparae with an intact lower genital tract with vaginal birth	Total number of standard primiparae who give birth vaginally
	7	Standard primiparae undergoing episiotomy and no 3rd- or 4th-degree perineal tear	Total number of standard primiparae undergoing episiotomy and no 3rd- or 4th-degree perineal tear with vaginal birth	Total number of standard primiparae who give birth vaginally
	8	Standard primiparae sustaining a 3rd- or 4th-degree perineal tear and no episiotomy	Total number of standard primiparae sustaining a 3rd- or 4th-degree perineal tear and no episiotomy with vaginal birth	Total number of standard primiparae who give birth vaginally
	9	Standard primiparae undergoing episiotomy and sustaining a 3rd- or 4th-degree perineal tear	Total number of standard primiparae undergoing episiotomy and sustaining a 3rd- or 4th-degree perineal tear with vaginal birth	Total number of standard primiparae who give birth vaginally

Population	Indicator		Numerator	Denominator
Women giving birth	10	Women having a general anaesthetic for caesarean section	Total number of women having a general anaesthetic for caesarean section	Total number of women who undergo caesarean section
	11	Women requiring a blood transfusion with caesarean section	Total number of women requiring a blood transfusion with caesarean section	Total number of women who undergo caesarean section
	12	Women requiring a blood transfusion with vaginal birth	Total number of women requiring a blood transfusion with vaginal birth	Total number of women who give birth vaginally
	13	Diagnosis of eclampsia at birth admission	Total number of women diagnosed with eclampsia during birth admission	Total number of women giving birth
	14	Women having a peripartum hysterectomy	Total number of women having an abdominal hysterectomy within 6 weeks after birth	Total number of women giving birth
	15	Women admitted to an intensive care unit (ICU) and requiring ventilation during the pregnancy or postnatal period	Total number of women admitted to ICU and requiring over 24 hours of mechanical ventilation during admission any time during the pregnancy or postnatal period	Total number of women giving birth
	16	Maternal tobacco use during postnatal period	Total number of women identified as smokers at 2 weeks after birth	Total number of women with smoking status at 2 weeks after birth reported
Live-born babies	17	Preterm birth	Total number of babies born under 37 weeks' gestation	Total number of babies born (live births)
	18	Small babies at term (37–42 weeks' gestation)	Total number of babies born at 37–42 weeks' gestation with birthweight under the 10th centile for their gestation	Total number of babies born at 37–42 weeks' gestation
	19	Small babies at term born at 40–42 weeks' gestation	Total number of babies born at 40–42 weeks' gestation with birthweight under the 10th centile for their gestation	Total number of babies born at 37–42 weeks' gestation with birthweight under the 10th centile for their gestation
	20	Babies born at 37+ weeks' gestation requiring respiratory support	Total number of babies born at 37+ weeks' gestation requiring over 4 hours of respiratory support	Total number of babies born at 37+ weeks' gestation

The Ministry of Health has produced a set of online tables to accompany this report and published it on its website (**www.health.govt.nz/publication/new-zealand-maternity-clinical-indicators-2017**). These tables present numbers and rates by:

- indicator, ethnic group and DHB of residence, 2009–2017
- indicator and facility of birth (primary, secondary and tertiary), 2009–2017
- gestation in weeks for indicator 18, 2009–2017.

Maps showing rates for each indicator by DHB of residence will be available on the Health Quality & Safety Commission's Atlas of Healthcare Variation (**www.hqsc.govt.nz/atlas**). The Atlas displays easy-to-use maps, graphs, tables and commentaries that highlight variations by geographic area in the provision and use of specific health services and health outcomes.

About the data

We extracted data for these indicators from all pregnancies and live-born babies recorded on the National Maternity Collection (MAT) on 17 August 2018. We extracted additional hospital event data for each pregnancy and live-born baby recorded on MAT from the National Minimum Dataset (NMDS).

We have excluded records of babies born at a gestational age of less than 20 weeks and the corresponding records for their mothers from this analysis. We have made all efforts to ensure that the data presented does not include duplicate events. We have counted women giving birth at home as having a spontaneous vaginal birth without an episiotomy.

We identified standard primiparae using maternal age, gestational age and parity sourced from MAT, and clinical codes sourced from the current birth event, from antenatal events corresponding to the pregnancy, and from a search of historical maternity events held in the NMDS. See 'Appendix 2: Technical notes' for more detail on definitions and code ranges.

The data presented in this report primarily pertains to women recorded as having given birth and babies live-born in 2017 from MAT. We have re-extracted data from births occurring from 2009 to 2017 using the same methods and criteria to provide an up-to-date time-series view.

As the definitions and data sources used in this report have been revised and may differ from previously published reports in this series, you should not compare the data this edition presents to the data in previous reports. See the accompanying spreadsheets for time-series analysis.

Data integrity

We have compiled this report from data supplied by DHBs and LMCs. District health boards and facilities are individually responsible for ensuring the completeness and quality of data they supply to national collections. Lead maternity carers are contractually responsible for ensuring the accuracy of data they supply on claims for payment. We have applied data quality management at several points in the collection, extraction and reporting of the data presented here. However, errors can occur. Contact the Ministry of Health if you have concerns regarding any of the data or analyses presented here.

Interpretation notes

We present data in this report in two ways:

- by DHB of residence: we intend this data to provide DHBs with information relevant to their usually resident population
- by place of birth: we intend this data to allow monitoring of trends over time at the facility level. We present data for births in secondary and tertiary facilities graphically in the body of this document, and data for births in primary and private facilities and home births in the accompanying online tables.

Numbers and rates

We present rates as raw percentages. We have not standardised rates by age or ethnicity; we have chosen denominators to group women into clinically similar cohorts that would be expected to experience similar birth outcomes (eg, standard primiparae).

Differences in rates by ethnicity or socioeconomic group could be an area of focus for analysis at the DHB level. Some rates reflect small numbers of events; treat them with caution.

Figures

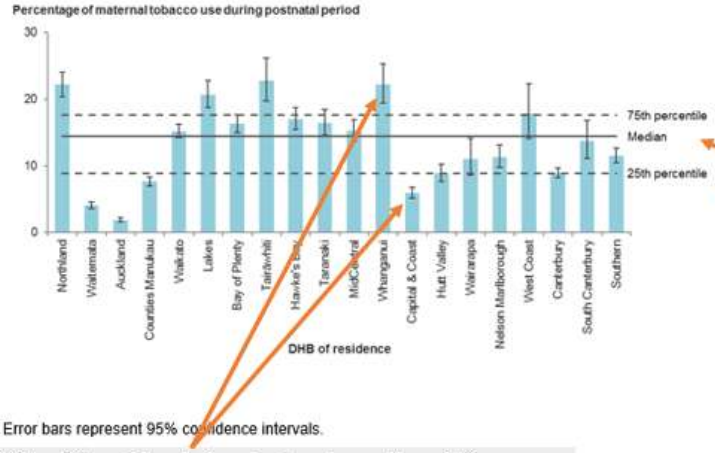
We have presented graphs showing rates by DHB of residence and secondary/tertiary facility of birth for each indicator, except indicators 13–15 due to very small numbers. We have displayed the median, as well as the 25th and 75th percentiles, on the graphs to help compare rates between DHBs and facilities. The following diagram explains some components of the graphs presented in this report.

Graph below shows the range of values described in the notes. In this example, the lowest rate was for Auckland DHB at 1.9% and the highest was for Tairawhiti DHB at 22.8%

Notes on 2017 data

Rates of maternal tobacco use in the postnatal period (measured at two weeks after birth) varied between DHBs and between secondary and tertiary facility of birth; DHB rates ranged from 1.9% to 22.8%, and facility rates ranged from 1.1% to 30.3%.

Figure 1: Percentage of women identified as smokers during postnatal period (2 weeks after birth), by DHB of residence, 2017



75% of DHBs (15 out of 20) have rates below the 75th percentile line

50% of DHBs (10 out of 20) have rates below the 50th percentile line

25% of DHBs (5 out of 20) have rates below the 25th percentile line

Error bars represent 95% confidence intervals.

95% confidence intervals (error bars) can be used to assist in comparing DHB rates. If the confidence intervals do not overlap, it is reasonable to assume that the difference is not due to chance. For example, the rate for Whanganui DHB can be considered as being significantly higher than the rate for Capital & Coast DHB.

Notes on national data

This section highlights how clinical indicator rates at a national level have changed from 2009 to 2017. See Table 2 for a summary of results, and Figure 2 for a graph showing rates for each indicator from 2009 to 2017. This figure is also available by DHB and by secondary or tertiary facility in the accompanying online tables. We present the following analysis by the population considered.

Standard primiparae

A 'standard primipara' is a woman expected to have an uncomplicated pregnancy; intervention and complication rates for such women should be low and consistent across hospitals and DHBs. Comparing data about standard primiparae (rather than all women giving birth) controls for differences in case mix and increases the validity of inter-hospital comparisons of maternity care (adapted from Australian Council on Healthcare Standards 2008, p 29).

For the purposes of this publication, we consider approximately 15 percent of women giving birth in New Zealand to be standard primiparae. These women are a subset of the general maternity population and so are not representative of birthing women in New Zealand.

Standard primiparae in this publication are women aged 20–34 years old at the time of giving birth who are giving birth for the first time (parity = 0)[1] at term (37–41 weeks' gestation) where the outcome of the birth is a singleton baby, the presentation is cephalic and there have been no recorded obstetric complications that are indications for specific obstetric interventions.

Standard primiparae as a proportion of women giving birth varied across DHBs in 2017, ranging from 13.0 percent (Tairāwhiti DHB) to 16.7 percent (Auckland DHB). The highest proportion (26.9 percent) of standard primiparous women were aged between 20 and 24 years old. A higher proportion of standard primiparous women identified as Asian (22.0 percent for Indian and 21.2 percent for other Asian); 12.2 percent identified as Pacific people and 11.0 percent as Māori. About 12.8 percent of women giving birth at home were standard primiparae, while 15.4 percent of women who gave birth at a maternity facility were standard primiparae (Figure 1).

[1] The proportion of women giving birth for the first time (parity = 0) is approximately 40 percent (ranging from 33 percent to 47 percent by DHB of residence). This proportion is lower among women giving birth at home, as 19 percent of women giving birth at home were having their first baby (ranging from 12 percent to 27 percent of home births by DHB of residence).

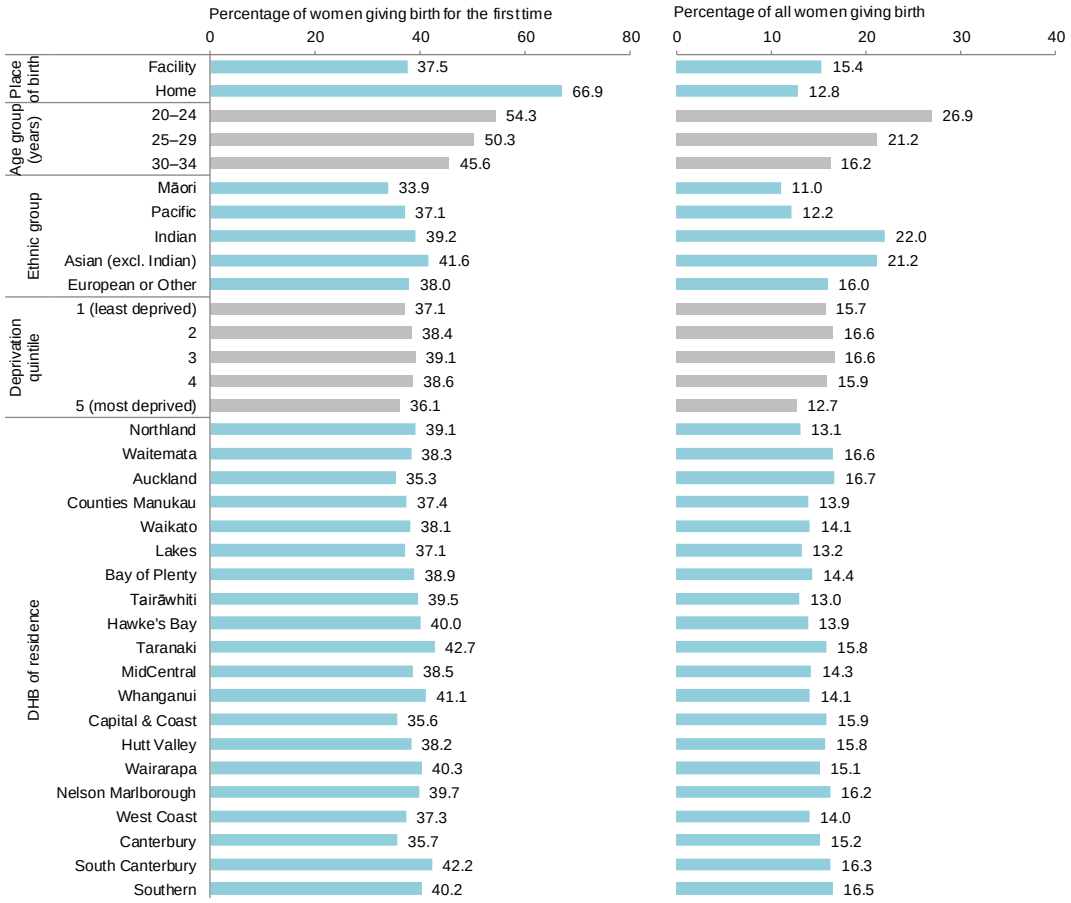
From 2009 to 2017, there was a statistically significant increase in the proportion of standard primiparae who had:

- an instrumental vaginal birth (indicator 3)
- a caesarean section (indicator 4)
- an induction of labour (indicator 5)
- an episiotomy without third- or fourth-degree perineal tear (indicator 7)
- a third- or fourth-degree tear and no episiotomy (indicator 8)
- an episiotomy and a third- or fourth-degree tear (indicator 9).

Conversely, there was a significant decrease in the proportion of standard primiparae who had:

- a spontaneous vaginal birth (indicator 2)
- an intact lower genital tract (indicator 6).

Figure 1: Number of standard primiparae as a proportion of women giving birth for the first time and of all women giving birth in 2017, by place of birth, age group, ethnic group, deprivation quintile and district health board of residence



Note: The number by each bar is the proportion of women who were standard primiparae.

Deprivation quintiles are based on the characteristics of the neighbourhood in which a person resides. Approximately equal numbers of the total New Zealand population reside in areas associated with each of the five deprivation quintiles.

Women registered with a lead maternity carer

The vast majority of women giving birth in New Zealand first register with a lead maternity carer (LMC) for their primary maternity care. This increased from 82 percent of women giving birth in 2009 to 92 percent of women giving birth in 2017.

Women are registering increasingly earlier with LMCs; there was a statistically significant increase in women registering within the first trimester of pregnancy (<13 weeks) from 2009 to 2017.

All women giving birth

Among all women giving birth, there was a statistically significant increase from 2009 to 2017 in the proportion requiring a blood transfusion with a vaginal birth (indicator 12).

In contrast, there was a significant decrease from 2009 to 2017 in the proportion of women:

- having a general anaesthetic for caesarean section (indicator 10)
- requiring a blood transfusion with a caesarean section (indicator 11)
- who smoked during the postnatal period (indicator 16).

Babies

From 2009 to 2017, there was a significant decrease in the proportion of:

- term (37–42 weeks' gestation) babies who were born small
- small babies at term (37–42 weeks' gestation) who were born at 40–42 weeks' gestation.

The proportion of term babies requiring respiratory support increased significantly from 2009 to 2017.

International comparisons

International comparisons are often problematic, due to differing methodology, definitions and availability of national data. When compared to Australia, New Zealand appears to have markedly lower rates of obstetric intervention, including among women at low risk of complications, although definitions of low risk differ between the two countries. Rates for other indicators among the total birthing population in New Zealand, including rates of general anaesthetic for caesarean section (indicator 10) and maternal tobacco use (indicator 16), appear similar to their Australian equivalents.

Table 2: New Zealand Maternity Clinical Indicator national rates by year, 2009–2017

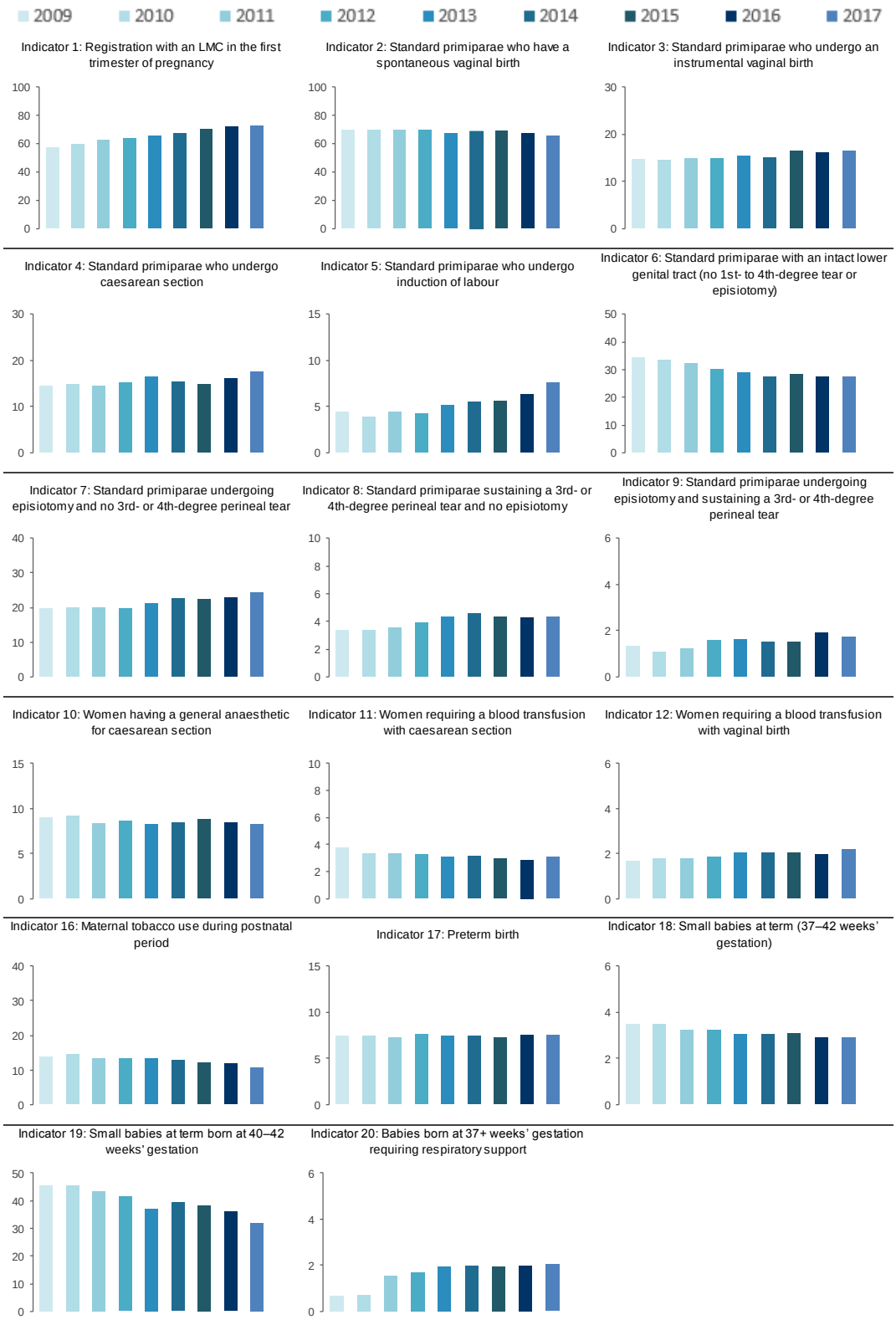
	Indicator	2009	2010	2011	2012	2013	2014	2015	2016	2017	From 2009 to 2017 (p-value)[1]
Women registered with an LMC											
	Registration with an LMC in the first trimester of pregnancy (%)	57.6	59.9	62.8	64.0	65.4	67.8	70.0	71.9	72.3	↑	(<0.001)
Standard primiparae											
2	Standard primiparae who have a spontaneous vaginal birth (%)	69.7	69.9	70.0	69.8	67.7	68.9	68.7	67.6	65.1	↓	(<0.000)
3	Standard primiparae who undergo an instrumental vaginal birth (%)	14.8	14.6	14.9	14.9	15.3	15.2	16.3	16.1	16.3	↑	(<0.000)
4	Standard primiparae who undergo caesarean section (%)	14.6	14.7	14.5	15.1	16.5	15.5	14.9	16.2	17.6	↑	(0.000)
5	Standard primiparae who undergo induction of labour (%)	4.4	3.8	4.4	4.2	5.2	5.6	5.7	6.3	7.6	↑	(<0.000)
6	Standard primiparae with an intact lower genital tract (no 1st- to 4th-degree tear or episiotomy) (%)	34.6	33.3	32.2	30.3	28.9	27.6	28.2	27.7	27.7	↓	(<0.000)
7	Standard primiparae undergoing episiotomy and no 3rd- or 4th-degree perineal tear (%)	19.6	19.9	19.9	19.7	21.0	22.7	22.2	23.0	24.5	↑	(<0.000)
8	Standard primiparae sustaining a 3rd- or 4th-degree perineal tear and no episiotomy (%)	3.4	3.4	3.5	3.9	4.3	4.5	4.4	4.2	4.4	↑	(<0.000)
9	Standard primiparae undergoing episiotomy and sustaining a 3rd- or 4th-degree perineal tear (%)	1.3	1.1	1.3	1.6	1.6	1.5	1.5	1.9	1.7	↑	(<0.000)
Women giving birth											
10	Women having a general anaesthetic for caesarean section (%)	9.0	9.1	8.4	8.6	8.3	8.4	8.8	8.5	8.2	↓	(0.011)
11	Women requiring a blood transfusion with caesarean section (%)	3.8	3.3	3.3	3.2	3.1	3.2	2.9	2.9	3.1	↓	(<0.000)
12	Women requiring a blood transfusion with vaginal birth (%)	1.7	1.8	1.8	1.9	2.0	2.1	2.0	2.0	2.2	↑	(<0.000)
13	Women with eclampsia at birth admission (numerator)[2]	27	22	17	12	17	18	26	28	17		N/A
14	Women having a peripartum hysterectomy (numerator)[2]	51	29	39	49	21	37	30	25	29		N/A
15	Women admitted to an ICU and requiring ventilation during the pregnancy or postnatal period (numerator)[2]	19	18	21	12	17	13	16	9	11		N/A
16	Maternal tobacco use during postnatal period (%)	13.7	14.4	13.4	13.3	13.2	12.8	12.0	11.7	10.5	↓	(<0.000)

Indicator	2009	2010	2011	2012	2013	2014	2015	2016	2017	From 2009 to 2017 (p-value)[1]
Babies										
17 Preterm birth (%)	7.4	7.4	7.3	7.6	7.4	7.4	7.3	7.5	7.5	–	(0.485)
18 Small babies at term (37–42 weeks' gestation) (%)	3.5	3.5	3.2	3.2	3.0	3.0	3.1	2.9	2.9	↓	(<0.000)
19 Small babies at term born at 40–42 weeks' gestation (%)	45.4	45.5	43.4	41.4	36.9	39.3	38.4	35.8	31.9	↓	(<0.000)
20 Babies born at 37+ weeks' gestation requiring respiratory support	0.7	0.7	1.6	1.7	1.9	2.0	1.9	2.0	2.0	↑	(<0.000)

1 Shows whether there was a statistically significant increase (↑), or decrease (↓), or no statistically significant change (–) in rates from 2009 to 2017. Statistical significance was derived using a chi-squared test for trend in proportions, at a 95% significance level for all indicators, except indicators 13–15 due to small numbers.

