

New Zealand Maternity Clinical Indicators 2009: Revised June 2012

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MANATŪ HAUORA

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Executive summary

This first report on the New Zealand Maternity Clinical Indicators is the result of a collaborative process involving the Ministry of Health and maternity stakeholders, representing consumer, midwifery, obstetric, general practice, paediatric and anaesthetic perspectives. Building on previous work undertaken across Australasia, an expert working group has established a set of 12 maternity clinical indicators that are relevant to the New Zealand setting and can be measured using available data collections.

This is the first time maternity clinical data has been benchmarked in such a comprehensive way using a standardised definition and presented at the national level in New Zealand. The use of the *standard primipara* definition allows the separate assessment of a group of women for whom interventions and outcomes should be similar. In addition to eight indicators for standard primiparae, there are also three indicators for all women giving birth in hospital and one indicator covering all babies born in hospital. Other indicators will be added over time as improved data becomes available.

The release of this report provides an opportunity for district health boards (DHBs) and local maternity stakeholders to participate in and add value to the process by undertaking further investigation at a local level as part of maternity quality and safety programmes.

This first report identifies significant variation between DHBs and between individual secondary and tertiary facilities. This variation among a group of women who would be expected to have similar outcomes needs to be investigated. There is particularly significant variation in rates of spontaneous vaginal birth, instrumental vaginal birth, induction of labour and intact lower genital tract. These findings should encourage further detailed investigation of data quality and integrity, as well as the practice management reasons for these variations.

Introduction

What are the New Zealand Maternity Clinical Indicators?

The New Zealand Maternity Clinical Indicators are benchmarked data for each DHB region and secondary/tertiary maternity facility showing key maternity outcomes. The purpose of the indicators is to increase the visibility of the quality and safety of maternity services and to highlight areas where quality improvement could be made. The benchmarked data will be used to support the local clinical review of maternity services. The purpose of local clinical review is to identify and implement service improvements.

The New Zealand Maternity Clinical Indicators are based on Australasian clinical indicators developed by the Australian Council on Healthcare Standards (2008, 2011). These indicators are evidence-based and cover a range of procedures and outcomes for mothers and their babies. The initial set of New Zealand Maternity Clinical Indicators is deliberately small and is focused on the labour and birth period. It is important to start small until there is strong sector confidence in the accuracy of the data used in the indicators.

Background to the New Zealand Maternity Clinical Indicators

In 2010 the Minister of Health asked the Ministry of Health to develop a national quality and safety programme for maternity services, including New Zealand maternity standards and clinical indicators. As a result, the Ministry of Health initiated conversations with key professional colleges to discuss the scope of clinical indicators and how they might be used as part of a national quality and safety programme.

It was agreed that the clinical indicators would be used to:

- increase the degree of national consistency in reporting maternity data
- support clinical quality improvement by helping DHBs to identify areas they should focus on in their local clinical reviews
- provide a broader national picture of maternity outcomes in New Zealand than solely maternal and perinatal mortality
- provide standardised (benchmarked) data to DHBs so that they can see how their maternity services compare to other maternity services in New Zealand.

The Ministry of Health convened an expert working group to develop the initial set of clinical indicators. The working group included representation from midwifery, obstetric, paediatric, general practice, epidemiology, service management and consumer backgrounds. As a starting point, the working group used the existing Australasian maternity indicators developed by the Australian Council on Healthcare Standards, as well as the work undertaken by Women's Hospitals Australasia on a core set of maternity indicators for Australia (Women's Hospitals Australasia 2007).

The working group aimed to establish an appropriate initial set of indicators for the New Zealand context. It decided on the set of 12 indicators presented in this document as those for which the data could be considered reliable and which would be relevant for local clinical review.

Overview of the indicators

Table 1 lists the set of maternity indicators covered in this publication, including the numerator and denominator for each indicator. Indicators 1 to 8 present information on standard primiparae giving birth in hospital, indicators 9 to 11 look at all women giving birth in hospital, and indicator 12 looks at all babies born in hospital.

For this report, a *standard primipara* is defined as a woman aged between 20 and 34 years at the time of birth in a hospital or birthing unit, with no record of any previous birth event in a New Zealand hospital, whose birth is at term (from 37 weeks 0 days to 41 weeks 6 days gestation), where the outcome of the birth is a singleton baby, presentation is cephalic, and the pregnancy has had no recorded obstetric complications that are indications for specific obstetric intervention.

The standard primipara represents an uncomplicated pregnancy for which intervention and complication rates should be low and consistent across hospitals.

Using standard primiparae (rather than all women giving birth) controls for differences in case mix and increases the validity of inter-hospital comparisons for maternity care (adapted from Australian Council on Healthcare Standards 2008, p.29). Standard primiparae account for approximately 16 percent of all births nationally, although this proportion varies from 12 to 21 percent across DHBs.¹ See 'Appendix 1: Technical notes' for more information on definitions.

¹ All primiparae account for approximately 41 percent of all births nationally, with the proportion ranging from 30 to 50 percent between DHBs.

How the indicators will be used

The indicators will be published at least annually. The aim is to help inform a programme of ongoing, systematic review by local multidisciplinary teams that work together to identify ways that maternity services and care can be improved and to implement those improvements. At the DHB level, the programme will consist of ongoing local clinical review of maternity services. It will be driven by local leaders from midwifery, general practice and obstetrics working together, and will include practitioners working across both community- and hospital-based maternity services and maternity consumer representation, brought together as a local maternity network.

Table 1: New Zealand Maternity Clinical Indicators

	Indicator	Numerator	Denominator
1	Standard primiparae who have a spontaneous vaginal birth	Total number of standard primiparae who have a spontaneous vaginal birth	Total number of standard primiparae who give birth
2	Standard primiparae who undergo an instrumental vaginal birth	Total number of standard primiparae who undergo an instrumental vaginal birth	Total number of standard primiparae who give birth
3	Standard primiparae who undergo Caesarean section	Total number of standard primiparae who undergo Caesarean section	Total number of standard primiparae who give birth
4	Standard primiparae who undergo induction of labour	Total number of standard primiparae who undergo induction of labour	Total number of standard primiparae who give birth
5	Standard primiparae with an intact lower genital tract (no 1st–4th-degree tear or episiotomy)	Total number of standard primiparae with an intact lower genital tract	Total number of standard primiparae giving birth vaginally
6	Standard primiparae undergoing episiotomy and no 3rd–4th-degree perineal tear	Total number of standard primiparae undergoing episiotomy and no 3rd–4th-degree perineal tear while giving birth vaginally	Total number of standard primiparae giving birth vaginally
7	Standard primiparae sustaining a 3rd–4th-degree perineal tear and no episiotomy	Total number of standard primiparae sustaining a 3rd–4th-degree perineal tear and no episiotomy	Total number of standard primiparae giving birth vaginally
8	Standard primiparae undergoing episiotomy and sustaining a 3rd–4th-degree perineal tear	Total number of standard primiparae undergoing episiotomy and sustaining a 3rd–4th-degree perineal tear while giving birth vaginally	Total number of standard primiparae giving birth vaginally
9	General anaesthesia for Caesarean section	Total number of women having a general anaesthetic for a Caesarean section	Total number of women having a Caesarean section
10	Blood transfusion after vaginal birth	Total number of women who give birth vaginally who require a blood transfusion during the same admission	Total number of women who give birth vaginally
11	Blood transfusion after Caesarean section	Total number of women who undergo Caesarean section who require a blood transfusion during the same admission	Total number of women who undergo Caesarean section
12	Premature births (delivery between 32 and 36 weeks)	Total number of babies born at between 32 weeks 0 days and 36 weeks 6 days gestation	Total number of babies born in hospital

