MINISTRY OF HEALTH
MANATŪ HAUORA

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New Zealand Maternity Clinical Indicators

2013

Citation: Ministry of Health. 2015. *New Zealand Maternity Clinical Indicators 2013*. Wellington: Ministry of Health.

Published in September 2015
by the Ministry of Health
PO Box 5013, Wellington 6145, New Zealand

ISBN: 978-0-478-44878-8 (online)
HP 6254

This document is available at www.health.govt.nz

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Executive summary

The New Zealand Maternity Clinical Indicators provide information on a series of maternity outcomes which relate to an optimal health outcome. 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 interventions and outcomes should be similar. Of the 21 indicators covered in this report:

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

This is the fifth report in the New Zealand Maternity Clinical Indicators series. It presents data on women giving birth, and babies born in the 2013 calendar year. It includes six new indicators, bringing the total number of indicators to 21, and presents trends for each indicator over a five-year period.

In 2013, compared to the four previous years, there was:

- an increase in the proportion of women who registered with an LMC in the first trimester of pregnancy and major variations between regions
- a decrease in the proportion of standard primiparae who had a spontaneous vaginal birth and an increase in standard primiparae who had a caesarean section or instrumental birth, and continued major variations between regions
- a decrease in the proportion of standard primiparae who had an intact perineum and an increase in the proportion who had an episiotomy or a third- or fourth-degree tear, or both an episiotomy and a third- or fourth-degree tear, and there was continued major variations between regions
- a decrease in the proportion of women who had a general anaesthetic for caesarean section
- a decrease in the proportion of women who required a blood transfusion following a caesarean section
- an increase in the proportion of women who required a blood transfusion following a vaginal birth
- a decrease in the proportion of women who smoked during the postnatal period
- an increase in the proportion of women with body mass index (BMI) over 35 at registration
- a decrease in the proportion of small babies at term (37–42 weeks' gestation) and in the proportion of small babies born at 40–42 weeks' gestation
- an increase in the proportion of term babies requiring respiratory support.

As the four previous reports demonstrated, reported maternity service delivery 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 five-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 mothers 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 every three years.

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 could be measured 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 objectives of the Maternity Clinical Indicators were retained.

The first phase of changes was implemented in *New Zealand Maternity Clinical Indicators 2012*; it included improving the quality and completeness of the original 12 indicators and introducing three new indicators. This report, *New Zealand Maternity Clinical Indicators 2013*, covers the second year to which these revised indicators apply, and the second phase of changes. These changes introduce six new indicators that consider outcomes for babies and for women experiencing severe morbidity, and expand the methodology to count outcomes for women giving birth outside a maternity facility more accurately.

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 2015 data.

Overview

This report presents the second year of reporting on the revised indicators, and the fifth edition in the *New Zealand Maternity Clinical Indicators* series (see Table 1 for a list of indicators presented in this publication). This report was developed in partnership with the New Zealand Maternity Clinical Indicators Expert Working Group. The key changes to this year's report are:

- **Expanded methodology for data extraction**: The methodology used for extracting data was expanded to count outcomes for women giving birth outside a maternity facility more accurately. This includes counting procedures during the birth admission for women giving birth at a maternity facility, as well as procedures occurring within three days of birth for women giving birth outside a maternity facility (without a birth admission). This affects indicators 5–9 and 12.
- **Inclusion of selected women having home births as standard primiparae:** Standard primiparae now include women giving birth in maternity facilities and at home who meet 'standard primipara' criteria, but exclude women who gave birth where the location was not reported.
- **Introduction of six new indicators:** This report introduces six new indicators, which monitor severe maternal morbidity and infant outcomes. These additions reflect the Ministry of Health recommendations for healthy weight gain during pregnancy, the recommendations of the National Maternity Monitoring Group on monitoring babies born small for gestational age and an increased focus on severe morbidity by the Perinatal and Maternal Mortality Review Committee.

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
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 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

Population	Indicator		Numerator	Denominator
Women registered with an LMC	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
	17	Women with BMI over 35	Total number of women with BMI over 35	Total number of women with BMI recorded
Live-born babies	18	Preterm birth	Total number of babies born under 37 weeks' gestation	Total number of babies born (live births)
	19	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
	20	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
	21	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

Note: This table lists the 21 indicators presented in this publication, and differs from previous reports in this publication series.

A set of online tables was produced to accompany this report and is available from the Ministry of Health's webpage (www.health.govt.nz/publication/new-zealand-maternity-clinical-indicators-2013). These tables present numbers and rates by:

- indicator, ethnic group and DHB of residence, 2009–2013
- indicator and facility of birth (primary, secondary and tertiary), 2009–2013
- gestation in weeks for indicator 19, 2009–2013.

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

Data for these indicators was extracted from all pregnancies and live-born babies recorded on the National Maternity Collection (MAT) on 26 March 2015. Additional hospital event data for each pregnancy and live-born baby recorded on MAT was extracted from the National Minimum Dataset (NMDS).

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

Standard primiparae were identified 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 2013 from MAT. Data from births occurring from 2009 to 2012 has been reanalysed using the same methods and criteria to provide a time-series view.

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

Data integrity

This report has been compiled 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. Data quality management has been applied 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

Data is presented in this report in two ways:

- by DHB of residence: this data is intended to provide DHBs with information relevant to their usually resident population
- by place of birth: this data is intended to allow monitoring of trends over time at the facility level. Data for births in secondary and tertiary facilities is presented graphically in the body of this document, and data for births in primary and private facilities and home births (where available) is presented in the accompanying online tables.

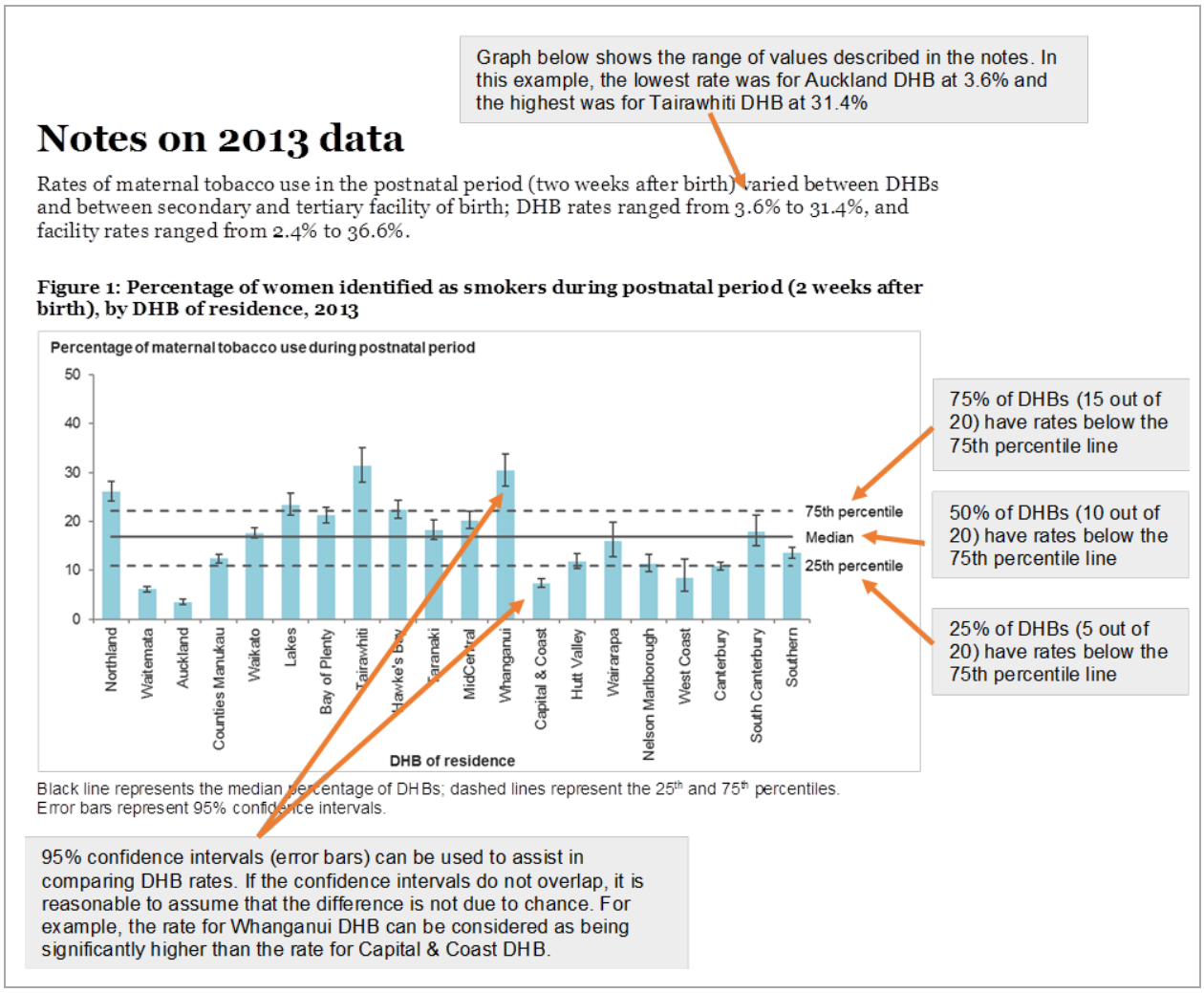
Numbers and rates

Rates are presented as raw percentages. Rates have not been standardised by age or ethnicity; denominators are chosen 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. Due to the design of the indicators, some rates are based on small numbers of events and should therefore be treated with caution.

Figures

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



Notes on national data

This section highlights how clinical indicator rates at a national level have changed from 2009 to 2013. See Table 2 for a summary of results, and Figure 2 for a graph showing rates for each indicator from 2009 to 2013. This figure is also available by DHB and by secondary or tertiary facility in the accompanying online tables. The following analysis is presented by the population considered.

Women registered with an LMC

The vast majority of women giving birth in New Zealand register with an LMC for their primary maternity care. This increased from 84.4% of women giving birth in 2009 to 90.4% of women giving birth in 2013.

Among women registered with an LMC and giving birth in 2013 compared with those registered with an LMC and giving birth in the previous four-year period (2009–2012), there was:

- a statistically significant increase in women registering with an LMC within the first trimester of their pregnancy (indicator 1)
- a statistically significant decrease in maternal tobacco use during the postnatal period (indicator 16).

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).

Approximately 15% of women giving birth in New Zealand are considered to be standard primiparae in this publication. These women are a sub-set of the general maternity population and 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 2013, ranging from 12.7% (Northland DHB) to 17.5% (Auckland DHB). The highest proportion (27.1%) of standard primiparous women were aged between 20 and 24 years old. There were a higher proportion of standard primiparous women identified as Asian (23.4%); 10.8% identified as Māori and 12.9% as Pasifika. The majority (40%) of standard primiparous women resided in the Auckland region and gave birth in one of the Auckland DHBs.

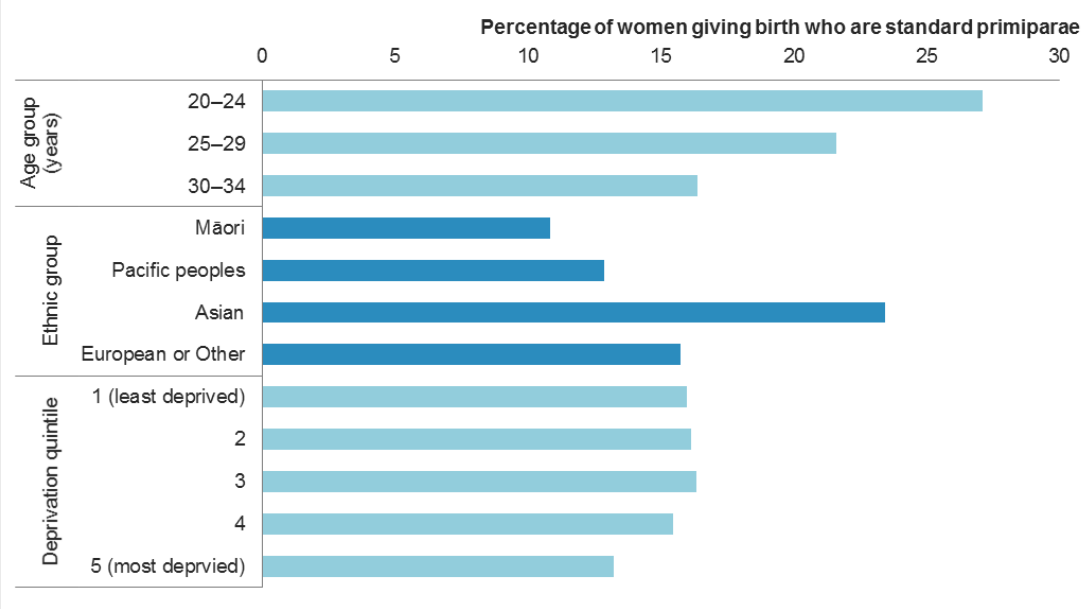
[1] The proportion of women giving birth for the first time (parity = 0) ranges from 34% to 49% between DHBs. The proportion of women giving birth for the first time at home is lower, at about 20% nationally; the proportion of primiparous women having a home birth ranges from 11% to 25% between DHBs.

The 2013 national rate was statistically significantly higher than in the previous four-year period, 2009–2012, for standard primiparae having:

- 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 sustaining a third- or fourth-degree tear (indicator 9).

Conversely, the 2013 national rate was statistically significantly lower than the 2009–2012 rate for standard primiparae having a spontaneous vaginal birth (indicator 2) and standard primiparae with an intact lower genital tract (indicator 6).

Figure 1: Percentage of women giving birth who are standard primiparae, 2009–2013



All women giving birth

Among all women giving birth in 2013, there was a statistically significant decrease from the rate for the previous four-year period, 2009–2012, for women requiring a general anaesthetic or a blood transfusion with a caesarean section (indicators 10 and 11). However, the rate of women requiring a blood transfusion with a vaginal birth (indicator 12) in 2013 showed a statistically significant increase from 2009–2012.

Babies

Comparing the 2013 rate with that of the previous four-year period (2009–2012), there was

- a statistically significant increase in babies born at 37+ week's gestation and requiring respiratory support (indicator 21)
- a statistically significant decrease in small babies born at term (37–42 week's gestation) and the proportion of small babies at term born at 40–42 weeks (indicators 19 and 20).

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 lower-risk women, although definitions of low risk differ. Other indicators among the total birthing population, including general anaesthetic for caesarean section (indicator 10) and maternal tobacco use (indicator 16), appear similar to Australian counterparts.

Table 2: New Zealand Maternity Clinical Indicator national rates by year, 2009–2013

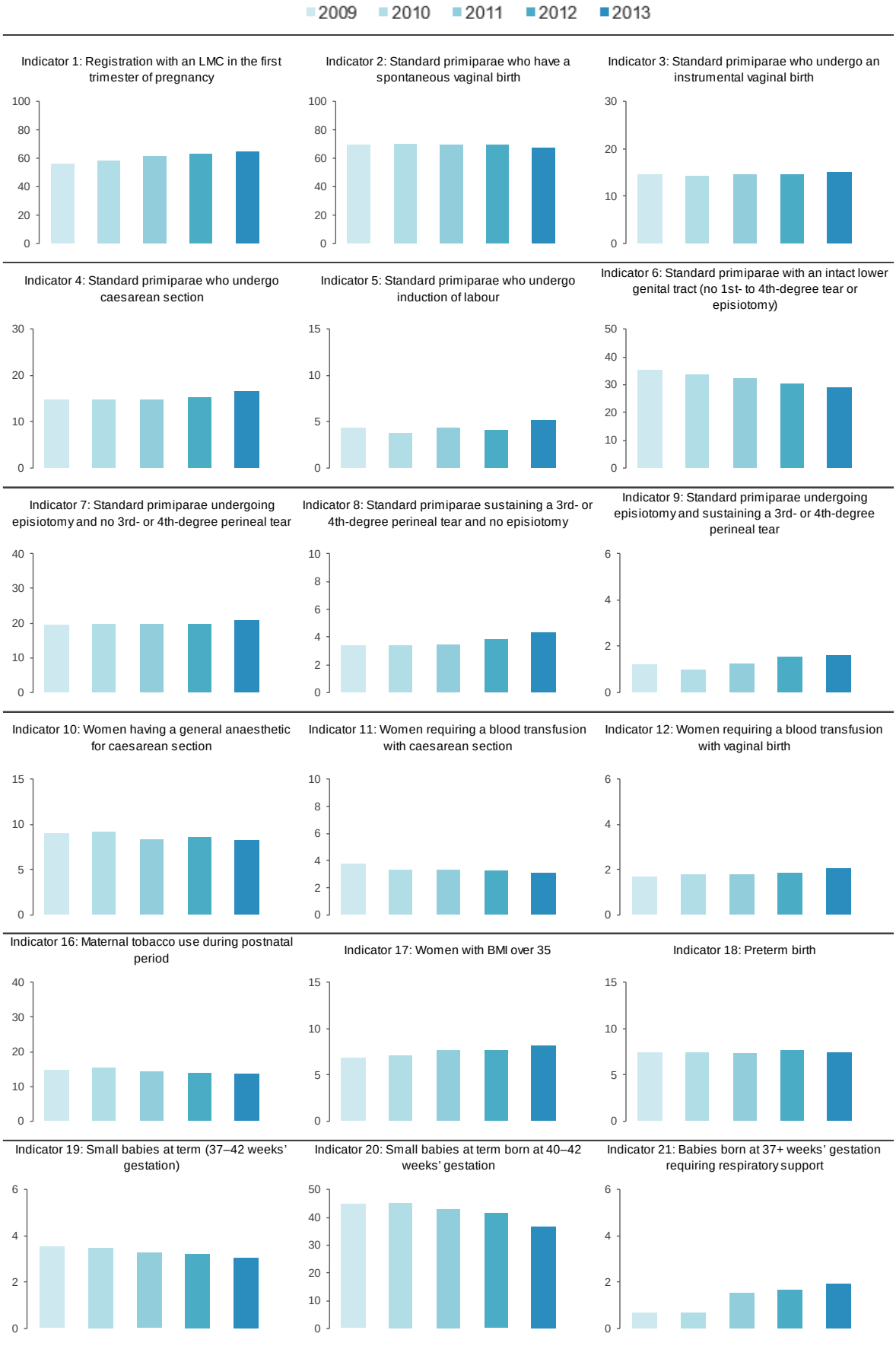
Population	Indicator		2009	2010	2011	2012	2013	2009–12 vs 2013 (p-value)[1]
Women registered with an LMC	1	Registration with an LMC in the first trimester of pregnancy (%)	56.1	58.2	61.5	63.3	64.9	↑ (< 0.001)
Standard primiparae	2	Standard primiparae who have a spontaneous vaginal birth (%)	69.7	70.1	70.0	69.9	67.7	↓ (< 0.001)
	3	Standard primiparae who undergo an instrumental vaginal birth (%)	14.6	14.3	14.7	14.8	15.2	– (0.165)
	4	Standard primiparae who undergo caesarean section (%)	14.7	14.8	14.7	15.2	16.6	↑ (< 0.001)
	5	Standard primiparae who undergo induction of labour (%)	4.4	3.8	4.4	4.1	5.2	↑ (< 0.001)
	6	Standard primiparae with an intact lower genital tract (no 1st- to 4th-degree tear or episiotomy) (%)	35.1	33.9	32.4	30.3	28.9	↓ (< 0.001)
	7	Standard primiparae undergoing episiotomy and no 3rd- or 4th-degree perineal tear (%)	19.5	19.7	19.7	19.6	21.0	↑ (0.010)
	8	Standard primiparae sustaining a 3rd- or 4th-degree perineal tear and no episiotomy (%)	3.4	3.4	3.5	3.8	4.3	↑ (< 0.001)
	9	Standard primiparae undergoing episiotomy and sustaining a 3rd- or 4th-degree perineal tear (%)	1.2	1.0	1.2	1.6	1.6	↑ (0.017)
Women giving birth	10	Women having a general anaesthetic for caesarean section (%)	9.0	9.1	8.4	8.6	8.3	↓ (0.048)
	11	Women requiring a blood transfusion with caesarean section (%)	3.8	3.3	3.3	3.2	3.1	↓ (0.049)
	12	Women requiring a blood transfusion with vaginal birth (%)	1.7	1.8	1.8	1.9	2.0	↑ (< 0.001)
	13	Women with eclampsia at birth admission (numerator)[2]	27	22	17	14	18	N/A
	14	Women having a peripartum hysterectomy (numerator)[2]	51	29	40	49	21	N/A
	15	Women admitted to ICU and requiring ventilation during the pregnancy or postnatal period (numerator)[2]	19	18	21	12	17	N/A

Population	Indicator		2009	2010	2011	2012	2013	2009–12 vs 2013 (p-value)[1]
Women registered with an LMC	16	Maternal tobacco use during postnatal period (%)	14.8	15.4	14.1	13.9	13.5	↓ (< 0.001)
	17	Women with BMI over 35 (%)	6.8	7.1	7.6	7.6	8.2	↑ (< 0.001)
Babies	18	Preterm birth (%)	7.4	7.4	7.3	7.6	7.4	– (0.788)
	19	Small babies at term (37–42 weeks' gestation) (%)	3.5	3.5	3.3	3.2	3.1	↓ (< 0.001)
	20	Small babies at term born at 40–42 weeks' gestation (%)	44.8	45.3	43.0	41.3	37.6	↓ (< 0.001)
	21	Babies born at 37+ weeks' gestation requiring respiratory support	0.7	0.7	1.3	1.7	1.9	↑ (< 0.001)

1 Shows whether there was a statistically significant increase (↑) or decrease (↓), or no statistically significant difference (–) from the rate in the 2009–2012 aggregated period to the rate in 2013. Statistical significance was calculated using Pearson's chi-squared test at 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, 2009–2013



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 an LMC, 2013

Rationale and purpose

The Perinatal and Maternal Mortality Review Committee (2012), the National Maternity Monitoring Group (2013), and the Health 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 under way in DHBs.

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. This indicator supports national and local monitoring of the effectiveness of activities to improve timely registration with an LMC.