2 Rates are not presented due to small numbers for these indicators. The numbers presented are the numerator values each year for the indicator.

Figure 2: New Zealand Maternity Clinical Indicator rates by year, 2009–2017



Note: Indicators 13–15 (showing severe maternal morbidity) are not presented as graphs due to very small numbers (see Table 2).

Indicator 1: Registration with a lead maternity carer

Rationale and purpose

The Perinatal and Maternal Mortality Review Committee (2017), the National Maternity Monitoring Group (2013) and the Health Select Committee Inquiry into improving child health outcomes and preventing child abuse with a focus on preconception to three years of age (2013) all recommend early engagement with maternity care. The National Institute for Health and Care Excellence (2008) recommends that antenatal care be started in the first trimester, and ideally by 10 weeks' gestation.

Early engagement with an LMC enables opportunities for screening, education and referral, and begins the primary maternity continuity of care relationship between a woman and her LMC. The National Maternity Monitoring Group recommended in their 2013 annual report that DHBs develop new ways to improve access to LMC services in the first trimester, and profiled a range of activities DHBs were already undertaking to this end.

This indicator monitors the number of women who registered with an LMC in the first trimester of their pregnancy, out of all women who gave birth and had an LMC providing their primary maternity care.[2] This indicator supports national and local monitoring of the effectiveness of activities to improve timely registration with an LMC.

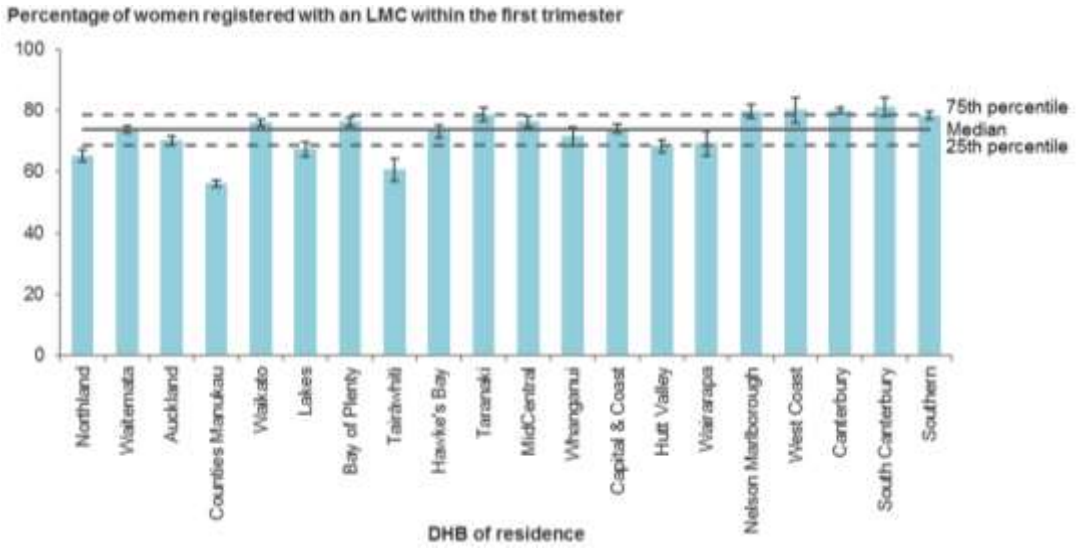
Notes on 2017 data

Rates of registration with an LMC in the first trimester varied between DHBs and between secondary and tertiary facility of birth; rates by DHB of residence ranged from 56.1 percent to 81.4 percent, and rates by facility of birth ranged from 50.3 percent to 85.3 percent. Initiatives in this area, such as a video Counties Manukau DHB produced specifically for Pacific women, are expected to increase the rate of women engaging with an LMC in the first trimester of their pregnancy.

[2] Women who register with a DHB primary maternity service are not counted in this indicator.

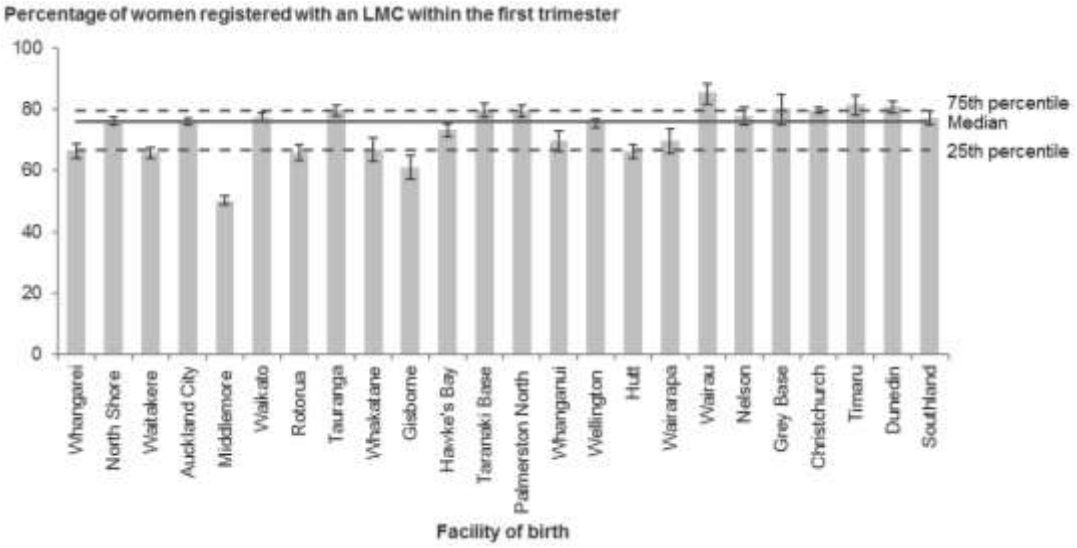
Indicator 1: Registration with a lead maternity carer in the first trimester of pregnancy, 2017

Figure 3: Percentage of women who register with a lead maternity carer in the first trimester of their pregnancy among all registered women giving birth, by district health board of residence, 2017



Error bars represent 95% confidence intervals.

Figure 4: Percentage of women who register with a lead maternity carer in the first trimester of their pregnancy among all registered women giving birth, by facility of birth (secondary and tertiary facilities), 2017



Error bars represent 95% confidence intervals.

Table 3: Number and percentage of women who register with a lead maternity carer in the first trimester of their pregnancy among all registered women, by district health board of residence, 2017

DHB of residence	Registered within the first trimester of pregnancy	All registered women	Rate (%)
Northland	1,361	2,084	65.3
Waitemata	5,442	7,382	73.7
Auckland	3,078	4,379	70.3
Counties Manukau	3,610	6,431	56.1
Waikato	3,936	5,172	76.1
Lakes	1,041	1,543	67.5
Bay of Plenty	2,352	3,079	76.4
Tairāwhiti	420	693	60.6
Hawke's Bay	1,459	1,995	73.1
Taranaki	1,098	1,394	78.8
MidCentral	1,584	2,075	76.3
Whanganui	574	801	71.7
Capital & Coast	2,428	3,281	74.0
Hutt Valley	1,259	1,842	68.3
Wairarapa	362	521	69.5
Nelson Marlborough	1,083	1,357	79.8
West Coast	284	354	80.2
Canterbury	5,089	6,362	80.0
South Canterbury	513	630	81.4
Southern	2,682	3,418	78.5
Unknown	151	269	–
New Zealand	**39,806**	**55,062**	**72.3**

Table 4: Number and percentage of women who register with a lead maternity carer in the first trimester of their pregnancy among all registered women, by facility of birth, 2017

Place of birth	Registered within the first trimester of pregnancy	All registered women	Rate (%)
Whangarei	962	1,448	66.4
North Shore	2,904	3,814	76.1
Waitakere	1,732	2,631	65.8
Auckland City	4,115	5,419	75.9
Middlemore	2,375	4,721	50.3
Waikato	2,662	3,439	77.4
Rotorua	854	1,296	65.9
Tauranga	1,519	1,907	79.7
Whakatane	410	612	67.0
Gisborne	391	640	61.1
Hawke's Bay	1,367	1,868	73.2
Taranaki Base	983	1,234	79.7
Palmerston North	1,411	1,778	79.4
Whanganui	493	707	69.7
Wellington	2,257	2,993	75.4
Hutt	1,159	1,752	66.2
Wairarapa	332	476	69.7
Wairau	349	409	85.3
Nelson	647	831	77.9
Grey Base	201	250	80.4
Christchurch	4,139	5,192	79.7
Timaru	478	586	81.6
Dunedin	1,344	1,663	80.8
Southland	951	1,231	77.3
All secondary and tertiary facilities	**34,035**	**46,897**	**72.6**
All primary facilities	**3,993**	**5,659**	**70.6**
All home births	**1,492**	**1,986**	**75.1**
New Zealand[1]	**39,806**	**55,062**	**72.3**

1 Includes women where birth location was unspecified.

Indicators 2 to 5: Type of birth

Rationale and purpose

Indicators 2 to 5 present data on types of birth among standard primiparae. They compare rates of spontaneous vaginal birth and rates of medical interventions in a low-risk population.[3] Their purpose is to encourage maternity service providers to review the appropriateness of these interventions among low-risk women, with the aims of supporting normal birth, improving maternal experience of maternity care, reducing maternal and perinatal morbidity, and supporting value for money for the health system. The following sections describe the rationale and purpose of the specific indicators.

Spontaneous vaginal birth (indicator 2)

This indicator measures the proportion of women having a spontaneous (non-instrumental) vaginal birth in a low-risk population. This measure includes births for which labour was augmented or induced. Maternity service providers should review, evaluate and make necessary changes to clinical practice aimed at supporting women to achieve a spontaneous vaginal birth, and may wish to consider further local measures that exclude other birth interventions.

Instrumental vaginal birth (indicator 3)

This indicator measures the use of instrumental interventions; that is, vacuum (ventouse) and forceps. The use of instruments is associated with both short-term and long-term complications for the woman and the baby, some of which can be serious. Maternity service providers should use instrumental interventions judiciously (AIHW 2013). If a maternity service provider's rates of intervention are significantly higher than its peer group at a national level, it should examine the use of instrumental birth alongside other indicators that instrumental birth may affect, including maternal and perinatal morbidity.

[3] Some indicators do not sum to 100 percent due to missing data codes for some events.

Caesarean section (indicator 4)

The purpose of this indicator is to encourage maternity service providers to evaluate whether they performed caesarean sections on the right women at the right place and at the right time, and to reduce the harm associated with potentially avoidable caesarean sections among low-risk women. Caesarean birth is safer now than in the past and serious complications are uncommon, particularly for healthy women, but a small risk of serious morbidity and mortality for both the woman and the baby remains, and a primary caesarean section can complicate a subsequent pregnancy (AIHW 2013). If a provider's caesarean section rates are significantly different from their peer group at a national level, it should examine its use of caesarean sections among low-risk women.

Induction of labour (indicator 5)

The purpose of this indicator is to benchmark rates of induction of labour in a low-risk population. Induction of labour is associated with risk of fetal distress, uterine hyper-stimulation and postpartum haemorrhage, and can be the start of a cascade of further medical interventions (AIHW 2013). Maternity service providers should use this indicator in further investigation of their policies and practices with respect to inducing labour in low-risk women. If a provider's rates of induction of labour are significantly higher than its peer group at a national level, it should review the appropriateness of inductions in this group as well as examine the results of other indicators that can be affected by induction, such as caesarean section and postpartum haemorrhage.

Notes on 2017 data

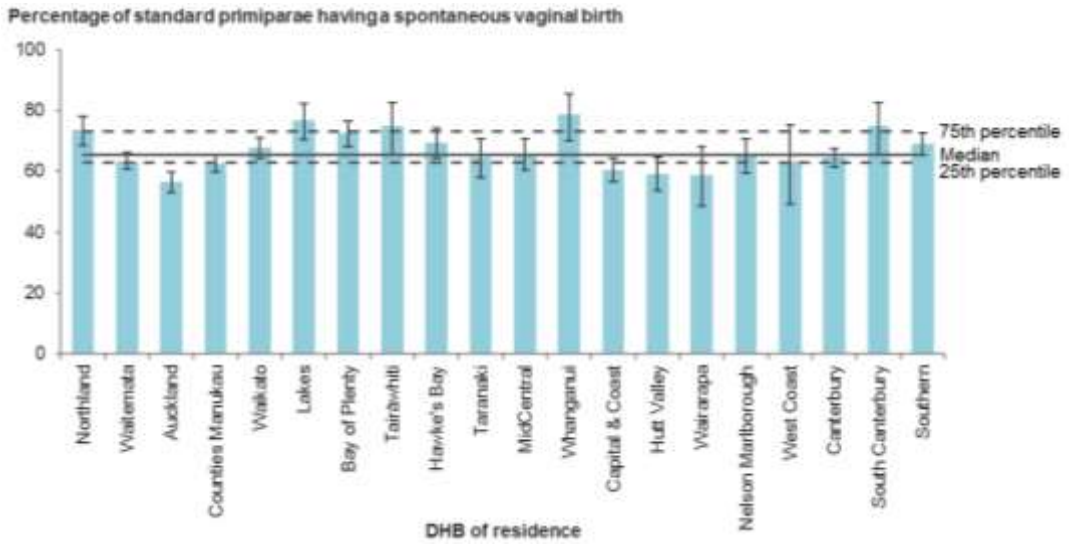
Rates of spontaneous vaginal birth among standard primiparae varied notably between DHBs and between secondary and tertiary facilities in 2017; DHB rates ranged from 56.5 percent to 78.7 percent and facility rates ranged from 45.9 percent to 83.3 percent. This variation merits further urgent investigation, as it represents significant variation in clinical practice among a clinically comparable cohort.

Rates of instrumental vaginal birth ranged from 6.9 percent to 32.0 percent between facilities. Caesarean section rates also varied by facility, from 8.3 percent to 27.1 percent, and by DHB, from 7.4 percent to 22.8 percent. These variations indicate an urgent need for the relevant DHBs to identify the standard primiparae who had inductions of labour or operative births and undertake multidisciplinary audit to determine whether the interventions were evidence based. District health boards not already reviewing caesarean sections among low-risk women should do so.

Standard primiparae are unlikely to have indications for induction of labour, so rates of induction for this group should be low. District health boards and facilities with rates significantly above the national median should investigate reasons for high induction rates.

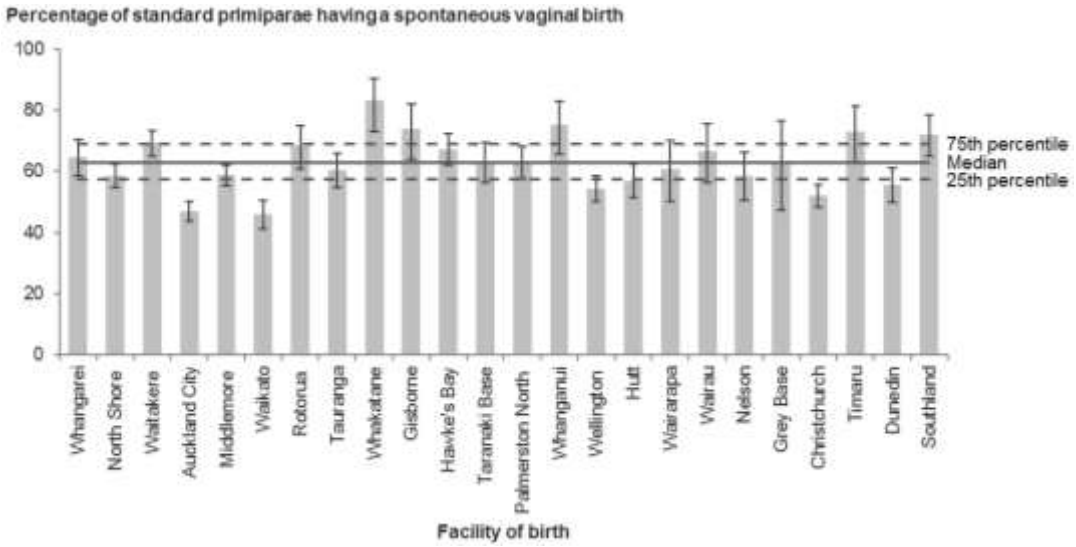
Indicator 2: Spontaneous vaginal birth among standard primiparae, 2017

Figure 5: Percentage of spontaneous vaginal births among standard primiparae, by district health board of residence, 2017



Error bars represent 95% confidence intervals.

Figure 6: Percentage of spontaneous vaginal births among standard primiparae, by facility of birth (secondary and tertiary facilities), 2017



Error bars represent 95% confidence intervals.

Table 5: Number and percentage of spontaneous vaginal births among standard primiparae, by district health board of residence, 2017

DHB of residence	Spontaneous vaginal births	Standard primiparae	Rate (%)
Northland	244	332	73.5
Waitemata	752	1,185	63.5
Auckland	491	869	56.5
Counties Manukau	750	1,198	62.6
Waikato	521	769	67.8
Lakes	152	198	76.8
Bay of Plenty	337	465	72.5
Tairāwhiti	72	96	75.0
Hawke's Bay	230	331	69.5
Taranaki	137	212	64.6
MidCentral	216	328	65.9
Whanganui	85	108	78.7
Capital & Coast	366	605	60.5
Hutt Valley	183	309	59.2
Wairarapa	54	92	58.7
Nelson Marlborough	171	262	65.3
West Coast	31	49	63.3
Canterbury	631	979	64.5
South Canterbury	72	96	75.0
Southern	405	587	69.0
Unknown	12	16	–
New Zealand	**5,912**	**9,086**	**65.1**

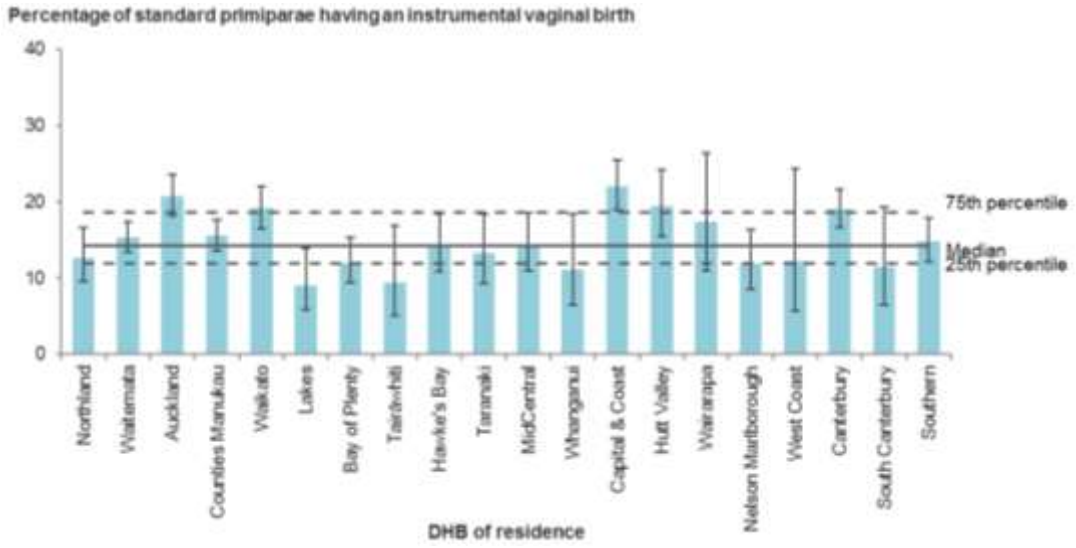
Table 6: Number and percentage of spontaneous vaginal births among standard primiparae, by place of birth, 2017

Place of birth	Spontaneous vaginal births	Standard primiparae	Rate (%)
Whangarei	158	244	64.8
North Shore	352	601	58.6
Waitakere	316	456	69.3
Auckland City	447	950	47.1
Middlemore	525	894	58.7
Waikato	202	440	45.9
Rotorua	110	161	68.3
Tauranga	178	295	60.3
Whakatane	60	72	83.3
Gisborne	68	92	73.9
Hawke's Bay	208	309	67.3
Taranaki Base	126	200	63.0
Palmerston North	189	300	63.0
Whanganui	70	93	75.3
Wellington	284	522	54.4
Hutt	174	305	57.0
Wairarapa	54	89	60.7
Wairau	58	87	66.7
Nelson	89	152	58.6
Grey Base	24	38	63.2
Christchurch	380	731	52.0
Timaru	65	89	73.0
Dunedin	168	302	55.6
Southland	121	168	72.0
All secondary and tertiary facilities	**4,426**	**7,590**	**58.3**
All primary facilities	**1,225**	**1,235**	**99.2**
All home births	**261**	**261**	**100.0**
New Zealand[1]	**5,912**	**9,086**	**65.1**

1 Includes women where birth location was unspecified.

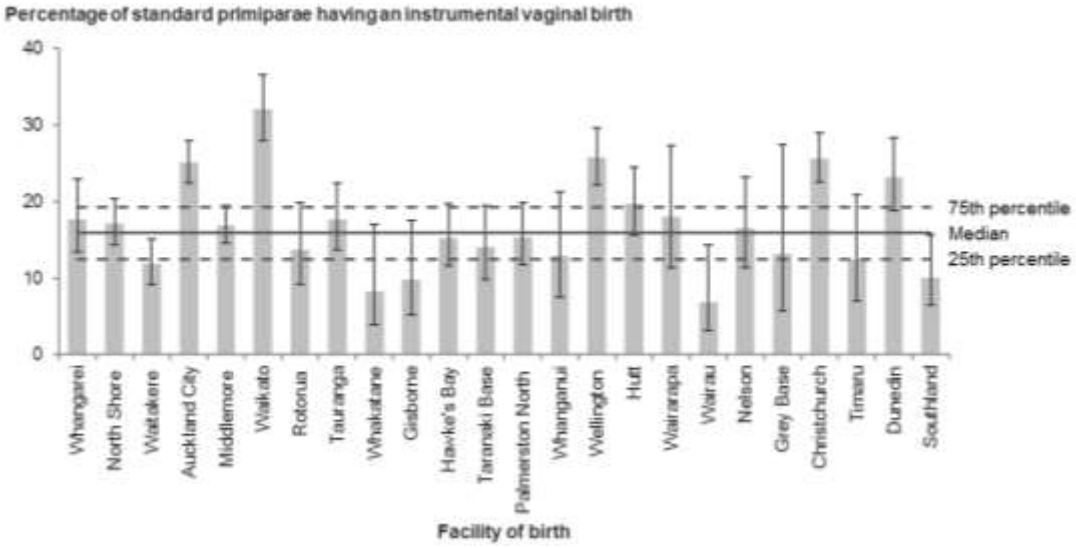
Indicator 3: Instrumental vaginal birth among standard primiparae, 2017

Figure 7: Percentage of instrumental vaginal births among standard primiparae, by district health board of residence, 2017



Error bars represent 95% confidence intervals.