Data sources for the indicators

All data for indicators were sourced from publicly funded hospital events reported to the National Minimum Dataset (NMDS). The NMDS holds information collected routinely from all publicly funded events in which a patient is discharged from a hospital in New Zealand. This information contains a substantial amount of clinical information, including health conditions and procedures, which are encoded using the appropriate International Statistical Classification of Disease and Related Health Problems, 10th revision, Australian Modification (ICD-10-AM) clinical codes. The NMDS includes births that occur in a publicly funded hospital and publicly funded births that occur in a private hospital or birthing unit.

For this report, all women discharged following a publicly funded hospital birth in 2009 and all babies live-born in hospital in 2009 were selected from the NMDS. Specific conditions and procedures (including birth type) were identified using ICD-10-AM-v6 clinical codes.

The standard primipara definition was applied using clinical codes and demographic information sourced from the current birth event, from any antenatal events corresponding to the pregnancy, and from a search of historical maternity events held in the NMDS to determine primiparity. See 'Appendix 1: Technical notes' for more detail on definitions and code ranges.

Data integrity

This report has been compiled from data supplied by DHBs. DHBs are responsible for ensuring the quality of data to national collections. No independent parity measure and no antenatal primary care information is available currently for reporting, and so the definition of standard primipara is approximate at this time. In future reports, use of the National Maternity Collection, which integrates different sources of maternity data, will improve the quality and completeness of the data presented.

Numbers and rates

Data are presented in this report in two ways.

- Data presented by DHB of domicile is intended to provide DHBs with information on the women usually resident in their region.
- Data presented by facility is intended to allow monitoring of trends over time at the facility level. Data for births in secondary and tertiary facilities are presented graphically, while data for births in primary and private facilities are presented in the appendices.

Rates are presented as raw percentages. Rates have not been standardised by age or ethnicity because the choice of denominator (standard primiparae) is intended to group women into clinically similar cohorts who would be expected to experience similar birth outcomes. Although this report does not include differences in rates by ethnicity or socioeconomic group, these could be a possible area of focus for future reports or for analysis at the DHB level. Due to the design of the indicators, some rates are based on small numbers of events. All rates derived from small numbers should be treated with caution.

Indicators 1–4: type of birth

Rationale and purpose

Indicators 1 to 4 present data on the type of birth among standard primiparae. These indicators compare the rate of spontaneous vaginal birth with rates of medical interventions in a pre-risk-adjusted population.² Their purpose is to encourage maternity service providers to review the appropriateness of these interventions, with the long-term aim of reducing maternal and perinatal morbidity, thereby improving maternal satisfaction with the process of giving birth, including infant bonding and establishment of breastfeeding (adapted from Women's Hospitals Australasia 2007, p.88-89). The following sections describe the rationale and purpose of the specific indicators.

Spontaneous vaginal birth

This indicator measures the proportion of women having a spontaneous (non-instrumental) vaginal birth, using a pre-risk-adjusted population. It is expected to encourage maternity service providers to review, evaluate and make necessary changes to clinical practice aimed at supporting women to achieve an unassisted birth (adapted from Women's Hospitals Australasia 2007, p.89). This measure includes events where labour may have been augmented or induced.

Instrumental vaginal birth

This indicator helps maternity service providers to evaluate the appropriate use of instrumental interventions, including ventouse and forceps births, in a pre-risk-adjusted population. If their rates are significantly higher than their peer group at a national level, service providers will need to examine the results of other indicators that may be affected by instrumental birth, including maternal and perinatal morbidity.

Caesarean section

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. If rates are significantly different from their peer group at a national level, maternity service providers may need to examine the results of other indicators that can be affected by Caesarean section (such as post-partum haemorrhage, and maternal and neonatal morbidity and mortality rates) to ascertain whether there is any correlation (adapted from Women's Hospitals Australasia 2007, p.74). The longer-term aim is to reduce the risks associated with an unnecessary Caesarean section, reduce the number of women at risk of a subsequent Caesarean section and reduce the number of women who experience difficulties with their second and subsequent births as a

² Indicators that do not sum to 100 percent are due to missing data codes for some events.

consequence of a primary Caesarean section (adapted from Women's Hospitals Australasia 2007, p.75).

Induction of labour

The purpose of this indicator is to benchmark rates of induction of labour within a pre-risk-adjusted population. It will provide maternity services with an indicator that may encourage further investigation of policies and practices with respect to inducing labour in low-risk women. If rates are significantly higher than their peer group at a national level, maternity services may need to examine the results of other indicators that can be affected by induction, such as Caesarean section, postpartum haemorrhage and episiotomy, to ascertain whether there is any correlation (adapted from Women's Hospitals Australasia 2007, p.68).

Comment on data for 1 January–31 December 2009

There is significant variation between DHBs and between secondary and tertiary facilities in the rates of spontaneous vaginal birth, with facility rates ranging from 51 to 79 percent. This merits further investigation. For some secondary or tertiary facilities, the rates of intervention could be influenced by transfers from primary facilities. Individual DHBs could compare rates of intervention according to where labour was initiated.

There is significant variation in the facility rates of instrumental vaginal birth, which range from 6 to 27 percent. Caesarean section rates also vary significantly, from 11 to 29 percent. These variations indicate the need for detailed review.