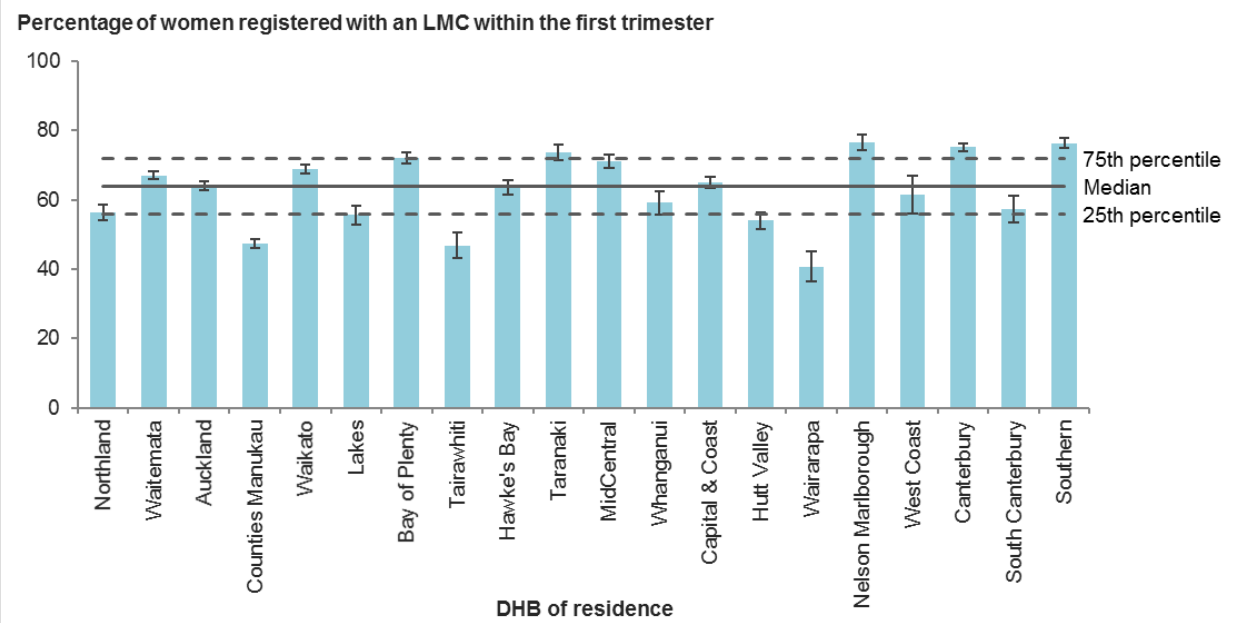
Women who access a DHB-funded primary maternity service are not yet captured in this data set. This is estimated to be around 9% of women giving birth in 2013. Collection of service provision data, including historical data, for women receiving a DHB-funded primary maternity service is under way and will be included in this indicator as it becomes available.

Notes on 2013 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 40.7% to 76.6%, and rates by facility of birth ranged from 41.7% to 82.6%. New initiatives in this area, such as the introduction of the Find Your Midwife website (www.findyourmidwife.co.nz/) in 2013, are expected to increase the rate of women engaging with an LMC in the first trimester of their pregnancy. The effects of these initiatives will become apparent in future reports.

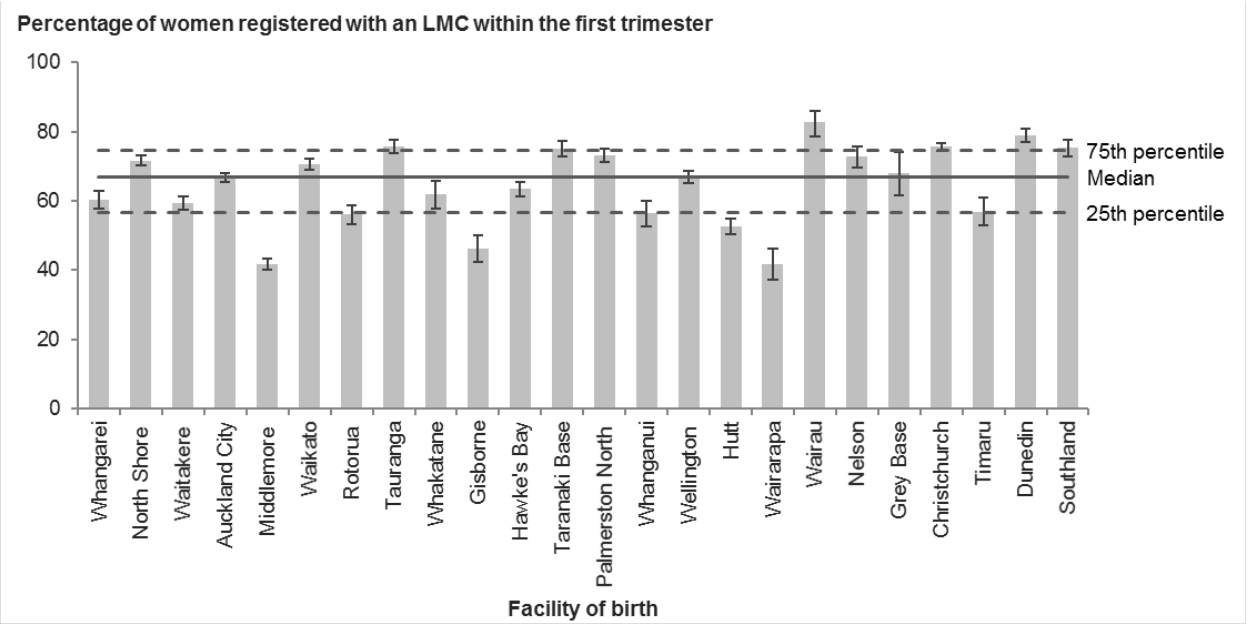
Indicator 1: Registration with an LMC in the first trimester of pregnancy, 2013

Figure 3: Percentage of women who register with an LMC in the first trimester of their pregnancy among all registered women giving birth, by DHB of residence, 2013



Black line represents the median percentage of DHBs; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Figure 4: Percentage of women who register with an LMC in the first trimester of their pregnancy among all registered women giving birth, by facility of birth (secondary and tertiary facilities), 2013



Black line represents the median percentage of secondary or tertiary facilities; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Table 3: Number and percentage of women who register with an LMC in the first trimester of their pregnancy among all registered women, by DHB of residence, 2013

DHB of residence	Registered within the first trimester of pregnancy	All registered women	Rate (%)
Northland	1,142	2,026	56.4
Waitemata	4,893	7,292	67.1
Auckland	3,096	4,832	64.1
Counties Manukau	2,725	5,738	47.5
Waikato	3,425	4,965	69.0
Lakes	786	1,413	55.6
Bay of Plenty	1,983	2,746	72.2
Tairawhiti	326	696	46.8
Hawke's Bay	1,297	2,043	63.5
Taranaki	1,112	1,509	73.7
MidCentral	1,453	2,040	71.2
Whanganui	456	771	59.1
Capital & Coast	2,181	3,354	65.0
Hutt Valley	984	1,822	54.0
Wairarapa	196	481	40.7
Nelson Marlborough	1,045	1,365	76.6
West Coast	185	300	61.7
Canterbury	4,367	5,807	75.2
South Canterbury	366	639	57.3
Southern	2,608	3,416	76.3
Unknown	134	264	–
New Zealand	**34,760**	**53,519**	**64.9**

Table 4: Number and percentage of women who register with an LMC in the first trimester of their pregnancy among all registered women, by facility of birth, 2013

Place of birth	Registered within the first trimester of pregnancy	All registered women	Rate (%)
Whangarei	866	1,435	60.3
North Shore	2,577	3,598	71.6
Waitakere	1,643	2,766	59.4
Auckland City	3,859	5,782	66.7
Middlemore	1,647	3,948	41.7
Waikato	2,287	3,238	70.6
Rotorua	680	1,213	56.1
Tauranga	1,473	1,947	75.7
Whakatane	338	547	61.8
Gisborne	299	647	46.2
Hawke's Bay	1,222	1,925	63.5
Taranaki Base	965	1,284	75.2
Palmerston North	1,321	1,805	73.2
Whanganui	359	637	56.4
Wellington	2,015	3,014	66.9
Hutt	932	1,773	52.6
Wairarapa	183	439	41.7
Wairau	338	409	82.6
Nelson	593	816	72.7
Grey Base	143	210	68.1
Christchurch	3,879	5,133	75.6
Timaru	334	587	56.9
Dunedin	1,308	1,654	79.1
Southland	918	1,218	75.4
All secondary and tertiary facilities	**30,179**	**46,025**	**65.6**
All primary facilities	**2,993**	**4,927**	**60.7**
All home births	**1,277**	**1,959**	**65.2**
New Zealand[1]	**34,760**	**53,519**	**64.9**

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.[2] Their purpose is to encourage maternity service providers to review the appropriateness of these interventions among low-risk women, with the long-term aim 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, including vacuum (ventouse) and forceps. The use of instruments is associated with both short-term and long-term complications for the mother and the baby, some of which can be serious. Judicious use of instrumental birth is needed (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 may be affected by instrumental birth, including maternal and perinatal morbidity.

Caesarean section (indicator 4)

The purpose of this indicator is to encourage maternity service providers to evaluate whether caesarean sections were performed 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 mother 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.

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

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 2013 data

Rates of spontaneous vaginal birth among standard primiparae varied notably between DHBs and between secondary and tertiary facilities in 2013; DHB rates ranged from 60.4% to 80.2% and facility rates ranged from 53.5% to 81.7%. This variation merits further urgent investigation, as it represents significant variation in clinical practice among a clinically comparable cohort.

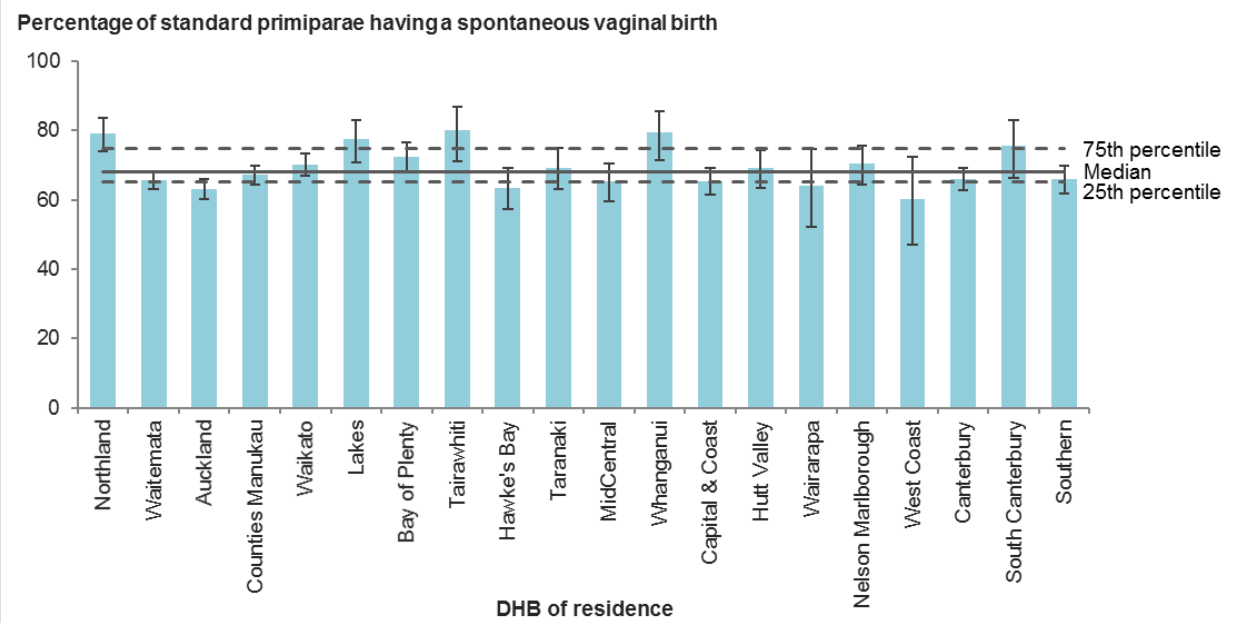
Rates of instrumental vaginal birth ranged from 5.1% to 30.2% between facilities. Caesarean section rates also varied by facility, from 3% to 24.8%, and by DHB, from 4.9% to 23.9%. These variations indicate a need for urgent detailed review. District health boards not already reviewing caesarean sections 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.

Rates of intervention in some secondary or tertiary facilities may be influenced by transfers from primary facilities, so DHBs should compare rates of intervention according to where labour was initiated, or by DHB of residence.

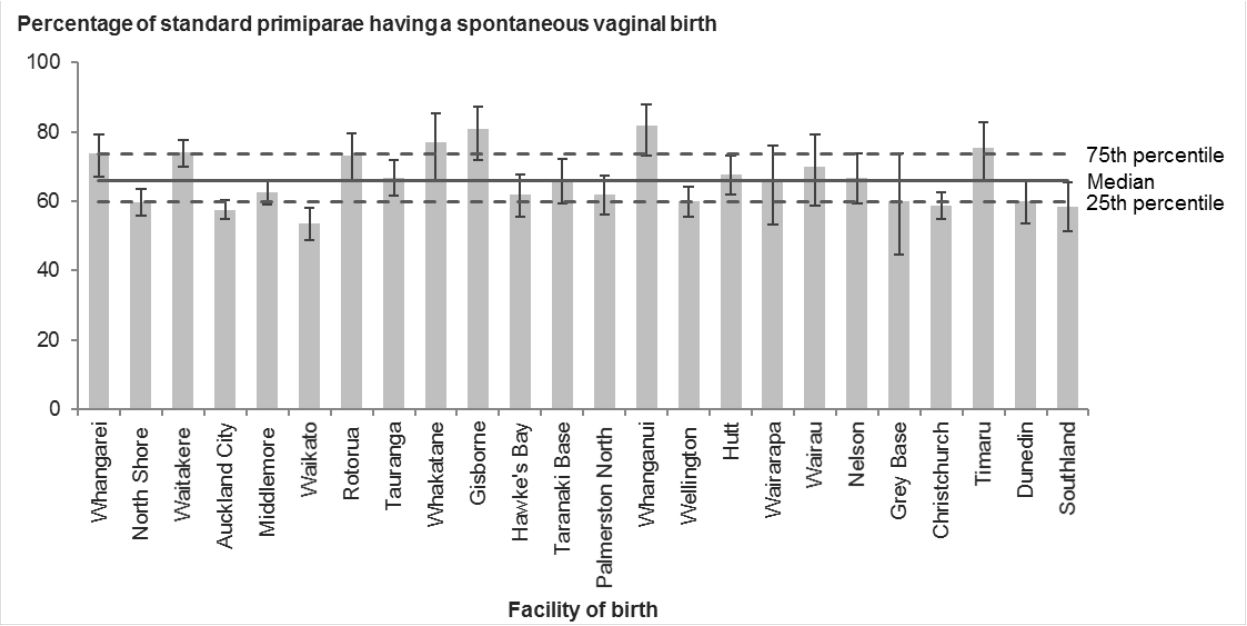
Indicator 2: Spontaneous vaginal birth among standard primiparae, 2013

Figure 5: Percentage of spontaneous vaginal births among standard primiparae, by DHB of residence, 2013



Black line represents the median percentage of DHBs; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Figure 6: Percentage of spontaneous vaginal births among standard primiparae, by facility of birth (secondary and tertiary facilities), 2013



Black line represents the median percentage of secondary and tertiary facilities; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Table 5: Number and percentage of spontaneous vaginal births among standard primiparae, by DHB of residence, 2013

DHB of residence	Spontaneous vaginal births	Standard primiparae	Rate (%)
Northland	203	256	79.3
Waitemata	815	1,241	65.7
Auckland	715	1,131	63.2
Counties Manukau	774	1,152	67.2
Waikato	529	753	70.3
Lakes	141	182	77.5
Bay of Plenty	304	420	72.4
Tairawhiti	77	96	80.2
Hawke's Bay	158	249	63.5
Taranaki	165	238	69.3
MidCentral	194	297	65.3
Whanganui	97	122	79.5
Capital & Coast	389	594	65.5
Hutt Valley	182	263	69.2
Wairarapa	43	67	64.2
Nelson Marlborough	176	250	70.4
West Coast	32	53	60.4
Canterbury	516	781	66.1
South Canterbury	75	99	75.8
Southern	349	529	66.0
Unknown	15	17	–
New Zealand	**5,949**	**8,790**	**67.7**

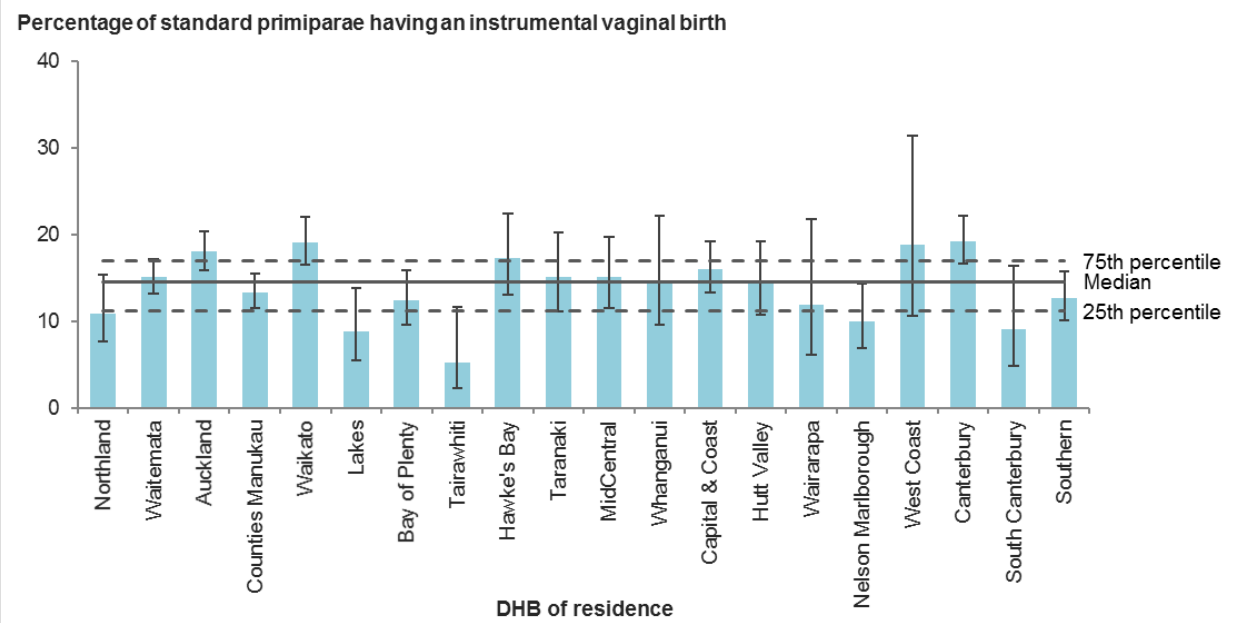
Table 6: Number and percentage of spontaneous vaginal births among standard primiparae, by place of birth, 2013

Place of birth	Spontaneous vaginal births	Standard primiparae	Rate (%)
Whangarei	146	198	73.7
North Shore	373	624	59.8
Waitakere	385	520	74.0
Auckland City	704	1,224	57.5
Middlemore	530	848	62.5
Waikato	243	454	53.5
Rotorua	114	156	73.1
Tauranga	208	311	66.9
Whakatane	54	70	77.1
Gisborne	80	99	80.8
Hawke's Bay	146	236	61.9
Taranaki Base	136	206	66.0
Palmerston North	175	282	62.1
Whanganui	85	104	81.7
Wellington	302	504	59.9
Hutt	180	266	67.7
Wairarapa	42	64	65.6
Wairau	51	73	69.9
Nelson	107	160	66.9
Grey Base	24	40	60.0
Christchurch	378	644	58.7
Timaru	73	97	75.3
Dunedin	152	254	59.8
Southland	110	188	58.5
All secondary and tertiary facilities	**4,798**	**7,622**	**62.9**
All primary facilities	**938**	**955**	**98.2**
All home births	**213**	**213**	**100.0**
New Zealand[1]	5,949	8,790	67.7

1 Includes women where birth location was unspecified.

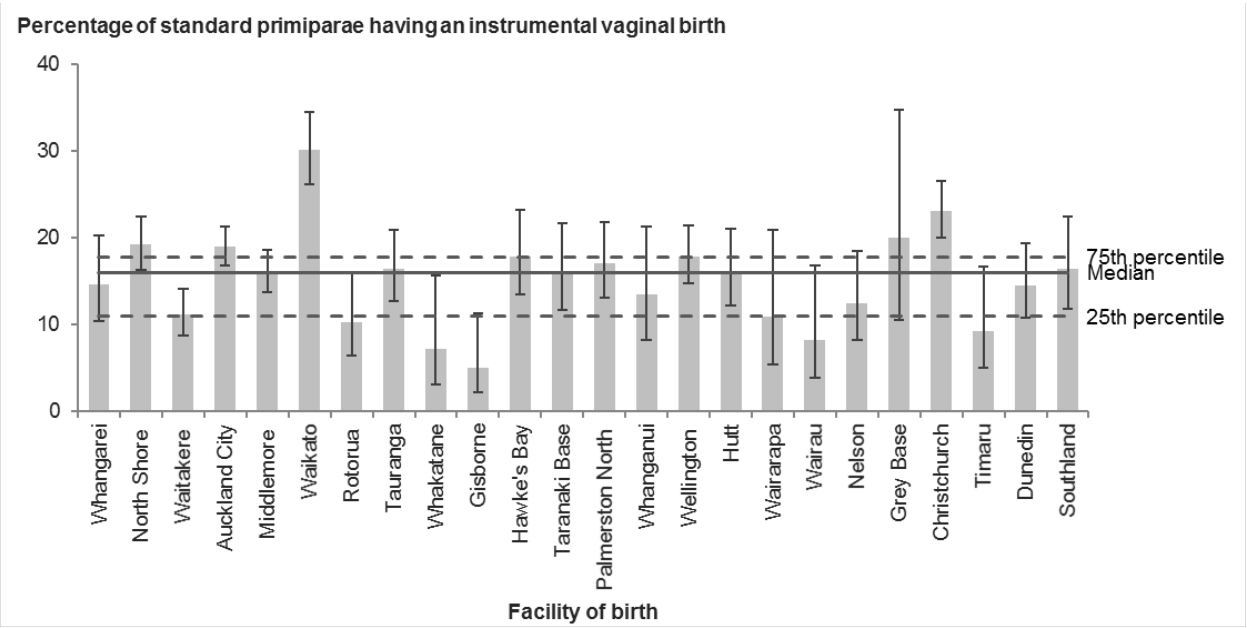
Indicator 3: Instrumental vaginal birth among standard primiparae, 2013

Figure 7: Percentage of instrumental vaginal births among standard primiparae, by DHB of residence, 2013



Black line represents the median percentage of DHBs; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Figure 8: Percentage of instrumental vaginal births among standard primiparae, by facility of birth (secondary and tertiary facilities), 2013



Black line represents the median percentage of secondary and tertiary facilities; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Table 7: Number and percentage of instrumental vaginal births among standard primiparae, by DHB of residence, 2013

DHB of residence	Instrumental vaginal births	Standard primiparae	Rate (%)
Northland	28	256	10.9
Waitemata	187	1,241	15.1
Auckland	204	1,131	18.0
Counties Manukau	154	1,152	13.4
Waikato	144	753	19.1
Lakes	16	182	8.8
Bay of Plenty	52	420	12.4
Tairawhiti	5	96	5.2
Hawke's Bay	43	249	17.3
Taranaki	36	238	15.1
MidCentral	45	297	15.2
Whanganui	18	122	14.8
Capital & Coast	95	594	16.0
Hutt Valley	38	263	14.4
Wairarapa	8	67	11.9
Nelson Marlborough	25	250	10.0
West Coast	10	53	18.9
Canterbury	150	781	19.2
South Canterbury	9	99	9.1
Southern	67	529	12.7
Unknown	0	17	–
New Zealand	**1,334**	**8,790**	**15.2**