Figure 8: Percentage of instrumental vaginal births among standard primiparae, by facility of birth (secondary and tertiary facilities), 2017



Error bars represent 95% confidence intervals.

Table 7: Number and percentage of instrumental vaginal births among standard primiparae, by district health board of residence, 2017

DHB of residence	Instrumental vaginal births	Standard primiparae	Rate (%)
Northland	42	332	12.7
Waitemata	181	1,185	15.3
Auckland	180	869	20.7
Counties Manukau	186	1,198	15.5
Waikato	147	769	19.1
Lakes	18	198	9.1
Bay of Plenty	56	465	12.0
Tairāwhiti	9	96	9.4
Hawke's Bay	47	331	14.2
Taranaki	28	212	13.2
MidCentral	47	328	14.3
Whanganui	12	108	11.1
Capital & Coast	133	605	22.0
Hutt Valley	60	309	19.4
Wairarapa	16	92	17.4
Nelson Marlborough	31	262	11.8
West Coast	6	49	12.2
Canterbury	186	979	19.0
South Canterbury	11	96	11.5
Southern	87	587	14.8
Unknown	2	16	–
New Zealand	**1,485**	**9,086**	**16.3**

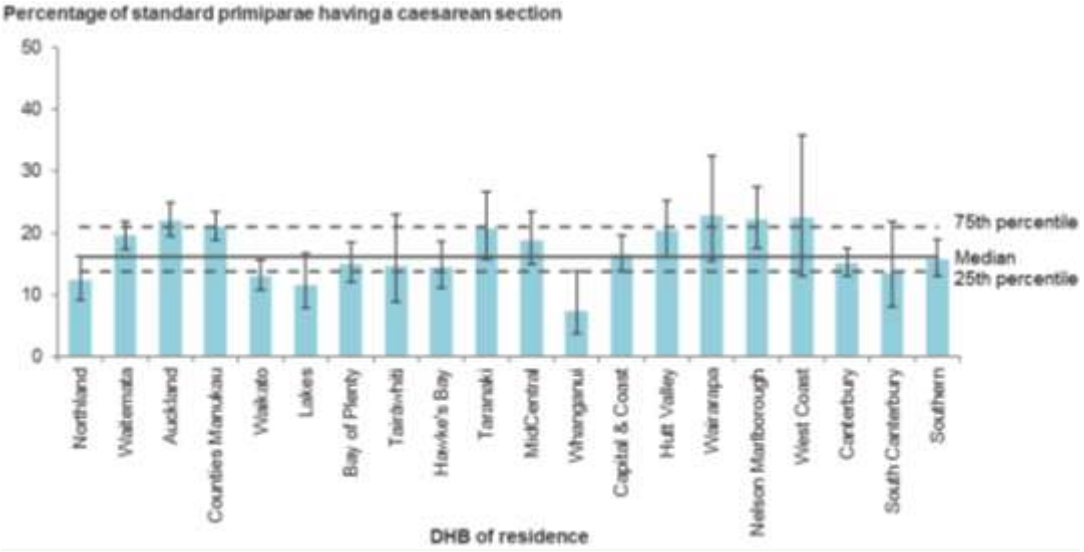
Table 8: Number and percentage of instrumental vaginal births among standard primiparae, by place of birth, 2017

Place of birth	Instrumental vaginal births	Standard primiparae	Rate (%)
Whangarei	43	244	17.6
North Shore	103	601	17.1
Waitakere	54	456	11.8
Auckland City	238	950	25.1
Middlemore	151	894	16.9
Waikato	141	440	32.0
Rotorua	22	161	13.7
Tauranga	52	295	17.6
Whakatane	6	72	8.3
Gisborne	9	92	9.8
Hawke's Bay	47	309	15.2
Taranaki Base	28	200	14.0
Palmerston North	46	300	15.3
Whanganui	12	93	12.9
Wellington	134	522	25.7
Hutt	60	305	19.7
Wairarapa	16	89	18.0
Wairau	6	87	6.9
Nelson	25	152	16.4
Grey Base	5	38	13.2
Christchurch	187	731	25.6
Timaru	11	89	12.4
Dunedin	70	302	23.2
Southland	17	168	10.1
All secondary and tertiary facilities	**1,483**	**7,590**	**19.5**
All primary facilities	**2**	**1,235**	**0.2**
All home births	**0**	**261**	**0.0**
New Zealand[1]	**1,485**	**9,086**	**16.3**

1 Includes women where birth location was unspecified.

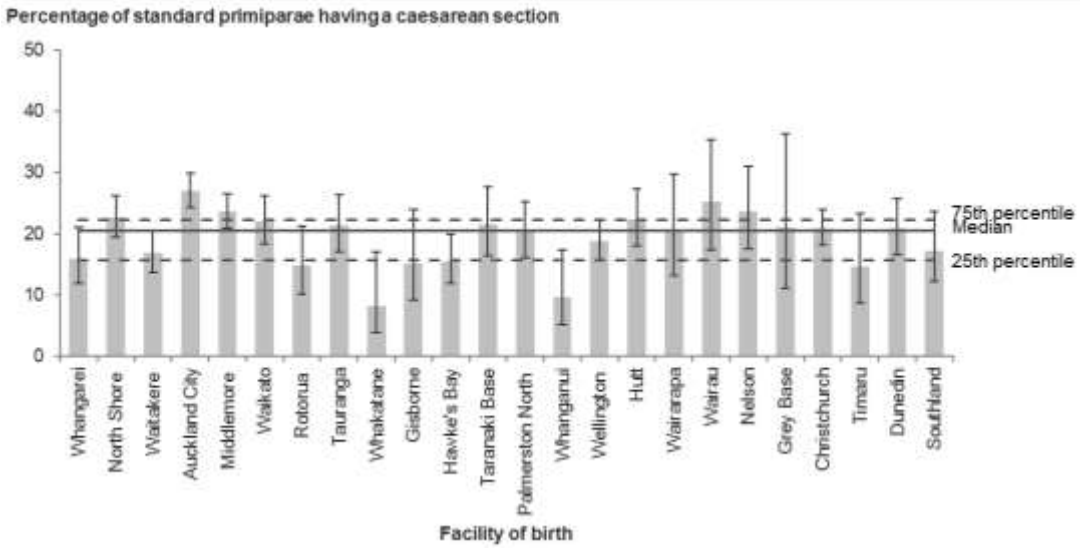
Indicator 4: Caesarean section among standard primiparae, 2017

Figure 9: Percentage of caesarean section deliveries among standard primiparae, by district health board of residence, 2017



Error bars represent 95% confidence intervals.

Figure 10: Percentage of caesarean section deliveries among standard primiparae, by facility of birth (secondary and tertiary facilities), 2017



Error bars represent 95% confidence intervals.

Table 9: Number and percentage of deliveries by caesarean section among standard primiparae, by district health board of residence, 2017

DHB of residence	Caesarean sections	Standard primiparae	Rate (%)
Northland	41	332	12.3
Waitemata	232	1,185	19.6
Auckland	192	869	22.1
Counties Manukau	252	1,198	21.0
Waikato	100	769	13.0
Lakes	23	198	11.6
Bay of Plenty	70	465	15.1
Tairāwhiti	14	96	14.6
Hawke's Bay	48	331	14.5
Taranaki	44	212	20.8
MidCentral	62	328	18.9
Whanganui	8	108	7.4
Capital & Coast	100	605	16.5
Hutt Valley	63	309	20.4
Wairarapa	21	92	22.8
Nelson Marlborough	58	262	22.1
West Coast	11	49	22.4
Canterbury	148	979	15.1
South Canterbury	13	96	13.5
Southern	93	587	15.8
Unknown	2	16	–
New Zealand	**1,595**	**9,086**	**17.6**

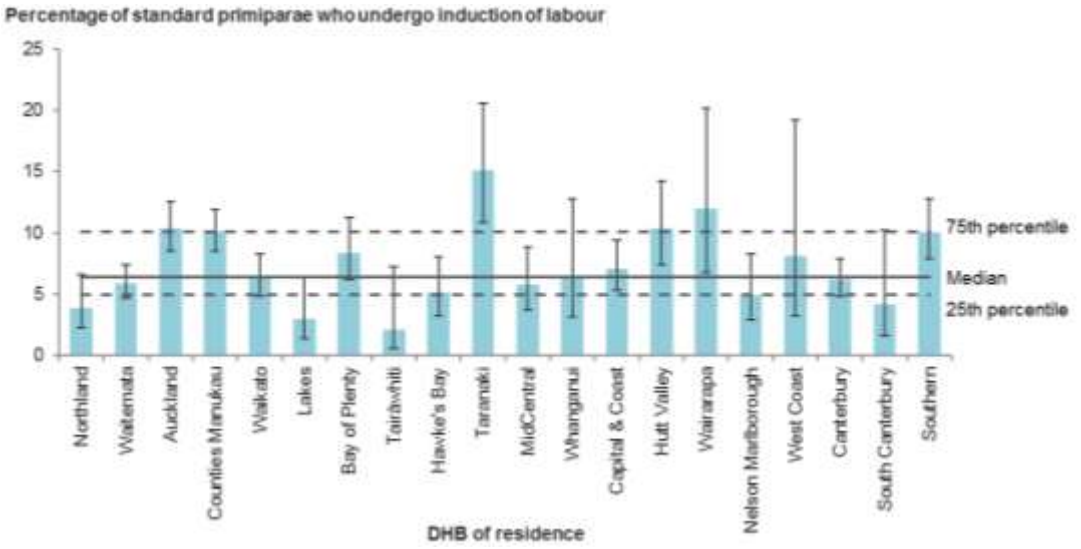
Table 10: Number and percentage of deliveries by caesarean section among standard primiparae, by place of birth, 2017

Place of birth	Caesarean sections	Standard primiparae	Rate (%)
Whangarei	39	244	16.0
North Shore	136	601	22.6
Waitakere	77	456	16.9
Auckland City	257	950	27.1
Middlemore	211	894	23.6
Waikato	97	440	22.0
Rotorua	24	161	14.9
Tauranga	63	295	21.4
Whakatane	6	72	8.3
Gisborne	14	92	15.2
Hawke's Bay	48	309	15.5
Taranaki Base	43	200	21.5
Palmerston North	61	300	20.3
Whanganui	9	93	9.7
Wellington	98	522	18.8
Hutt	68	305	22.3
Wairarapa	18	89	20.2
Wairau	22	87	25.3
Nelson	36	152	23.7
Grey Base	8	38	21.1
Christchurch	153	731	20.9
Timaru	13	89	14.6
Dunedin	63	302	20.9
Southland	29	168	17.3
All secondary and tertiary facilities	**1,593**	**7,590**	**21.0**
All primary facilities	**2**	**1,235**	**0.2**
All home births	**0**	**261**	**0.0**
New Zealand[1]	**1,595**	**9,086**	**17.6**

1 Includes women where birth location was unspecified.

Indicator 5: Induction of labour among standard primiparae, 2017

Figure 11: Percentage of inductions of labour among standard primiparae, by district health board of residence, 2017



Error bars represent 95% confidence intervals.

Figure 12: Percentage of inductions of labour among standard primiparae, by facility of birth (secondary and tertiary facilities), 2017

Error bars represent 95% confidence intervals.

Table 11: Number and percentage of inductions of labour among standard primiparae, by district health board of residence, 2017

DHB of residence	Inductions of labour	Standard primiparae	Rate (%)
Northland	13	332	3.9
Waitemata	70	1,185	5.9
Auckland	90	869	10.4
Counties Manukau	121	1,198	10.1
Waikato	49	769	6.4
Lakes	6	198	3.0
Bay of Plenty	39	465	8.4
Tairāwhiti	2	96	2.1
Hawke's Bay	17	331	5.1
Taranaki	32	212	15.1
MidCentral	19	328	5.8
Whanganui	7	108	6.5
Capital & Coast	43	605	7.1
Hutt Valley	32	309	10.4
Wairarapa	11	92	12.0
Nelson Marlborough	13	262	5.0
West Coast	4	49	8.2
Canterbury	61	979	6.2
South Canterbury	4	96	4.2
Southern	59	587	10.1
Unknown	1	16	–
New Zealand	**693**	**9,086**	**7.6**

Table 12: Number and percentage of inductions of labour among standard primiparae, by facility of birth (secondary and tertiary facilities), 2017

Place of birth	Inductions of labour	Standard primiparae	Rate (%)
Whangarei	10	244	4.1
North Shore	36	601	6.0
Waitakere	33	456	7.2
Auckland City	107	950	11.3
Middlemore	102	894	11.4
Waikato	43	440	9.8
Rotorua	6	161	3.7
Tauranga	24	295	8.1
Whakatane	5	72	6.9
Gisborne	1	92	1.1
Hawke's Bay	17	309	5.5
Taranaki Base	33	200	16.5
Palmerston North	18	300	6.0
Whanganui	7	93	7.5
Wellington	47	522	9.0
Hutt	29	305	9.5
Wairarapa	11	89	12.4
Wairau	5	87	5.7
Nelson	6	152	3.9
Grey Base	2	38	5.3
Christchurch	64	731	8.8
Timaru	4	89	4.5
Dunedin	40	302	13.2
Southland	17	168	10.1
All secondary and tertiary facilities	**667**	**7,590**	**8.8**
All primary facilities	**26**	**1,235**	**2.1**
All home births	**0**	**261**	**0.0**
New Zealand[1]	**693**	**9,086**	**7.6**

1 Includes women where birth location was unspecified.

Indicators 6 to 9: Damage to the lower genital tract

Rationale and purpose

Indicators 6 to 9 cover the degree of damage to the lower genital tract from vaginal birth among standard primiparae. Perineal trauma remains one of the most common complications of childbirth, and is thought to affect between 60 percent and 85 percent of women who give birth vaginally (WHA 2007). Reasons for perineal trauma are varied, and may reflect either maternal or neonatal issues. Perineal damage can cause women pain and longer-term morbidity. The aim of these indicators is to reduce such trauma and its associated maternal morbidity. This may improve maternal satisfaction and mother–infant bonding by reducing maternal pain and discomfort. The following sections describe the rationale and purpose of the specific indicators.

Intact lower genital tract (indicator 6)

The four categories of perineal tear classification enable a standardised description of perineal damage. Assessing and identifying degrees of perineal damage remains a complex process. A classification of first or second degree does not necessarily reflect the level of pain or long-term morbidity a woman experiences. This indicator provides a concise measure of all perineal trauma, and is intended to encourage further investigation to determine how maternity service providers can improve rates of intact lower genital tract.

Episiotomy (indicator 7)

This indicator aims to encourage further investigation among maternity service providers to ensure that they assess risks to the woman and infant appropriately before undertaking an episiotomy. Meta-analysis of randomised controlled trials confirms that judicious use of episiotomy is better practice than routine use of episiotomy (AIHW 2013). If a provider's rates of episiotomy, particularly among low-risk women, are significantly higher than its peer group at a national level, it should examine these results. Providers should also consider their rates alongside other indicators that can be affected by episiotomies, such as third-degree tears, postpartum haemorrhage, infection and maternal admission to high-dependency units or intensive care units (ICUs), to ascertain whether there is any correlation.

Third- and fourth-degree tears (with and without episiotomy) (indicators 8 and 9)

The aim of these indicators is to encourage maternity service providers to consider the rate of tears in conjunction with episiotomy rates, and to undertake further investigation of labour management if rates are significantly different from their peer group at a national level. Labour management may include birth position, the use of induction, instrumental delivery and management of second-stage labour.

Notes on 2017 data

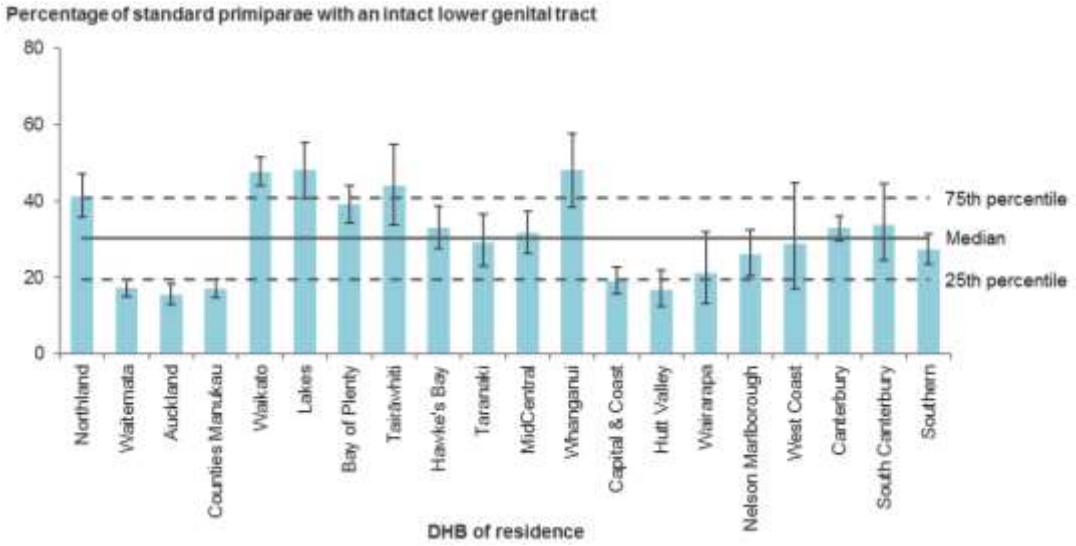
Rates of intact lower genital tract after vaginal birth among standard primiparae ranged from 15.5 percent to 48.0 percent across DHBs, and from 6.8 percent to 47.0 percent across secondary and tertiary facilities. This regional variation suggests that we should investigate both data integrity and local clinical practice. Rates of intact lower genital tract appear to have decreased over time since 2009. We need to further investigate the causes of this, including through review of coding practices, particularly given there has been no statistically significant increase in the rates of instrumental birth among the same population over this time.

Rates of episiotomy without third- or fourth-degree tear also varied, from 4.9 percent to 41.1 percent across DHBs, and from 5.1 percent to 49.2 percent across secondary and tertiary facilities. Facilities and DHBs with rates significantly above the median should investigate the reasons for these differences, which could include review of the clinical indications given in specific cases, education and policy review, and identification of the discipline and number of practitioners performing episiotomies.

All DHBs should undertake more detailed local analysis of the relationship between rates of intact perineum, episiotomies and third- and fourth-degree tears.

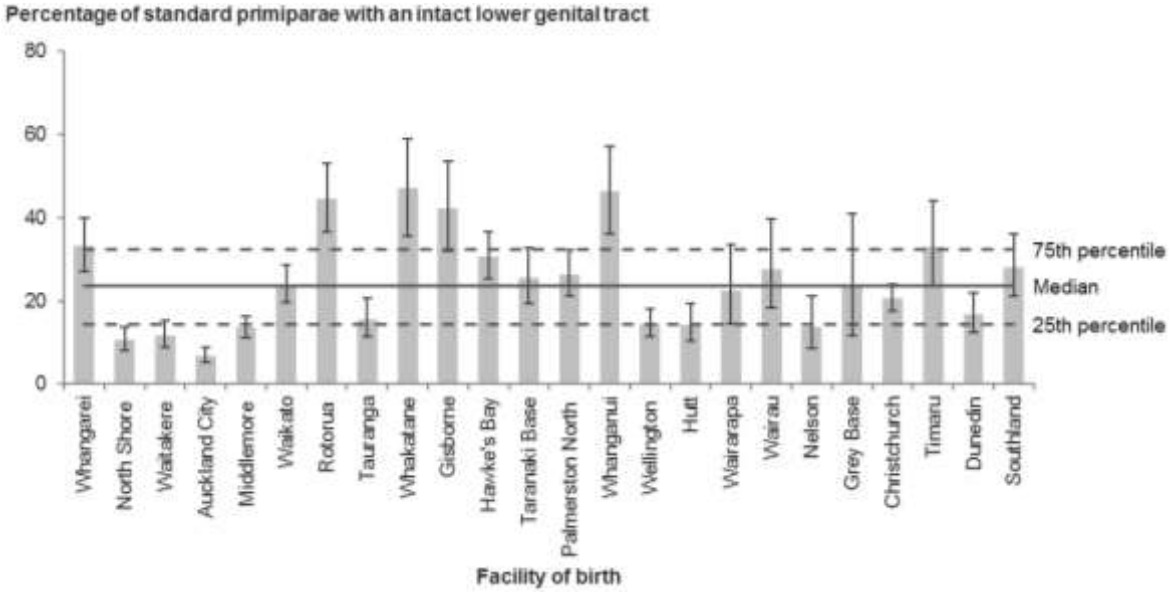
Indicator 6: Intact lower genital tract among standard primiparae giving birth vaginally, 2017

Figure 13: Percentage of standard primiparae giving birth vaginally with intact lower genital tract, by district health board of residence, 2017



Error bars represent 95% confidence intervals.

Figure 14: Percentage of standard primiparae giving birth vaginally with intact lower genital tract, by facility of birth (secondary and tertiary facilities), 2017



Error bars represent 95% confidence intervals.