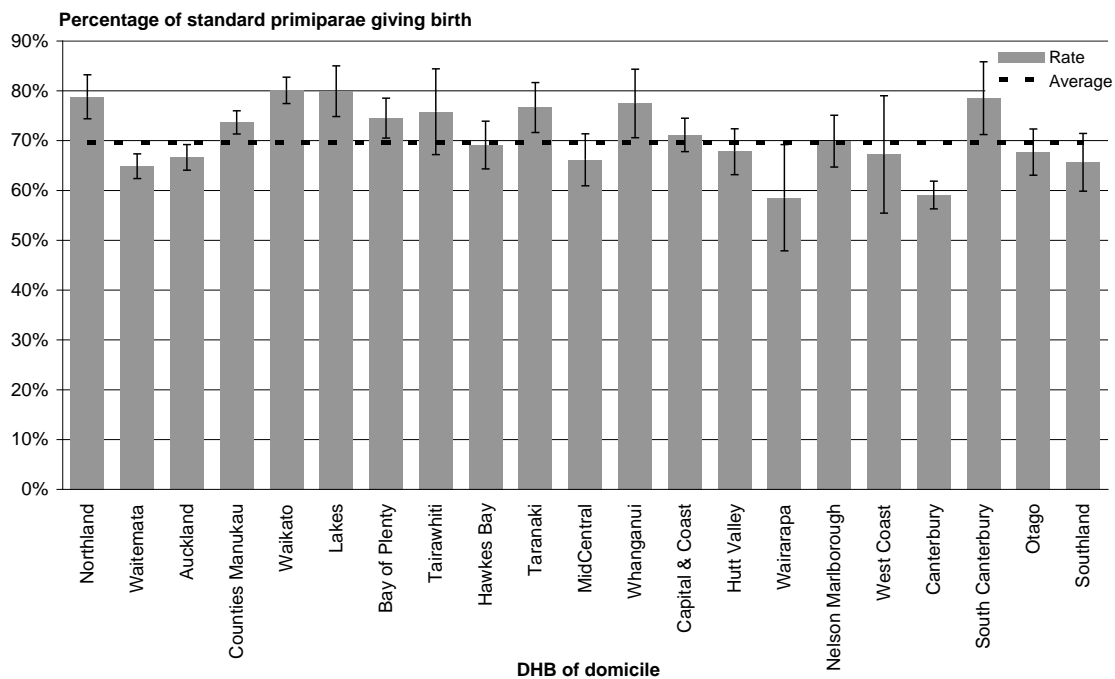
Standard primiparae are unlikely to have indications for induction of labour and so rates of induction for this group should be low. Rates significantly above the national average should be investigated.

Indicator 1: Spontaneous vaginal births among standard primiparae, 2009

Table 2: Number and percentage of spontaneous vaginal births among standard primiparae, by DHB of domicile, 2009

DHB of domicile	Spontaneous vaginal births	Standard primiparae	Rate (%)
Northland	260	330	78.8
Waitemata	925	1426	64.9
Auckland	854	1282	66.6
Counties Manukau	1010	1371	73.7
Waikato	699	873	80.1
Lakes	191	239	79.9
Bay of Plenty	339	455	74.5
Tairāwhiti	72	95	75.8
Hawkes Bay	246	356	69.1
Taranaki	210	274	76.6
MidCentral	209	316	66.1
Whanganui	110	142	77.5
Capital & Coast	500	703	71.1
Hutt Valley	267	394	67.8
Wairarapa	48	82	58.5
Nelson Marlborough	209	299	69.9
West Coast	41	61	67.2
Canterbury	716	1212	59.1
South Canterbury	95	121	78.5
Otago	264	390	67.7
Southland	170	259	65.6
Unspecified	3	3	100.0
New Zealand	7438	10,683	69.6

Figure 1: Percentage of spontaneous vaginal births among standard primiparae, by DHB, 2009



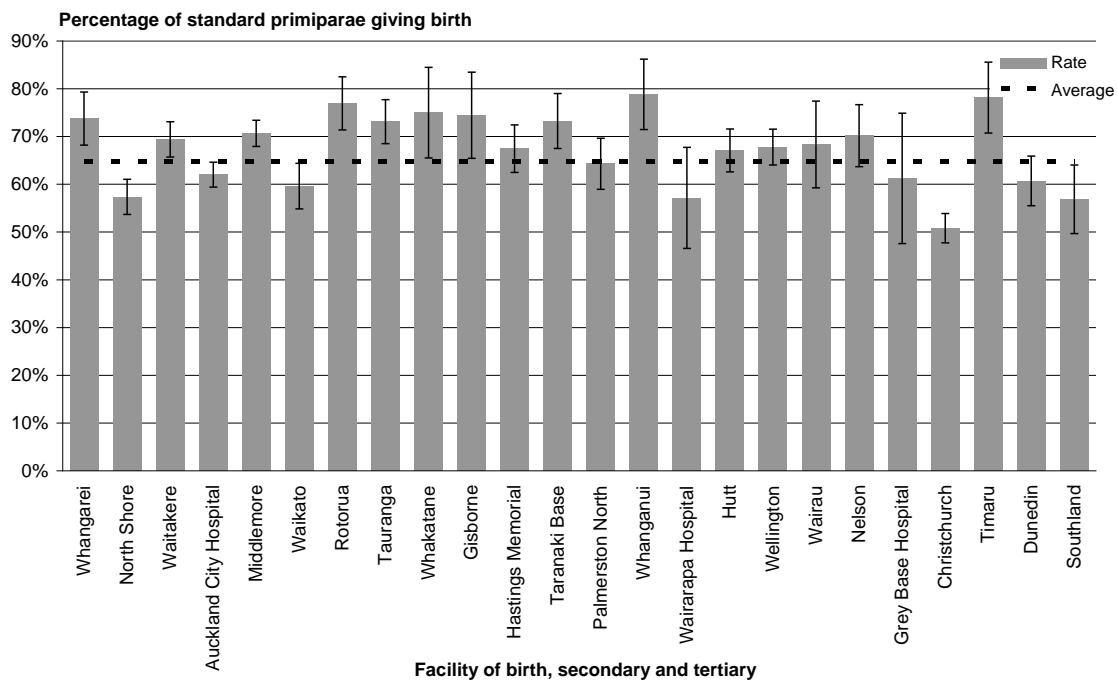
Black line represents national average

Error bars represent 95% confidence interval

Table 3: Number and percentage of spontaneous vaginal births among standard primiparae, by facility of birth (secondary and tertiary facilities), 2009

Facility	Spontaneous vaginal births	Standard primiparae	Rate (%)
Whangarei	177	240	73.8
North Shore	402	701	57.3
Waitakere	415	598	69.4
Auckland City Hospital	827	1334	62.0
Middlemore	749	1060	70.7
Waikato	242	406	59.6
Rotorua	170	221	76.9
Tauranga	261	357	73.1
Whakatane	60	80	75.0
Gisborne	67	90	74.4
Hastings Memorial	230	341	67.4
Taranaki Base	167	228	73.2
Palmerston North	198	308	64.3
Wanganui	93	118	78.8
Wairarapa Hospital	48	84	57.1
Hutt	281	419	67.1
Wellington	404	596	67.8
Wairau	69	101	68.3
Nelson	134	191	70.2
Grey Base Hospital	30	49	61.2
Christchurch	513	1010	50.8
Timaru	93	119	78.2
Dunedin	207	341	60.7
Southland	104	183	56.8
All secondary and tertiary facilities	5941	9175	64.8