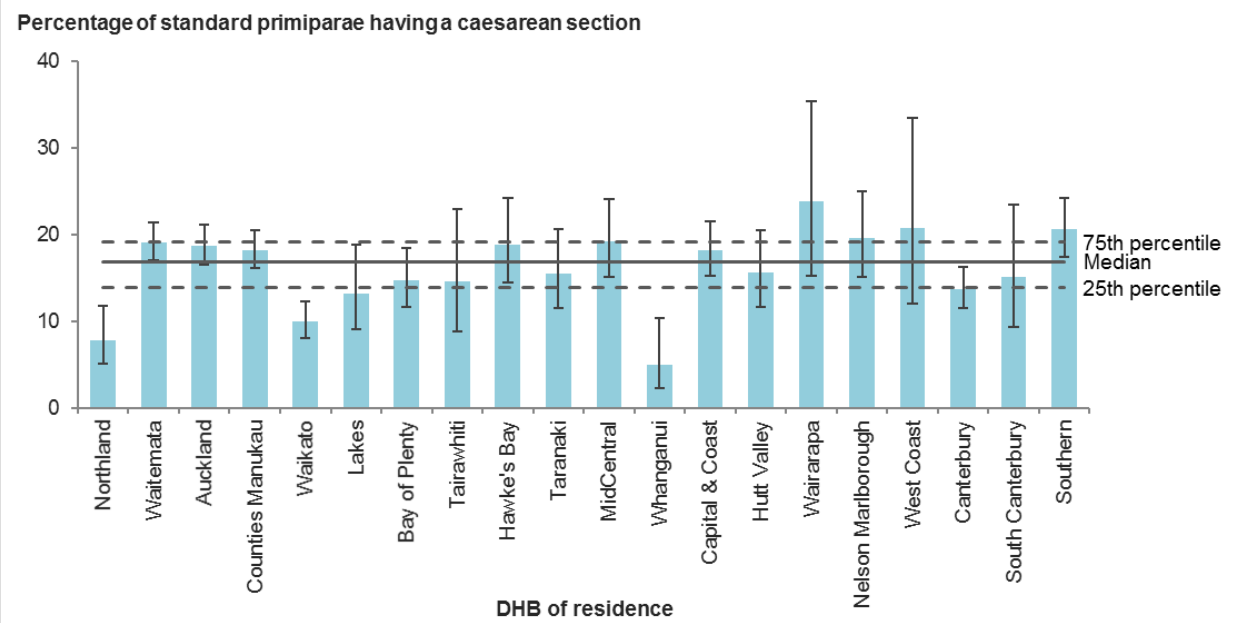
Table 8: Number and percentage of instrumental vaginal births among standard primiparae, by place of birth, 2013

Place of birth	Instrumental vaginal births	Standard primiparae	Rate (%)
Whangarei	29	198	14.6
North Shore	120	624	19.2
Waitakere	58	520	11.2
Auckland City	232	1,224	19.0
Middlemore	136	848	16.0
Waikato	137	454	30.2
Rotorua	16	156	10.3
Tauranga	51	311	16.4
Whakatane	5	70	7.1
Gisborne	5	99	5.1
Hawke's Bay	42	236	17.8
Taranaki Base	33	206	16.0
Palmerston North	48	282	17.0
Whanganui	14	104	13.5
Wellington	90	504	17.9
Hutt	43	266	16.2
Wairarapa	7	64	10.9
Wairau	6	73	8.2
Nelson	20	160	12.5
Grey Base	8	40	20.0
Christchurch	149	644	23.1
Timaru	9	97	9.3
Dunedin	37	254	14.6
Southland	31	188	16.5
All secondary and tertiary facilities	**1,326**	**7,622**	**17.4**
All primary facilities	**8**	**955**	**0.8**
All home births	**0**	**213**	**–**
New Zealand[1]	**1,334**	**8,790**	**15.2**

1 Includes women where birth location was unspecified.

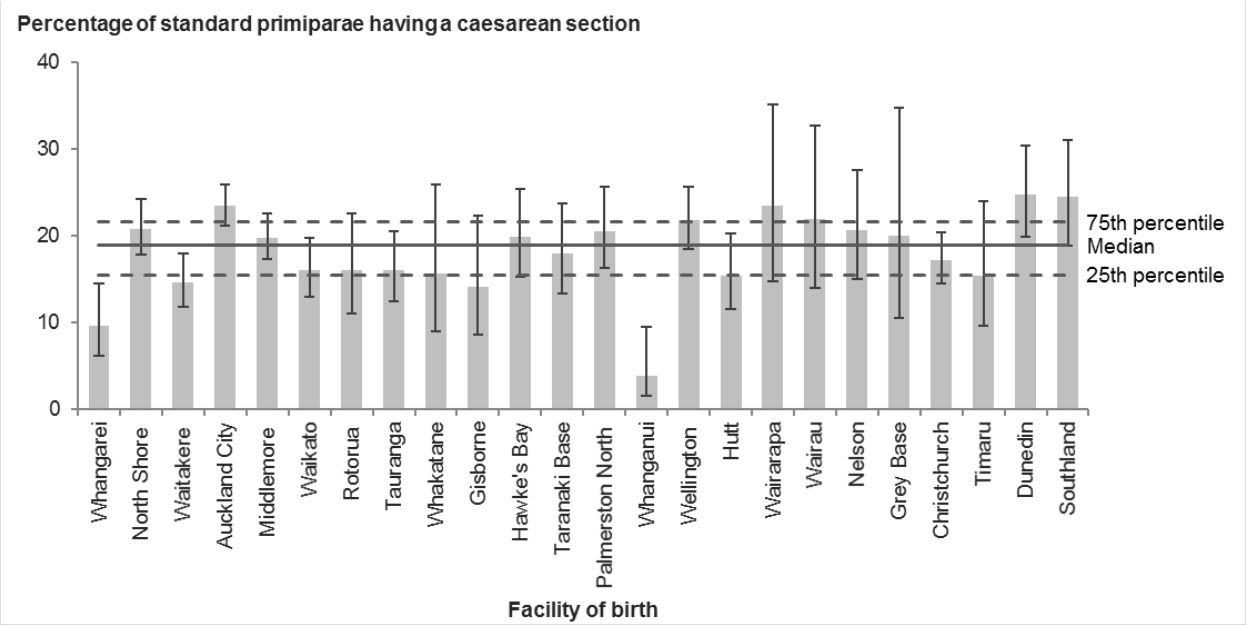
Indicator 4: Caesarean section among standard primiparae, 2013

Figure 9: Percentage of caesarean section deliveries among standard primiparae, by DHB of residence, 2013



Black line represents the median percentage of DHBs; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Figure 10: Percentage of caesarean section deliveries among standard primiparae, by facility of birth (secondary and tertiary facilities), 2013



Black line represents the median percentage of secondary and tertiary facilities; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Table 9: Number and percentage of deliveries by caesarean section among standard primiparae, by DHB of residence, 2013

DHB of residence	Caesarean sections	Standard primiparae	Rate (%)
Northland	20	256	7.8
Waitemata	237	1,241	19.1
Auckland	212	1,131	18.7
Counties Manukau	210	1,152	18.2
Waikato	75	753	10.0
Lakes	24	182	13.2
Bay of Plenty	62	420	14.8
Tairawhiti	14	96	14.6
Hawke's Bay	47	249	18.9
Taranaki	37	238	15.5
MidCentral	57	297	19.2
Whanganui	6	122	4.9
Capital & Coast	108	594	18.2
Hutt Valley	41	263	15.6
Wairarapa	16	67	23.9
Nelson Marlborough	49	250	19.6
West Coast	11	53	20.8
Canterbury	107	781	13.7
South Canterbury	15	99	15.2
Southern	109	529	20.6
Unknown	2	17	–
New Zealand	**1,459**	**8,790**	**16.6**

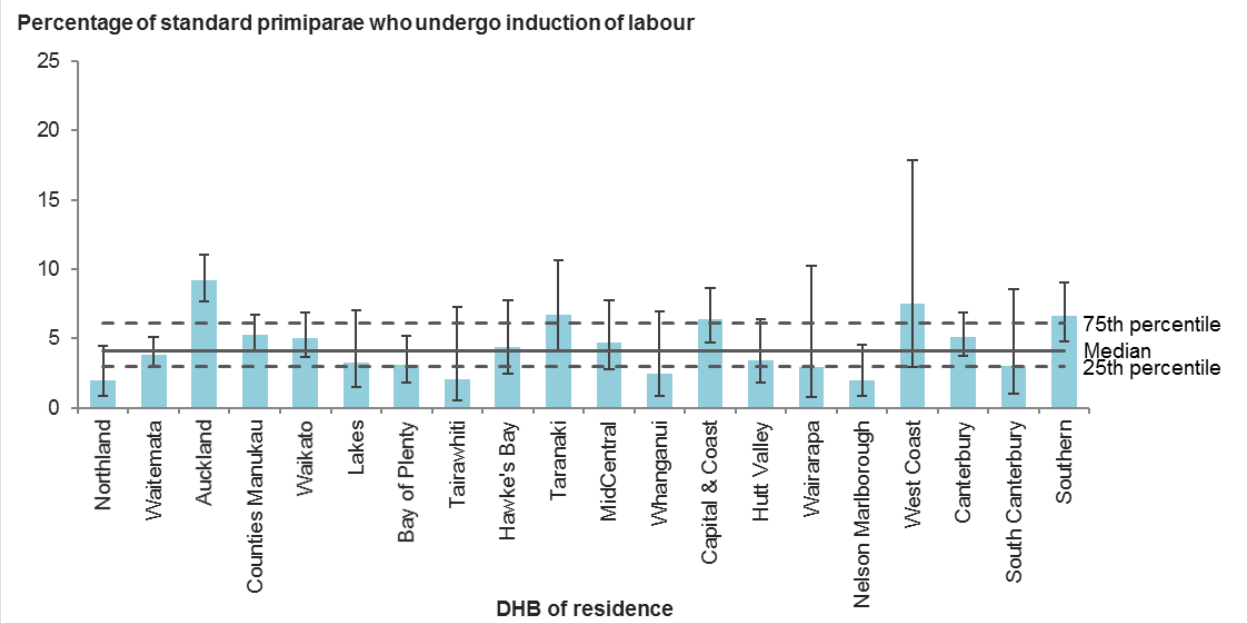
Table 10: Number and percentage of deliveries by caesarean section among standard primiparae, by place of birth, 2013

Place of birth	Caesarean sections	Standard primiparae	Rate (%)
Whangarei	19	198	9.6
North Shore	130	624	20.8
Waitakere	76	520	14.6
Auckland City	288	1,224	23.5
Middlemore	168	848	19.8
Waikato	73	454	16.1
Rotorua	25	156	16.0
Tauranga	50	311	16.1
Whakatane	11	70	15.7
Gisborne	14	99	14.1
Hawke's Bay	47	236	19.9
Taranaki Base	37	206	18.0
Palmerston North	58	282	20.6
Whanganui	4	104	3.8
Wellington	110	504	21.8
Hutt	41	266	15.4
Wairarapa	15	64	23.4
Wairau	16	73	21.9
Nelson	33	160	20.6
Grey Base	8	40	20.0
Christchurch	111	644	17.2
Timaru	15	97	15.5
Dunedin	63	254	24.8
Southland	46	188	24.5
All secondary and tertiary facilities	**1,458**	**7,622**	**19.1**
All primary facilities	**1**	**955**	**0.1**
All home births	**0**	**213**	**–**
New Zealand[1]	1,459	8,790	16.6

1 Includes women where birth location was unspecified.

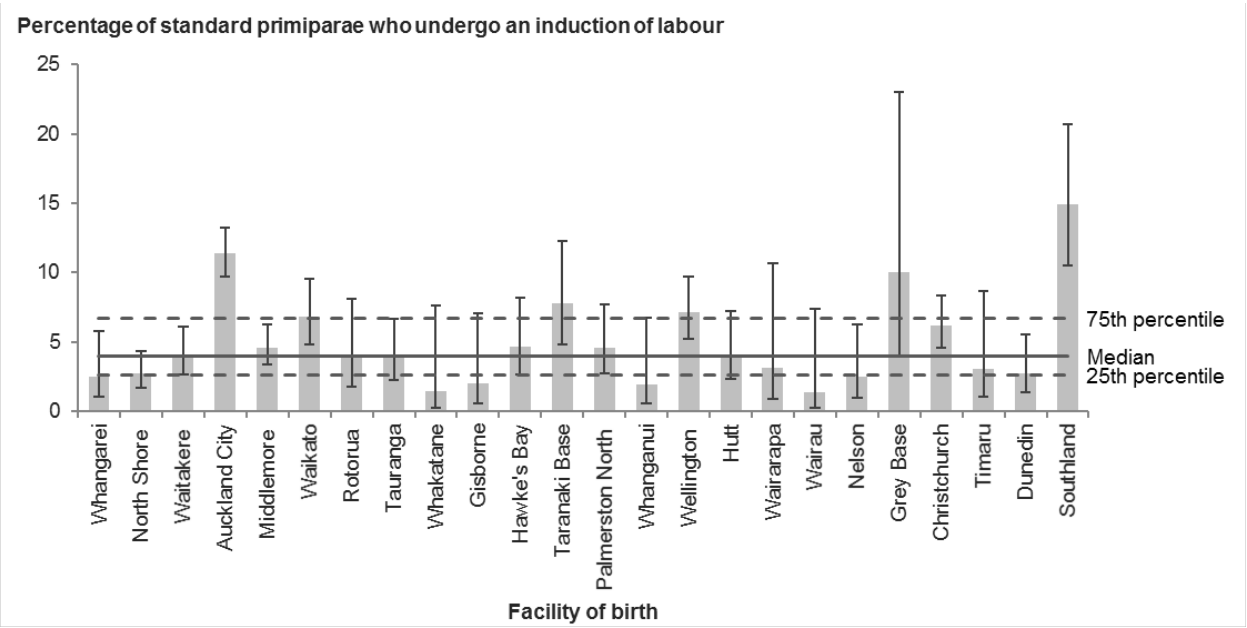
Indicator 5: Induction of labour among standard primiparae, 2013

Figure 11: Percentage of inductions of labour among standard primiparae, by DHB of residence, 2013



Black line represents the median percentage of DHBs; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Figure 12: Percentage of inductions of labour among standard primiparae, by facility of birth (secondary and tertiary facilities), 2013



Black line represents the median percentage of secondary and tertiary facilities; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Table 11: Number and percentage of inductions of labour among standard primiparae, by DHB of residence, 2013

DHB of residence	Inductions of labour	Standard primiparae	Rate (%)
Northland	5	256	2.0
Waitemata	48	1,241	3.9
Auckland	104	1,131	9.2
Counties Manukau	61	1,152	5.3
Waikato	38	753	5.0
Lakes	6	182	3.3
Bay of Plenty	13	420	3.1
Tairawhiti	2	96	2.1
Hawke's Bay	11	249	4.4
Taranaki	16	238	6.7
MidCentral	14	297	4.7
Whanganui	3	122	2.5
Capital & Coast	38	594	6.4
Hutt Valley	9	263	3.4
Wairarapa	2	67	3.0
Nelson Marlborough	5	250	2.0
West Coast	4	53	7.5
Canterbury	40	781	5.1
South Canterbury	3	99	3.0
Southern	35	529	6.6
Unknown	0	17	–
New Zealand	**457**	**8,790**	**5.2**

Table 12: Number and percentage of inductions of labour among standard primiparae, by facility of birth (secondary and tertiary facilities), 2013

Place of birth	Inductions of labour	Standard primiparae	Rate (%)
Whangarei	5	198	2.5
North Shore	17	624	2.7
Waitakere	21	520	4.0
Auckland City	139	1,224	11.4
Middlemore	39	848	4.6
Waikato	31	454	6.8
Rotorua	6	156	3.8
Tauranga	12	311	3.9
Whakatane	1	70	1.4
Gisborne	2	99	2.0
Hawke's Bay	11	236	4.7
Taranaki Base	16	206	7.8
Palmerston North	13	282	4.6
Whanganui	2	104	1.9
Wellington	36	504	7.1
Hutt	11	266	4.1
Wairarapa	2	64	3.1
Wairau	1	73	1.4
Nelson	4	160	2.5
Grey Base	4	40	10.0
Christchurch	40	644	6.2
Timaru	3	97	3.1
Dunedin	7	254	2.8
Southland	28	188	14.9
All secondary and tertiary facilities	**451**	**7,622**	**5.9**
All primary facilities	**6**	**955**	**0.6**
All home births	**0**	**213**	**–**
New Zealand[1]	**457**	**8,790**	**5.2**

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% and 85% 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 long-term 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 exposure to 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 mother 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 bleeding, infection and maternal morbidity rates, 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 2013 data

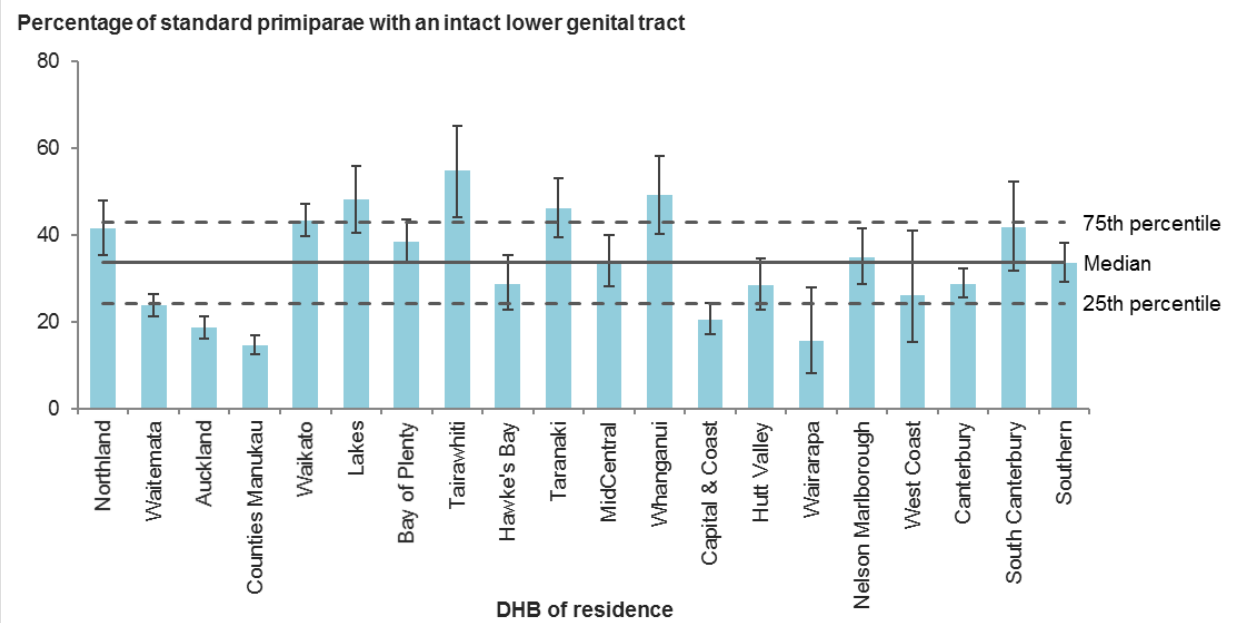
Rates of intact lower genital tract after vaginal birth among standard primiparae ranged from 14.5% to 54.9% across DHBs, and from 10.4% to 57.6% across secondary and tertiary facilities. This regional variation suggests that investigation of both data integrity and local clinical practice is required. Rates of intact lower genital tract appear to have decreased over time since 2009. Further investigation of the causes of this is required, 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 3.7% to 32.2% across DHBs, and from 4.7% to 35.9% across secondary and tertiary facilities. Outlier DHBs and facilities should investigate the reasons for these differences, which could include review of the clinical indications given in specific cases and 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.