Table 13: Number and percentage of standard primiparae giving birth vaginally with intact lower genital tract, by district health board of residence, 2017

DHB of residence	Intact lower genital tract	Standard primiparae giving birth vaginally	Rate (%)
Northland	120	291	41.2
Waitemata	164	953	17.2
Auckland	105	677	15.5
Counties Manukau	161	946	17.0
Waikato	319	669	47.7
Lakes	84	175	48.0
Bay of Plenty	154	395	39.0
Tairāwhiti	36	82	43.9
Hawke's Bay	93	283	32.9
Taranaki	49	168	29.2
MidCentral	84	266	31.6
Whanganui	48	100	48.0
Capital & Coast	96	505	19.0
Hutt Valley	41	246	16.7
Wairarapa	15	71	21.1
Nelson Marlborough	53	204	26.0
West Coast	11	38	28.9
Canterbury	273	831	32.9
South Canterbury	28	83	33.7
Southern	135	494	27.3
Unknown	9	14	–
New Zealand	**2,078**	**7,491**	**27.7**

Table 14: Number and percentage of standard primiparae giving birth vaginally with intact lower genital tract, by facility of birth (secondary and tertiary facilities), 2017

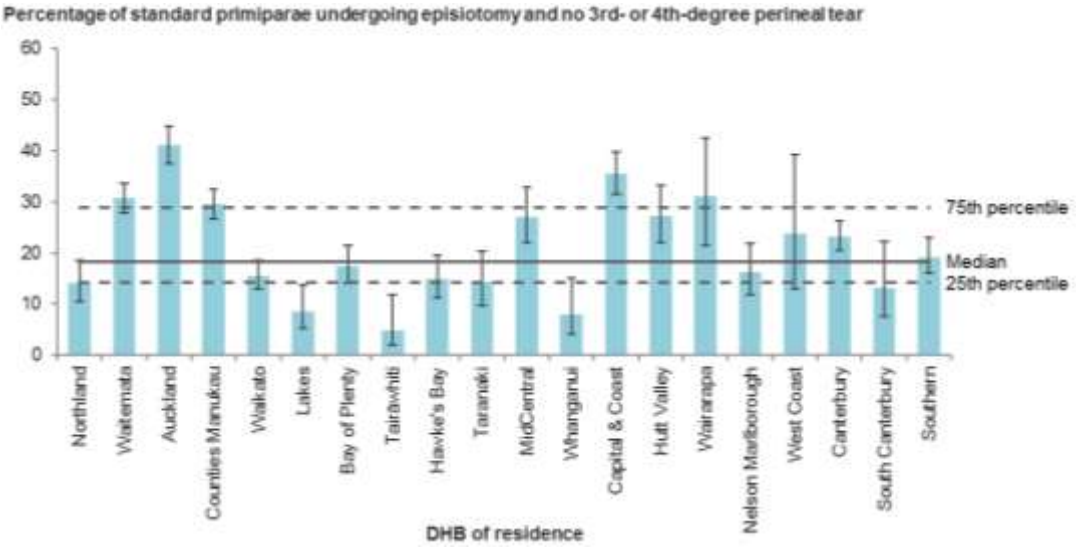
Place of birth	Intact lower genital tract	Standard primiparae giving birth vaginally	Rate (%)
Whangarei	68	205	33.2
North Shore	49	465	10.5
Waitakere	44	379	11.6
Auckland City	47	693	6.8
Middlemore	93	683	13.6
Waikato	82	343	23.9
Rotorua	61	137	44.5
Tauranga	36	232	15.5
Whakatane	31	66	47.0
Gisborne	33	78	42.3
Hawke's Bay	80	261	30.7
Taranaki Base	40	157	25.5
Palmerston North	63	239	26.4
Whanganui	39	84	46.4
Wellington	61	424	14.4
Hutt	34	237	14.3
Wairarapa	16	71	22.5
Wairau	18	65	27.7
Nelson	16	116	13.8
Grey Base	7	30	23.3
Christchurch	119	578	20.6
Timaru	25	76	32.9
Dunedin	40	239	16.7
Southland	39	139	28.1
All secondary and tertiary facilities	**1,141**	**5,997**	**19.0**
All primary facilities	**710**	**1,233**	**57.6**
All home births[1]	**227**	**261**	**87.0**
New Zealand[2]	**2,078**	**7,491**	**27.7**

1 The numerator is derived by subtracting the number of women who were admitted to a maternity facility with a diagnosis of perineal tear within three days of giving birth from the total number of women who gave birth at home. Women who received care for perineal trauma from non-maternity facilities may be included in the numerator. Therefore, the presented rate may be higher than the true rate.

2 Includes women where birth location was unspecified.

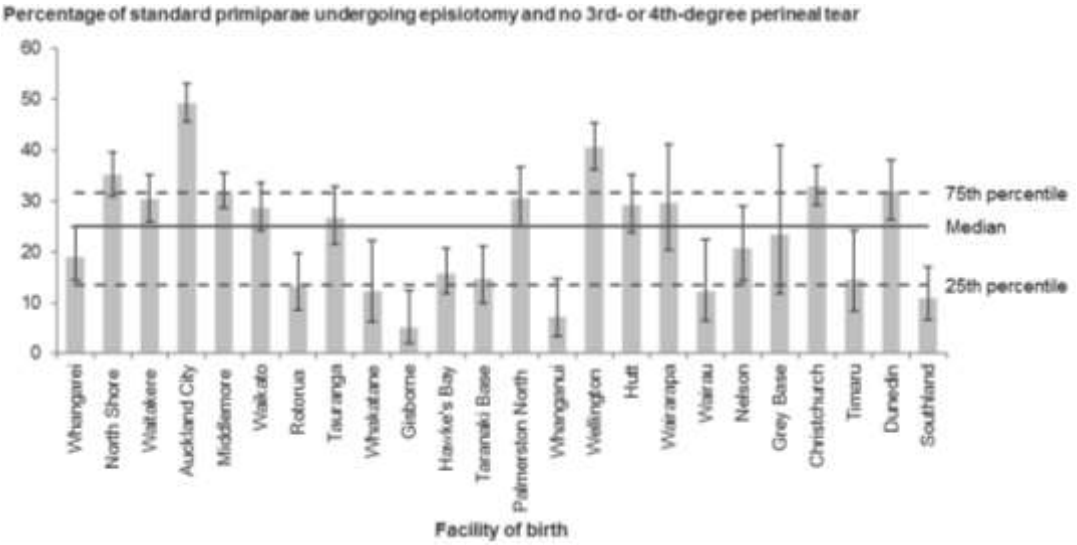
Indicator 7: Episiotomy and no third- or fourth-degree tear among standard primiparae giving birth vaginally, 2017

Figure 15: Percentage of standard primiparae giving birth vaginally and undergoing episiotomy without third- or fourth-degree tear, by district health board of residence, 2017



Error bars represent 95% confidence intervals.

Figure 16: Percentage of standard primiparae giving birth vaginally and undergoing episiotomy without third- or fourth-degree tear, by facility of birth (secondary and tertiary facilities), 2017



Error bars represent 95% confidence intervals.

Table 15: Number and percentage of standard primiparae giving birth vaginally and undergoing episiotomy without third- or fourth-degree tear, by district health board of residence, 2017

DHB of residence	Episiotomy without 3rd- or 4th-degree tear	Standard primiparae giving birth vaginally	Rate (%)
Northland	41	291	14.1
Waitemata	292	953	30.6
Auckland	278	677	41.1
Counties Manukau	279	946	29.5
Waikato	104	669	15.5
Lakes	15	175	8.6
Bay of Plenty	69	395	17.5
Tairāwhiti	4	82	4.9
Hawke's Bay	42	283	14.8
Taranaki	24	168	14.3
MidCentral	72	266	27.1
Whanganui	8	100	8.0
Capital & Coast	179	505	35.4
Hutt Valley	67	246	27.2
Wairarapa	22	71	31.0
Nelson Marlborough	33	204	16.2
West Coast	9	38	23.7
Canterbury	193	831	23.2
South Canterbury	11	83	13.3
Southern	95	494	19.2
Unknown	1	14	–
New Zealand	**1,838**	**7,491**	**24.5**

Table 16: Number and percentage of standard primiparae giving birth vaginally and undergoing episiotomy without third- or fourth-degree tear, by facility of birth (secondary and tertiary facilities), 2017

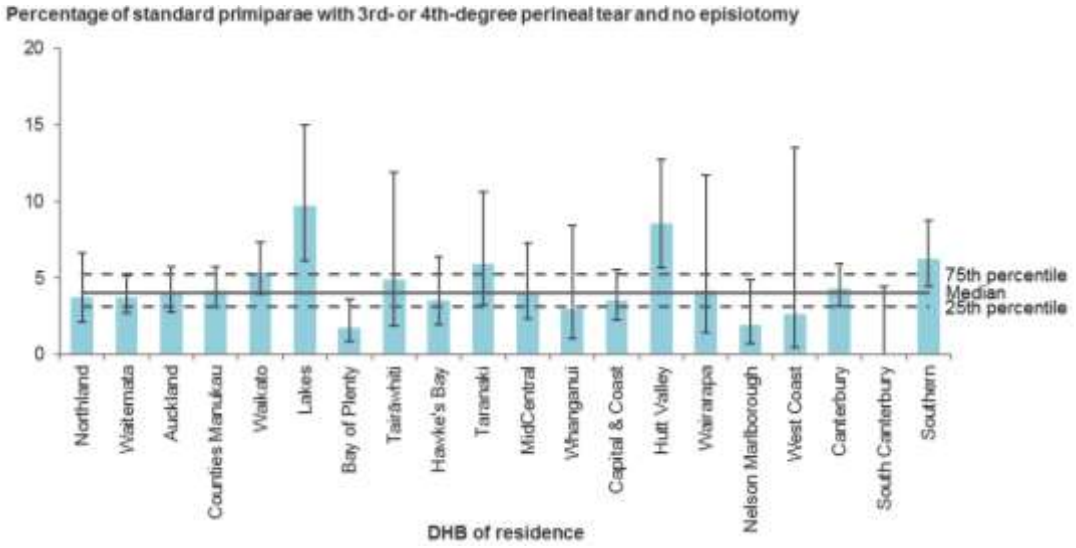
Place of birth	Episiotomy without 3rd- or 4th-degree tear	Standard primiparae giving birth vaginally	Rate (%)
Whangarei	39	205	19.0
North Shore	163	465	35.1
Waitakere	115	379	30.3
Auckland City	341	693	49.2
Middlemore	218	683	31.9
Waikato	98	343	28.6
Rotorua	18	137	13.1
Tauranga	62	232	26.7
Whakatane	8	66	12.1
Gisborne	4	78	5.1
Hawke's Bay	41	261	15.7
Taranaki Base	23	157	14.6
Palmerston North	73	239	30.5
Whanganui	6	84	7.1
Wellington	172	424	40.6
Hutt	69	237	29.1
Wairarapa	21	71	29.6
Wairau	8	65	12.3
Nelson	24	116	20.7
Grey Base	7	30	23.3
Christchurch	190	578	32.9
Timaru	11	76	14.5
Dunedin	76	239	31.8
Southland	15	139	10.8
All secondary and tertiary facilities	**1,802**	**5,997**	**30.0**
All primary facilities	**36**	**1,233**	**2.9**
All home births[1]	**0**	**261**	**0.0**
New Zealand[2]	**1,838**	**7,491**	**24.5**

1 For the purposes of this indicator, all women giving birth at home are counted as having had a spontaneous vaginal birth without an episiotomy. The rate presented may not reflect the true rate due to this assumption.

2 Includes women where birth location was unspecified.

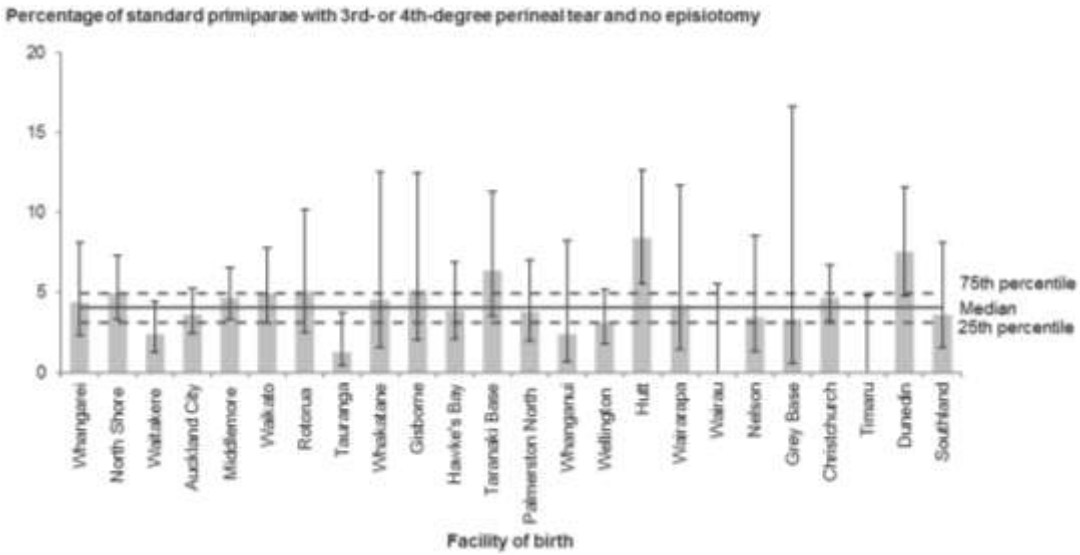
Indicator 8: Third- or fourth-degree tear and no episiotomy among standard primiparae giving birth vaginally, 2017

Figure 17: Percentage of standard primiparae giving birth vaginally sustaining a third- or fourth-degree tear and not undergoing episiotomy, by district health board of residence, 2017



Error bars represent 95% confidence intervals.

Figure 18: Percentage of standard primiparae giving birth vaginally sustaining a third- or fourth-degree tear and not undergoing episiotomy, by facility of birth (secondary and tertiary facilities), 2017



Error bars represent 95% confidence intervals.

Table 17: Number and percentage of standard primiparae giving birth vaginally sustaining a third- or fourth-degree tear and not undergoing episiotomy, by district health board of residence, 2017

DHB of residence	3rd- or 4th-degree tear without episiotomy	Standard primiparae giving birth vaginally	Rate (%)
Northland	11	291	3.8
Waitemata	36	953	3.8
Auckland	27	677	4.0
Counties Manukau	40	946	4.2
Waikato	36	669	5.4
Lakes	17	175	9.7
Bay of Plenty	7	395	1.8
Tairāwhiti	4	82	4.9
Hawke's Bay	10	283	3.5
Taranaki	10	168	6.0
MidCentral	11	266	4.1
Whanganui	3	100	3.0
Capital & Coast	18	505	3.6
Hutt Valley	21	246	8.5
Wairarapa	3	71	4.2
Nelson Marlborough	4	204	2.0
West Coast	1	38	2.6
Canterbury	36	831	4.3
South Canterbury	0	83	0.0
Southern	31	494	6.3
Unknown	0	14	–
New Zealand	**326**	**7,491**	**4.4**

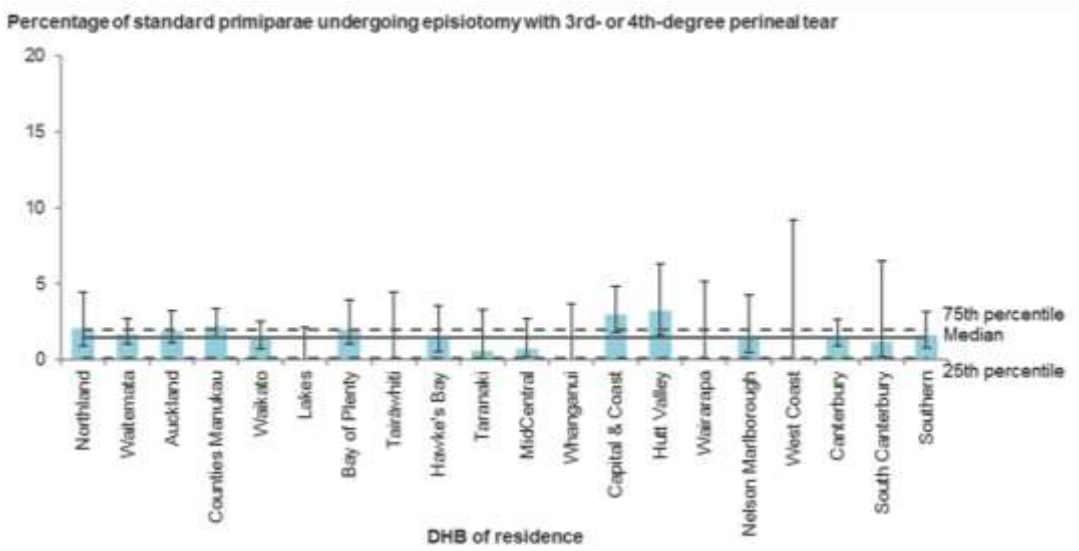
Table 18: Number and percentage of standard primiparae giving birth vaginally sustaining a third- or fourth-degree tear and not undergoing episiotomy, by facility of birth (secondary and tertiary facilities), 2017

Place of birth	3rd- or 4th-degree tear without episiotomy	Standard primiparae giving birth vaginally	Rate (%)
Whangarei	9	205	4.4
North Shore	23	465	4.9
Waitakere	9	379	2.4
Auckland City	25	693	3.6
Middlemore	32	683	4.7
Waikato	17	343	5.0
Rotorua	7	137	5.1
Tauranga	3	232	1.3
Whakatane	3	66	4.5
Gisborne	4	78	5.1
Hawke's Bay	10	261	3.8
Taranaki Base	10	157	6.4
Palmerston North	9	239	3.8
Whanganui	2	84	2.4
Wellington	13	424	3.1
Hutt	20	237	8.4
Wairarapa	3	71	4.2
Wairau	0	65	0.0
Nelson	4	116	3.4
Grey Base	1	30	3.3
Christchurch	27	578	4.7
Timaru	0	76	0.0
Dunedin	18	239	7.5
Southland	5	139	3.6
All secondary and tertiary facilities	**254**	**5,997**	**4.2**
All primary facilities	**63**	**1,233**	**5.1**
All home births	**9**	**261**	**3.4**
New Zealand[1]	**326**	**7,491**	**4.4**

1 Includes women where birth location was unspecified.

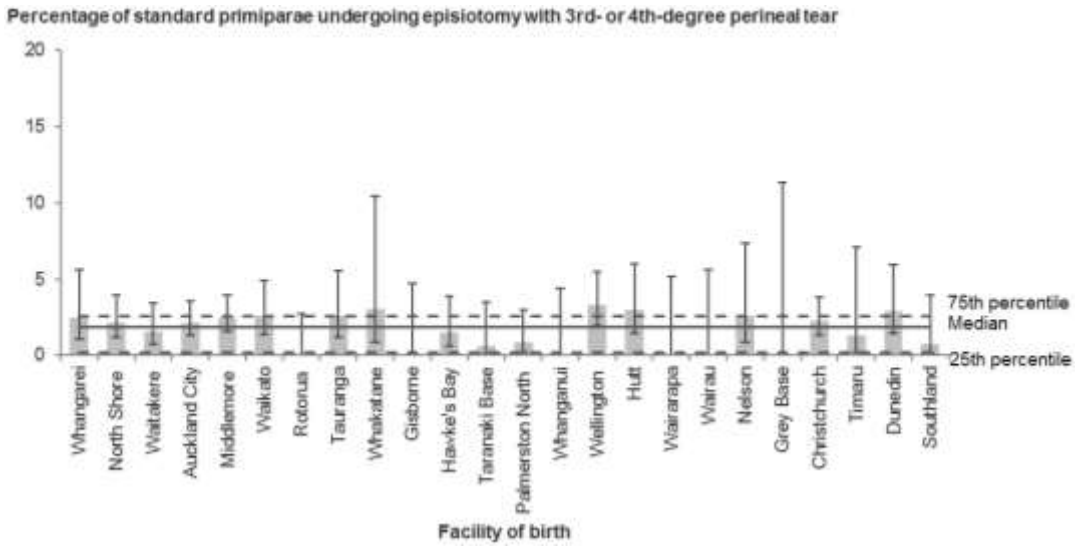
Indicator 9: Episiotomy and third- or fourth-degree tear among standard primiparae giving birth vaginally, 2017

Figure 19: Percentage of standard primiparae giving birth vaginally undergoing episiotomy and sustaining a third- or fourth-degree tear, by district health board of residence, 2017



Error bars represent 95% confidence intervals.

Figure 20: Percentage of standard primiparae giving birth vaginally undergoing episiotomy and sustaining a third- or fourth-degree tear, by facility of birth (secondary and tertiary facilities), 2017



Error bars represent 95% confidence intervals.

Table 19: Number and percentage of standard primiparae giving birth vaginally undergoing episiotomy and sustaining a third- or fourth-degree tear, by district health board of residence, 2017

DHB of residence	Episiotomy with 3rd- or 4th-degree tear	Standard primiparae giving birth vaginally	Rate (%)
Northland	6	291	2.1
Waitemata	16	953	1.7
Auckland	13	677	1.9
Counties Manukau	21	946	2.2
Waikato	9	669	1.3
Lakes	0	175	0.0
Bay of Plenty	8	395	2.0
Tairāwhiti	0	82	0.0
Hawke's Bay	4	283	1.4
Taranaki	1	168	0.6
MidCentral	2	266	0.8
Whanganui	0	100	0.0
Capital & Coast	15	505	3.0
Hutt Valley	8	246	3.3
Wairarapa	0	71	0.0
Nelson Marlborough	3	204	1.5
West Coast	0	38	0.0
Canterbury	13	831	1.6
South Canterbury	1	83	1.2
Southern	8	494	1.6
Unknown	0	14	–
New Zealand	**128**	**7,491**	**1.7**

Table 20: Number and percentage of standard primiparae giving birth vaginally undergoing episiotomy and sustaining a third- or fourth-degree tear, by facility of birth (secondary and tertiary facilities), 2017

Place of birth	Episiotomy with 3rd- or 4th-degree tear	Standard primiparae giving birth vaginally	Rate (%)
Whangarei	5	205	2.4
North Shore	10	465	2.2
Waitakere	6	379	1.6
Auckland City	15	693	2.2
Middlemore	17	683	2.5
Waikato	9	343	2.6
Rotorua	0	137	0.0
Tauranga	6	232	2.6
Whakatane	2	66	3.0
Gisborne	0	78	0.0
Hawke's Bay	4	261	1.5
Taranaki Base	1	157	0.6
Palmerston North	2	239	0.8
Whanganui	0	84	0.0
Wellington	14	424	3.3
Hutt	7	237	3.0
Wairarapa	0	71	0.0
Wairau	0	65	0.0
Nelson	3	116	2.6
Grey Base	0	30	0.0
Christchurch	13	578	2.2
Timaru	1	76	1.3
Dunedin	7	239	2.9
Southland	1	139	0.7
All secondary and tertiary facilities	**123**	**5,997**	**2.1**
All primary facilities	**5**	**1,233**	**0.4**
All home births	**0**	**261**	**0.0**
New Zealand[1]	**128**	**7,491**	**1.7**

1 Includes women where birth location was unspecified.

Indicator 10: General anaesthetic for women giving birth by caesarean section

Rationale and purpose

Although the risks of general anaesthetic for caesarean section have reduced greatly in recent decades, regional anaesthetic is still safer than general anaesthetic because it results in less maternal and neonatal morbidity (Australian Council on Healthcare Standards 2008, p 474).