Figure 2: Percentage of spontaneous vaginal births among standard primiparae, by facility of birth (secondary and tertiary facilities), 2009



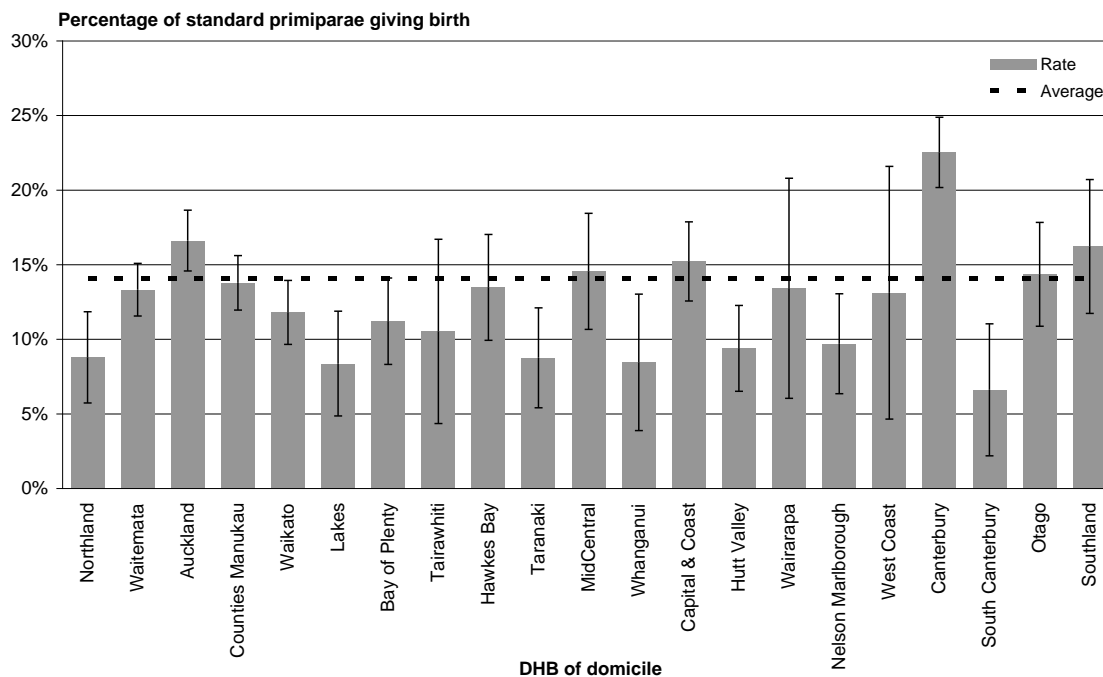
Black line represents average for all secondary and tertiary facilities
 Error bars represent 95% confidence interval

Indicator 2: Instrumental vaginal birth among standard primiparae, 2009

Table 4: Number and percentage of standard primiparae undergoing an instrumental vaginal birth, by DHB of domicile, 2009

DHB of domicile	Instrumental vaginal births	Standard primiparae	Rate (%)
Northland	29	330	8.8
Waitemata	190	1426	13.3
Auckland	213	1282	16.6
Counties Manukau	189	1371	13.8
Waikato	103	873	11.8
Lakes	20	239	8.4
Bay of Plenty	51	455	11.2
Tairāwhiti	10	95	10.5
Hawkes Bay	48	356	13.5
Taranaki	24	274	8.8
MidCentral	46	316	14.6
Whanganui	12	142	8.5
Capital & Coast	107	703	15.2
Hutt Valley	37	394	9.4
Wairarapa	11	82	13.4
Nelson Marlborough	29	299	9.7
West Coast	8	61	13.1
Canterbury	273	1212	22.5
South Canterbury	8	121	6.6
Otago	56	390	14.4
Southland	42	259	16.2
Unspecified	0	3	
New Zealand	1506	10,683	14.1

Figure 3: Percentage of standard primiparae undergoing an instrumental vaginal birth, by DHB of domicile, 2009



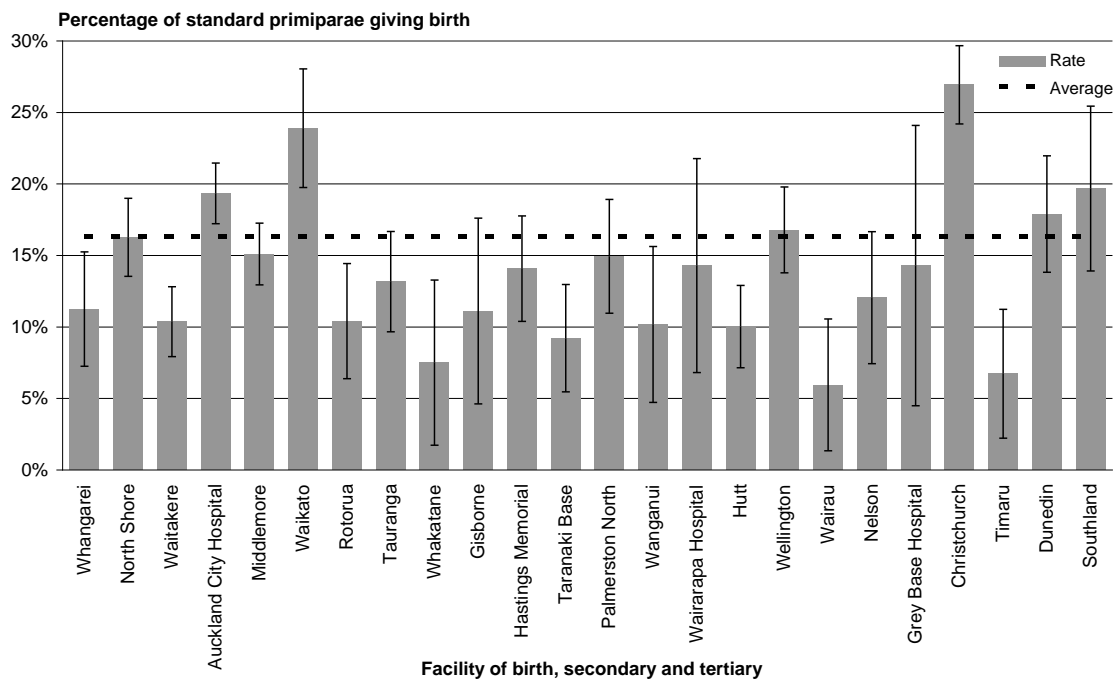
Black line represents national average

Error bars represent 95% confidence interval

Table 5: Number and percentage of standard primiparae undergoing an instrumental vaginal birth, by facility of birth (secondary and tertiary facilities), 2009