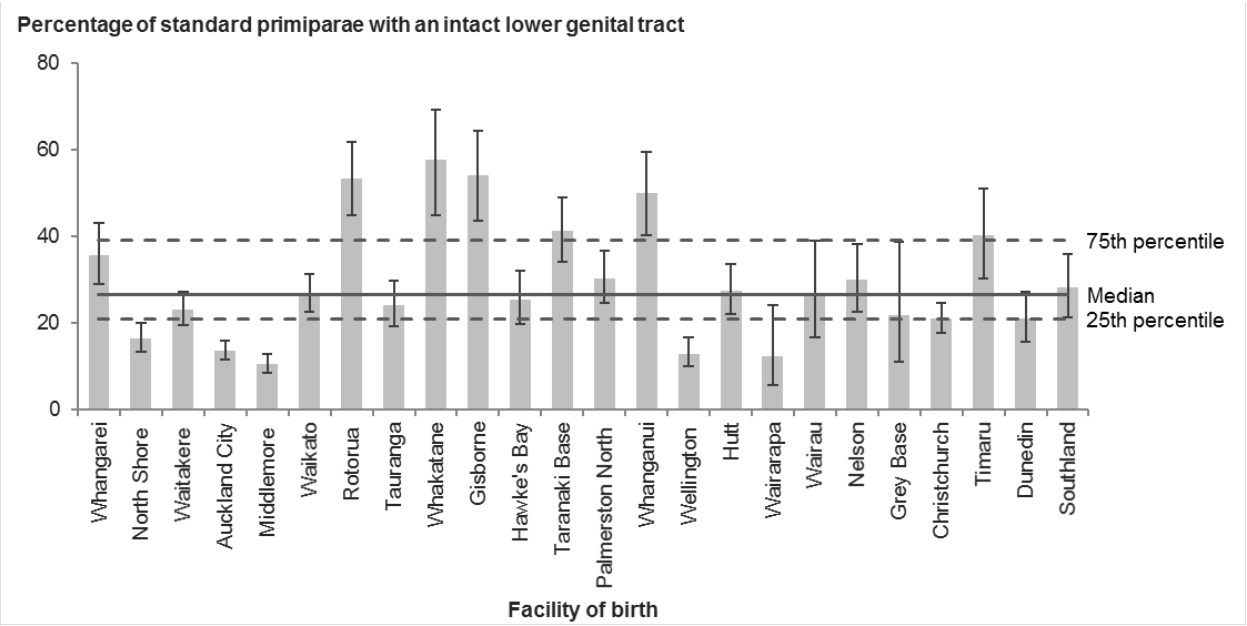
Indicator 6: Intact lower genital tract among standard primiparae giving birth vaginally, 2013

Figure 13: Percentage of standard primiparae giving birth vaginally with intact lower genital tract, by DHB of residence, 2013



Black line represents the median percentage of DHBs; dashed lines represent the 25th and 75th percentiles.
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), 2013



Black line represents the median percentage of secondary and tertiary facilities; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Table 13: Number and percentage of standard primiparae giving birth vaginally with intact lower genital tract, by DHB of residence, 2013

DHB of residence	Intact lower genital tract	Standard primiparae giving birth vaginally	Rate (%)
Northland	98	236	41.5
Waitemata	238	1,004	23.7
Auckland	171	919	18.6
Counties Manukau	137	942	14.5
Waikato	294	678	43.4
Lakes	76	158	48.1
Bay of Plenty	138	358	38.5
Tairawhiti	45	82	54.9
Hawke's Bay	58	202	28.7
Taranaki	93	201	46.3
MidCentral	81	240	33.8
Whanganui	57	116	49.1
Capital & Coast	100	486	20.6
Hutt Valley	63	222	28.4
Wairarapa	8	51	15.7
Nelson Marlborough	70	201	34.8
West Coast	11	42	26.2
Canterbury	194	674	28.8
South Canterbury	35	84	41.7
Southern	141	420	33.6
Unknown	12	15	–
New Zealand	**2,120**	**7,331**	**28.9**

Table 14: Number and percentage of standard primiparae giving birth vaginally with intact lower genital tract, by facility of birth (secondary and tertiary facilities), 2013

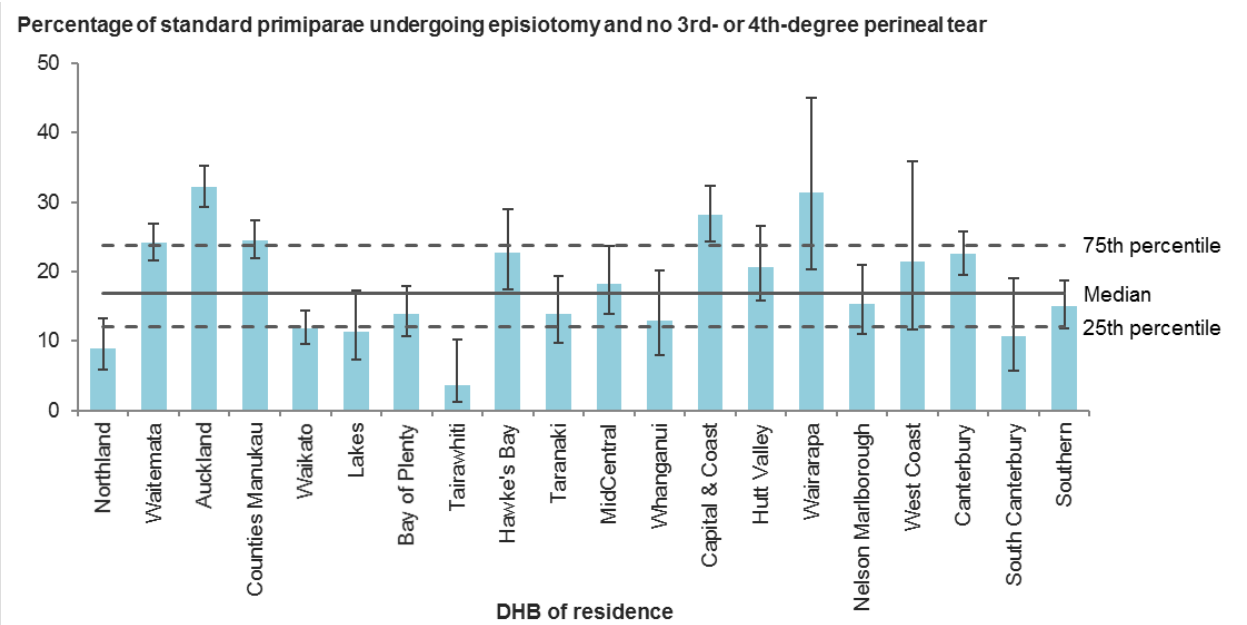
Place of birth	Intact lower genital tract	Standard primiparae giving birth vaginally	Rate (%)
Whangarei	64	179	35.8
North Shore	81	494	16.4
Waitakere	103	444	23.2
Auckland City	127	936	13.6
Middlemore	71	680	10.4
Waikato	102	381	26.8
Rotorua	70	131	53.4
Tauranga	63	261	24.1
Whakatane	34	59	57.6
Gisborne	46	85	54.1
Hawke's Bay	48	189	25.4
Taranaki Base	70	169	41.4
Palmerston North	68	224	30.4
Whanganui	50	100	50.0
Wellington	51	394	12.9
Hutt	62	225	27.6
Wairarapa	6	49	12.2
Wairau	15	57	26.3
Nelson	38	127	29.9
Grey Base	7	32	21.9
Christchurch	112	533	21.0
Timaru	33	82	40.2
Dunedin	40	191	20.9
Southland	40	142	28.2
All secondary and tertiary facilities	**1,401**	**6,164**	**22.7**
All primary facilities	**535**	**954**	**56.1**
All home births[1]	**184**	**213**	**86.4**
New Zealand[2]	**2,120**	**7,331**	**28.9**

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.

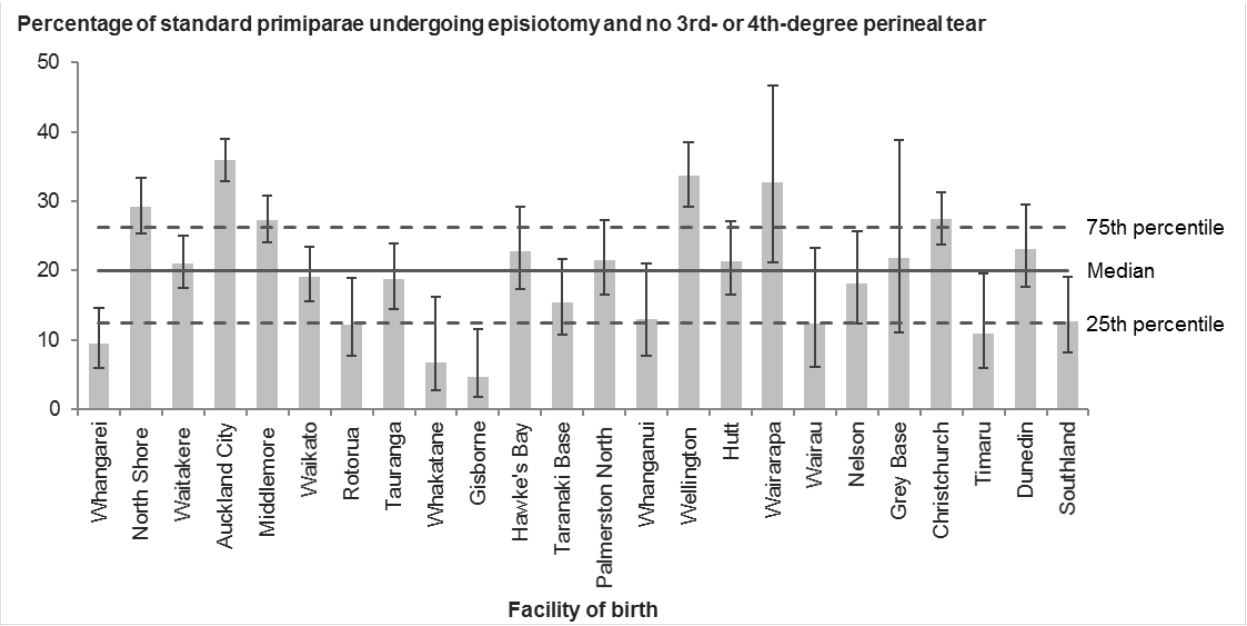
Indicator 7: Episiotomy and no third- or fourth-degree tear among standard primiparae giving birth vaginally, 2013

Figure 15: Percentage of standard primiparae giving birth vaginally and undergoing episiotomy without mention of third- or fourth-degree tear, by DHB of residence, 2013



Black line represents the median percentage of DHBs; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Figure 16: Percentage of standard primiparae giving birth vaginally and undergoing episiotomy without mention of third- or fourth-degree tear, by facility of birth (secondary and tertiary facilities), 2013



Black line represents the median percentage of secondary and tertiary facilities; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Table 15: Number and percentage of standard primiparae giving birth vaginally and undergoing episiotomy without mention of third- or fourth-degree tear, by DHB of residence, 2013

DHB of residence	Episiotomy without 3rd- or 4th-degree tear	Standard primiparae giving birth vaginally	Rate (%)
Northland	21	236	8.9
Waitemata	243	1,004	24.2
Auckland	296	919	32.2
Counties Manukau	231	942	24.5
Waikato	80	678	11.8
Lakes	18	158	11.4
Bay of Plenty	50	358	14.0
Tairawhiti	3	82	3.7
Hawke's Bay	46	202	22.8
Taranaki	28	201	13.9
MidCentral	44	240	18.3
Whanganui	15	116	12.9
Capital & Coast	137	486	28.2
Hutt Valley	46	222	20.7
Wairarapa	16	51	31.4
Nelson Marlborough	31	201	15.4
West Coast	9	42	21.4
Canterbury	152	674	22.6
South Canterbury	9	84	10.7
Southern	63	420	15.0
Unknown	0	15	–
New Zealand	**1,538**	**7,331**	**21.0**

Table 16: Number and percentage of standard primiparae giving birth vaginally and undergoing episiotomy without mention of third- or fourth-degree tear, by facility of birth (secondary and tertiary facilities), 2013

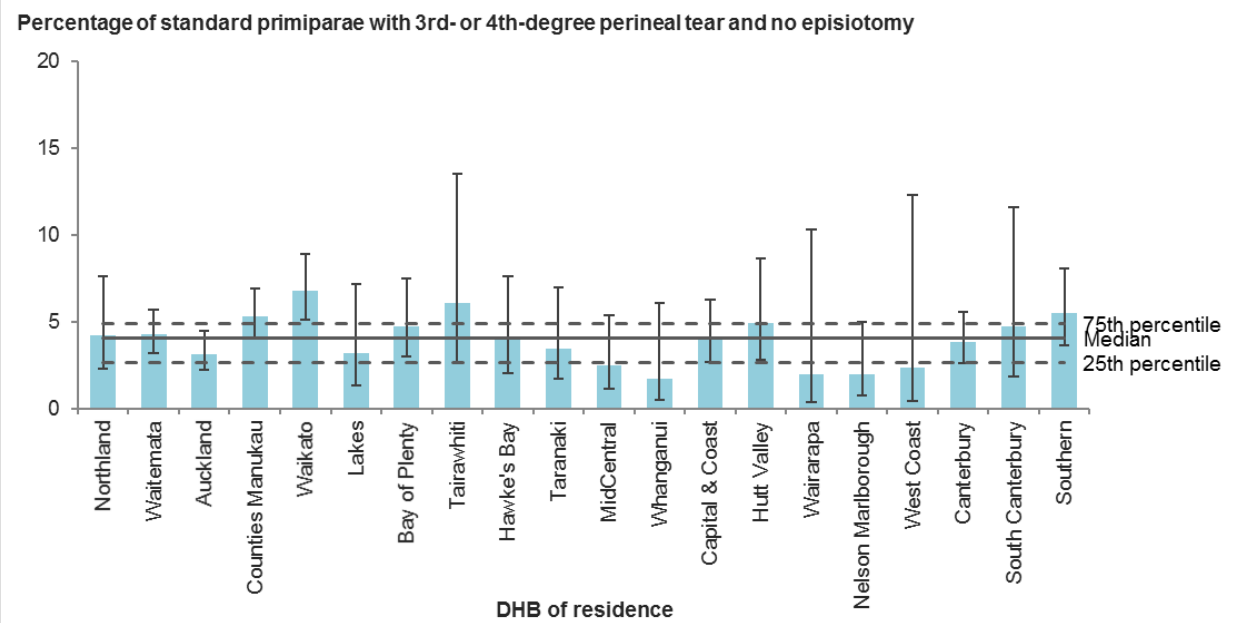
Place of birth	Episiotomy without 3rd- or 4th-degree tear	Standard primiparae giving birth vaginally	Rate (%)
Whangarei	17	179	9.5
North Shore	144	494	29.1
Waitakere	93	444	20.9
Auckland City	336	936	35.9
Middlemore	186	680	27.4
Waikato	73	381	19.2
Rotorua	16	131	12.2
Tauranga	49	261	18.8
Whakatane	4	59	6.8
Gisborne	4	85	4.7
Hawke's Bay	43	189	22.8
Taranaki Base	26	169	15.4
Palmerston North	48	224	21.4
Whanganui	13	100	13.0
Wellington	133	394	33.8
Hutt	48	225	21.3
Wairarapa	16	49	32.7
Wairau	7	57	12.3
Nelson	23	127	18.1
Grey Base	7	32	21.9
Christchurch	146	533	27.4
Timaru	9	82	11.0
Dunedin	44	191	23.0
Southland	18	142	12.7
All secondary and tertiary facilities	**1,503**	**6,164**	**24.4**
All primary facilities	**35**	**954**	**3.7**
All home births[1]	**0**	**213**	**–**
New Zealand[2]	**1,538**	**7,331**	**21.0**

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.

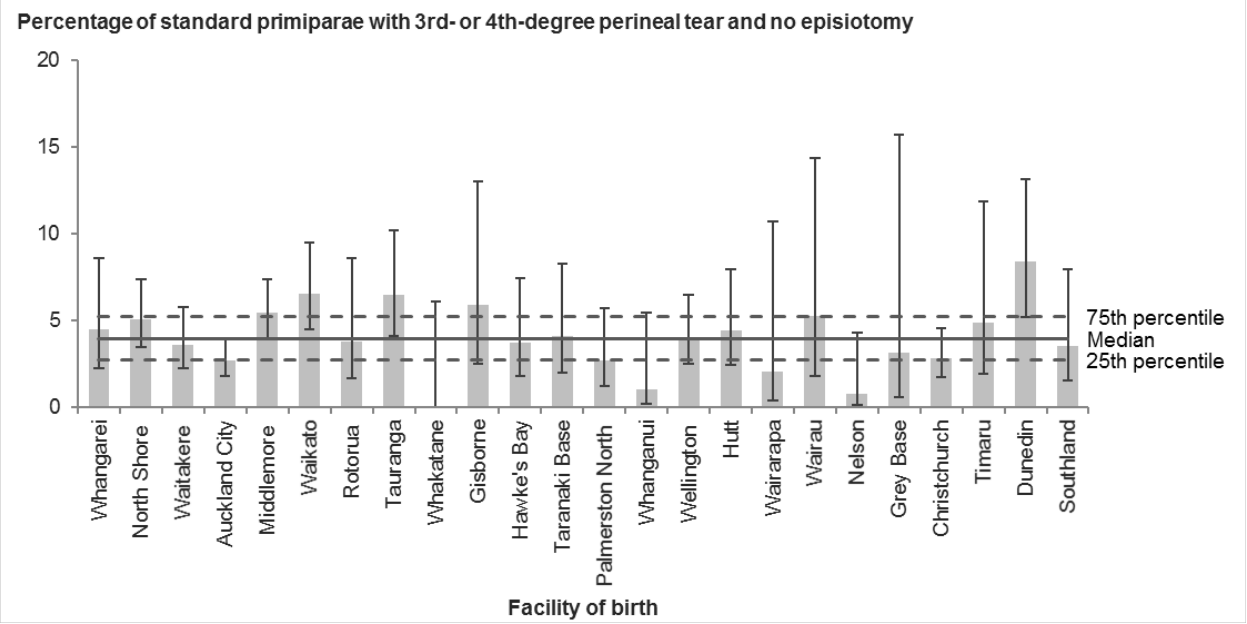
Indicator 8: Third- or fourth-degree tear and no episiotomy among standard primiparae giving birth vaginally, 2013

Figure 17: Percentage of standard primiparae giving birth vaginally sustaining a third- or fourth-degree tear and not undergoing episiotomy, by DHB of residence, 2013



Black line represents the median percentage of DHBs; dashed lines represent the 25th and 75th percentiles.
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), 2013



Black line represents the median percentage of secondary and tertiary facilities; dashed lines represent the 25th and 75th percentiles.
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 DHB of residence, 2013

DHB of residence	3rd- or 4th-degree tear without episiotomy	Standard primiparae giving birth vaginally	Rate (%)
Northland	10	236	4.2
Waitemata	43	1,004	4.3
Auckland	29	919	3.2
Counties Manukau	50	942	5.3
Waikato	46	678	6.8
Lakes	5	158	3.2
Bay of Plenty	17	358	4.7
Tairawhiti	5	82	6.1
Hawke's Bay	8	202	4.0
Taranaki	7	201	3.5
MidCentral	6	240	2.5
Whanganui	2	116	1.7
Capital & Coast	20	486	4.1
Hutt Valley	11	222	5.0
Wairarapa	1	51	2.0
Nelson Marlborough	4	201	2.0
West Coast	1	42	2.4
Canterbury	26	674	3.9
South Canterbury	4	84	4.8
Southern	23	420	5.5
Unknown	0	15	–
New Zealand	**318**	**7,331**	**4.3**

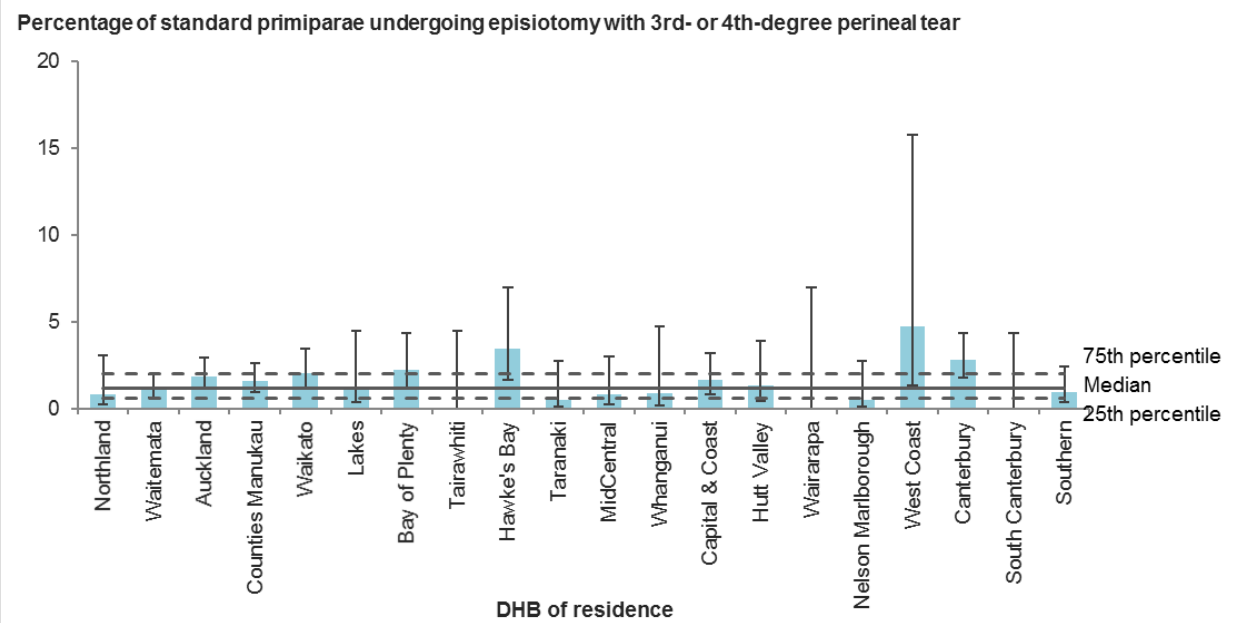
Table 18: Number and percentage of standard primiparae giving birth vaginally sustaining a third- or fourth-degree tear and not undergoing episiotomy, by facility of birth (secondary and tertiary facilities), 2013

Place of birth	3rd- or 4th-degree tear without episiotomy	Standard primiparae giving birth vaginally	Rate (%)
Whangarei	8	179	4.5
North Shore	25	494	5.1
Waitakere	16	444	3.6
Auckland City	25	936	2.7
Middlemore	37	680	5.4
Waikato	25	381	6.6
Rotorua	5	131	3.8
Tauranga	17	261	6.5
Whakatane	0	59	–
Gisborne	5	85	5.9
Hawke's Bay	7	189	3.7
Taranaki Base	7	169	4.1
Palmerston North	6	224	2.7
Whanganui	1	100	1.0
Wellington	16	394	4.1
Hutt	10	225	4.4
Wairarapa	1	49	2.0
Wairau	3	57	5.3
Nelson	1	127	0.8
Grey Base	1	32	3.1
Christchurch	15	533	2.8
Timaru	4	82	4.9
Dunedin	16	191	8.4
Southland	5	142	3.5
All secondary and tertiary facilities	**256**	**6,164**	**4.2**
All primary facilities	**54**	**954**	**5.7**
All home births	**8**	**213**	**3.8**
New Zealand[1]	**318**	**7,331**	**4.3**

1 Includes women where birth location was unspecified.

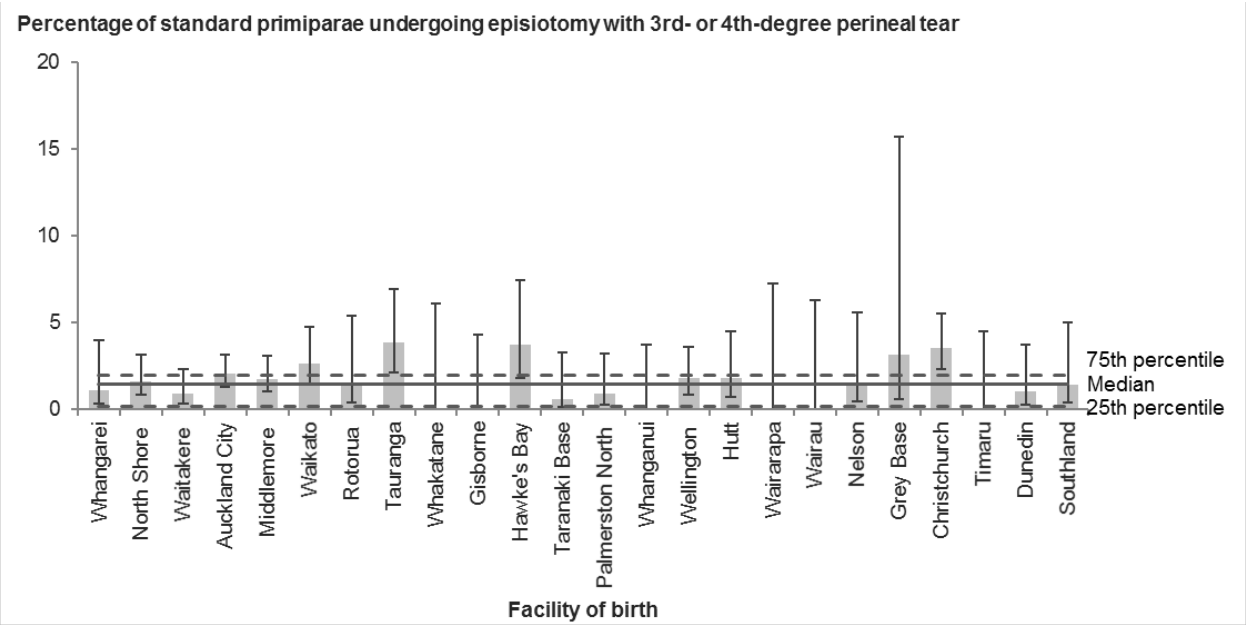
Indicator 9: Episiotomy and third- or fourth-degree tear among standard primiparae giving birth vaginally, 2013

Figure 19: Percentage of standard primiparae giving birth vaginally undergoing episiotomy and sustaining a third- or fourth-degree tear, by DHB of residence, 2013



Black line represents the median percentage of DHBs; dashed lines represent the 25th and 75th percentiles.
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), 2013



Black line represents the median percentage of secondary and tertiary facilities; dashed lines represent the 25th and 75th percentiles.
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 DHB of residence, 2013

DHB of residence	Episiotomy with 3rd- or 4th-degree tear	Standard primiparae giving birth vaginally	Rate (%)
Northland	2	236	0.8
Waitemata	11	1,004	1.1
Auckland	17	919	1.8
Counties Manukau	15	942	1.6
Waikato	14	678	2.1
Lakes	2	158	1.3
Bay of Plenty	8	358	2.2
Tairawhiti	0	82	–
Hawke's Bay	7	202	3.5
Taranaki	1	201	0.5
MidCentral	2	240	0.8
Whanganui	1	116	0.9
Capital & Coast	8	486	1.6
Hutt Valley	3	222	1.4
Wairarapa	0	51	–
Nelson Marlborough	1	201	0.5
West Coast	2	42	4.8
Canterbury	19	674	2.8
South Canterbury	0	84	–
Southern	4	420	1.0
Unknown	0	15	–
New Zealand	**117**	**7,331**	**1.6**

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), 2013

Place of birth	Episiotomy with 3rd- or 4th-degree tear	Standard primiparae giving birth vaginally	Rate (%)
Whangarei	2	179	1.1
North Shore	8	494	1.6
Waitakere	4	444	0.9
Auckland City	19	936	2.0
Middlemore	12	680	1.8
Waikato	10	381	2.6
Rotorua	2	131	1.5
Tauranga	10	261	3.8
Whakatane	0	59	–
Gisborne	0	85	–
Hawke's Bay	7	189	3.7
Taranaki Base	1	169	0.6
Palmerston North	2	224	0.9
Whanganui	0	100	–
Wellington	7	394	1.8
Hutt	4	225	1.8
Wairarapa	0	49	–
Wairau	0	57	–
Nelson	2	127	1.6
Grey Base	1	32	3.1
Christchurch	19	533	3.6
Timaru	0	82	–
Dunedin	2	191	1.0
Southland	2	142	1.4
All secondary and tertiary facilities	**114**	**6,164**	**1.8**
All primary facilities	**3**	**954**	**0.3**
All home births	**0**	**213**	**–**
New Zealand[1]	**117**	**7,331**	**1.6**

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).