Maternity service providers will continue to perform a proportion of caesarean sections under general anaesthetic because of factors such as patient preference, as well as in some high-risk cases (such as if a woman has pre-eclampsia) when only general anaesthetic can be used. Providers are more likely to use general anaesthetic when they do caesarean sections urgently; factors affecting this can include the configuration and organisation of obstetric and anaesthetic services (for example, whether a specialist anaesthetist is on site) and the level of antenatal care a woman has received.

The objective of this indicator is to encourage services that have higher-than-average rates of general anaesthetic for caesarean sections to undertake further investigation to determine the causes of these higher rates and evaluate whether they are justified.

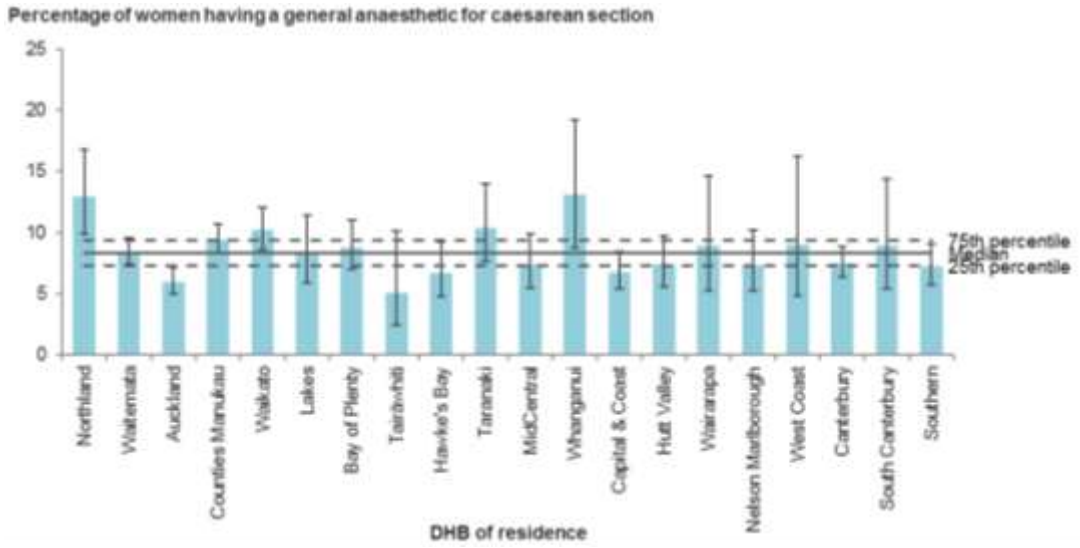
Notes on 2017 data

Rates of general anaesthetic use in caesarean section deliveries ranged from 5.1 percent to 13.1 percent across DHBs, and from 3.8 percent to 13.6 percent across secondary and tertiary facilities. These rates are based on small numbers, so caution must be used when making comparisons.

Maternity service providers that are outliers in terms of these figures should review their rates of general anaesthetic for caesarean sections and consider the impact of the ratio between emergency and elective caesarean section rates. Providers should further investigate the reasons for higher rates of general anaesthetic for emergency caesarean sections, to ensure their practice represents the best possible quality of care for women and their babies.

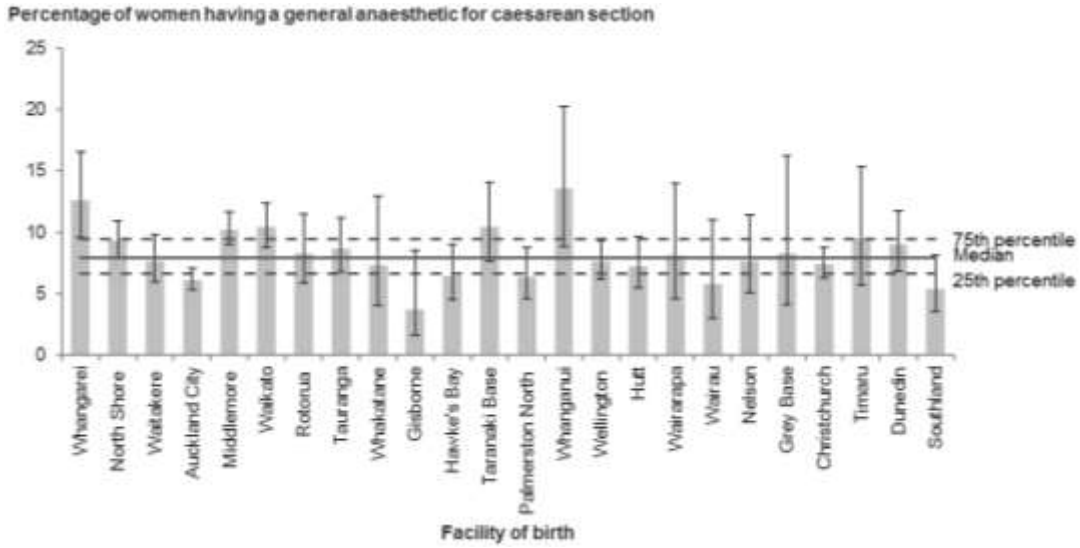
Indicator 10: General anaesthetic for women giving birth by caesarean section, 2017

Figure 21: Percentage of women undergoing a caesarean section under general anaesthetic, by district health board of residence, 2017



Error bars represent 95% confidence intervals.

Figure 22: Percentage of women undergoing a caesarean section under general anaesthetic, by facility of birth (secondary and tertiary facilities), 2017



Error bars represent 95% confidence intervals.

Table 21: Number and percentage of women undergoing a caesarean section under general anaesthetic, by district health board of residence, 2017

DHB of residence	Caesarean sections under general anaesthetic	All caesarean sections	Rate (%)
Northland	48	370	13.0
Waitemata	209	2,487	8.4
Auckland	116	1,931	6.0
Counties Manukau	224	2,369	9.5
Waikato	118	1,156	10.2
Lakes	32	388	8.2
Bay of Plenty	68	772	8.8
Tairāwhiti	7	138	5.1
Hawke's Bay	33	493	6.7
Taranaki	37	357	10.4
MidCentral	42	567	7.4
Whanganui	21	160	13.1
Capital & Coast	70	1,031	6.8
Hutt Valley	46	623	7.4
Wairarapa	13	146	8.9
Nelson Marlborough	31	423	7.3
West Coast	9	100	9.0
Canterbury	129	1,715	7.5
South Canterbury	14	157	8.9
Southern	66	912	7.2
Unknown	2	15	–
New Zealand	**1,335**	**16,310**	**8.2**

Table 22: Number and percentage of women undergoing a caesarean section under general anaesthetic, by facility of birth (secondary and tertiary facilities), 2017

Place of birth	Caesarean sections under general anaesthetic	All caesarean sections	Rate (%)
Whangarei	44	348	12.6
North Shore	136	1,458	9.3
Waitakere	56	728	7.7
Auckland City	165	2,688	6.1
Middlemore	205	2,001	10.2
Waikato	120	1,148	10.5
Rotorua	31	375	8.3
Tauranga	54	620	8.7
Whakatane	10	137	7.3
Gisborne	5	133	3.8
Hawke's Bay	31	482	6.4
Taranaki Base	36	345	10.4
Palmerston North	35	549	6.4
Whanganui	19	140	13.6
Wellington	86	1,129	7.6
Hutt	44	605	7.3
Wairarapa	11	135	8.1
Wairau	8	138	5.8
Nelson	21	274	7.7
Grey Base	7	84	8.3
Christchurch	128	1,724	7.4
Timaru	14	147	9.5
Dunedin	48	531	9.0
Southland	21	386	5.4
All secondary and tertiary facilities	**1,335**	**16,305**	**8.2**
All primary facilities	**0**	**4**	**0.0**
All home births	**0**	**0**	**0.0**
New Zealand[1]	**1,335**	**16,310**	**8.2**

1 Includes women where birth location was unspecified.

Indicators 11 and 12: Blood transfusion during birth admission

Rationale and purpose

These indicators look at the way maternity providers handle excessive blood loss in women who have just given birth, also known as postpartum haemorrhage. According to the Australian Council on Healthcare Standards (2008), 'postpartum haemorrhage (PPH) is a potentially life-threatening complication of birth that occurs in about 3–5% of vaginal births [and globally] remains a leading cause of maternal morbidity and mortality' (p 480). Excessive blood loss is often defined as an amount in excess of 1000 mL, although accuracy of measurement at this level is questionable, especially as the blood loss is often cumulative. A different and (some suggest) more objective measure is whether there is a requirement for blood transfusion due to excessive blood loss during or following birth. This measurement is also not without difficulties; for example, decisions to perform blood transfusions depend on individual levels of patient tolerance, and some patients refuse a transfusion for religious or other beliefs. However, as a broad measure of excessive blood loss and potential long-term morbidity due to that blood loss, this indicator is a useful measure of severe, life-threatening PPH.

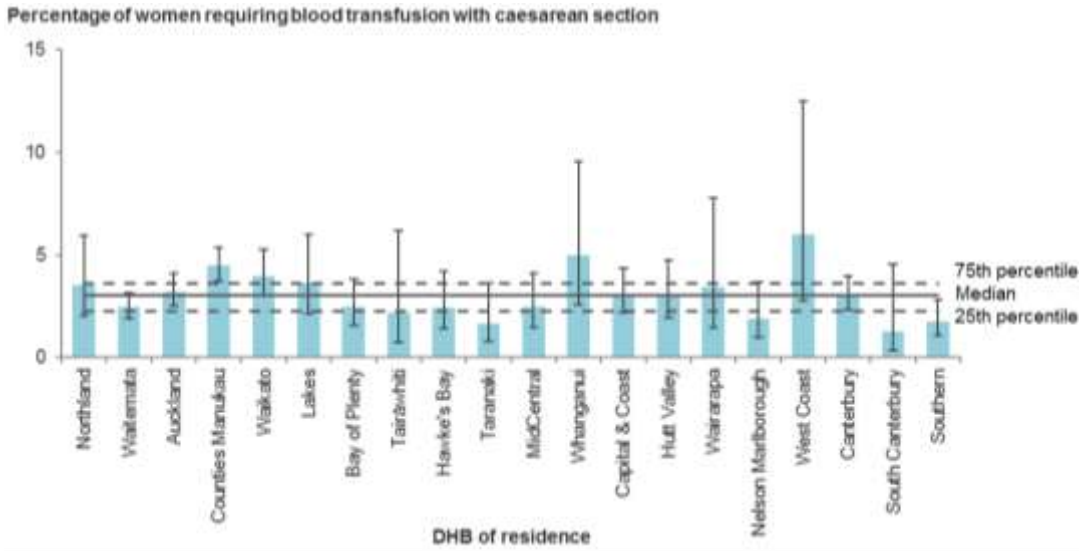
This indicator aims to provide maternity service providers with an indicator of significant blood loss that will stimulate further investigation of clinical management and intervention. All maternity service providers should be familiar with the national consensus guideline for treatment of PPH (Ministry of Health 2013).

Notes on 2017 data

District health boards should investigate the reasons behind the greater variation in rates of blood transfusion with caesarean section and vaginal birth. They need to consider the impact of high elective caesarean section rates on any differences between rates for elective and emergency caesarean sections. Because these indicators are markers for PPH and for management of anaemia, the focus should be on understanding and addressing the underlying causes of bleeding.

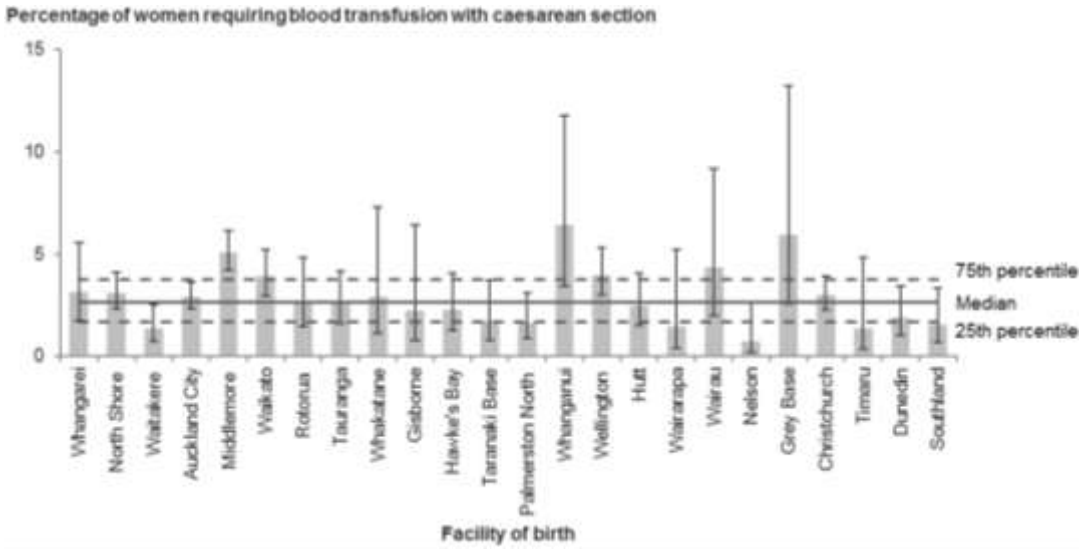
Indicator 11: Blood transfusion during birth admission for caesarean section delivery, 2017

Figure 23: Percentage of women giving birth by caesarean section and undergoing blood transfusion during birth admission, by district health board of residence, 2017



Error bars represent 95% confidence intervals.

Figure 24: Percentage of women giving birth by caesarean section and undergoing blood transfusion during birth admission, by facility of birth (secondary and tertiary facilities), 2017



Error bars represent 95% confidence intervals.

Table 23: Number and percentage of women giving birth by caesarean section and undergoing blood transfusion during birth admission, by district health board of residence, 2017

DHB of residence	Caesarean sections with blood transfusion	All caesarean sections	Rate (%)
Northland	13	370	3.5
Waitemata	61	2,487	2.5
Auckland	62	1,931	3.2
Counties Manukau	106	2,369	4.5
Waikato	46	1,156	4.0
Lakes	14	388	3.6
Bay of Plenty	19	772	2.5
Tairāwhiti	3	138	2.2
Hawke's Bay	12	493	2.4
Taranaki	6	357	1.7
MidCentral	14	567	2.5
Whanganui	8	160	5.0
Capital & Coast	32	1,031	3.1
Hutt Valley	19	623	3.0
Wairarapa	5	146	3.4
Nelson Marlborough	8	423	1.9
West Coast	6	100	6.0
Canterbury	52	1,715	3.0
South Canterbury	2	157	1.3
Southern	16	912	1.8
Unknown	0	15	–
New Zealand	**504**	**16,310**	**3.1**

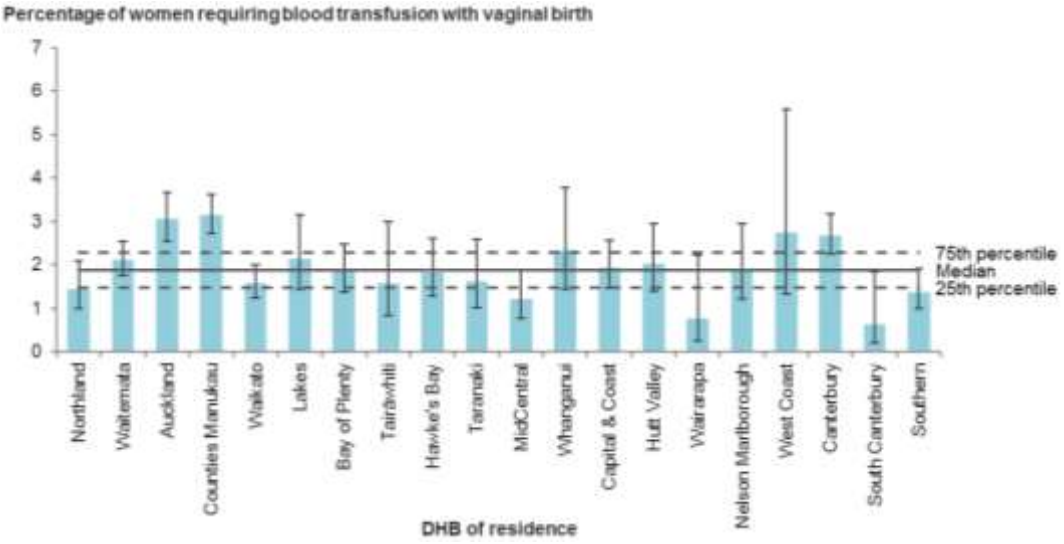
Table 24: Number and percentage of women giving birth by caesarean section and undergoing blood transfusion during birth admission, by facility of birth (secondary and tertiary facilities), 2017

Place of birth	Caesarean sections with blood transfusion	All caesarean sections	Rate (%)
Whangarei	11	348	3.2
North Shore	45	1,458	3.1
Waitakere	10	728	1.4
Auckland City	78	2,688	2.9
Middlemore	102	2,001	5.1
Waikato	45	1,148	3.9
Rotorua	10	375	2.7
Tauranga	16	620	2.6
Whakatane	4	137	2.9
Gisborne	3	133	2.3
Hawke's Bay	11	482	2.3
Taranaki Base	6	345	1.7
Palmerston North	9	549	1.6
Whanganui	9	140	6.4
Wellington	45	1,129	4.0
Hutt	15	605	2.5
Wairarapa	2	135	1.5
Wairau	6	138	4.3
Nelson	2	274	0.7
Grey Base	5	84	6.0
Christchurch	52	1,724	3.0
Timaru	2	147	1.4
Dunedin	10	531	1.9
Southland	6	386	1.6
All secondary and tertiary facilities	**504**	**16,305**	**3.1**
All primary facilities	**0**	**4**	**0.0**
All home births	**0**	**0**	**0.0**
New Zealand[1]	**504**	**16,310**	**3.1**

1 Includes women where birth location was unspecified.

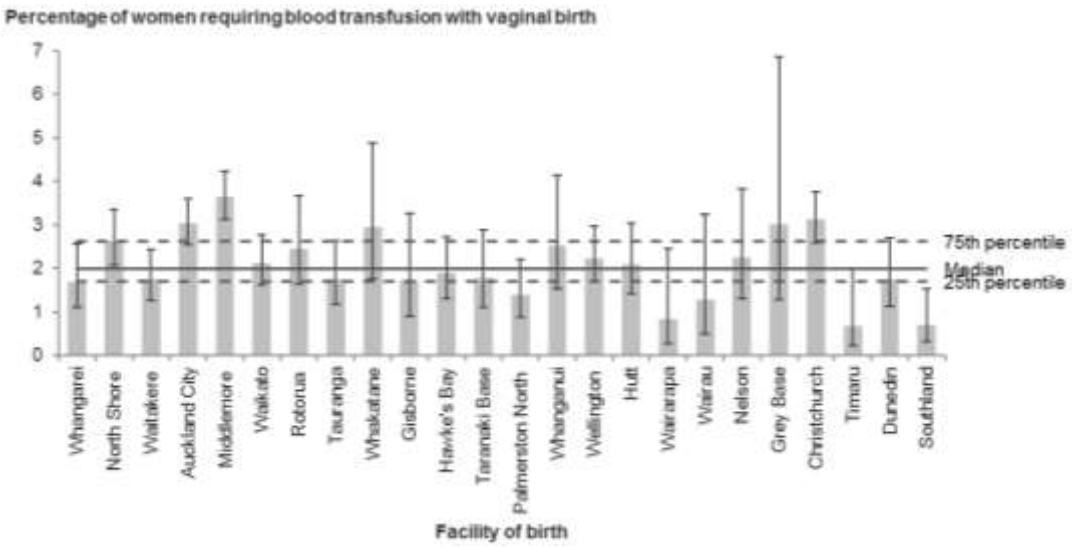
Indicator 12: Blood transfusion during birth admission for vaginal birth, 2017

Figure 25: Percentage of women giving birth vaginally and undergoing blood transfusion during birth admission, by district health board of residence, 2017



Error bars represent 95% confidence intervals.

Figure 26: Percentage of women giving birth vaginally and undergoing blood transfusion during birth admission, by facility of birth (secondary and tertiary facilities), 2017



Error bars represent 95% confidence intervals.