Facility	Instrumental vaginal births	Standard primiparae	Rate (%)
Whangarei	27	240	11.3
North Shore	114	701	16.3
Waitakere	62	598	10.4
Auckland City Hospital	258	1334	19.3
Middlemore	160	1060	15.1
Waikato	97	406	23.9
Rotorua	23	221	10.4
Tauranga	47	357	13.2
Whakatane	6	80	7.5
Gisborne	10	90	11.1
Hastings Memorial	48	341	14.1
Taranaki Base	21	228	9.2
Palmerston North	46	308	14.9
Wanganui	12	118	10.2
Wairarapa Hospital	12	84	14.3
Hutt	42	419	10.0
Wellington	100	596	16.8
Wairau	6	101	5.9
Nelson	23	191	12.0
Grey Base Hospital	7	49	14.3
Christchurch	272	1010	26.9
Timaru	8	119	6.7
Dunedin	61	341	17.9
Southland	36	183	19.7
All secondary and tertiary facilities	1498	9175	16.3

Figure 4: Percentage of standard primiparae undergoing an instrumental vaginal birth, by facility of birth (secondary and tertiary facilities), 2009



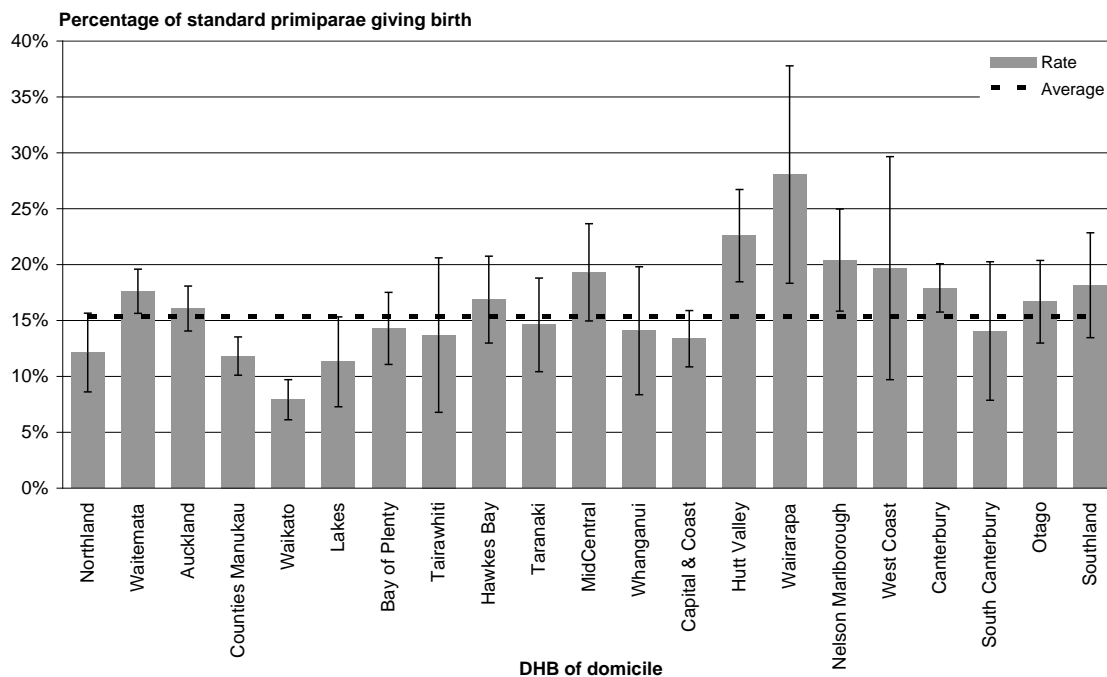
Black line represents average for all secondary and tertiary facilities
 Error bars represent 95% confidence interval

Indicator 3: Rate of Caesarean section among standard primiparae, 2009

Table 6: Number and percentage of standard primiparae giving birth by caesarean section, by DHB of domicile, 2009

DHB of domicile	Caesarean sections	Standard primiparae	Rate (%)
Northland	40	330	12.1
Waitemata	251	1426	17.6
Auckland	206	1282	16.1
Counties Manukau	162	1371	11.8
Waikato	69	873	7.9
Lakes	27	239	11.3
Bay of Plenty	65	455	14.3
Tairāwhiti	13	95	13.7
Hawkes Bay	60	356	16.9
Taranaki	40	274	14.6
MidCentral	61	316	19.3
Whanganui	20	142	14.1
Capital & Coast	94	703	13.4
Hutt Valley	89	394	22.6
Wairarapa	23	82	28.0
Nelson Marlborough	61	299	20.4
West Coast	12	61	19.7
Canterbury	217	1212	17.9
South Canterbury	17	121	14.0
Otago	65	390	16.7
Southland	47	259	18.1
Unspecified	0	3	
New Zealand	1639	10,683	15.3

Figure 5: Percentage of standard primiparae giving birth by Caesarean section, by DHB of domicile, 2009