A proportion of caesarean sections will continue to be done 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. General anaesthetic is more likely to be used when caesarean sections are done 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.

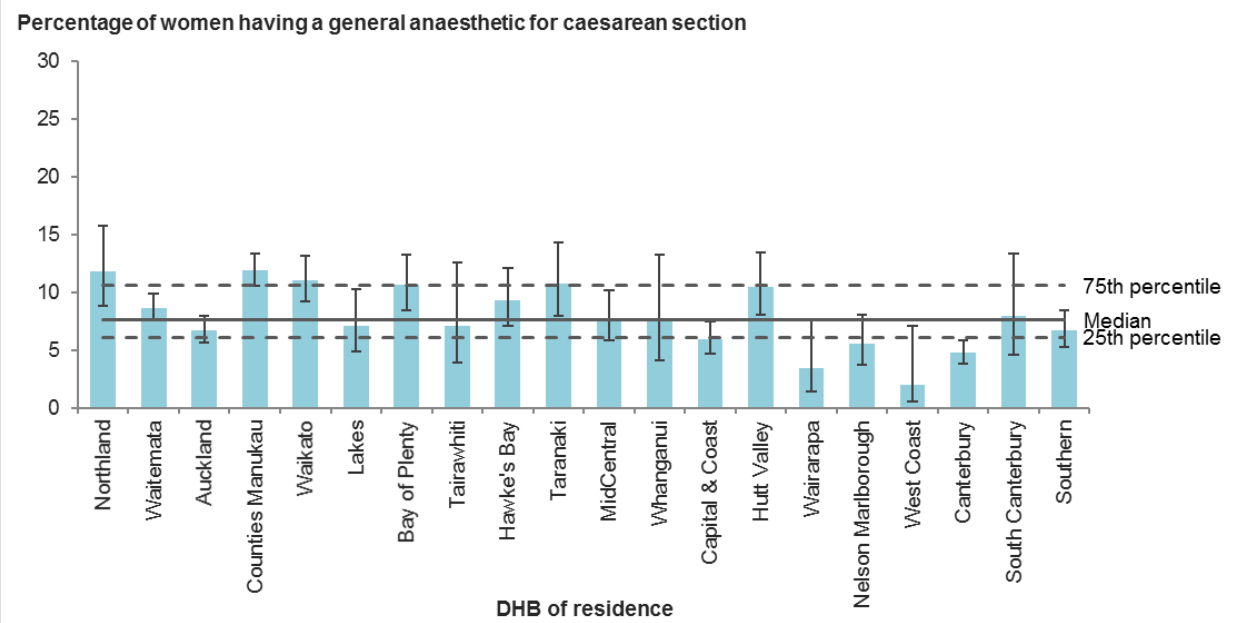
Notes on 2013 data

Rates of general anaesthetic use in caesarean section deliveries ranged from 2.0% to 11.9% across DHBs, and from 2.5%to 16.2% across secondary and tertiary facilities. These rates are based on small numbers, so caution must be used when making comparisons.

All maternity service providers who are outliers 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 this represents best possible quality of care for the woman and her baby.

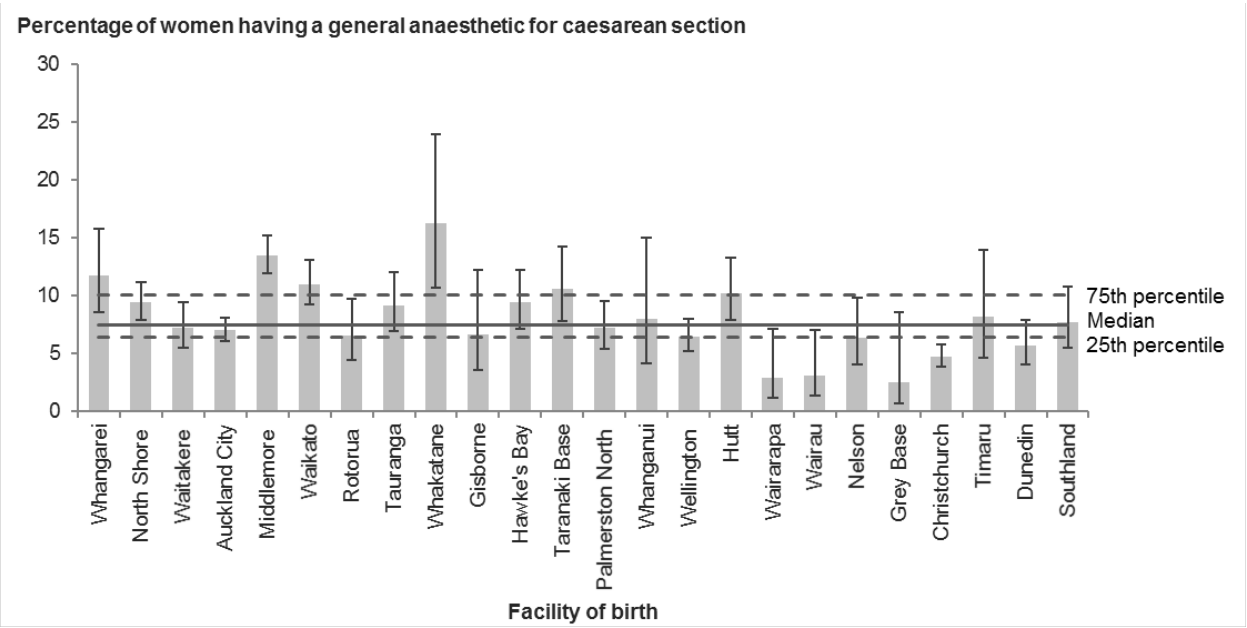
Indicator 10: General anaesthetic for women giving birth by caesarean section, 2013

Figure 21: Percentage of women undergoing a caesarean section under general anaesthetic, by DHB of residence, 2013



Black line represents the median percentage of DHBs; dashed lines represent the 25th and 75th percentiles.
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), 2013



Black line represents the median percentage of secondary and tertiary facilities; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Table 21: Number and percentage of women undergoing a caesarean section under general anaesthetic, by DHB of residence, 2013

DHB of residence	Caesarean sections under general anaesthetic	All caesarean sections	Rate (%)
Northland	39	329	11.9
Waitemata	194	2,235	8.7
Auckland	121	1,808	6.7
Counties Manukau	240	2,019	11.9
Waikato	109	986	11.1
Lakes	25	351	7.1
Bay of Plenty	68	640	10.6
Tairawhiti	10	141	7.1
Hawke's Bay	49	525	9.3
Taranaki	39	363	10.7
MidCentral	45	581	7.7
Whanganui	10	133	7.5
Capital & Coast	63	1,063	5.9
Hutt Valley	51	489	10.4
Wairarapa	5	147	3.4
Nelson Marlborough	25	453	5.5
West Coast	2	99	2.0
Canterbury	83	1,744	4.8
South Canterbury	12	151	7.9
Southern	65	967	6.7
Unknown	6	28	–
New Zealand	**1,261**	**15,252**	**8.3**

Table 22: Number and percentage of women undergoing a caesarean section under general anaesthetic, by facility of birth (secondary and tertiary facilities), 2013

Place of birth	Caesarean sections under general anaesthetic	All caesarean sections	Rate (%)
Whangarei	36	307	11.7
North Shore	116	1,234	9.4
Waitakere	50	690	7.2
Auckland City	176	2,502	7.0
Middlemore	231	1,708	13.5
Waikato	108	981	11.0
Rotorua	23	349	6.6
Tauranga	47	512	9.2
Whakatane	19	117	16.2
Gisborne	9	135	6.7
Hawke's Bay	48	511	9.4
Taranaki Base	37	350	10.6
Palmerston North	42	584	7.2
Whanganui	8	100	8.0
Wellington	74	1,148	6.4
Hutt	50	488	10.2
Wairarapa	4	139	2.9
Wairau	5	161	3.1
Nelson	18	282	6.4
Grey Base	2	81	2.5
Christchurch	83	1,758	4.7
Timaru	11	135	8.1
Dunedin	33	579	5.7
Southland	30	388	7.7
All secondary and tertiary facilities	**1,260**	**15,239**	**8.3**
All primary facilities	**0**	**3**	**–**
All home births	**0**	**0**	**–**
New Zealand[1]	**1,261**	**15,252**	**8.3**

1 Includes women where birth location was unspecified.

Indicators 11 and 12: Blood transfusion during birth admission

Rationale and purpose

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, facilities may have differing guidelines regarding transfusion 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).

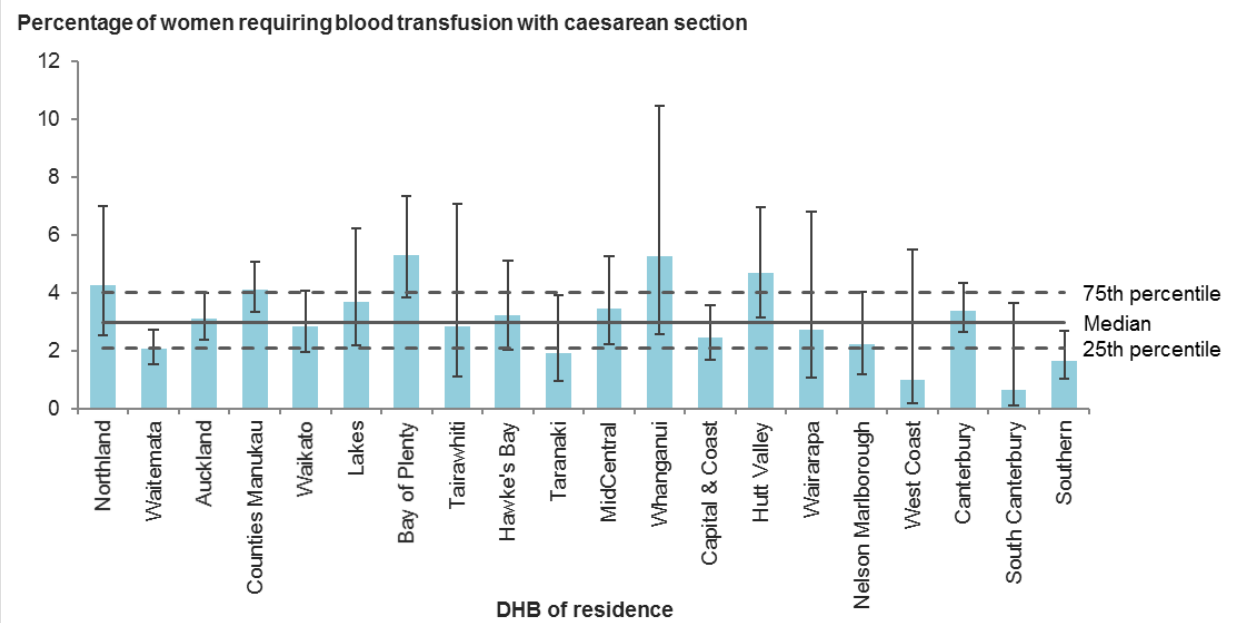
Notes on 2013 data

Overall, rates of blood transfusion for 2013 were low and did not vary widely, although the rate and range was greater in the case of caesarean section births than vaginal births. These rates data were based on small numbers, so caution must be used when making comparisons.

District health boards should investigate the reasons behind the greater variation in rates of blood transfusion with caesarean sections. Because this indicator is a marker for PPH, the focus should be on understanding and addressing underlying causes, rather than addressing the indicator in isolation. All DHBs should ensure local practice aligns with the national consensus guideline for treatment of PPH (Ministry of Health 2013).

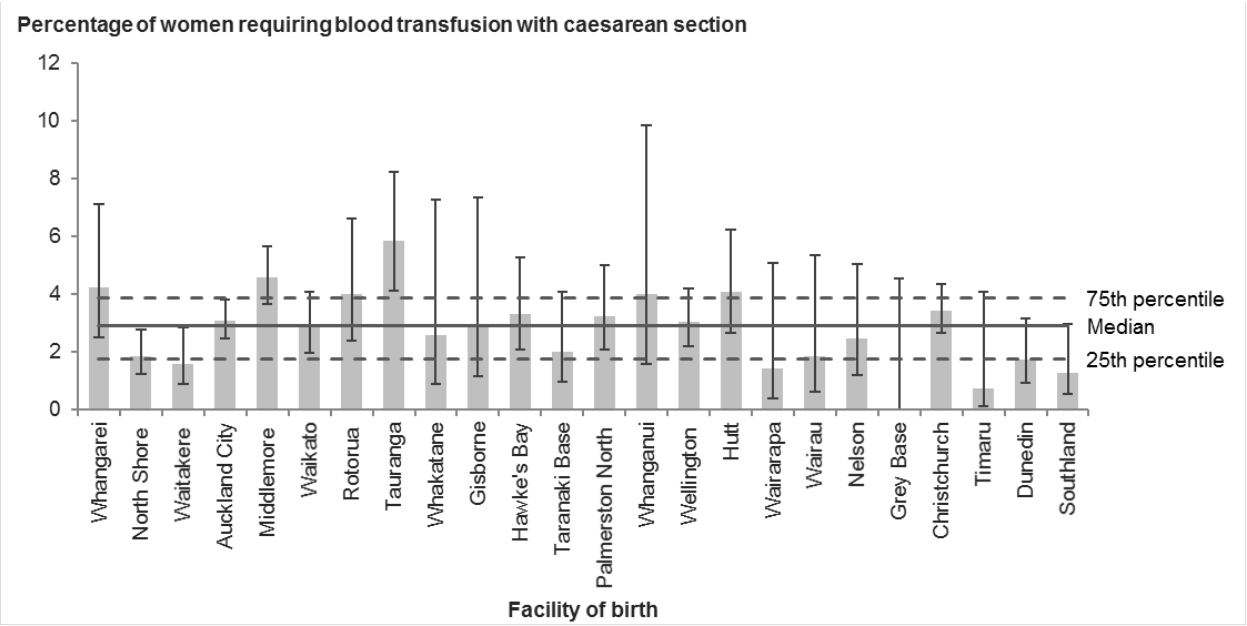
Indicator 11: Blood transfusion during birth admission for caesarean section delivery, 2013

Figure 23: Percentage of women giving birth by caesarean section and undergoing blood transfusion during birth admission, by DHB of residence, 2013



Black line represents the median percentage of DHBs; dashed lines represent the 25th and 75th percentiles.
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), 2013



Black line represents the median percentage of secondary and tertiary facilities; dashed lines represent the 25th and 75th percentiles.
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 DHB of residence, 2013

DHB of residence	Caesarean sections with blood transfusion	All caesarean sections	Rate (%)
Northland	14	329	4.3
Waitemata	46	2,235	2.1
Auckland	56	1,808	3.1
Counties Manukau	83	2,019	4.1
Waikato	28	986	2.8
Lakes	13	351	3.7
Bay of Plenty	34	640	5.3
Tairawhiti	4	141	2.8
Hawke's Bay	17	525	3.2
Taranaki	7	363	1.9
MidCentral	20	581	3.4
Whanganui	7	133	5.3
Capital & Coast	26	1,063	2.4
Hutt Valley	23	489	4.7
Wairarapa	4	147	2.7
Nelson Marlborough	10	453	2.2
West Coast	1	99	1.0
Canterbury	59	1,744	3.4
South Canterbury	1	151	0.7
Southern	16	967	1.7
Unknown	2	28	–
New Zealand	**471**	**15,252**	**3.1**

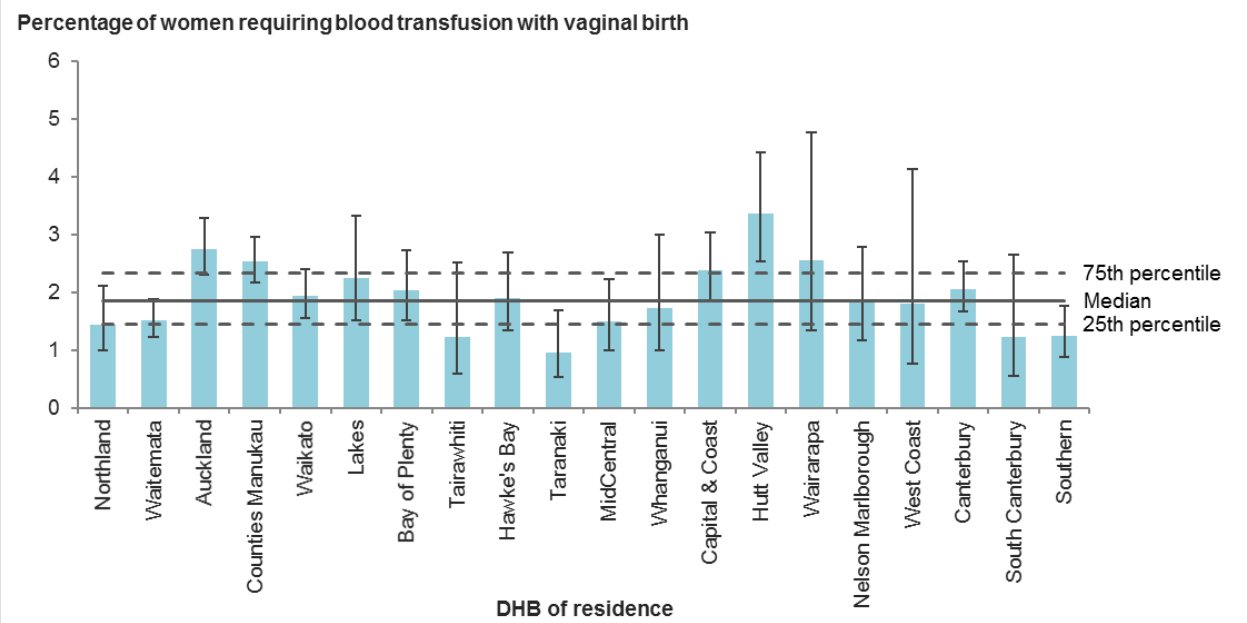
Table 24: Number and percentage of women giving birth by caesarean section and undergoing blood transfusion during birth admission, by facility of birth (secondary and tertiary facilities), 2013

Place of birth	Caesarean sections with blood transfusion	All caesarean sections	Rate (%)
Whangarei	13	307	4.2
North Shore	23	1,234	1.9
Waitakere	11	690	1.6
Auckland City	77	2,502	3.1
Middlemore	78	1,708	4.6
Waikato	28	981	2.9
Rotorua	14	349	4.0
Tauranga	30	512	5.9
Whakatane	3	117	2.6
Gisborne	4	135	3.0
Hawke's Bay	17	511	3.3
Taranaki Base	7	350	2.0
Palmerston North	19	584	3.3
Whanganui	4	100	4.0
Wellington	35	1,148	3.0
Hutt	20	488	4.1
Wairarapa	2	139	1.4
Wairau	3	161	1.9
Nelson	7	282	2.5
Grey Base	0	81	–
Christchurch	60	1,758	3.4
Timaru	1	135	0.7
Dunedin	10	579	1.7
Southland	5	388	1.3
All secondary and tertiary facilities	**471**	**15,239**	**3.1**
All primary facilities	**0**	**3**	**–**
All home births	**0**	**0**	**–**
New Zealand[1]	471	15,252	3.1