Table 25: Number and percentage of women giving birth vaginally and undergoing blood transfusion during birth admission, by district health board of residence, 2017

DHB of residence	Vaginal births with blood transfusion	All vaginal births	Rate (%)
Northland	27	1,872	1.4
Waitemata	111	5,231	2.1
Auckland	113	3,698	3.1
Counties Manukau	186	5,904	3.2
Waikato	66	4,161	1.6
Lakes	25	1,166	2.1
Bay of Plenty	43	2,327	1.8
Tairāwhiti	9	566	1.6
Hawke's Bay	30	1,637	1.8
Taranaki	17	1,044	1.6
MidCentral	19	1,566	1.2
Whanganui	16	683	2.3
Capital & Coast	48	2,461	2.0
Hutt Valley	27	1,327	2.0
Wairarapa	3	390	0.8
Nelson Marlborough	19	999	1.9
West Coast	7	254	2.8
Canterbury	125	4,679	2.7
South Canterbury	3	475	0.6
Southern	35	2,525	1.4
Unknown	7	373	–
New Zealand	**936**	**43,338**	**2.2**

Table 26: Number and percentage of women giving birth vaginally and undergoing blood transfusion during birth admission, by facility of birth (secondary and tertiary facilities), 2017

Place of birth	Vaginal births with blood transfusion	All vaginal births	Rate (%)
Whangarei	21	1,240	1.7
North Shore	66	2,493	2.6
Waitakere	35	1,991	1.8
Auckland City	125	4,111	3.0
Middlemore	162	4,443	3.6
Waikato	51	2,402	2.1
Rotorua	23	933	2.5
Tauranga	23	1,302	1.8
Whakatane	14	475	2.9
Gisborne	9	517	1.7
Hawke's Bay	28	1,473	1.9
Taranaki Base	16	895	1.8
Palmerston North	18	1,287	1.4
Whanganui	15	593	2.5
Wellington	47	2,100	2.2
Hutt	26	1,242	2.1
Wairarapa	3	353	0.8
Wairau	4	312	1.3
Nelson	13	577	2.3
Grey Base	5	166	3.0
Christchurch	109	3,493	3.1
Timaru	3	440	0.7
Dunedin	20	1,140	1.8
Southland	6	853	0.7
All secondary and tertiary facilities	**842**	**34,831**	**2.4**
All primary facilities	**54**	**5,882**	**0.9**
All home births	**25**	**1,992**	**1.3**
New Zealand[1]	**936**	**43,338**	**2.2**

1 Includes women where birth location was unspecified.

Indicators 13 to 15: Severe maternal morbidity

Rationale and purpose

Maternity systems have long monitored maternal mortality as an indicator of their safety and quality. However, the number of maternal deaths in any given year is low. The impact of severe morbidity is significant and long term, of high personal cost to a woman and her family and of high financial cost to the health system. Monitoring severe morbidity allows a view of a larger (but still limited) set of cases that might provide a broader picture of the true impact of adverse outcomes in maternity in New Zealand and allow individual units to benchmark whether their rates of severe morbidity are consistent with those in other units. Cases of severe maternal morbidity should be subject to local multidisciplinary review for quality improvement purposes.

Eclampsia (indicator 13)

Pre-eclampsia is a disorder of pregnancy characterised by high blood pressure and protein in the urine. Pre-eclampsia affects between 2 percent and 8 percent of pregnancies worldwide. Eclampsia is a serious complication of pre-eclampsia and results in high rates of perinatal and maternal morbidity and mortality (WHO 2011). Eclampsia is considered preventable through early detection and management of pre-eclampsia. The purpose of this indicator is to drive local investigation, including case review, into the appropriate diagnosis and management of pre-eclampsia with a view to decreasing the incidence of eclampsia.

Peripartum hysterectomy (indicator 14)

Peripartum hysterectomy is a surgical intervention usually only performed to save a woman's life, and usually when uncontrollable obstetric haemorrhage or extensive uterine rupture complicates birth. It is a marker of severe maternal morbidity, and may indicate the failure of upstream interventions to prevent and manage antecedents such as haemorrhage or prolonged obstructed labour. The purpose of this indicator is to drive local investigation including case review to reduce the need for this significant surgery.

Mechanical ventilation (indicator 15)

Mechanical ventilation for greater than 24 hours of a pregnant or postpartum woman is a marker of severe maternal morbidity that does not distinguish by cause. It denotes a high degree of severity, and its measurement is more sensitive than measurement of intensive/special care unit admissions, as it is not dependent on local layout of facilities. The purpose of this indicator is to drive local investigation including case review of the reasons for mechanical ventilation of a pregnant or postpartum woman to identify opportunities to prevent or reduce severe maternal and perinatal morbidity.

Notes on 2017 data

Of women giving birth in 2017:

- 17 were diagnosed with eclampsia during the birth admission
- 29 had a peripartum hysterectomy
- 11 were admitted to an ICU and required over 24 hours of mechanical ventilation at some time during their pregnancy or postnatal period.

District health boards with cases pertaining to these indicators should investigate each case to confirm the accuracy of the data and to determine whether there were opportunities for prevention.

Indicator 13: Diagnosis of eclampsia during birth admission, 2017

Table 27: Number and percentage of women diagnosed with eclampsia during birth admission, by district health board of residence, 2017

DHB of residence	Diagnosis of eclampsia during birth admission	All women giving birth
Northland	0	2,242
Waitemata	1	7,718
Auckland	2	5,629
Counties Manukau	4	8,273
Waikato	1	5,317
Lakes	1	1,554
Bay of Plenty	2	3,099
Tairāwhiti	0	704
Hawke's Bay	1	2,130
Taranaki	0	1,401
MidCentral	1	2,133
Whanganui	0	843
Capital & Coast	1	3,492
Hutt Valley	0	1,950
Wairarapa	0	536
Nelson Marlborough	0	1,422
West Coast	0	354
Canterbury	3	6,394
South Canterbury	0	632
Southern	0	3,437
Unknown	0	388
New Zealand	**17**	**59,648**

Table 28: Number and percentage of women diagnosed with eclampsia during birth admission, by facility of birth (secondary and tertiary facilities), 2017

Place of birth	Diagnosis of eclampsia during birth admission	All women giving birth
Whangarei	0	1,588
North Shore	2	3,951
Waitakere	0	2,719
Auckland City	2	6,799
Middlemore	3	6,444
Waikato	1	3,550
Rotorua	1	1,308
Tauranga	1	1,922
Whakatane	1	612
Gisborne	0	650
Hawke's Bay	1	1,955
Taranaki Base	0	1,240
Palmerston North	1	1,836
Whanganui	0	733
Wellington	1	3,229
Hutt	0	1,847
Wairarapa	0	488
Wairau	0	450
Nelson	0	851
Grey Base	0	250
Christchurch	3	5,217
Timaru	0	587
Dunedin	0	1,671
Southland	0	1,239
All secondary and tertiary facilities	**17**	**51,136**
All primary facilities	**0**	**5,886**
All home births	**0**	**1,992**
New Zealand[1]	**17**	**59,648**

1 Includes women where birth location was unspecified.

Indicator 14: Peripartum hysterectomy, 2017

Table 29: Number and percentage of women having a peripartum hysterectomy, by district health board of residence, 2017

DHB of residence	Peripartum hysterectomy	All women giving birth
Northland	1	2,242
Waitemata	3	7,718
Auckland	3	5,629
Counties Manukau	6	8,273
Waikato	2	5,317
Lakes	1	1,554
Bay of Plenty	0	3,099
Tairāwhiti	1	704
Hawke's Bay	2	2,130
Taranaki	1	1,401
MidCentral	0	2,133
Whanganui	1	843
Capital & Coast	2	3,492
Hutt Valley	0	1,950
Wairarapa	0	536
Nelson Marlborough	0	1,422
West Coast	0	354
Canterbury	2	6,394
South Canterbury	1	632
Southern	3	3,437
Unknown	0	388
New Zealand	**29**	**59,648**

Table 30: Number and percentage of women having a peripartum hysterectomy, by facility of birth (secondary and tertiary facilities), 2017

Place of birth	Peripartum hysterectomy	All women giving birth
Whangarei	1	1,588
North Shore	1	3,951
Waitakere	1	2,719
Auckland City	7	6,799
Middlemore	4	6,444
Waikato	2	3,550
Rotorua	0	1,308
Tauranga	0	1,922
Whakatane	0	612
Gisborne	1	650
Hawke's Bay	2	1,955
Taranaki Base	1	1,240
Palmerston North	0	1,836
Whanganui	1	733
Wellington	2	3,229
Hutt	0	1,847
Wairarapa	0	488
Wairau	0	450
Nelson	0	851
Grey Base	0	250
Christchurch	2	5,217
Timaru	1	587
Dunedin	2	1,671
Southland	1	1,239
All secondary and tertiary facilities	**29**	**51,136**
All primary facilities	**0**	**5,886**
All home births	**0**	**1,992**
New Zealand[1]	**29**	**59,648**

1 Includes women where birth location was unspecified.

Indicator 15: Mechanical ventilation during pregnancy or postnatal period, 2017

Table 31: Number and percentage of women admitted to an intensive care unit and requiring over 24 hours of mechanical ventilation any time during the pregnancy or postnatal period, by district health board of residence, 2017

DHB of residence	ICU admission with over 24 hours of mechanical ventilation	All women giving birth
Northland	0	2,242
Waitemata	2	7,718
Auckland	3	5,629
Counties Manukau	1	8,273
Waikato	1	5,317
Lakes	0	1,554
Bay of Plenty	0	3,099
Tairāwhiti	0	704
Hawke's Bay	0	2,130
Taranaki	0	1,401
MidCentral	0	2,133
Whanganui	1	843
Capital & Coast	0	3,492
Hutt Valley	0	1,950
Wairarapa	0	536
Nelson Marlborough	0	1,422
West Coast	0	354
Canterbury	2	6,394
South Canterbury	1	632
Southern	0	3,437
Unknown	0	388
New Zealand	**11**	**59,648**

Table 32: Number and percentage of women admitted to an intensive care unit and requiring over 24 hours of mechanical ventilation any time during the pregnancy or postnatal period, by facility of birth (secondary and tertiary facilities), 2017

Place of birth	ICU admission with over 24 hours of mechanical ventilation	All women giving birth
Whangarei	0	1,588
North Shore	2	3,951
Waitakere	0	2,719
Auckland City	2	6,799
Middlemore	0	6,444
Waikato	0	3,550
Rotorua	0	1,308
Tauranga	0	1,922
Whakatane	0	612
Gisborne	0	650
Hawke's Bay	0	1,955
Taranaki Base	0	1,240
Palmerston North	0	1,836
Whanganui	1	733
Wellington	0	3,229
Hutt	0	1,847
Wairarapa	0	488
Wairau	0	450
Nelson	0	851
Grey Base	0	250
Christchurch	2	5,217
Timaru	1	587
Dunedin	0	1,671
Southland	0	1,239
All secondary and tertiary facilities	**8**	**51,136**
All primary facilities	**0**	**5,886**
All home births	**2**	**1,992**
New Zealand[1]	**11**	**59,648**

1 Includes women where birth location was unspecified.

Indicator 16: Maternal tobacco use during postnatal period

Rationale and purpose

Smoking during pregnancy leads to increased carbon monoxide concentration in the blood of both the woman and her baby, resulting in reduced oxygen and nourishment available to the baby. This increases the risk of babies being born with a low birthweight and increases the risk of neonatal mortality, sudden and unexpected death in infancy and long-term respiratory problems for the child (The Quit Group 2004).

This indicator monitors maternal tobacco use at two weeks postnatal, which potentially identifies the number of women who have continued to smoke during pregnancy and following the birth as well as those who have re-commenced smoking following the birth. We can use this indicator to identify how we can support women and families to stop smoking.

Improving rates against this indicator will require providers to ensure they offer coordinated tobacco cessation support during pregnancy and into the postnatal period that meets the needs of local populations. It will require tobacco cessation services to work closely with LMCs and DHB maternity services.

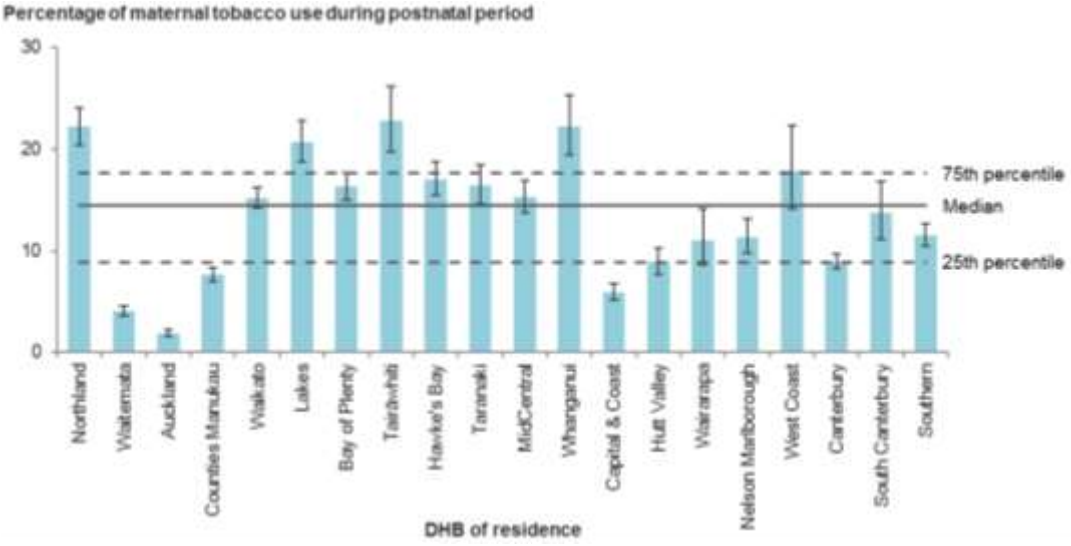
Notes on 2017 data

Rates of maternal tobacco use in the postnatal period (measured at two weeks after birth) varied between DHBs and between secondary and tertiary facility of birth; DHB rates ranged from 1.9 percent to 22.8 percent, and facility rates ranged from 1.1 percent to 30.3 percent. District health boards and facilities with higher rates should undertake further investigation into their provision of appropriate smoking cessation services and development of new initiatives to support smoking cessation among pregnant and postpartum women, particularly among population groups known to have high rates of tobacco use.

This indicator currently presents tobacco use information from women registered with an LMC or a DHB primary maternity service. Completeness of this data varies between DHBs. In 2017, completeness ranged from 59 percent to 97 percent of all women giving birth. Data completeness was over 90 percent for 15 of the 20 DHBs.

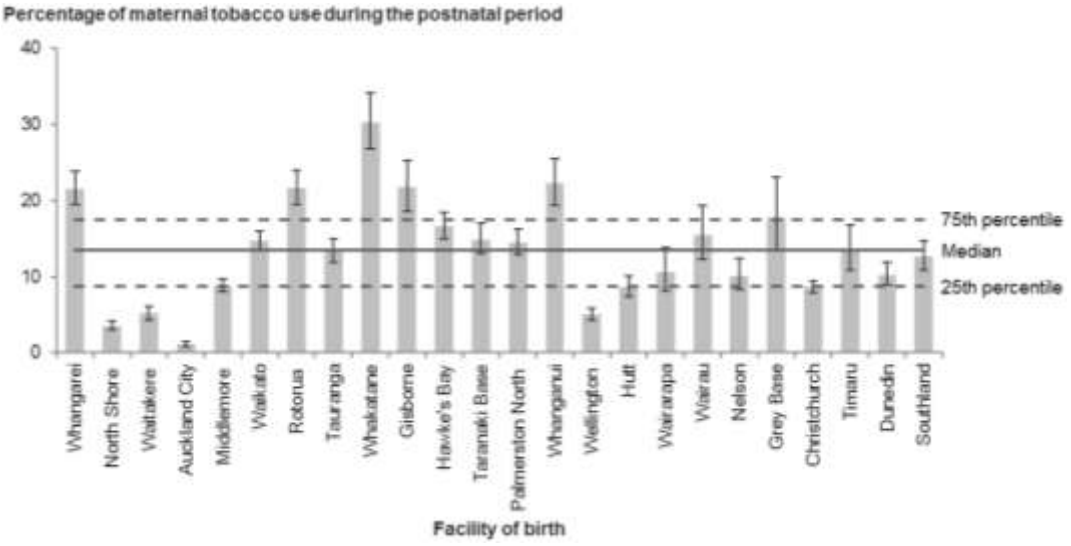
Indicator 16: Maternal tobacco use during postnatal period, 2017

Figure 27: Percentage of women identified as smokers during postnatal period (two weeks after birth), by district health board of residence, 2017



Error bars represent 95% confidence intervals.

Figure 28: Percentage of women identified as smokers during postnatal period (two weeks after birth), by facility of birth (secondary and tertiary facilities), 2017



Error bars represent 95% confidence intervals.

Table 33: Number and percentage of women identified as smokers during postnatal period (two weeks after birth), by district health board of residence, 2017

DHB of residence	Women identified as smokers at 2 weeks after birth	All women with reported smoking status at 2 weeks after birth	Rate (%)
Northland	445	2,009	22.2
Waitemata	294	7,258	4.1
Auckland	97	5,173	1.9
Counties Manukau	454	5,967	7.6
Waikato	758	5,003	15.2
Lakes	308	1,491	20.7
Bay of Plenty	488	3,000	16.3
Tairāwhiti	147	646	22.8
Hawke's Bay	338	1,987	17.0
Taranaki	225	1,373	16.4
MidCentral	301	1,976	15.2
Whanganui	169	763	22.1
Capital & Coast	192	3,253	5.9
Hutt Valley	159	1,794	8.9
Wairarapa	55	498	11.0
Nelson Marlborough	150	1,324	11.3
West Coast	60	337	17.8
Canterbury	555	6,208	8.9
South Canterbury	76	556	13.7
Southern	379	3,294	11.5
Unknown	31	250	–
New Zealand	**5,681**	**54,160**	**10.5**

Table 34: Number and percentage of women identified as smokers during postnatal period (two weeks after birth), by facility of birth (secondary and tertiary facilities), 2017

Place of birth	Women identified as smokers at 2 weeks after birth	All women with reported smoking status at 2 weeks after birth	Rate (%)
Whangarei	302	1,402	21.5
North Shore	132	3,725	3.5
Waitakere	130	2,532	5.1
Auckland City	71	6,328	1.1
Middlemore	377	4,262	8.8
Waikato	481	3,278	14.7
Rotorua	272	1,262	21.6
Tauranga	250	1,872	13.4
Whakatane	181	598	30.3
Gisborne	130	599	21.7
Hawke's Bay	306	1,843	16.6
Taranaki Base	181	1,217	14.9
Palmerston North	246	1,700	14.5
Whanganui	151	679	22.2
Wellington	148	2,934	5.0
Hutt	148	1,707	8.7
Wairarapa	49	462	10.6
Wairau	62	401	15.5
Nelson	82	810	10.1
Grey Base	43	242	17.8
Christchurch	440	5,068	8.7
Timaru	70	518	13.5
Dunedin	166	1,619	10.3
Southland	149	1,175	12.7
All secondary and tertiary facilities	**4,567**	**46,233**	**9.9**
All primary facilities	**831**	**5,493**	**15.1**
All home births	**186**	**1,944**	**9.6**
New Zealand[1]	**5,681**	**54,160**	**10.5**

1 Includes women where birth location was unspecified.

Indicator 17: Preterm birth

Rationale and purpose

Preterm birth is a significant contributor to perinatal mortality and neonatal morbidity, especially for babies born under 32 weeks' gestation. Preterm birth is among the top causes of death in infants worldwide (WHO 2013).

Preterm birth may have a number of consequences, including:

- higher neonatal mortality and morbidity
- long-term effects on babies, such as poorer neurodevelopmental and educational outcomes, more hospital admissions and increased general disease burden in childhood
- greater use of health resources
- long-term effects on disease risk through to adulthood, such as hypertension and diabetes.

Spontaneous onset of labour, premature rupture of membranes, antepartum haemorrhage, multiple pregnancy and pregnancy-induced hypertension are the most common causes of preterm birth.

Management of maternal hypertension and tobacco use may reduce rates of early preterm birth. Clinical decision-making regarding timing of induction and elective caesarean section affects rates of late preterm birth.

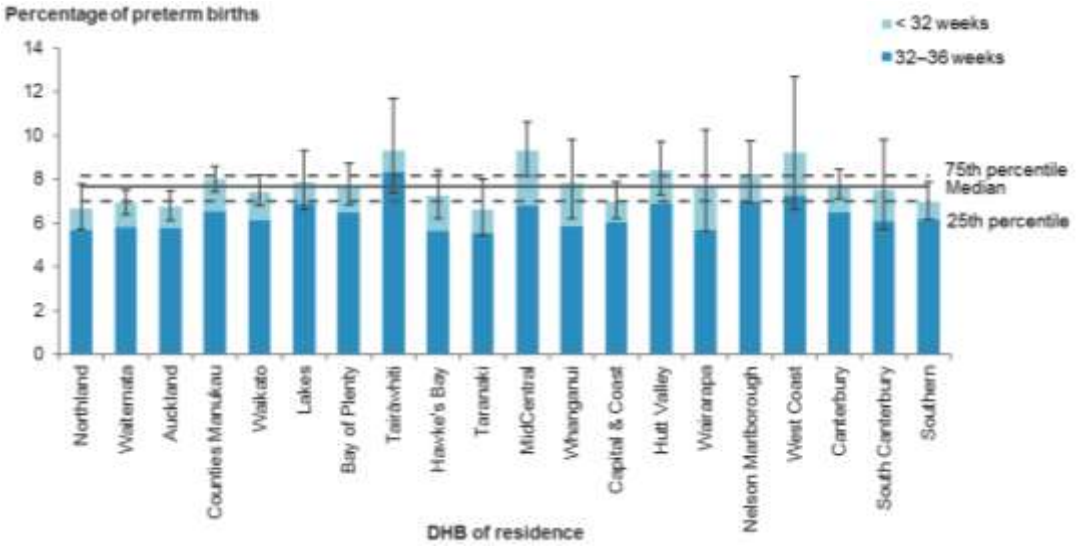
Recent investigation by the National Maternity Monitoring Group found that rates of preterm birth at 34 and 35 weeks' gestation remained fairly constant over the four years from 2008 to 2011. However, preterm births at 36 weeks' gestation have increased. This may represent changes in planned preterm births. The National Maternity Monitoring Group recommends that all DHBs should audit preterm births in their region; particularly births at 34, 35 and 36 weeks (National Maternity Monitoring Group 2015, pp 28–30).

Notes on 2017 data

Overall rates of preterm birth (< 37 weeks' gestation) varied between DHBs, ranging from 6.6 percent to 9.3 percent, and varied more widely between secondary and tertiary facilities, ranging from 4.3 percent to 12.0 percent. The latter variation is likely to reflect clinical decision-making on place of birth for women in preterm labour and at risk of iatrogenic preterm birth.