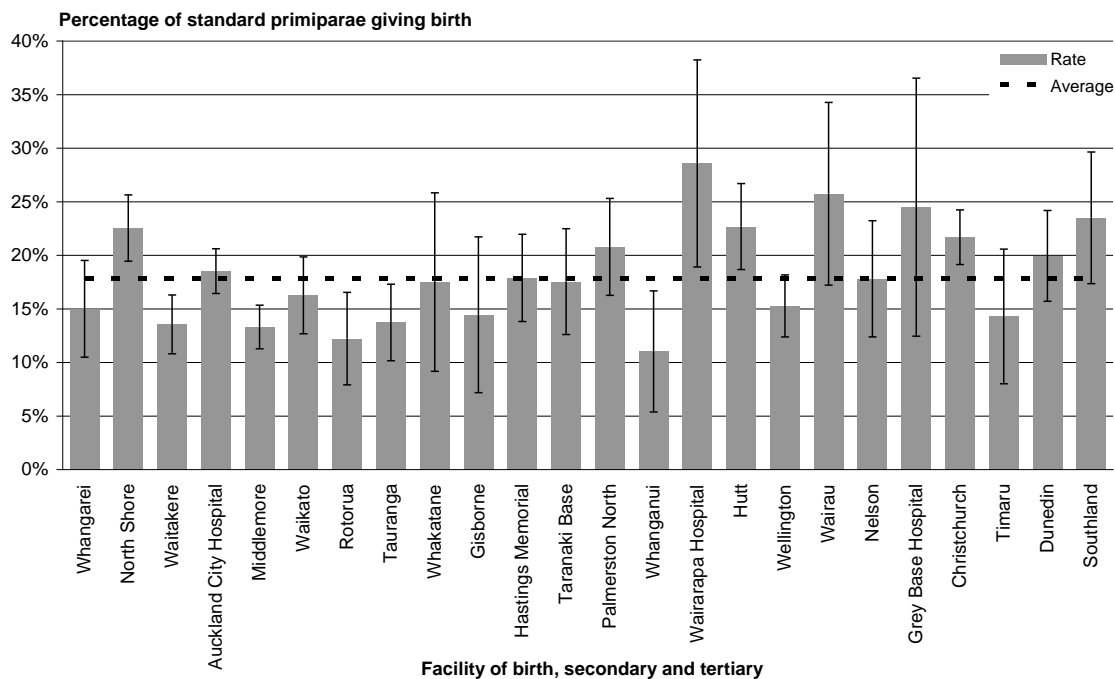
Black line represents national average

Error bars represent 95% confidence interval

Table 7: Number and percentage of standard primiparae giving birth by Caesarean section, by facility of birth (secondary and tertiary facilities), 2009

Facility	Caesarean sections	Standard primiparae	Rate (%)
Whangarei	36	240	15.0
North Shore	158	701	22.5
Waitakere	81	598	13.5
Auckland City Hospital	247	1334	18.5
Middlemore	141	1060	13.3
Waikato	66	406	16.3
Rotorua	27	221	12.2
Tauranga	49	357	13.7
Whakatane	14	80	17.5
Gisborne	13	90	14.4
Hastings Memorial	61	341	17.9
Taranaki Base	40	228	17.5
Palmerston North	64	308	20.8
Wanganui	13	118	11.0
Wairarapa Hospital	24	84	28.6
Hutt	95	419	22.7
Wellington	91	596	15.3
Wairau	26	101	25.7
Nelson	34	191	17.8
Grey Base Hospital	12	49	24.5
Christchurch	219	1010	21.7
Timaru	17	119	14.3
Dunedin	68	341	19.9
Southland	43	183	23.5
All secondary and tertiary facilities	1639	9175	17.9

Figure 6: Percentage of standard primiparae giving birth by Caesarean section, secondary and tertiary facilities, 2009



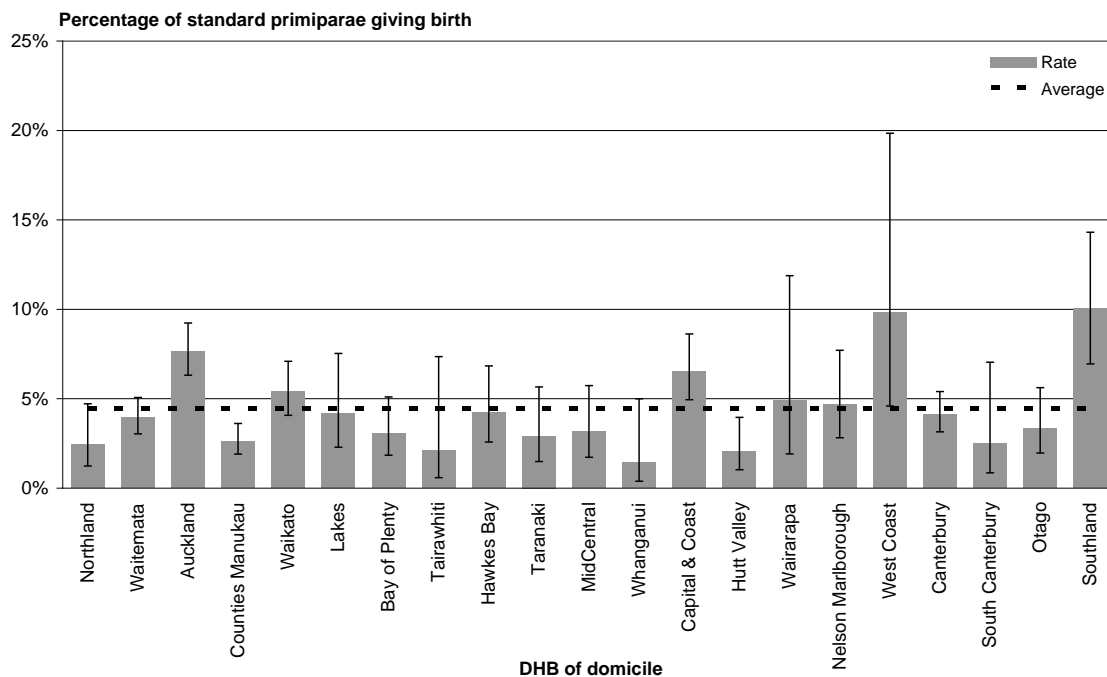
Black line represents average for all secondary and tertiary facilities
 Error bars represent 95% confidence interval

Indicator 4: Induction of labour among standard primiparae, 2009

Table 8: Number and percentage of standard primiparae undergoing induction of labour, by DHB of domicile, 2009

DHB of domicile	Induction of labour	Standard primiparae	Rate (%)
Northland	8	330	2.4
Waitemata	56	1426	3.9
Auckland	98	1282	7.6
Counties Manukau	36	1371	2.6
Waikato	47	873	5.4
Lakes	10	239	4.2
Bay of Plenty	14	455	3.1
Tairāwhiti	2	95	2.1
Hawkes Bay	15	356	4.2
Taranaki	8	274	2.9
MidCentral	10	316	3.2
Whanganui	2	142	1.4
Capital & Coast	46	703	6.5
Hutt Valley	8	394	2.0
Wairarapa	4	82	4.9
Nelson Marlborough	14	299	4.7
West Coast	6	61	9.8
Canterbury	50	1212	4.1
South Canterbury	3	121	2.5
Otago	13	390	3.3
Southland	26	259	10.0
Unspecified	0	3	
New Zealand	476	10,683	4.5

Figure 7: Percentage of standard primiparae undergoing induction of labour, by DHB of domicile, 2009