1 Includes women where birth location was unspecified.

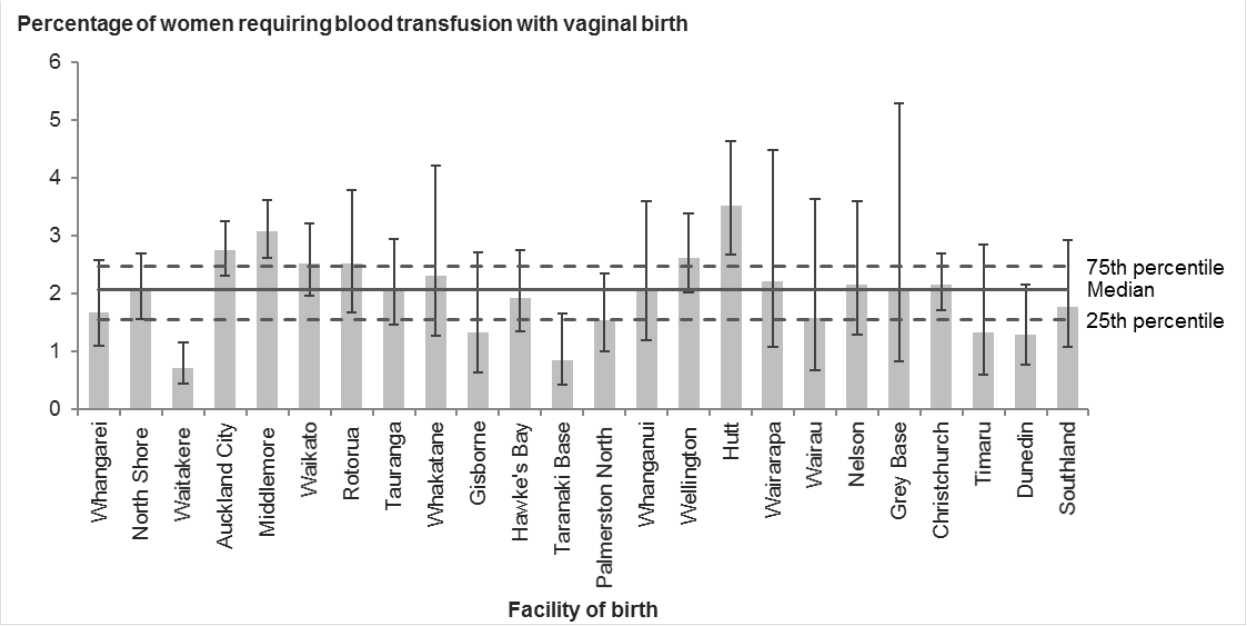
Indicator 12: Blood transfusion during birth admission for vaginal birth, 2013

Figure 25: Percentage of women giving birth vaginally and undergoing blood transfusion during birth admission, by DHB of residence, 2013



Black line represents the median percentage of DHBs; dashed lines represent the 25th and 75th percentiles.
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), 2013



Black line represents the median percentage of secondary and tertiary facilities; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Table 25: Number and percentage of women giving birth vaginally and undergoing blood transfusion during birth admission, by DHB of residence, 2013

DHB of residence	Vaginal births with blood transfusion	All vaginal births	Rate (%)
Northland	26	1,797	1.4
Waitemata	82	5,417	1.5
Auckland	122	4,428	2.8
Counties Manukau	155	6,126	2.5
Waikato	82	4,240	1.9
Lakes	24	1,069	2.2
Bay of Plenty	43	2,120	2.0
Tairawhiti	7	569	1.2
Hawke's Bay	31	1,631	1.9
Taranaki	11	1,158	0.9
MidCentral	23	1,539	1.5
Whanganui	12	693	1.7
Capital & Coast	61	2,567	2.4
Hutt Valley	48	1,427	3.4
Wairarapa	9	353	2.5
Nelson Marlborough	20	1,100	1.8
West Coast	5	278	1.8
Canterbury	84	4,077	2.1
South Canterbury	6	490	1.2
Southern	31	2,477	1.3
Unknown	6	404	–
New Zealand	**888**	**43,960**	**2.0**

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), 2013

Place of birth	Vaginal births with blood transfusion	All vaginal births	Rate (%)
Whangarei	20	1,189	1.7
North Shore	51	2,481	2.1
Waitakere	16	2,249	0.7
Auckland City	128	4,665	2.7
Middlemore	143	4,640	3.1
Waikato	61	2,426	2.5
Rotorua	22	870	2.5
Tauranga	30	1,447	2.1
Whakatane	10	431	2.3
Gisborne	7	527	1.3
Hawke's Bay	29	1,500	1.9
Taranaki Base	8	945	0.8
Palmerston North	20	1,304	1.5
Whanganui	12	576	2.1
Wellington	57	2,175	2.6
Hutt	48	1,361	3.5
Wairarapa	7	317	2.2
Wairau	5	317	1.6
Nelson	14	648	2.2
Grey Base	4	190	2.1
Christchurch	73	3,393	2.2
Timaru	6	454	1.3
Dunedin	14	1,085	1.3
Southland	15	842	1.8
All secondary and tertiary facilities	**800**	**36,032**	**2.2**
All primary facilities	**52**	**5,208**	**1.0**
All home births	**22**	**1,964**	**1.1**
New Zealand[1]	**888**	**43,960**	**2.0**

1 Includes women where birth location was unspecified.

Indicators 13 to 15: Severe maternal morbidity

Rationale and purpose

Maternal mortality has long been monitored as an indicator of maternity system safety and quality. However, the number of maternal deaths in any given year is low, and fewer still are potentially avoidable.[3] 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% and 8% 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.

[3] The 8th Annual Perinatal and Maternal Mortality Review Committee report identified 10 maternal deaths in 2012. For the period 2006 to 2012, 33.8% of maternal deaths were classified as potentially avoidable (PMMRC 2014).

Notes on 2013 data

Of women giving birth in 2013:

- 18 were diagnosed with eclampsia during the birth admission
- 21 had a peripartum hysterectomy
- 17 were admitted to an intensive care unit (ICU) and required over 24 hours of mechanical ventilation at some time during their pregnancy or postnatal period.

District health boards with cases should investigate each case to determine if there were opportunities for prevention.

Indicator 13: Diagnosis of eclampsia during birth admission, 2013

Table 27: Number and percentage of women diagnosed with eclampsia during birth admission, by DHB of residence, 2013

DHB of residence	Diagnosis of eclampsia during birth admission	All women giving birth
Northland	0	2,126
Waitemata	2	7,652
Auckland	2	6,236
Counties Manukau	1	8,145
Waikato	4	5,226
Lakes	1	1,420
Bay of Plenty	1	2,760
Tairawhiti	1	710
Hawke's Bay	0	2,156
Taranaki	0	1,521
MidCentral	0	2,120
Whanganui	0	826
Capital & Coast	1	3,630
Hutt Valley	0	1,916
Wairarapa	1	500
Nelson Marlborough	1	1,553
West Coast	0	377
Canterbury	2	5,821
South Canterbury	1	641
Southern	0	3,444
Unknown	0	432
New Zealand	**18**	**59,212**

Table 28: Number and percentage of women diagnosed with eclampsia during birth admission, by facility of birth (secondary and tertiary facilities), 2013

Place of birth	Diagnosis of eclampsia during birth admission	All women giving birth
Whangarei	0	1,496
North Shore	1	3,715
Waitakere	1	2,939
Auckland City	2	7,167
Middlemore	1	6,348
Waikato	4	3,407
Rotorua	1	1,219
Tauranga	1	1,959
Whakatane	0	548
Gisborne	1	662
Hawke's Bay	0	2,011
Taranaki Base	0	1,295
Palmerston North	0	1,888
Whanganui	0	676
Wellington	1	3,323
Hutt	0	1,849
Wairarapa	1	456
Wairau	1	478
Nelson	0	930
Grey Base	0	271
Christchurch	2	5,151
Timaru	1	589
Dunedin	0	1,664
Southland	0	1,230
All secondary and tertiary facilities	**18**	**51,271**
All primary facilities	**0**	**5,211**
All home births	**0**	**1,964**
New Zealand[1]	**18**	**59,212**

1 Includes women where birth location was unspecified.

Indicator 14: Peripartum hysterectomy, 2013

Table 29: Number and percentage of women having a peripartum hysterectomy, by DHB of residence, 2013

DHB of residence	Peripartum hysterectomy	All women giving birth
Northland	0	2,126
Waitemata	2	7,652
Auckland	2	6,236
Counties Manukau	7	8,145
Waikato	2	5,226
Lakes	1	1,420
Bay of Plenty	0	2,760
Tairawhiti	1	710
Hawke's Bay	0	2,156
Taranaki	0	1,521
MidCentral	2	2,120
Whanganui	0	826
Capital & Coast	0	3,630
Hutt Valley	1	1,916
Wairarapa	0	500
Nelson Marlborough	0	1,553
West Coast	0	377
Canterbury	1	5,821
South Canterbury	0	641
Southern	2	3,444
Unknown	0	432
New Zealand	**21**	**59,212**

Table 30: Number and percentage of women having a peripartum hysterectomy, by facility of birth (secondary and tertiary facilities), 2013

Place of birth	Abdominal hysterectomy within 6 weeks of birth	All women giving birth
Whangarei	0	1,496
North Shore	1	3,715
Waitakere	1	2,939
Auckland City	5	7,167
Middlemore	4	6,348
Waikato	2	3,407
Rotorua	1	1,219
Tauranga	0	1,959
Whakatane	0	548
Gisborne	1	662
Hawke's Bay	0	2,011
Taranaki Base	0	1,295
Palmerston North	1	1,888
Whanganui	0	676
Wellington	2	3,323
Hutt	0	1,849
Wairarapa	0	456
Wairau	0	478
Nelson	0	930
Grey Base	0	271
Christchurch	1	5,151
Timaru	0	589
Dunedin	1	1,664
Southland	1	1,230
All secondary and tertiary facilities	**21**	**51,271**
All primary facilities	**0**	**5,211**
All home births	**0**	**1,964**
New Zealand[1]	**21**	**59,212**

1 Includes women where birth location was unspecified.

Indicator 15: Mechanical ventilation during pregnancy or postnatal period, 2013

Table 31: Number and percentage of women admitted to ICU and requiring over 24 hours of mechanical ventilation any time during the pregnancy or postnatal period, by DHB of residence, 2013

DHB of residence	ICU admission with over 24 hours of mechanical ventilation	All women giving birth
Northland	0	2,126
Waitemata	2	7,652
Auckland	4	6,236
Counties Manukau	2	8,145
Waikato	0	5,226
Lakes	0	1,420
Bay of Plenty	1	2,760
Tairawhiti	0	710
Hawke's Bay	1	2,156
Taranaki	0	1,521
MidCentral	1	2,120
Whanganui	0	826
Capital & Coast	0	3,630
Hutt Valley	1	1,916
Wairarapa	0	500
Nelson Marlborough	0	1,553
West Coast	0	377
Canterbury	4	5,821
South Canterbury	0	641
Southern	0	3,444
Unknown	1	432
New Zealand	**17**	**59,212**

Table 32: Number and percentage of women admitted to ICU and requiring over 24 hours of mechanical ventilation any time during the pregnancy or postnatal period, by facility of birth (secondary and tertiary facilities), 2013

Place of birth	ICU admission with over 24 hours of mechanical ventilation	All women giving birth
Whangarei	0	1,496
North Shore	0	3,715
Waitakere	0	2,939
Auckland City	7	7,167
Middlemore	2	6,348
Waikato	0	3,407
Rotorua	0	1,219
Tauranga	0	1,959
Whakatane	1	548
Gisborne	0	662
Hawke's Bay	0	2,011
Taranaki Base	0	1,295
Palmerston North	1	1,888
Whanganui	0	676
Wellington	2	3,323
Hutt	1	1,849
Wairarapa	0	456
Wairau	0	478
Nelson	0	930
Grey Base	0	271
Christchurch	3	5,151
Timaru	0	589
Dunedin	0	1,664
Southland	0	1,230
All secondary and tertiary facilities	**17**	**51,271**
All primary facilities	**0**	**5,211**
All home births	**0**	**1,964**
New Zealand[1]	**17**	**59,212**

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 mother and her baby, resulting in reduced oxygen and nourishment available to the baby. This increases the risk of babies being born with a low birth weight 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 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. This indicator can be used to identify support needs of women and families in terms of support to stop smoking.

Improving 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.

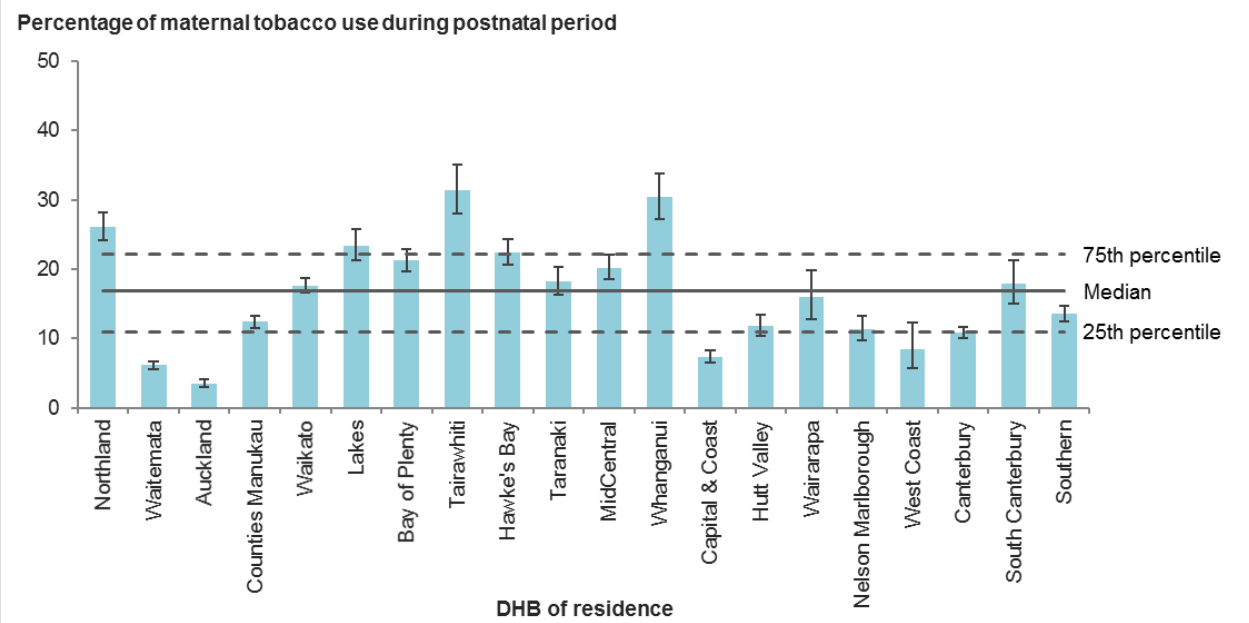
Notes on 2013 data

Rates of maternal tobacco use in the postnatal period (two weeks after birth) varied between DHBs and between secondary and tertiary facility of birth; DHB rates ranged from 3.6% to 31.4%, and facility rates ranged from 2.4% to 36.6%. 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 collected from women registered with an LMC (90% of women in 2013). Collection of tobacco use data for women who receive DHB-funded primary maternity services is under way; the data will be included in this indicator when it becomes available.

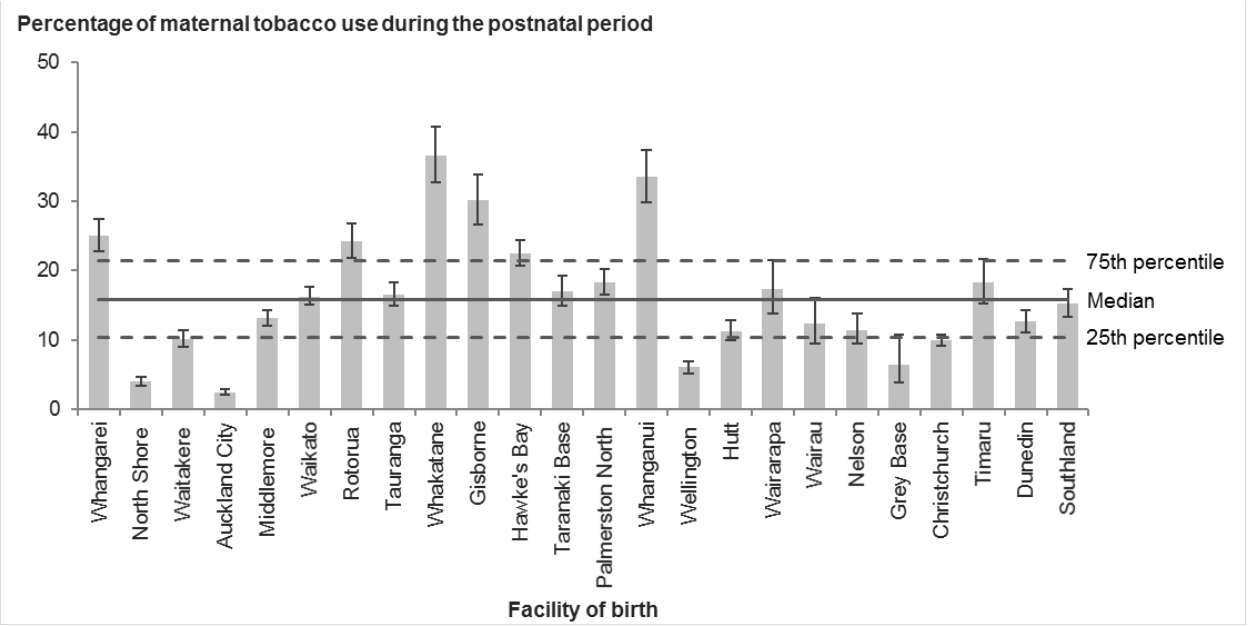
Indicator 16: Maternal tobacco use during postnatal period, 2013

Figure 27: Percentage of women identified as smokers during postnatal period (2 weeks after birth), by DHB of residence, 2013



Black line represents the median percentage of DHBs; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Figure 28: Percentage of women identified as smokers during postnatal period (2 weeks after birth), by facility of birth (secondary and tertiary facilities), 2013



Black line represents the median percentage of secondary and tertiary facilities; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Table 33: Number and percentage of women identified as smokers during postnatal period (2 weeks after birth), by DHB of residence, 2013

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	491	1,876	26.2
Waitemata	436	7,078	6.2
Auckland	163	4,578	3.6
Counties Manukau	671	5,396	12.4
Waikato	851	4,824	17.6
Lakes	316	1,349	23.4
Bay of Plenty	574	2,700	21.3
Tairawhiti	206	656	31.4
Hawke's Bay	450	2,004	22.5
Taranaki	263	1,438	18.3
MidCentral	393	1,942	20.2
Whanganui	225	739	30.4
Capital & Coast	241	3,249	7.4
Hutt Valley	208	1,752	11.9
Wairarapa	67	417	16.1
Nelson Marlborough	150	1,315	11.4
West Coast	24	283	8.5
Canterbury	617	5,674	10.9
South Canterbury	106	589	18.0
Southern	454	3,352	13.5
Unknown	41	237	–
New Zealand	**6,947**	**51,448**	**13.5**

Table 34: Number and percentage of women identified as smokers during postnatal period (2 weeks after birth), by facility of birth (secondary and tertiary facilities), 2013

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	331	1,325	25.0
North Shore	138	3,499	3.9
Waitakere	272	2,682	10.1
Auckland City	133	5,471	2.4
Middlemore	480	3,647	13.2
Waikato	508	3,124	16.3
Rotorua	282	1,164	24.2
Tauranga	319	1,925	16.6
Whakatane	196	535	36.6
Gisborne	185	613	30.2
Hawke's Bay	426	1,896	22.5
Taranaki Base	208	1,224	17.0
Palmerston North	314	1,721	18.2
Whanganui	205	612	33.5
Wellington	174	2,887	6.0
Hutt	193	1,709	11.3
Wairarapa	66	381	17.3
Wairau	48	386	12.4
Nelson	91	794	11.5
Grey Base	13	201	6.5
Christchurch	497	4,998	9.9
Timaru	99	543	18.2
Dunedin	206	1,634	12.6
Southland	181	1,187	15.2
All secondary and tertiary facilities	**5,565**	**44,158**	**12.6**
All primary facilities	**990**	**4,802**	**20.6**
All home births	**278**	**1,921**	**14.5**
New Zealand[1]	**6,947**	**51,448**	**13.5**

1 Includes women where birth location was unspecified.

Indicator 17: Maternal obesity

Rationale and purpose

Maternal obesity (where obesity is defined as a BMI of 30+) can result in negative outcomes for both women and fetuses. The maternal risks during pregnancy include gestational diabetes and pre-eclampsia. The fetus is at risk for stillbirth and congenital anomalies. Obesity in pregnancy can also affect health later in life for both mother and child. For women, these risks include heart disease and hypertension. Offspring have increased risks of future obesity and heart disease. Women and their offspring are also at increased risk for diabetes (Leddy et al 2008).

A BMI of 35+ in early pregnancy is associated with a number of pregnancy complications and perinatal conditions. The risk of complications and perinatal conditions increases further for women with a BMI of 40+ (Cedergen 2004).

The *Guidelines for Consultation with Obstetric and Related Medical Services (Referral Guidelines)* (Ministry of Health 2012) recommend providers refer for consultation all women with a BMI over 35 and transfer clinical responsibility to specialist services for all women with a BMI over 40.

District health boards with high rates of women with obesity, and in particular with a BMI over 35, should consider strategies for prevention and reduction of obesity within their population and provide sufficient resources to ensure that high-quality services are available for women who are obese during pregnancy.

Notes on 2013 data

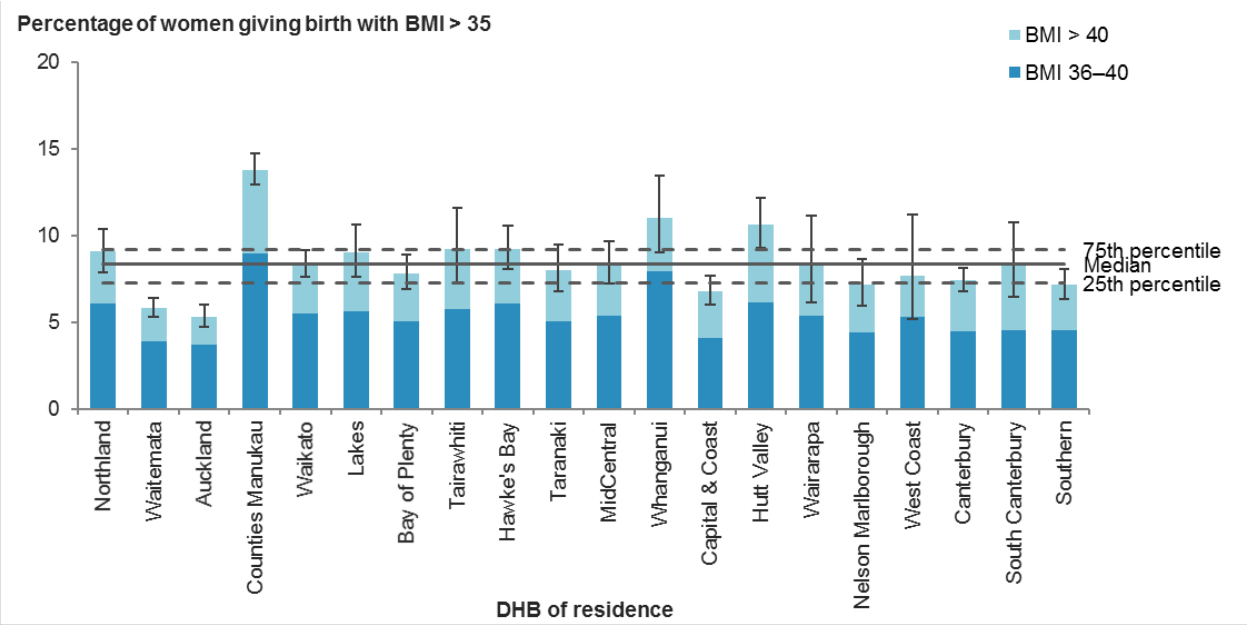
Rates of women giving birth with BMI over 35 at registration varied between DHBs, ranging from 5.3% to 13.8%.