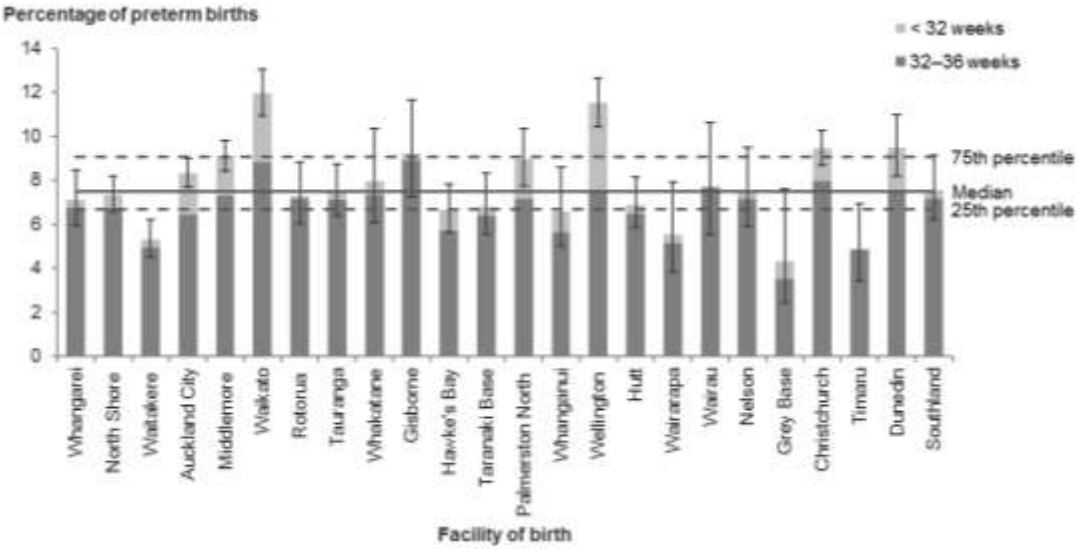
Indicator 17: Preterm births, 2017

Figure 29: Percentage of preterm births, by district health board of residence, 2017



Error bars represent 95% confidence intervals.

Figure 30: Percentage of preterm births, by facility of birth (secondary and tertiary facilities), 2017



Error bars represent 95% confidence intervals.

Table 35: Number and percentage of preterm births, by district health board of residence, 2017

DHB of residence	Babies born under 37 weeks' gestation			All babies born (live births)	Rate (%)
	<32 weeks	32–36 weeks	Total		
Northland	22	127	149	2,232	6.7
Waitemata	85	452	537	7,762	6.9
Auckland	56	328	384	5,670	6.8
Counties Manukau	123	547	670	8,365	8.0
Waikato	72	329	401	5,382	7.5
Lakes	15	108	123	1,563	7.9
Bay of Plenty	39	203	242	3,132	7.7
Tairāwhiti	7	59	66	709	9.3
Hawke's Bay	35	120	155	2,136	7.3
Taranaki	15	79	94	1,421	6.6
MidCentral	54	146	200	2,145	9.3
Whanganui	17	50	67	856	7.8
Capital & Coast	33	212	245	3,502	7.0
Hutt Valley	30	135	165	1,958	8.4
Wairarapa	10	29	39	511	7.6
Nelson Marlborough	18	99	117	1,421	8.2
West Coast	7	26	33	358	9.2
Canterbury	82	418	500	6,440	7.8
South Canterbury	9	39	48	639	7.5
Southern	28	214	242	3,460	7.0
Unknown	7	8	15	352	–
New Zealand	**764**	**3,728**	**4,492**	**60,014**	**7.5**

Table 36: Number and percentage of preterm births, by facility of birth (secondary and tertiary facilities), 2017

Place of birth	Babies born under 37 weeks' gestation			All babies born (live births)	Rate (%)
	< 32 weeks	32–36 weeks	Total		
Whangarei	6	108	114	1,603	7.1
North Shore	23	270	293	3,996	7.3
Waitakere	9	137	146	2,751	5.3
Auckland City	132	445	577	6,914	8.3
Middlemore	117	478	595	6,550	9.1
Waikato	114	319	433	3,621	12.0
Rotorua	2	95	97	1,327	7.3
Tauranga	7	139	146	1,954	7.5
Whakatane	4	46	50	627	8.0
Gisborne	2	59	61	662	9.2
Hawke's Bay	19	113	132	1,980	6.7
Taranaki Base	5	80	85	1,250	6.8
Palmerston North	33	134	167	1,866	8.9
Whanganui	7	42	49	744	6.6
Wellington	128	248	376	3,270	11.5
Hutt	8	121	129	1,869	6.9
Wairarapa	2	25	27	487	5.5
Wairau	0	33	33	428	7.7
Nelson	3	59	62	825	7.5
Grey Base	2	9	11	254	4.3
Christchurch	79	418	497	5,258	9.5
Timaru	0	29	29	594	4.9
Dunedin	33	127	160	1,687	9.5
Southland	5	90	95	1,259	7.5
All secondary and tertiary facilities	**740**	**3,624**	**4,364**	**51,776**	**8.4**
All primary facilities	**8**	**49**	**57**	**5,795**	**1.0**
All home births	**6**	**43**	**49**	**1,990**	**2.5**
New Zealand[1]	**764**	**3,728**	**4,492**	**60,014**	**7.5**

1 Includes babies without a birth location recorded.

Indicators 18 and 19: Small for gestational age at term

Rationale and purpose

Infants who are born small for gestational age (SGA) are at increased risk of neonatal morbidity and mortality, reduced growth through childhood, lower childhood neurodevelopmental scores, reduced educational attainment and increased lifetime risk for impaired glucose tolerance, including type 2 diabetes, and cardiovascular disease (Arcangeli et al 2012; Lawn et al 2014).

Placental disease (including that associated with pre-eclampsia) and smoking are common causes of poor fetal growth leading to SGA babies. Appropriate management of women at increased risk of SGA (those with a past history of SGA, hypertension or obesity, and those who smoke) may reduce the risk. Timely detection of poor fetal growth in those women with or without risk factors for SGA may reduce the risk of stillbirth by presenting the opportunity for enhanced surveillance and iatrogenic preterm birth.

Small babies at term (indicator 18)

This indicator measures the proportion of all babies born at term gestation who are small for their gestational age. This is defined as less than the 10th percentile for birthweight on the INTERGROWTH-21 growth charts for gestational ages 37 to 42 weeks. INTERGROWTH-21, an international consortium on issues concerning fetal growth, developed and published these growth standards, using the same methodology as the World Health Organization childhood growth standards (**www.health.govt.nz/system/files/documents/pages/factsheet-2-growth-charts-well-child.pdf**) recommended for use in New Zealand. The percentage of babies within New Zealand that fall above or below a given percentile on these charts will be different from the equivalent percentages on New Zealand population charts and from customised centile charts which are widely used in New Zealand.

There is extensive evidence for maternal factors leading to SGA, including smoking, hypertension, pre-eclampsia, poorly controlled diabetes, obesity and poor nutrition. We intend this indicator to drive multidisciplinary review of the prevention and management of poor fetal growth at a population level, with the potential for reducing risk of SGA, morbidity from SGA, and stillbirth.

Small babies at term born at 40–42 weeks' gestation (indicator 19)

This indicator measures the proportion of SGA babies at term gestation (37–42 weeks) who were born at 40–42 weeks' gestation.

This indicator is intended to drive review of the identification and management of poor fetal growth at term. Evidence/best practice recommends the expedited birth of babies identified as SGA once they reach term, and ideally before 40 weeks; therefore, this indicator represents the proportion of unrecognised or sub-optimally managed cases.

Notes on 2017 data

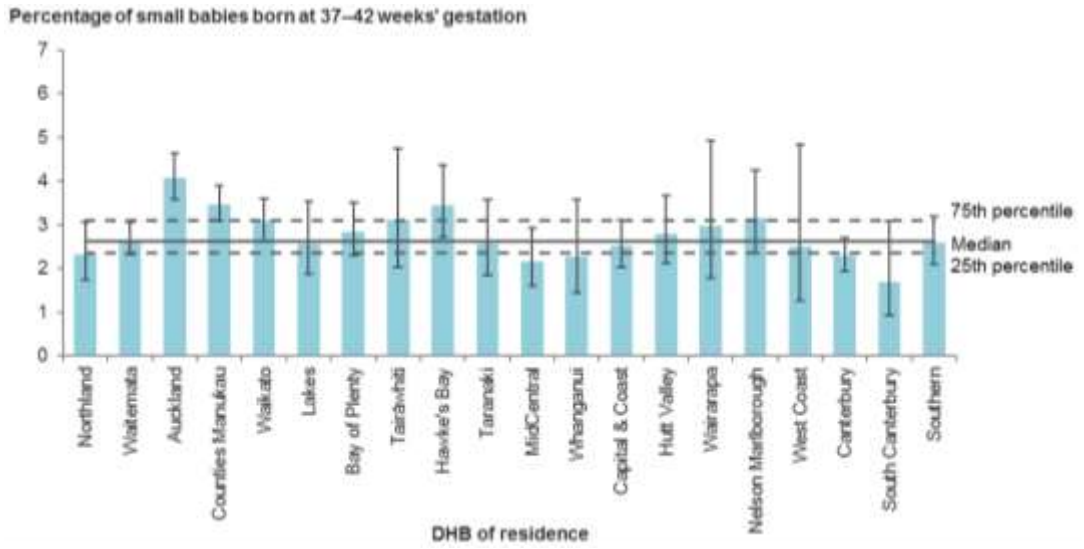
Of all babies born at 37–42 weeks' gestation, the proportion of SGA babies was generally low, but varied two-fold across the DHBs, ranging from 1.7 percent to 4.1 percent, and from 1.6 percent to 3.9 percent across secondary and tertiary facilities.

Of all SGA babies who were born at 37–42 weeks' gestation, the proportion of those who were born at 40–42 weeks' gestation varied widely, from 10.0 percent to 50.0 percent between DHBs, and from 0.0 percent to 75.0 percent across secondary and tertiary facilities. These rates were based on small numbers (in both numerators and denominators); we advise caution when making comparisons.

Nevertheless, DHBs with high rates of SGA babies born at 40–42 weeks' gestation should consider whether investigation may lead to earlier detection of babies at significantly increased risk of stillbirth and perinatal compromise.

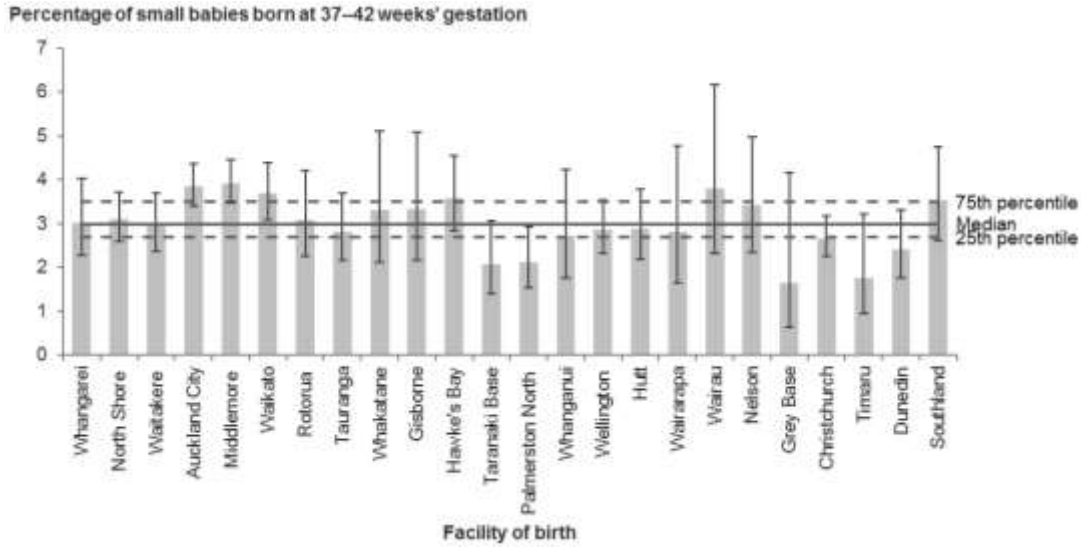
Indicator 18: Small babies at term (37–42 weeks' gestation), 2017

Figure 31: Percentage of small babies at term (37–42 weeks' gestation), by district health board of residence, 2017



Error bars represent 95% confidence intervals.

Figure 32: Percentage 0f small babies at term (37–42 weeks' gestation), by facility of birth (secondary and tertiary facilities), 2017



Error bars represent 95% confidence intervals.

Table 37: Number and percentage of small babies at term (37–42 weeks' gestation), by district health board of residence, 2017

DHB of residence	Babies born at 37–42 weeks' gestation with birthweight under the 10th centile for their gestation	Babies born at 37–42 weeks' gestation	Rate (%)
Northland	48	2,075	2.3
Waitemata	192	7,210	2.7
Auckland	215	5,274	4.1
Counties Manukau	266	7,665	3.5
Waikato	153	4,947	3.1
Lakes	37	1,434	2.6
Bay of Plenty	82	2,879	2.8
Tairāwhiti	20	643	3.1
Hawke's Bay	68	1,969	3.5
Taranaki	34	1,320	2.6
MidCentral	42	1,937	2.2
Whanganui	18	788	2.3
Capital & Coast	82	3,252	2.5
Hutt Valley	50	1,790	2.8
Wairarapa	14	471	3.0
Nelson Marlborough	41	1,299	3.2
West Coast	8	321	2.5
Canterbury	136	5,918	2.3
South Canterbury	10	591	1.7
Southern	83	3,212	2.6
Unknown	1	277	–
New Zealand	**1,600**	**55,272**	**2.9**

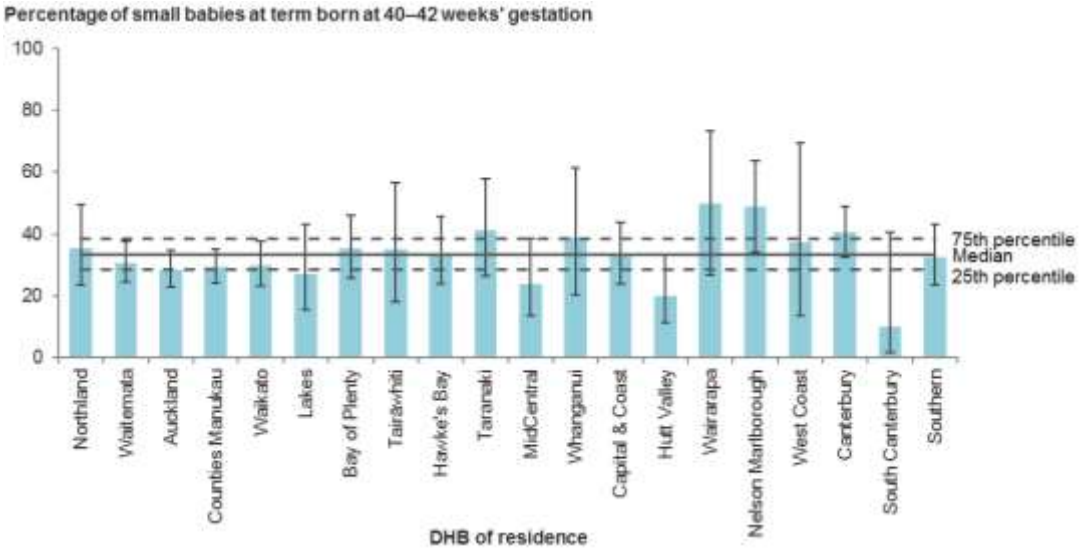
Table 38: Number and percentage of small babies at term (37–42 weeks' gestation), by facility of birth (secondary and tertiary facilities), 2017

Place of birth	Babies born at 37–42 weeks' gestation with birthweight under the 10th centile for their gestation	Babies born at 37–42 weeks' gestation	Rate (%)
Whangarei	45	1,488	3.0
North Shore	115	3,701	3.1
Waitakere	77	2,600	3.0
Auckland City	244	6,328	3.9
Middlemore	233	5,933	3.9
Waikato	117	3,175	3.7
Rotorua	38	1,229	3.1
Tauranga	51	1,804	2.8
Whakatane	19	575	3.3
Gisborne	20	601	3.3
Hawke's Bay	66	1,840	3.6
Taranaki Base	24	1,160	2.1
Palmerston North	36	1,695	2.1
Whanganui	19	694	2.7
Wellington	83	2,890	2.9
Hutt	50	1,738	2.9
Wairarapa	13	460	2.8
Wairau	15	395	3.8
Nelson	26	760	3.4
Grey Base	4	243	1.6
Christchurch	127	4,759	2.7
Timaru	10	565	1.8
Dunedin	37	1,527	2.4
Southland	41	1,163	3.5
All secondary and tertiary facilities	**1,510**	**47,323**	**3.2**
All primary facilities	**88**	**5,712**	**1.5**
All home births	**2**	**1,872**	**0.1**
New Zealand[1]	**1,600**	**55,272**	**2.9**

1 Includes babies where birth location was unspecified.

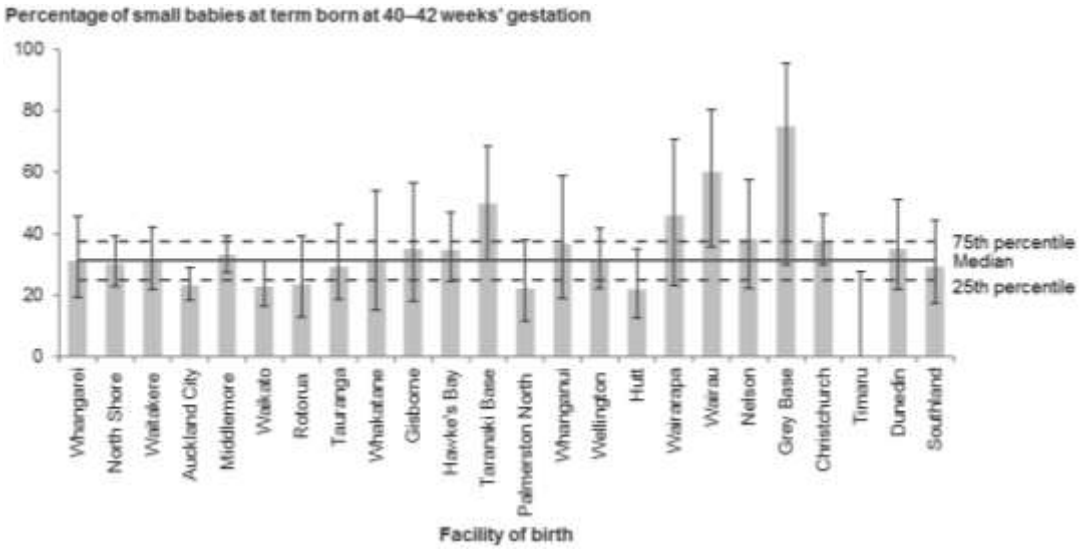
Indicator 19: Small babies at term born at 40–42 weeks' gestation, 2017

Figure 33: Percentage of small babies at term born at 40–42 weeks' gestation, by district health board of residence, 2017



Error bars represent 95% confidence intervals.

Figure 34: Percentage of small babies at term born at 40–42 weeks' gestation, by facility of birth (secondary and tertiary facilities), 2017



Error bars represent 95% confidence intervals.

Table 39: Number and percentage of small babies at term born at 40–42 weeks' gestation, by district health board of residence, 2017

DHB of residence	Babies born at 40–42 weeks' gestation with birthweight under the 10th centile for their gestation	Babies born at 37–42 weeks' gestation with birthweight under the 10th centile for their gestation	Rate (%)
Northland	17	48	35.4
Waitemata	59	192	30.7
Auckland	61	215	28.4
Counties Manukau	78	266	29.3
Waikato	46	153	30.1
Lakes	10	37	27.0
Bay of Plenty	29	82	35.4
Tairāwhiti	7	20	35.0
Hawke's Bay	23	68	33.8
Taranaki	14	34	41.2
MidCentral	10	42	23.8
Whanganui	7	18	38.9
Capital & Coast	27	82	32.9
Hutt Valley	10	50	20.0
Wairarapa	7	14	50.0
Nelson Marlborough	20	41	48.8
West Coast	3	8	37.5
Canterbury	55	136	40.4
South Canterbury	1	10	10.0
Southern	27	83	32.5
Unknown	0	1	–
New Zealand	**511**	**1,600**	**31.9**

Table 40: Number and percentage of small babies at term born at 40–42 weeks' gestation, by facility of birth (secondary and tertiary facilities), 2017

Place of birth	Babies born at 40–42 weeks' gestation with birthweight under the 10th centile for their gestation	Babies born at 37–42 weeks' gestation with birthweight under the 10th centile for their gestation	Rate (%)
Whangarei	14	45	31.1
North Shore	35	115	30.4
Waitakere	24	77	31.2
Auckland City	57	244	23.4
Middlemore	77	233	33.0
Waikato	27	117	23.1
Rotorua	9	38	23.7
Tauranga	15	51	29.4
Whakatane	6	19	31.6
Gisborne	7	20	35.0
Hawke's Bay	23	66	34.8
Taranaki Base	12	24	50.0
Palmerston North	8	36	22.2
Whanganui	7	19	36.8
Wellington	26	83	31.3
Hutt	11	50	22.0
Wairarapa	6	13	46.2
Wairau	9	15	60.0
Nelson	10	26	38.5
Grey Base	3	4	75.0
Christchurch	48	127	37.8
Timaru	0	10	0.0
Dunedin	13	37	35.1
Southland	12	41	29.3
All secondary and tertiary facilities	**459**	**1,510**	**30.4**
All primary facilities	**52**	**88**	**59.1**
All home births	**0**	**2**	**0.0**
New Zealand[1]	**511**	**1,600**	**31.9**

1 Includes babies where birth location was unspecified.

Indicator 20: Term babies requiring respiratory support

Rationale and purpose

Respiratory support for a baby born at term is a marker of severe morbidity that does not distinguish by cause and denotes a high degree of severity. It is a more specific measure of severity than measurement of neonatal intensive/special care unit admissions, as it is not dependent on variations in local layout of facilities and in admission practices. The underlying factors driving the need for respiratory support at term may be more amenable than those driving respiratory support of the preterm infant, where prematurity is the largest driver. Respiratory support in this indicator includes both mechanical and non-invasive ventilation where the sum of both is greater than four hours.

The purpose of this indicator is to drive local investigation, including case review, of the reasons for the need for respiratory support of term babies, to help providers identify opportunities to prevent or reduce perinatal morbidity.