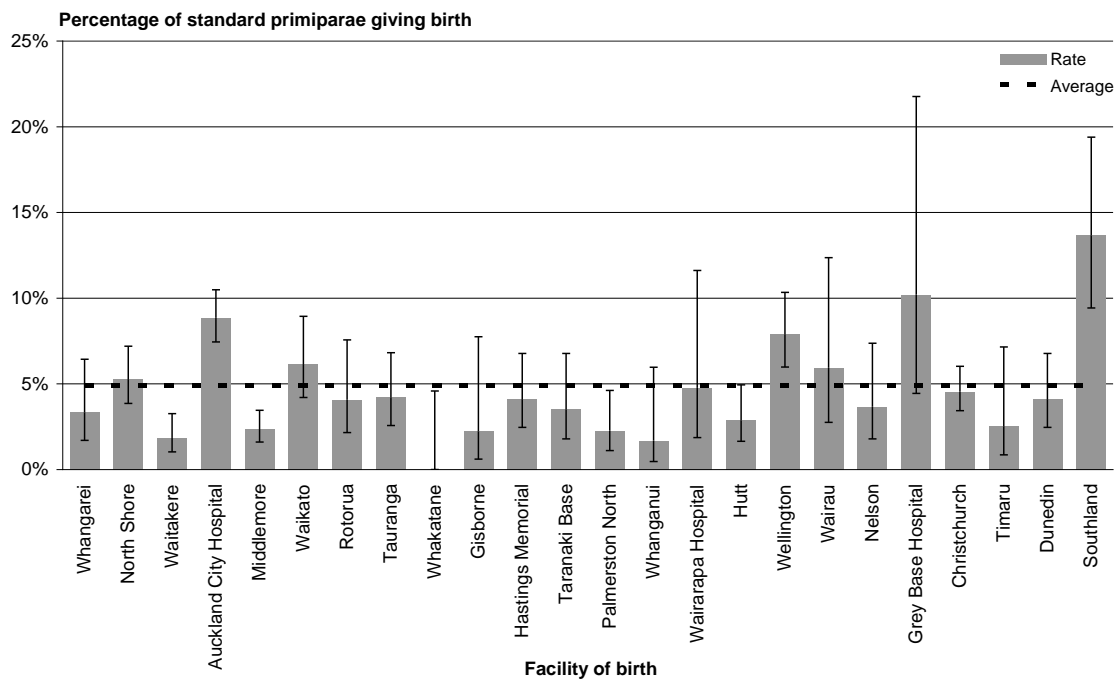
Black line represents national average

Error bars represent 95% confidence interval

Table 9: Number and percentage of standard primiparae undergoing induction of labour, by facility of birth, secondary and tertiary facilities, 2009

Facility	Induction of labour	Standard primiparae	Rate (%)
Whangarei	8	240	3.3
North Shore	37	701	5.3
Waitakere	11	598	1.8
Auckland City Hospital	118	1334	8.8
Middlemore	25	1060	2.4
Waikato	25	406	6.2
Rotorua	9	221	4.1
Tauranga	15	357	4.2
Whakatane	0	80	0.0
Gisborne	2	90	2.2
Hastings Memorial	14	341	4.1
Taranaki Base	8	228	3.5
Palmerston North	7	308	2.3
Wanganui	2	118	1.7
Wairarapa Hospital	4	84	4.8
Hutt	12	419	2.9
Wellington	47	596	7.9
Wairau	6	101	5.9
Nelson	7	191	3.7
Grey Base Hospital	5	49	10.2
Christchurch	46	1010	4.6
Timaru	3	119	2.5
Dunedin	14	341	4.1
Southland	25	183	13.7
All secondary and tertiary facilities	450	9175	4.9

Figure 8: Percentage of standard primiparae undergoing induction of labour, by facility of birth, secondary and tertiary facilities, 2009



Black line represents average for all secondary and tertiary facilities
 Error bars represent 95% confidence interval

Indicators 5–8: degree of damage to the lower genital tract

Rationale and purpose

Indicators 5 to 8 cover the degree of damage to the lower genital tract from vaginal birth in standard primiparae. Perineal trauma remains one of the most common complications of childbirth and is thought to affect between 60 and 85 percent of women who give birth vaginally. Reasons for perineal trauma are varied and may reflect either maternal or neonatal issues. For women, any perineal damage can cause pain and longer-term morbidity. The long-term aim of these indicators is to reduce genital tract trauma and its associated maternal morbidity, improving maternal satisfaction and mother–infant bonding by reducing maternal exposure to pain and discomfort (adapted from Women’s Hospitals Australasia 2007, p. 78–79).

Intact lower genital tract

The four categories of perineal tear classification enable a standardised description of perineal damage, with third- and fourth-degree tears being further classified depending on the involvement of the anal sphincter. Assessing and identifying the degree of lower genital tract damage remains a complex process, and the classification of first- or second-degree tear does not reflect the level of pain or longer-term morbidity the woman may experience. Measuring the number of women who are not affected by perineal trauma (who have an intact perineum) provides a more concise measure which cannot presently be achieved by reviewing the rates of first- or second-degree tears. This indicator will therefore provide a measure that can encourage further investigation to determine how higher rates of intact perineum can be achieved.

Episiotomy

This indicator aims to encourage further investigation to ensure that risks to the mother as well as the infant are assessed before undertaking an episiotomy. If rates are significantly higher than their peer group at a national level, maternity service providers may need to examine the results of other indicators that can be affected by episiotomy, such as bleeding, infection and maternal morbidity rates, to ascertain whether there is any correlation (adapted from Women’s Hospitals Australasia 2007, p.79).

Third- and fourth-degree tears (with or without episiotomy)

The aim of this indicator 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. This includes the use of induction, instrumental delivery and management of second-stage labour (adapted from Women's Hospitals Australasia 2007, p.82-83).

Comment on data for 1 January–31 December 2009

Rates of intact lower genital tract range from 22 to 65 percent across DHBs and 16 to 62 percent across secondary and tertiary facilities. This variation requires investigation of data integrity as well as of local clinical practice.

There are also significant variations in the rate of episiotomy without third- or fourth-degree tear (6 to 31 percent across DHBs and 7 to 33 percent across secondary and tertiary facilities). Outlier DHBs and facilities should investigate the reasons for these differences, which could include the clinical indications given in specific cases and the type and number of practitioners performing episiotomies.