This indicator currently presents BMI data collected from women registered with an LMC (around 90% of women in 2013). Collection of BMI data for women who receive DHB-funded primary maternity services is under way; this data will be included in the indicator when it becomes available.

Data presented for this indicator may reflect variation in practices regarding recording of maternal height and weight. All practitioners should ensure accurate measurement and reporting of maternal height and weight.

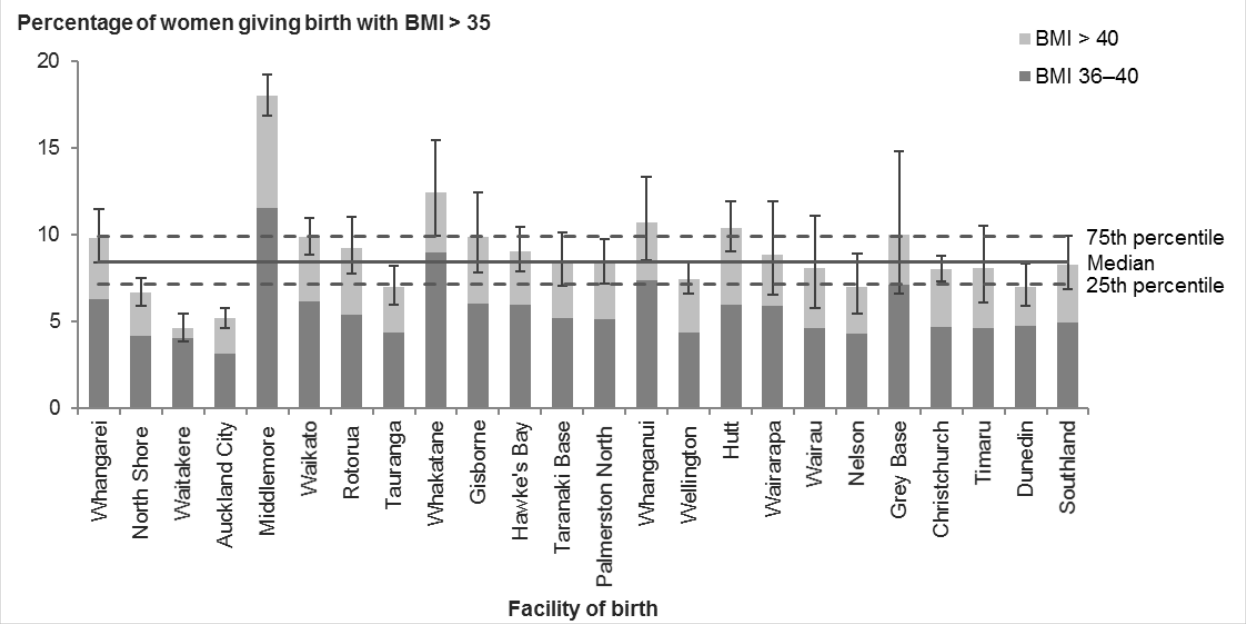
Indicator 17: Women with BMI over 35, 2013

Figure 29: Percentage of women giving birth with BMI over 35 at registration, by DHB of residence, 2013



Black line represents the median percentage of DHBs; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Figure 30: Percentage of women giving birth with BMI over 35 at registration, by facility of birth (secondary and tertiary facilities), 2013



Black line represents the median percentage of secondary and tertiary facilities; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Table 35: Number and percentage of women giving birth with BMI over 35 at registration, by DHB of residence, 2013

DHB of residence	Women with BMI > 35 at registration			All women with reported BMI	Rate (%)
	36–40	> 40	Total		
Northland	123	61	184	2,026	9.1
Waitemata	283	142	425	7,289	5.8
Auckland	180	78	258	4,828	5.3
Counties Manukau	515	277	792	5,736	13.8
Waikato	272	142	414	4,957	8.4
Lakes	79	48	127	1,406	9.0
Bay of Plenty	138	77	215	2,744	7.8
Tairawhiti	40	24	64	696	9.2
Hawke's Bay	124	64	188	2,033	9.2
Taranaki	76	45	121	1,508	8.0
MidCentral	110	61	171	2,039	8.4
Whanganui	61	24	85	769	11.1
Capital & Coast	137	91	228	3,352	6.8
Hutt Valley	110	81	191	1,795	10.6
Wairarapa	26	14	40	481	8.3
Nelson Marlborough	60	38	98	1,365	7.2
West Coast	16	7	23	300	7.7
Canterbury	261	172	433	5,806	7.5
South Canterbury	29	24	53	635	8.3
Southern	155	89	244	3,416	7.1
Unknown	16	4	20	245	–
New Zealand	**2,811**	**1,563**	**4,374**	**53,426**	**8.2**

Table 36: Number and percentage of women giving birth with BMI over 35 at registration, by facility of birth (secondary and tertiary facilities), 2013

Place of birth	Women with BMI > 35 at registration			All women with reported BMI	Rate (%)
	36–40	> 40	Total		
Whangarei	90	51	141	1,435	9.8
North Shore	149	90	239	3,597	6.6
Waitakere	112	15	127	2,764	4.6
Auckland City	183	117	300	5,778	5.2
Middlemore	456	255	711	3,947	18.0
Waikato	199	120	319	3,233	9.9
Rotorua	65	47	112	1,208	9.3
Tauranga	85	51	136	1,946	7.0
Whakatane	49	19	68	546	12.5
Gisborne	39	25	64	647	9.9
Hawke's Bay	114	60	174	1,916	9.1
Taranaki Base	67	42	109	1,283	8.5
Palmerston North	93	58	151	1,803	8.4
Whanganui	47	21	68	636	10.7
Wellington	132	93	225	3,012	7.5
Hutt	104	78	182	1,746	10.4
Wairarapa	26	13	39	439	8.9
Wairau	19	14	33	409	8.1
Nelson	35	22	57	816	7.0
Grey Base	15	6	21	210	10.0
Christchurch	240	172	412	5,132	8.0
Timaru	27	20	47	583	8.1
Dunedin	79	37	116	1,654	7.0
Southland	60	41	101	1,218	8.3
All secondary and tertiary facilities	**2,485**	**1,467**	**3,952**	**45,958**	**8.6**
All primary facilities	**224**	**63**	**287**	**4,923**	**5.8**
All home births	**68**	**24**	**92**	**1,959**	**4.7**
New Zealand[1]	**2,811**	**1,563**	**4,374**	**53,426**	**8.2**

1 Includes women where birth location was unspecified.

Indicator 18: 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 health 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, 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.

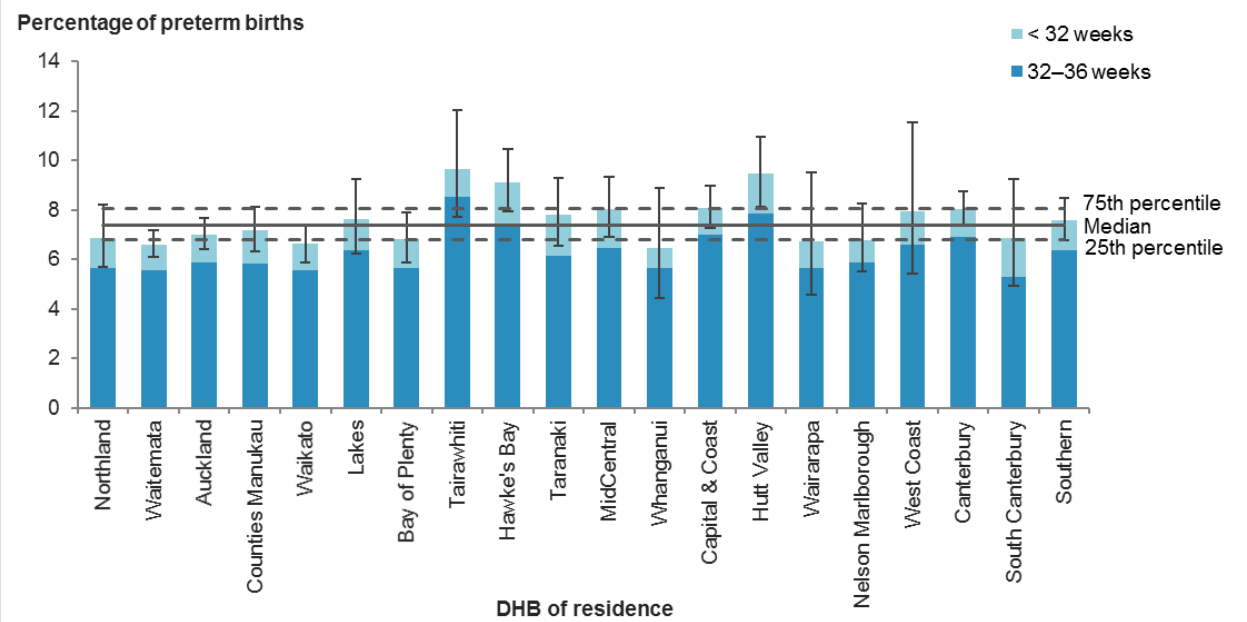
Recent investigation by the National Maternity Monitoring Group found that rates of preterm birth at 34 and 35 weeks' gestation remained fairly constant over the four years from 2008 to 2011. However, preterm births at 36 weeks' gestation may be increasing. This may represent changes in planned preterm 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.

Notes on 2013 data

Overall rates of preterm birth (< 37 weeks' gestation) varied between DHBs, ranging from 6.5% to 9.7%, and varied more widely between secondary and tertiary facilities, ranging from 1.8% to 11.9%. The latter variation is likely to reflect clinical decision-making on place of birth for women in preterm labour.

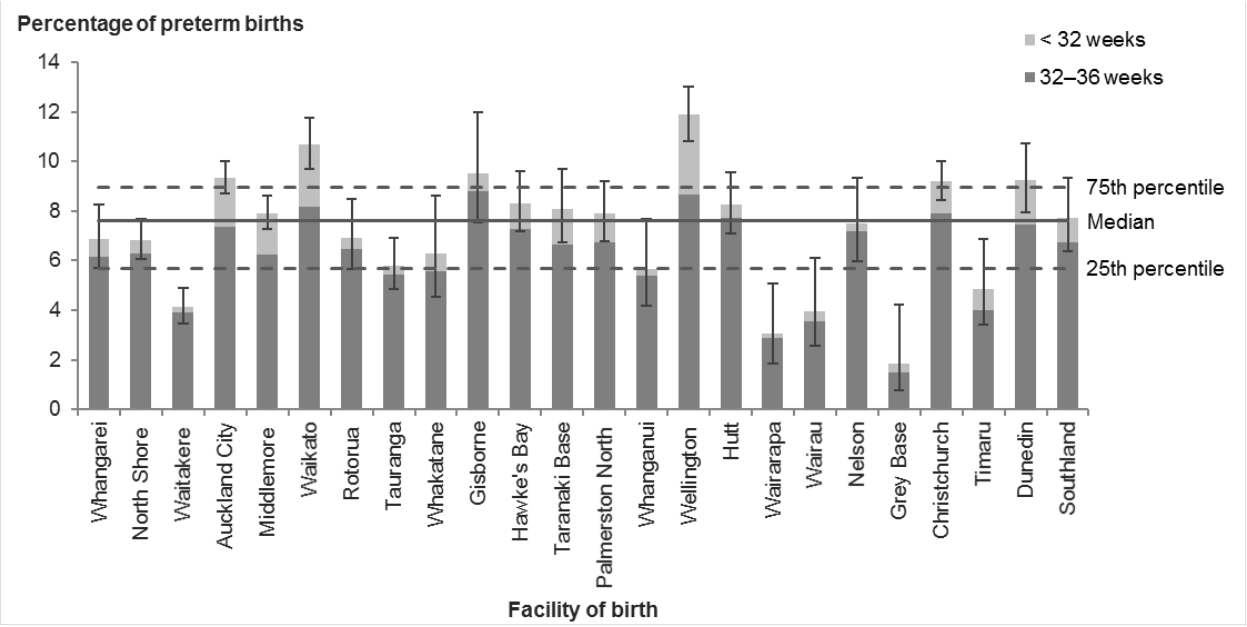
Indicator 18: Preterm births, 2013

Figure 31: Percentage of preterm births, by DHB of residence, 2013



Black line represents the median percentage of DHBs; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Figure 32: Percentage of preterm births, by facility of birth (secondary and tertiary facilities), 2013



Black line represents the median percentage of secondary and tertiary facilities; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Table 37: Number and percentage of preterm births, by DHB of residence, 2013

DHB of residence	Babies born under 37 weeks' gestation			All babies born (live births)	Rate (%)
	< 32 weeks	32–36 weeks	Total		
Northland	26	121	147	2,138	6.9
Waitemata	81	429	510	7,721	6.6
Auckland	71	370	441	6,297	7.0
Counties Manukau	110	481	591	8,220	7.2
Waikato	56	293	349	5,272	6.6
Lakes	18	91	109	1,432	7.6
Bay of Plenty	33	157	190	2,779	6.8
Tairawhiti	8	61	69	715	9.7
Hawke's Bay	39	159	198	2,171	9.1
Taranaki	26	94	120	1,535	7.8
MidCentral	34	139	173	2,152	8.0
Whanganui	7	47	54	835	6.5
Capital & Coast	39	257	296	3,666	8.1
Hutt Valley	31	151	182	1,926	9.4
Wairarapa	5	27	32	476	6.7
Nelson Marlborough	14	92	106	1,566	6.8
West Coast	5	25	30	378	7.9
Canterbury	66	406	472	5,879	8.0
South Canterbury	10	34	44	643	6.8
Southern	42	221	263	3,472	7.6
Unknown	7	18	25	333	–
New Zealand	**728**	**3,673**	**4,401**	**59,606**	**7.4**

Table 38: Number and percentage of preterm births, by facility of birth (secondary and tertiary facilities), 2013

Place of birth	Babies born under 37 weeks' gestation			All babies born (live births)	Rate (%)
	< 32 weeks	32–36 weeks	Total		
Whangarei	11	94	105	1,523	6.9
North Shore	20	237	257	3,755	6.8
Waitakere	6	117	123	2,988	4.1
Auckland City	144	537	681	7,292	9.3
Middlemore	109	402	511	6,447	7.9
Waikato	88	284	372	3,476	10.7
Rotorua	6	80	86	1,240	6.9
Tauranga	7	108	115	1,986	5.8
Whakatane	4	31	35	556	6.3
Gisborne	5	59	64	671	9.5
Hawke's Bay	21	148	169	2,032	8.3
Taranaki Base	19	88	107	1,321	8.1
Palmerston North	22	129	151	1,911	7.9
Whanganui	2	37	39	687	5.7
Wellington	108	294	402	3,383	11.9
Hutt	10	145	155	1,877	8.3
Wairarapa	1	13	14	455	3.1
Wairau	2	17	19	479	4.0
Nelson	3	68	71	946	7.5
Grey Base	1	4	5	272	1.8
Christchurch	66	409	475	5,162	9.2
Timaru	5	24	29	598	4.8
Dunedin	30	125	155	1,676	9.2
Southland	12	84	96	1,244	7.7
All secondary and tertiary facilities	**702**	**3,534**	**4,236**	**51,977**	**8.1**
All primary facilities	**8**	**58**	**66**	**5,236**	**1.3**
All home births	**5**	**55**	**60**	**1,908**	**3.1**
New Zealand[1]	**728**	**3,673**	**4,401**	**59,606**	**7.4**

1 Includes babies without a birth location recorded.

Indicators 19 and 20: 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 may reduce the risk of stillbirth by presenting the opportunity for enhanced surveillance and iatrogenic early birth.

Small babies at term (indicator 19)

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, recently developed and published these growth standards, using the same methodology as the WHO 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 may be different from population charts.

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

Small babies at term born at 40–42 weeks' gestation (indicator 20)

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

This indicator is intended to drive review of clinical practice management for 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.

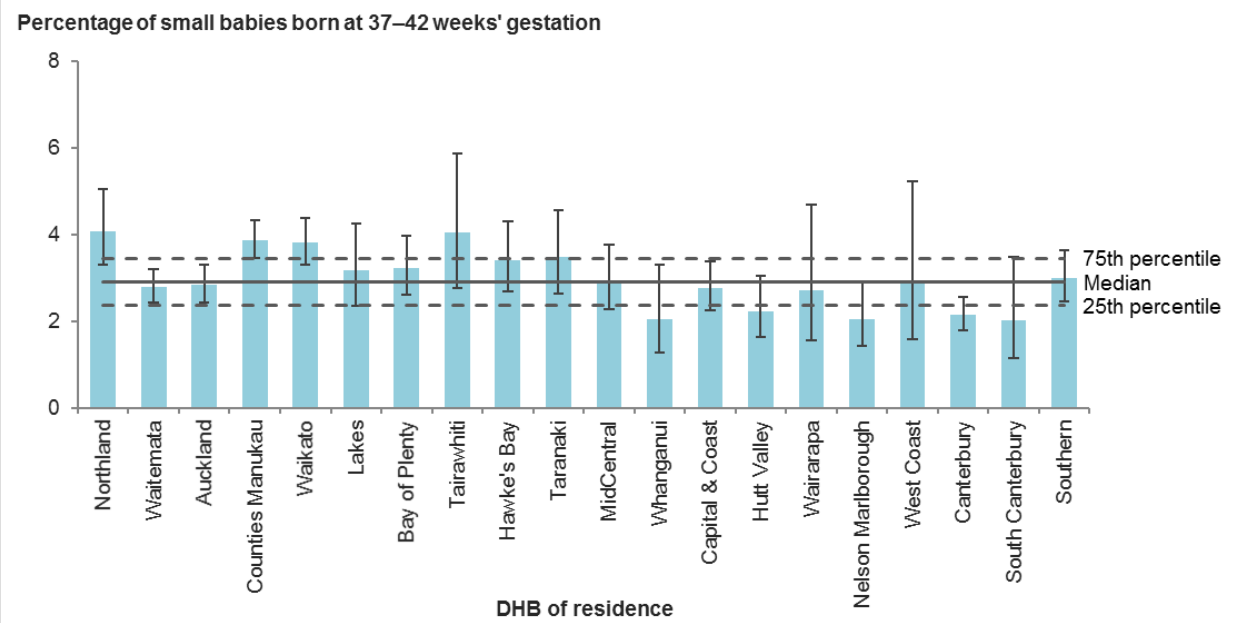
Notes on 2013 data

The rate of babies born small at 37–42 weeks' gestation was generally low, but varied two-fold across the DHBs, ranging from 2.0% to 4.1%, and from 2.1% to 4.5% across secondary and tertiary facilities.

The rate of SGA babies at term born at 40–42 weeks' gestation ranged from 19.2% to 58.3% across the DHBs, and from 19.2% to 57.1% across secondary and tertiary facilities.

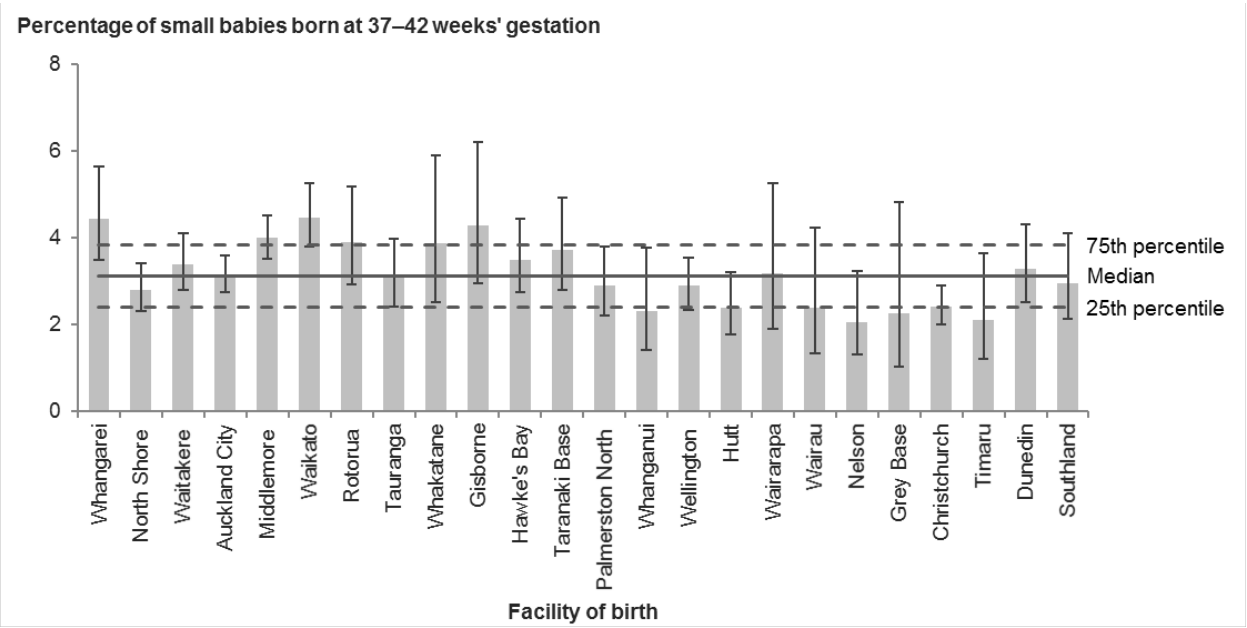
Indicator 19: Small babies at term (37–42 weeks' gestation), 2013

Figure 33: Percentage of small babies at term (37–42 weeks' gestation), by DHB of residence, 2013



Black line represents the median percentage of DHBs; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Figure 34: Percentage 0f small babies at term (37–42 weeks' gestation), by facility of birth (secondary and tertiary facilities), 2013



Black line represents the median percentage of secondary and tertiary facilities; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Table 39: Number and percentage of small babies at term (37–42 weeks' gestation), by DHB of residence, 2013

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	81	1,985	4.1
Waitemata	201	7,205	2.8
Auckland	166	5,849	2.8
Counties Manukau	294	7,590	3.9
Waikato	186	4,887	3.8
Lakes	42	1,322	3.2
Bay of Plenty	83	2,577	3.2
Tairawhiti	26	643	4.0
Hawke's Bay	67	1,963	3.4
Taranaki	49	1,411	3.5
MidCentral	58	1,974	2.9
Whanganui	16	778	2.1
Capital & Coast	93	3,362	2.8
Hutt Valley	39	1,743	2.2
Wairarapa	12	442	2.7
Nelson Marlborough	30	1,459	2.1
West Coast	10	346	2.9
Canterbury	116	5,397	2.1
South Canterbury	12	597	2.0
Southern	96	3,201	3.0
Unknown	4	256	–
New Zealand	**1,681**	**54,987**	**3.1**