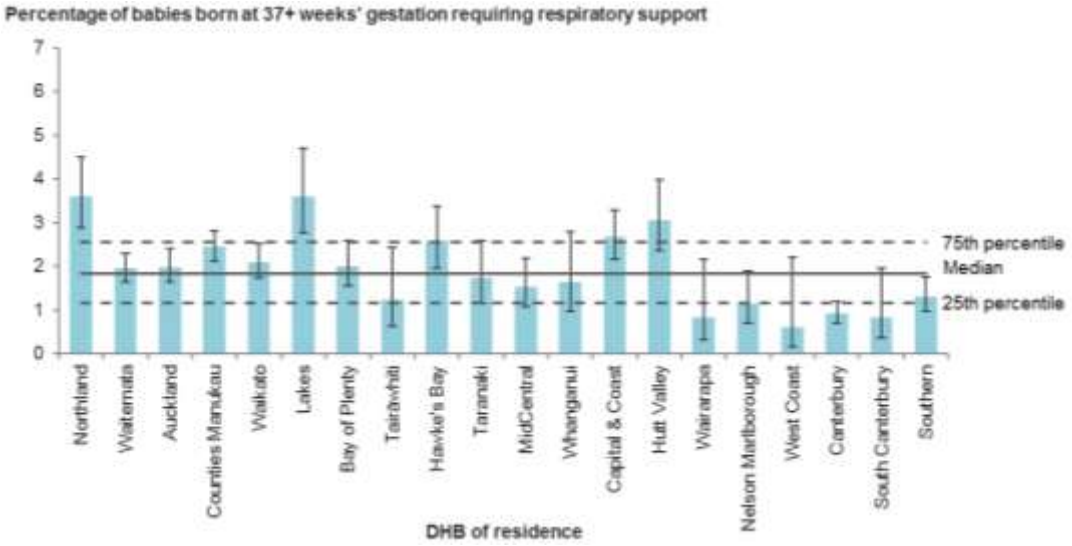
Data presented for this indicator may reflect variation in reporting practices regarding respiratory support for babies. District health boards should address this locally; all DHBs should ensure the data they report to the national collections is accurate and complete.

Notes on 2017 data

There was considerable variation in the rate of babies born at term (37+ weeks' gestation) requiring respiratory support, ranging from 0.6 percent to 3.6 percent across the DHBs, and from 0.4 percent to 4.3 percent across secondary and tertiary facilities. This warrants further investigation at the local level.

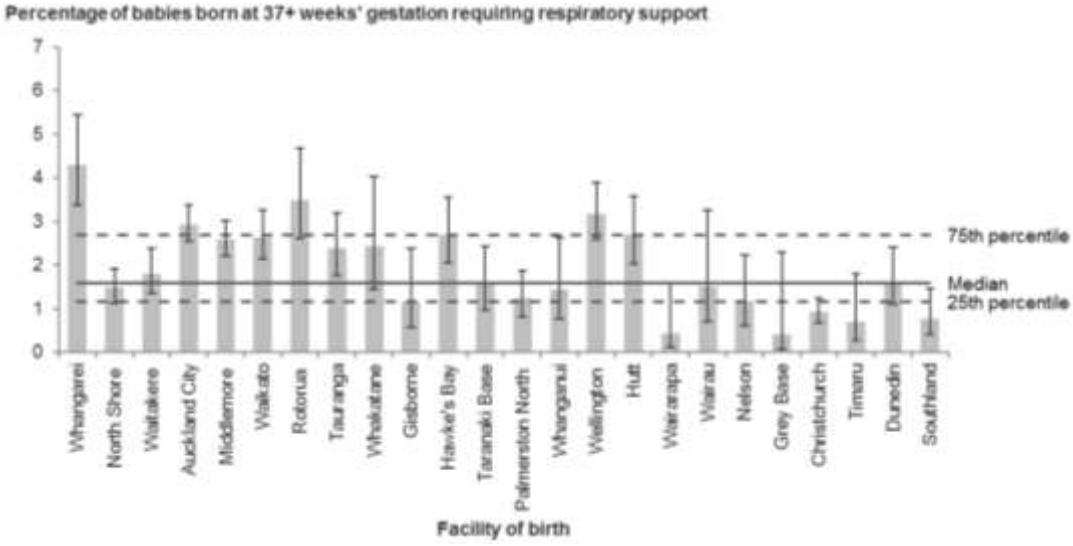
Indicator 20: Babies born at 37+ weeks' gestation requiring respiratory support, 2017

Figure 35: Percentage of babies born at 37+ weeks' gestation requiring respiratory support, by district health board of residence, 2017



Error bars represent 95% confidence intervals.

Figure 36: Percentage of babies born at 37+ weeks' gestation requiring respiratory support, by facility of birth (secondary and tertiary facilities), 2017



Error bars represent 95% confidence intervals.

Table 41: Number and percentage of babies born at 37+ weeks' gestation requiring respiratory support, by district health board of residence, 2017

DHB of residence	Babies born at 37+ weeks' gestation requiring over 4 hours of respiratory support	Babies born at 37+ weeks' gestation	Rate (%)
Northland	75	2,082	3.6
Waitemata	141	7,222	2.0
Auckland	105	5,280	2.0
Counties Manukau	188	7,672	2.5
Waikato	104	4,970	2.1
Lakes	52	1,440	3.6
Bay of Plenty	58	2,888	2.0
Tairāwhiti	8	643	1.2
Hawke's Bay	51	1,974	2.6
Taranaki	23	1,324	1.7
MidCentral	30	1,945	1.5
Whanganui	13	789	1.6
Capital & Coast	87	3,255	2.7
Hutt Valley	55	1,791	3.1
Wairarapa	4	472	0.8
Nelson Marlborough	15	1,302	1.2
West Coast	2	325	0.6
Canterbury	55	5,933	0.9
South Canterbury	5	591	0.8
Southern	42	3,218	1.3
Unknown	3	284	–
New Zealand	**1,116**	**55,400**	**2.0**

Table 42: Number and percentage of babies born at 37+ weeks' gestation requiring respiratory support, by facility of birth (secondary and tertiary facilities), 2017

Place of birth	Babies born at 37+ weeks' gestation requiring over 4 hours of respiratory support	Babies born at 37+ weeks' gestation	Rate (%)
Whangarei	64	1,489	4.3
North Shore	55	3,703	1.5
Waitakere	47	2,603	1.8
Auckland City	186	6,332	2.9
Middlemore	154	5,937	2.6
Waikato	84	3,180	2.6
Rotorua	43	1,229	3.5
Tauranga	43	1,806	2.4
Whakatane	14	577	2.4
Gisborne	7	601	1.2
Hawke's Bay	50	1,843	2.7
Taranaki Base	18	1,162	1.5
Palmerston North	21	1,699	1.2
Whanganui	10	695	1.4
Wellington	92	2,892	3.2
Hutt	47	1,739	2.7
Wairarapa	2	460	0.4
Wairau	6	395	1.5
Nelson	9	761	1.2
Grey Base	1	243	0.4
Christchurch	44	4,759	0.9
Timaru	4	565	0.7
Dunedin	25	1,527	1.6
Southland	9	1,164	0.8
All secondary and tertiary facilities	**1,035**	**47,361**	**2.2**
All primary facilities	**64**	**5,730**	**1.1**
All home births	**13**	**1,931**	**0.7**
New Zealand[1]	**1,116**	**55,400**	**2.0**

1 Includes babies where birth location was unspecified.

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Appendices

Appendix 1: National Maternity Collection

The Ministry of Health's National Maternity Collection (MAT) provides statistical, demographic and clinical information about selected publicly funded maternity services up to nine months before and three months after a birth. It collates data about each pregnancy that results in birth and each live-born baby separately from:

- inpatient and day-patient health event data during pregnancy, birth and the postnatal period for women giving birth and their babies, sourced from the National Minimum Dataset (NMDS)
- lead maternity carer (LMC) claim forms for primary maternity services provided under the Primary Maternity Services Notice 2007
- primary maternity services provided by DHBs to women who do not have a midwife LMC.[4]

The Ministry of Health collects these sources for administrative purposes (including the funding of maternity services). The collection does not contain details of stillborn babies. The Mortality Collection includes information about stillbirths. Refer to the data dictionary (**www.health.govt.nz/publication/national-maternity-collection-data-dictionary**) for more information on the data held in MAT.

National Minimum Dataset

The NMDS stores administrative information routinely collected for all publicly funded inpatients of a New Zealand maternity facility (hospitals and birthing units). This information contains a large amount of demographic and clinical data, including data on diagnoses and the procedures used. The NMDS assigns information standardised codes that are internationally comparable. The classification system used is the International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification. This system is designed for the classification of morbidity and mortality information for statistical, epidemiological and clinical purposes. Refer to the data dictionary (**www.health.govt.nz/publication/national-minimum-dataset-hospital-events-data-dictionary**) for more information on the data held in the NMDS.

[4] Collection of this data set (from 2014 onwards) is under way, but still incomplete. We have included data currently available in MAT in this publication.

Lead maternity carer claims data

The LMC claims data set contains information on women and babies who access primary maternity services provided under Section 88 of the New Zealand Public Health and Disability Act 2000. The Ministry of Health receives information through LMC claim forms; this information includes all women registered with an LMC. This represented 92 percent of all women giving birth in 2017. Data sourced from LMC claim forms includes details on registration with an LMC, as well as other antenatal and postnatal factors (eg, parity, smoking status and breastfeeding status).

District health board-funded primary maternity services data

Collection of this data set is under way. This data set contains information (similar to LMC claims data) on women who access DHB primary maternity services, including DHB caseload midwives, DHB primary midwifery teams and shared care arrangements.

The extent of primary maternity services DHBs are providing varies significantly by DHB, ranging from DHBs that do not currently provide any primary maternity services to DHBs that provide primary maternity services to at least one-quarter of their women giving birth. Not all DHBs that provide primary maternity services have provided data to MAT.[5]

Once complete, this data set will increase the scope of information the Ministry holds on women (and their babies) who access primary maternity services.

[5] From 2009 to 2015, approximately 87 percent of women giving birth registered to receive primary maternity care with an LMC, and 8 percent registered to receive care from a DHB primary maternity service. Provision of care was unknown for 5 percent of women giving birth. We expect that most of these women received care from the respective DHB primary maternity services (not yet reporting), but some may not have received any primary maternity care (Ministry of Health 2015).

Appendix 2: Technical notes

Obtaining the data

This publication uses the National Maternity Collection (MAT) as the primary source for identifying all women giving birth and live-born babies. We extracted variables used to identify the women and babies from MAT, as well as the following variables: delivery date, place of birth, age, ethnicity, smoking status, parity, primary maternity care provider, gestation and birthweight.

The National Maternity Collection primarily sources parity and smoking status data from LMC claim forms, with additional data from some DHB primary maternity services. This data is therefore only available for women registered with an LMC or with a DHB primary maternity service (95 percent of women giving birth in 2017).

Indicators 2 to 12 and 20 require additional information that is not available in MAT. Therefore, we identified and extracted hospital events occurring during the pregnancy and postnatal period for these women and their babies from the National Minimum Dataset (NMDS).

The NMDS codes hospital events using the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification (ICD-10-AM) for diagnoses codes and uses the Australian Classification of Health Interventions (ACHI) for procedure codes. Both ICD-10-AM and ACHI are from the Independent Hospital Pricing Authority, Australia. NMDS is based on the 6th edition for hospital discharges up to 30 June 2014 and the 8th edition for hospital discharges from 1 July 2014 onwards. The next section provides the relevant clinical and procedure codes.

Clinical codes and definitions

Standard primiparae: a group of women considered to be clinically comparable and expected to require low levels of obstetric intervention. This report defines standard primiparae as women recorded in MAT who meet all of the following criteria:

- gave birth at a maternity facility or had a home birth[6]
- are aged between 20 and 34 years (inclusive) at birth
- are pregnant with a single baby presenting in labour in cephalic position (see Tables A1 and A2)
- have no known prior pregnancy of 20 weeks and over gestation

[6] Place of birth is designated as 'home' if there was an LMC claim for home birth supplies and no corresponding record for a birth at a maternity facility.

- give birth to a live or stillborn baby at term gestation: between 37 and 41 weeks inclusive (based on gestational age recorded for the baby and exclusion criteria in Table A3)
- have no recorded obstetric complications in the present pregnancy that are indications for specific obstetric interventions (see Table A4).

Table A1: Singleton birth exclusion criteria

Clinical code	Description
O300–O309	Multiple gestation
O318	Other complications specific to multiple gestation
O325	Maternal care for multiple gestation
O632	Delayed delivery of second twin, triplet, etc
O840–O849*	Multiple delivery
Z372–Z377	Outcome of delivery – twins or multiple

* Introduced in the 8th edition of ICD-10-AM.

Table A2: Cephalic presentation exclusion criteria

Clinical code	Description
9047000	Spontaneous breech delivery
9047001	Assisted breech delivery
9047002	Assisted breech delivery with forceps to after-coming head
9047003	Breech extraction
9047004	Breech extraction with forceps to after-coming head
O640–O649	Labour and delivery affected by malposition and malpresentation of fetus

Table A3: Duration of pregnancy (gestation exclusion criteria)

Clinical code	Description
O090–O095	Duration of pregnancy under 37 weeks
O48	Prolonged pregnancy
O601	Preterm labour and delivery

Table A4: Obstetric complications exclusion criteria

Clinical code	Description
O10–O16	Hypertension, proteinuria, pre-eclampsia, eclampsia
O240–O249	Diabetes mellitus in pregnancy
O360, O361, O363, O364, O365	Known or suspected fetal problems
O411, O420–O429	Infection of the amniotic sac/membranes or premature rupture of membranes
O450–O459, O460–O469, O48	Premature separation of placenta, antepartum haemorrhage, prolonged pregnancy

Spontaneous vaginal birth: the birth of a baby without obstetric intervention (ie, without caesarean section, forceps or vacuum (ventouse)), identified by the presence of a spontaneous vaginal birth clinical code with no concurrent instrumental/caesarean section code (see Table A5). Spontaneous vaginal births may include births where labour has been induced or augmented. We counted women giving birth at home as having had a spontaneous vaginal birth.

Table A5: Delivery type codes

Clinical code	Description
O80	Single spontaneous delivery
O81	Single delivery by forceps and vacuum extractor
O82	Single delivery by caesarean section
O83*	Other assisted single delivery
O840*	Multiple delivery, all spontaneous
O841*	Multiple delivery, all by forceps and vacuum extractor
O842*	Multiple delivery, all by caesarean section
O848*	Other multiple delivery
O849*	Multiple delivery, unspecified
9046700	Spontaneous vertex delivery
9046800–9046804	Forceps delivery
9046900	Vacuum extraction with delivery
1652000–1652003	Caesarean section

* Introduced in the 8th edition of ICD-10-AM.

Instrumental vaginal birth: a vaginal birth requiring instrumental assistance with no concurrent clinical code indicating a caesarean section. Interventions include forceps and/or vacuum (ventouse) extraction (see Table A5). Instrumental vaginal births do not include failed attempts at forceps or vacuum extraction (see Table A6).

Table A6: Excluded delivery procedure codes

Clinical code	Description
9046805	Failed forceps
9046901	Failed vacuum extraction

Caesarean section: an operative birth through an abdominal incision. This definition includes emergency and elective, lower segment and classical caesarean sections, and it is identified by the presence of any caesarean section clinical code (see Table A5).

Induction of labour: an intervention to stimulate the onset of labour by pharmacological or other means, identified by induction of labour clinical codes (see Table A7).

Table A7: Induction procedure codes

Clinical code	Description
9046500	Medical induction of labour, oxytocin
9046501	Medical induction of labour, prostaglandin
9046502	Other medical induction of labour
9046503	Surgical induction of labour by artificial rupture of membranes
9046504	Other surgical induction of labour
9046505	Medical and surgical induction of labour

Intact lower genital tract: identified by an absence of clinical codes indicating an episiotomy or a tear of any degree (first to fourth, and including 'was unspecified' degree) (see Table A8).

Episiotomy: an incision of the perineal tissue surrounding the vagina at the time of birth to facilitate delivery, identified by the presence of an episiotomy clinical code (see Table A8). We counted women giving birth at home as having had a spontaneous vaginal birth without an episiotomy.

Third- and fourth-degree tear: a third- or fourth-degree perineal laceration during birth, identified by the presence of a third- or fourth-degree tear clinical code (see Table A8) in a hospital admission within three days after birth.

Table A8: Episiotomy and/or perineal tear codes

Clinical code	Description
9047200	Episiotomy
O700	First-degree perineal laceration during delivery
O701	Second-degree perineal laceration during delivery
O702	Third-degree perineal laceration during delivery
O703	Fourth-degree perineal laceration during delivery
O709	Perineal laceration during delivery, was unspecified
9048100	Suture of first or second degree tear of perineum
1657300	Suture of third or fourth degree tear of perineum

General anaesthetic for a caesarean section birth: identified by the presence of a general anaesthetic clinical code (see Table A9) and a caesarean section clinical code (see Table A5).

Table A9: General anaesthetic procedure code

Clinical code	Description
92514XX	General anaesthesia

Blood transfusion during birth admission: identified by clinical codes for selected blood transfusion procedures (see Table A10) in a hospital admission within three days after birth.

Table A10: Blood transfusion procedure codes

Clinical code	Description
1370601	Administration of whole blood
1370602	Administration of packed cells
1370603	Administration of platelets
9206000	Administration of autologous blood
9206200	Administration of other serum
9206300	Administration of blood expander
9206400	Administration of other blood product

Diagnosis of eclampsia at birth admission: identified by the presence of an eclampsia clinical code (see Table A11) during birth admission.

Table A11: Eclampsia codes

Clinical code	Description
O150	Eclampsia in pregnancy
O151	Eclampsia in labour
O152	Eclampsia in the puerperium
O159	Eclampsia, was unspecified as to time period

Diagnosis of peripartum hysterectomy: identified by the presence of an abdominal hysterectomy clinical code (see Table A12) in a hospital admission within six weeks after birth.

Table A12: Peripartum hysterectomy codes

Clinical code	Description
3565300	Subtotal abdominal hysterectomy
3565301	Total abdominal hysterectomy
3565304	Total abdominal hysterectomy with removal of adnexa

Mechanical ventilation required during pregnancy or postnatal period: identified by any hospital admission during the pregnancy or postnatal period where the woman was in an intensive care unit and required more than 24 hours of mechanical ventilation.

First trimester registration with an LMC: applicable where date of registration with an LMC is within the first 12 completed weeks of pregnancy, based on the woman's estimated date of delivery reported at registration.

Preterm birth: the birth of a live-born baby between 20 weeks 0 days and 36 weeks 6 days gestation.

Small for gestational age: applies to babies born with birthweight below the 10th percentile for their gestational age, based on smoothed centile tables for birthweight according to gestational age from the INTERGROWTH-21st project (see Table A13).

Table A13: 10th centile birthweight for male and female babies according to gestational age

Gestational age (weeks)	Male (kg)	Female (kg)
37	2.38	2.33
38	2.57	2.50
39	2.73	2.65
40	2.88	2.78
41	3.01	2.89
42	3.12	2.98

Source: Villar et al 2014.

Respiratory support during birth admission: applies to a baby requiring over four hours of mechanical ventilation or of continuous positive airway pressure during a hospital admission within three days after birth.

Other technical notes

Facility graphs: all facility graphs in this report present maternity events occurring in secondary and tertiary maternity facilities (hospitals) only, while DHB graphs present maternity events by DHB of residence and include births at all maternity facilities (including primary facilities). The aim of this is to enable the comparison of births for which clinicians have access to similar clinical facilities and interventions. The accompanying online tables provide data for individual primary facilities. Take care when making comparisons, because many primary units deal with only a small number of maternity events, meaning that in many cases differences between rates will not be statistically significant.

Presentation of confidence intervals: the error bars on the charts in this document represent 95 percent confidence intervals for the sample proportion, which have been calculated using the Wilson score (see Newcombe 1998).

Southern DHB data: in May 2010, Otago and Southland DHBs were merged into a single entity, Southern DHB, which began reporting to the Ministry of Health National Collections in 2011. This report includes all relevant data under 'Southern DHB'.

Christchurch and Christchurch Women's data: from 1 July 2009 maternity events that had previously been reported as occurring in Christchurch Women's Hospital were reported as occurring in Christchurch Hospital. This change represents a change in the way the data is reported, rather than a change in patient care. For the purposes of this report, we have summed Christchurch Women's Hospital and Christchurch Hospital events.

Appendix 3: Catchment areas

The primary, secondary and tertiary maternity facilities that reported births between 2009 and 2017 are listed by DHB region (of location) in the table below. Figure A1 presents their geographical locations.

DHB	Tertiary facility[1]	Secondary facility[2]	Primary facility[3]
Northland	Auckland City	Whangarei	Bay of Islands Dargaville (closed) Hokianga Health Kaitaia
Waitemata		North Shore Waitakere	Helensville Warkworth Wellsford
Auckland			Birthcare Auckland
Counties Manukau	Middlemore		Botany Downs Papakura Pukekohe
Waikato	Waikato		Birthcare Huntly Matariki (closed) Pohlen Trust Rhoda Read (closed) River Ridge Taumaranui Te Awamutu Te Kuiti Thames Tokoroa Waihi Waterford
Lakes		Rotorua	Taupo
Bay of Plenty		Tauranga Whakatane	Bethlehem Murupara Ōpotiki
Tairāwhiti		Gisborne	Ngati Porou Hauora
Taranaki		Taranaki Base	Elizabeth R (closed) Hawera
Hawke's Bay	Wellington	Hawke's Bay Regional	Wairoa
MidCentral		Palmerston North	Dannevirke Horowhenua Te Papaioea
Whanganui		Whanganui	Otaihape Waimarino
Capital & Coast			Kapiti Kenepuru

DHB	Tertiary facility[1]	Secondary facility[2]	Primary facility[3]
Hutt Valley		Hutt	
Wairarapa		Wairarapa	
Nelson Marlborough		Wairau Nelson	Golden Bay Motueka
West Coast	Christchurch	Grey Base	Buller Reefton
Canterbury			Akaroa (closed) Ashburton Burwood (closed) Darfield Kaikoura Lincoln Rangiora St George's Waikari (closed)
South Canterbury		Timaru	
Southern		Dunedin Southland	Charlotte Jean Clutha Dunstan (closed) Gore Lakes District Lumsden Maniototo (closed) Ōamaru Tuatapere Winton

1 A facility that provides a multidisciplinary specialist team for women and babies with complex or rare maternity needs; for example, babies with major fetal disorders requiring prenatal diagnostic and fetal therapy services, or women with obstetric histories that significantly increase the risks during pregnancy, labour and delivery (for example, those who have already had two placental abruptions). This includes neonatal intensive care units.

2 A facility that provides additional care during the antenatal, labour and birth, and postnatal periods for women and babies who experience complications and who have a clinical need for either specialist consultation or transfer.

3 A facility that does not have inpatient secondary maternity services or 24-hour on-site availability of specialist obstetricians, paediatricians and anaesthetists. This includes birthing units.

Note: Several facilities that have closed remain listed on this table. This is because while these facilities are currently closed, births still occurred there between 2009 and 2017.

Figure A1: Maternity facilities in New Zealand by DHB and facility type (2009–2017)