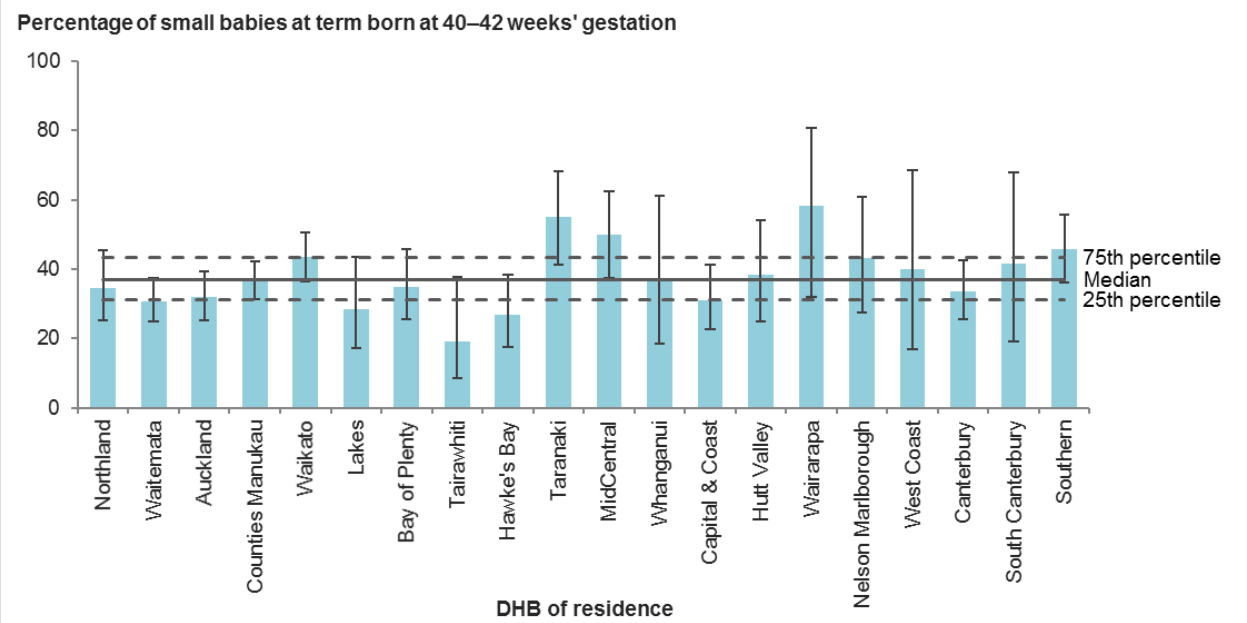
Table 40: Number and percentage of small babies at term (37–42 weeks' gestation), by facility of birth (secondary and tertiary facilities), 2013

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	63	1,416	4.4
North Shore	98	3,496	2.8
Waitakere	97	2,862	3.4
Auckland City	208	6,605	3.1
Middlemore	236	5,906	4.0
Waikato	138	3,092	4.5
Rotorua	45	1,154	3.9
Tauranga	58	1,869	3.1
Whakatane	20	517	3.9
Gisborne	26	605	4.3
Hawke's Bay	65	1,858	3.5
Taranaki Base	45	1,212	3.7
Palmerston North	51	1,756	2.9
Whanganui	15	648	2.3
Wellington	86	2,976	2.9
Hutt	41	1,722	2.4
Wairarapa	14	441	3.2
Wairau	11	460	2.4
Nelson	18	875	2.1
Grey Base	6	267	2.2
Christchurch	113	4,686	2.4
Timaru	12	569	2.1
Dunedin	50	1,519	3.3
Southland	34	1,148	3.0
All secondary and tertiary facilities	**1,550**	**47,659**	**3.3**
All primary facilities	**131**	**5,144**	**2.5**
All home births	**0**	**1,798**	**–**
New Zealand[1]	**1,681**	**54,987**	**3.1**

1 Includes babies where birth location was unspecified.

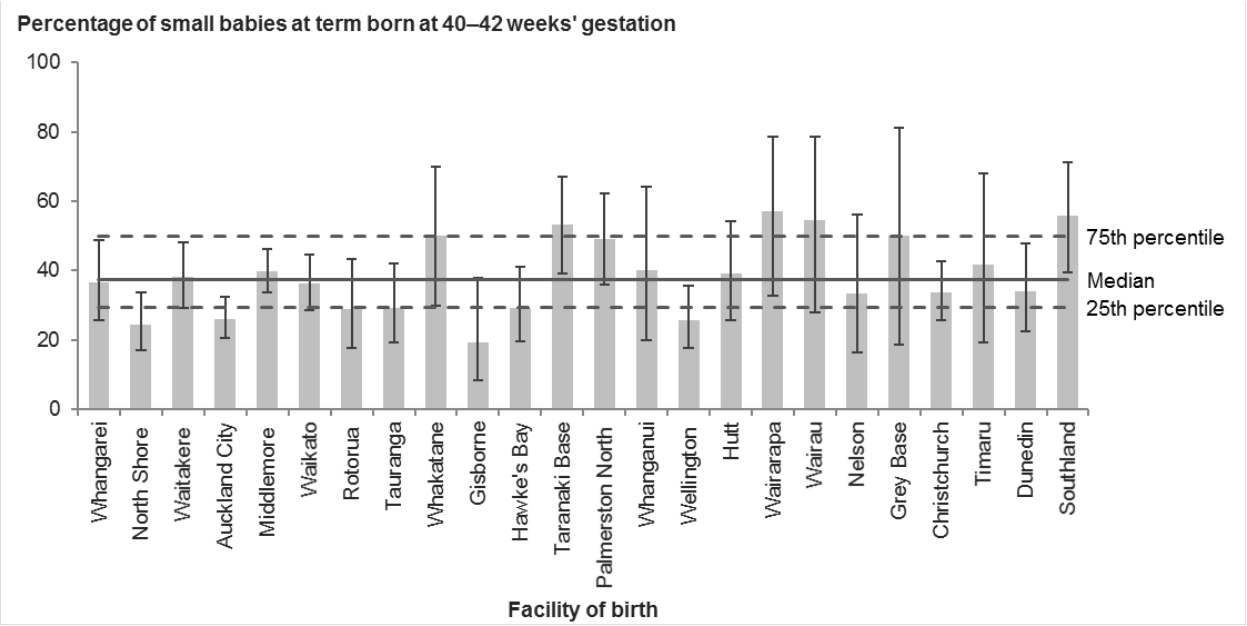
Indicator 20: Small babies at term born at 40–42 weeks' gestation, 2013

Figure 35: Percentage of small babies at term born at 40–42 weeks' gestation, by DHB of residence, 2013



Black line represents the median percentage of DHBs; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Figure 36: Percentage of small babies at term born at 40–42 weeks' gestation, by facility of birth (secondary and tertiary facilities), 2013



Black line represents the median percentage of secondary and tertiary facilities; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Table 41: Number and percentage of small babies at term born at 40–42 weeks' gestation, by DHB of residence, 2013

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	28	81	34.6
Waitemata	62	201	30.8
Auckland	53	166	31.9
Counties Manukau	108	294	36.7
Waikato	81	186	43.5
Lakes	12	42	28.6
Bay of Plenty	29	83	34.9
Tairawhiti	5	26	19.2
Hawke's Bay	18	67	26.9
Taranaki	27	49	55.1
MidCentral	29	58	50.0
Whanganui	6	16	37.5
Capital & Coast	29	93	31.2
Hutt Valley	15	39	38.5
Wairarapa	7	12	58.3
Nelson Marlborough	13	30	43.3
West Coast	4	10	40.0
Canterbury	39	116	33.6
South Canterbury	5	12	41.7
Southern	44	96	45.8
Unknown	3	4	–
New Zealand	**617**	**1,681**	**36.7**

Table 42: Number and percentage of small babies at term born at 40–42 weeks' gestation, by facility of birth (secondary and tertiary facilities), 2013

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	23	63	36.5
North Shore	24	98	24.5
Waitakere	37	97	38.1
Auckland City	54	208	26.0
Middlemore	94	236	39.8
Waikato	50	138	36.2
Rotorua	13	45	28.9
Tauranga	17	58	29.3
Whakatane	10	20	50.0
Gisborne	5	26	19.2
Hawke's Bay	19	65	29.2
Taranaki Base	24	45	53.3
Palmerston North	25	51	49.0
Whanganui	6	15	40.0
Wellington	22	86	25.6
Hutt	16	41	39.0
Wairarapa	8	14	57.1
Wairau	6	11	54.5
Nelson	6	18	33.3
Grey Base	3	6	50.0
Christchurch	38	113	33.6
Timaru	5	12	41.7
Dunedin	17	50	34.0
Southland	19	34	55.9
All secondary and tertiary facilities	**541**	**1,550**	**34.9**
All primary facilities	**76**	**131**	**58.0**
All home births	**0**	**0**	**–**
New Zealand[1]	**617**	**1,681**	**36.7**

1 Includes babies where birth location was unspecified.

Indicator 21: 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 clinical practice. 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 identify opportunities to prevent or reduce perinatal morbidity.

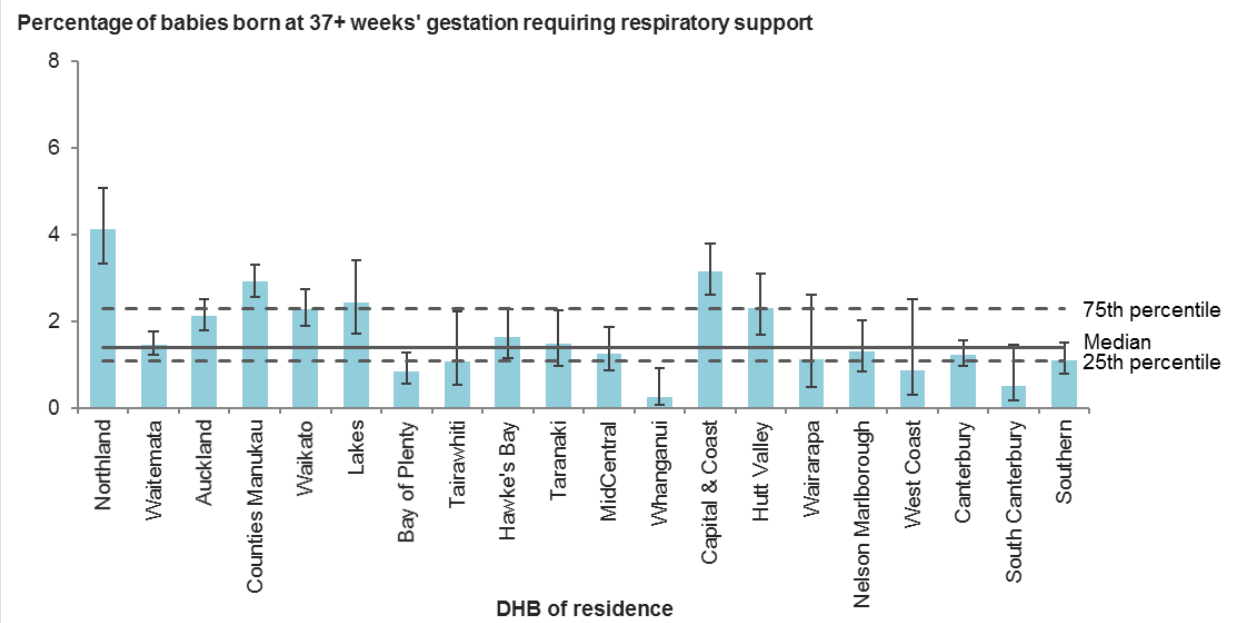
Data presented for this indicator may reflect variation in reporting practices regarding respiratory support for babies. This should be addressed locally; all DHBs should ensure data they report to the national collections is accurate and complete.

Notes on 2013 data

There was considerable variation in the rate of babies born at term (37+ weeks' gestation) requiring respiratory support, ranging from 0.3% to 4.1% across the DHBs, and from 0.3% to 4.9% across secondary and tertiary facilities.

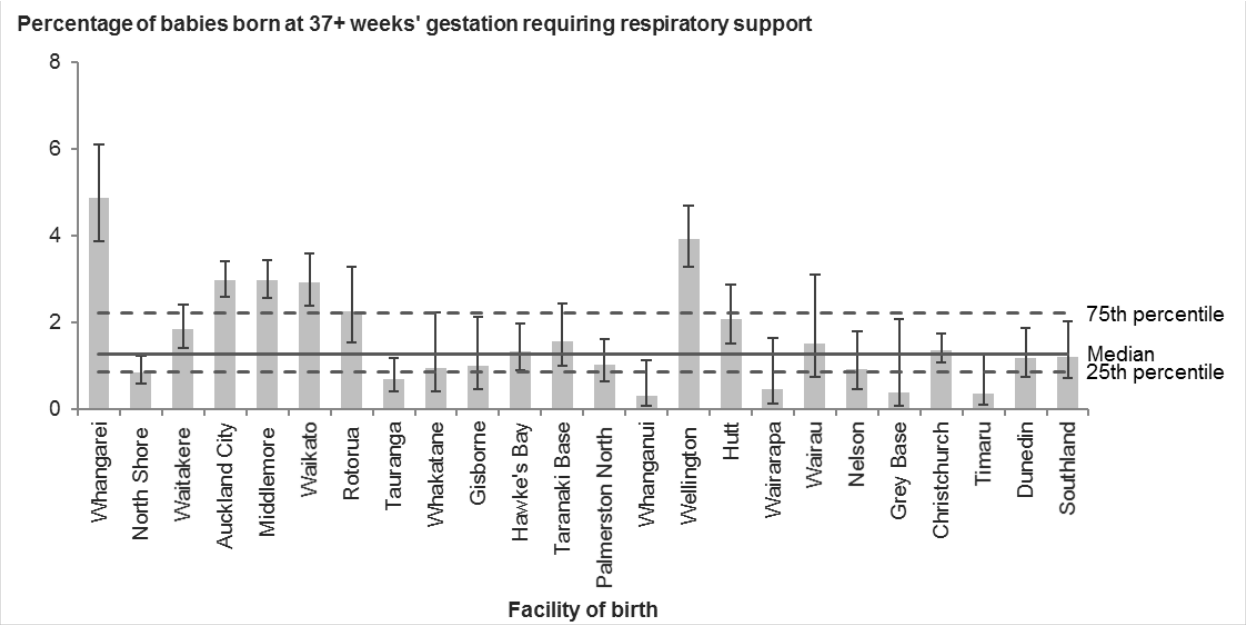
Indicator 21: Babies born at 37+ week's gestation requiring respiratory support, 2013

Figure 37: Percentage of babies born at 37+ week's gestation requiring respiratory support, by DHB of residence, 2013



Black line represents the median percentage of DHBs; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Figure 38: Percentage of babies born at 37+ week's gestation requiring respiratory support, by facility of birth (secondary and tertiary facilities), 2013



Black line represents the median percentage of secondary and tertiary facilities; dashed lines represent the 25th and 75th percentiles.
Error bars represent 95% confidence intervals.

Table 39: Number and percentage of babies born at 37+ week's gestation requiring respiratory support, by DHB of residence, 2013

DHB of residence	Babies born at 37+ weeks' gestation requiring over 4 hours of respiratory support	Babies born at 37+ weeks' gestation	Rate (%)
Northland	82	1,989	4.1
Waitemata	106	7,207	1.5
Auckland	124	5,852	2.1
Counties Manukau	221	7,596	2.9
Waikato	112	4,910	2.3
Lakes	32	1,322	2.4
Bay of Plenty	22	2,585	0.9
Tairawhiti	7	645	1.1
Hawke's Bay	32	1,967	1.6
Taranaki	21	1,413	1.5
MidCentral	25	1,978	1.3
Whanganui	2	780	0.3
Capital & Coast	106	3,368	3.1
Hutt Valley	40	1,743	2.3
Wairarapa	5	443	1.1
Nelson Marlborough	19	1,460	1.3
West Coast	3	346	0.9
Canterbury	66	5,407	1.2
South Canterbury	3	598	0.5
Southern	35	3,206	1.1
Unknown	5	259	–
New Zealand	**1,068**	**55,074**	**1.9**

Table 40: Number and percentage of babies born at 37+ week's gestation requiring respiratory support, by facility of birth (secondary and tertiary facilities), 2013

Place of birth	Babies born at 37+ weeks' gestation requiring over 4 hours of respiratory support	Babies born at 37+ weeks' gestation	Rate (%)
Whangarei	69	1,417	4.9
North Shore	30	3,497	0.9
Waitakere	53	2,862	1.9
Auckland City	197	6,606	3.0
Middlemore	176	5,910	3.0
Waikato	91	3,098	2.9
Rotorua	26	1,154	2.3
Tauranga	13	1,871	0.7
Whakatane	5	520	1.0
Gisborne	6	606	1.0
Hawke's Bay	25	1,861	1.3
Taranaki Base	19	1,213	1.6
Palmerston North	18	1,759	1.0
Whanganui	2	648	0.3
Wellington	117	2,979	3.9
Hutt	36	1,722	2.1
Wairarapa	2	441	0.5
Wairau	7	460	1.5
Nelson	8	875	0.9
Grey Base	1	267	0.4
Christchurch	64	4,687	1.4
Timaru	2	569	0.4
Dunedin	18	1,519	1.2
Southland	14	1,148	1.2
All secondary and tertiary facilities	**999**	**47,689**	**2.1**
All primary facilities	**51**	**5,157**	**1.0**
All home births	**16**	**1,836**	**0.9**
New Zealand[1]	**1,068**	**55,074**	**1.9**

1 Includes babies where birth location was unspecified.

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Appendices

Appendix 1: National Maternity Collection

The 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 integrates health information from three sources:

- inpatient and day-patient health event data during pregnancy, birth and the postnatal period for mother and baby, sourced from the National Minimum Dataset (NMDS)
- lead maternity carer (LMC) claim forms for primary maternity services provided under Section 88 of the New Zealand Public Health and Disability Act 2000
- primary maternity services provided by district health boards (DHBs) to women who do not have a community LMC or are under the care of a DHB secondary service during their pregnancy or birth.[4]

These sources are collected for administrative purposes (including the funding of maternity services). The collection does not contain details of stillborn babies. Information about stillbirths is included in the Mortality Collection. Refer to the MAT 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 National Minimum Dataset (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 information is assigned 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 (ICD-10-AM). This system is designed for the classification of morbidity and mortality information for statistical, epidemiological and clinical purposes. Refer to the NMDS data dictionary (www.health.govt.nz/publication/national-minimum-dataset-hospital-events-data-dictionary) for more information on the data held in the NMDS.

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 information is received through the LMC claim forms, and includes all women registered with an LMC. This represented 90% of all women giving birth in 2013.

[4] This data is being collected in 2014; it is not included in this report. All data on primary maternity services in this report is sourced from LMC claims.

District health board-funded primary maternity services data

Collection of the DHB-funded primary maternity services data set is under way, and is expected to be available in future reports. This data set contains information on women who access a DHB provider, including a DHB caseload midwife, DHB primary midwifery teams and shared care arrangements. Once complete, this data set will increase the scope of information the Ministry holds on women and babies who access primary maternity services, including the level of service they receive and their trimester of registration when the DHB is the primary maternity provider.

Appendix 2: Technical notes

Clinical codes and definitions

Standard primiparae: a group of mothers considered to be clinically comparable and expected to require low levels of obstetric intervention. Standard primiparae are defined in this report as women recorded in the National Maternity Collection (MAT) who meet all of the following inclusions:

- gave birth at a maternity facility or had a home birth[5]
- 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
- 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 (ICD-10-AM)	Description
O300–O309	Multiple gestation
O632	Delayed delivery of second twin, triplet, etc
Z372–Z377	Outcome of delivery – twins or multiple

Table A2: Cephalic presentation exclusion criteria

Clinical code (ICD-10-AM)	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 (ICD-10-AM)	Description
O090–O095	Duration of pregnancy under 37 weeks
O48	Prolonged pregnancy
O60	Preterm labour and delivery

[5] 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.

Table A4: Obstetric complications exclusion criteria

Clinical code (ICD-10-AM)	Description
O100–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. Women giving birth at home are counted as having had a spontaneous vaginal birth.

Table A5: Delivery type codes

Clinical code (ICD-10-AM)	Description
O80	Single spontaneous delivery
O81	Single delivery by forceps and vacuum extractor
O82	Single delivery by caesarean section
9046700	Spontaneous vertex delivery
9046800–9046804	Forceps delivery
9046900	Vacuum extraction with delivery
1652000–1652003	Caesarean section

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 (ICD-10-AM)	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 (ICD-10-AM)	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). Women giving birth at home are counted 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 (ICD-10-AM)	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

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 (ICD-10-AM)	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 (ICD-10-AM)	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 (ICD-10-AM)	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 (ICD-10-AM)	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 a lead maternity carer (LMC): 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. Data for individual primary facilities is provided in the accompanying online tables. Care should be taken 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% 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. All relevant data is reported in this report 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, Christchurch Women's Hospital and Christchurch Hospital events have been summed.

Appendix 3: Catchment areas

The primary, secondary and tertiary maternity facilities that reported births between 2009 and 2012 are listed by district health board (DHB) in the table below. Their geographical locations are presented in Figure A1.

DHB	Tertiary facility[1]	Secondary facility[2]	Primary facility[3]
Northland	Auckland City	Whangarei	Bay of Islands Dargaville 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 Pohlen Trust Rhoda Read River Ridge Taumaranui Te Kuiti Thames Tokoroa Waihi Waterford
Lakes		Rotorua	Taupo
Bay of Plenty		Tauranga Whakatane	Murupara Opotiki
Tairawhiti		Gisborne	Ngati Porou Hauora
Taranaki		Taranaki Base	Elizabeth R Hawera
Hawke's Bay	Wellington	Hawke's Bay Regional	Wairoa
MidCentral		Palmerston North	Dannevirke Horowhenua
Whanganui		Whanganui	Otaihape Waimarino
Capital & Coast			Kapiti Kenepuru
Hutt Valley		Hutt	
Wairarapa		Wairarapa	
Nelson Marlborough		Wairau Nelson	Golden Bay Motueka*

DHB	Tertiary facility[1]	Secondary facility[2]	Primary facility[3]
West Coast	Christchurch	Grey Base	Buller
Canterbury			Akaroa* Ashburton Burwood Darfield Kaikoura Lincoln Rangiora St George's* Waikari*
South Canterbury		Timaru	
Southern		Dunedin Southland	Charlotte Jean Clutha Dunstan Gore Lakes District Lumsden Maniototo Oamaru 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.

* These facilities did not provide birth care in 2013.

Figure A1: Maternity facilities in New Zealand by DHB and facility type (2009–2013)