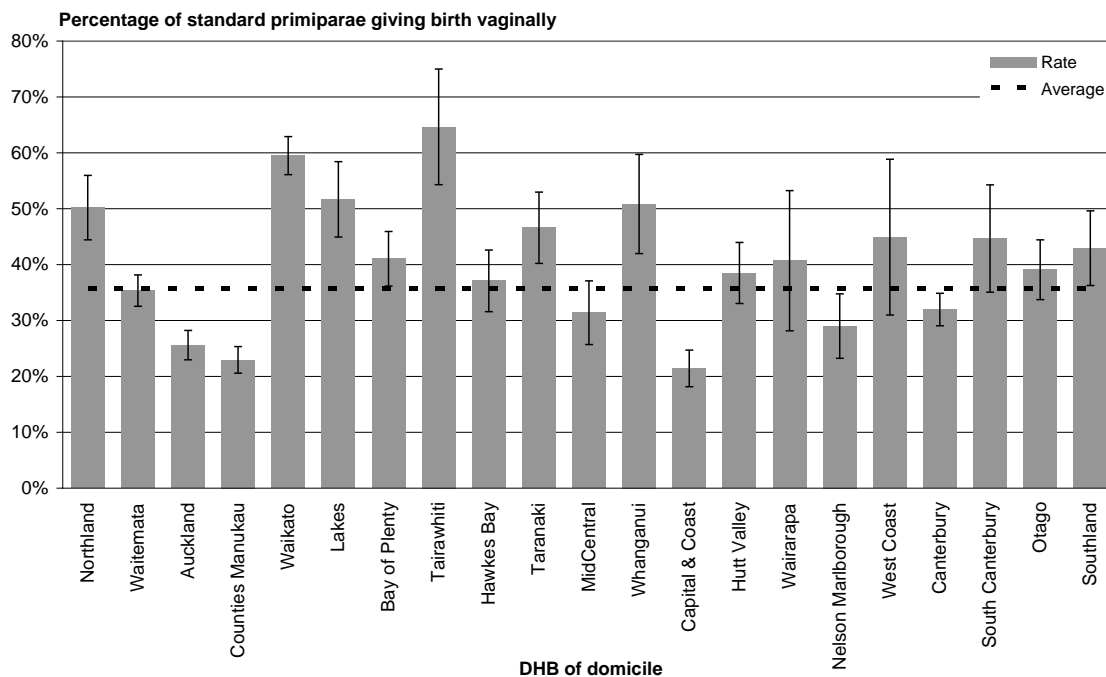
National data does not show a systematic correlation between episiotomy rates and rates of third- and fourth-degree tears. DHBs are encouraged to undertake more detailed analysis at a local level of the relationship between rates of intact perineum, episiotomy and third- and fourth-degree tears.

Indicator 5: Intact lower genital tract among standard primiparae giving birth vaginally, 2009

Table 10: Number and percentage of standard primiparae giving birth vaginally with intact lower genital tract, by DHB of domicile, 2009

DHB of domicile	Intact lower genital tract	Standard primiparae giving birth vaginally	Rate (%)
Northland	145	289	50.2
Waitemata	394	1115	35.3
Auckland	273	1067	25.6
Counties Manukau	275	1199	22.9
Waikato	477	802	59.5
Lakes	109	211	51.7
Bay of Plenty	160	390	41.0
Tairāwhiti	53	82	64.6
Hawkes Bay	109	294	37.1
Taranaki	109	234	46.6
MidCentral	80	255	31.4
Whanganui	62	122	50.8
Capital & Coast	130	607	21.4
Hutt Valley	117	304	38.5
Wairarapa	24	59	40.7
Nelson Marlborough	69	238	29.0
West Coast	22	49	44.9
Canterbury	316	989	32.0
South Canterbury	46	103	44.7
Otago	125	320	39.1
Southland	91	212	42.9
Unspecified	1	3	33.3
New Zealand	3187	8944	35.6

Figure 9: Percentage of standard primiparae giving birth vaginally with intact lower genital tract, by DHB of domicile, 2009



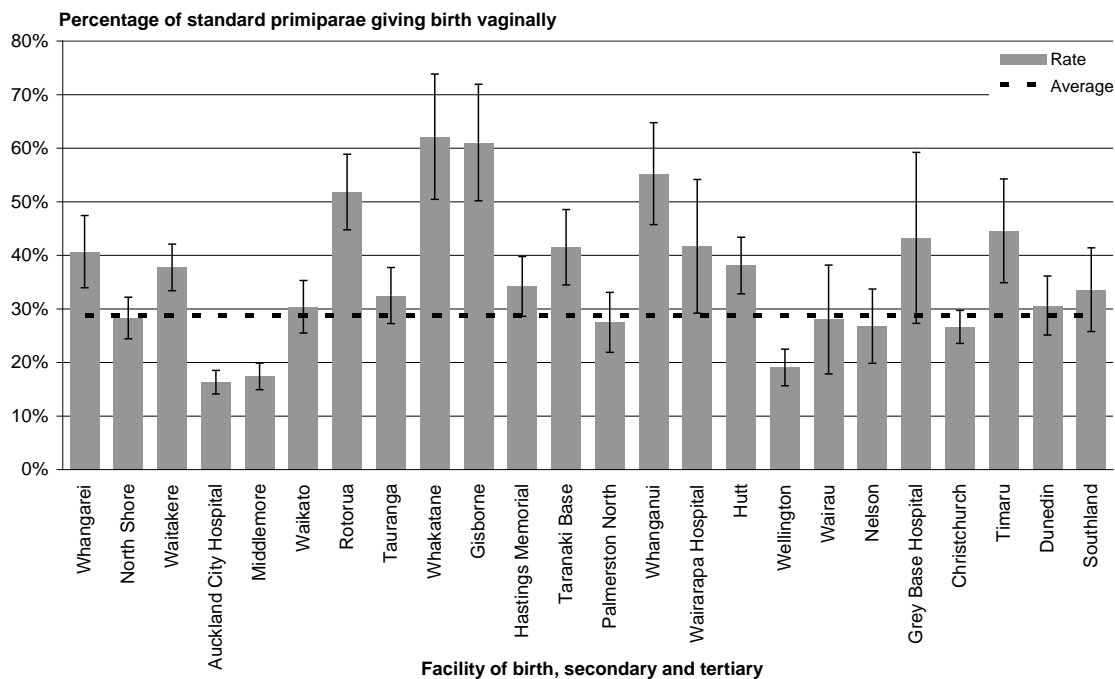
Black line represents national average

Error bars represent 95% confidence interval

Table 11: Number and percentage of standard primiparae giving birth vaginally with an intact lower genital tract, by facility of birth (secondary and tertiary facilities), 2009

Facility	Intact lower genital tract	Standard primiparae giving birth vaginally	Rate (%)
Whangarei	83	204	40.7
North Shore	146	516	28.3
Waitakere	180	477	37.7
Auckland City Hospital	177	1085	16.3
Middlemore	158	909	17.4
Waikato	103	339	30.4
Rotorua	100	193	51.8
Tauranga	100	308	32.5
Whakatane	41	66	62.1
Gisborne	47	77	61.0
Hastings Memorial	95	278	34.2
Taranaki Base	78	188	41.5
Palmerston North	67	244	27.5
Wanganui	58	105	55.2
Wairarapa Hospital	25	60	41.7
Hutt	123	323	38.1
Wellington	96	504	19.0
Wairau	21	75	28.0
Nelson	42	157	26.8
Grey Base Hospital	16	37	43.2
Christchurch	209	785	26.6
Timaru	45	101	44.6
Dunedin	82	268	30.6
Southland	47	140	33.6
All secondary and tertiary facilities	2139	7439	28.8

Figure 10: Percentage of standard primiparae giving birth vaginally with an intact lower genital tract, by facility of birth (secondary and tertiary facilities), 2009



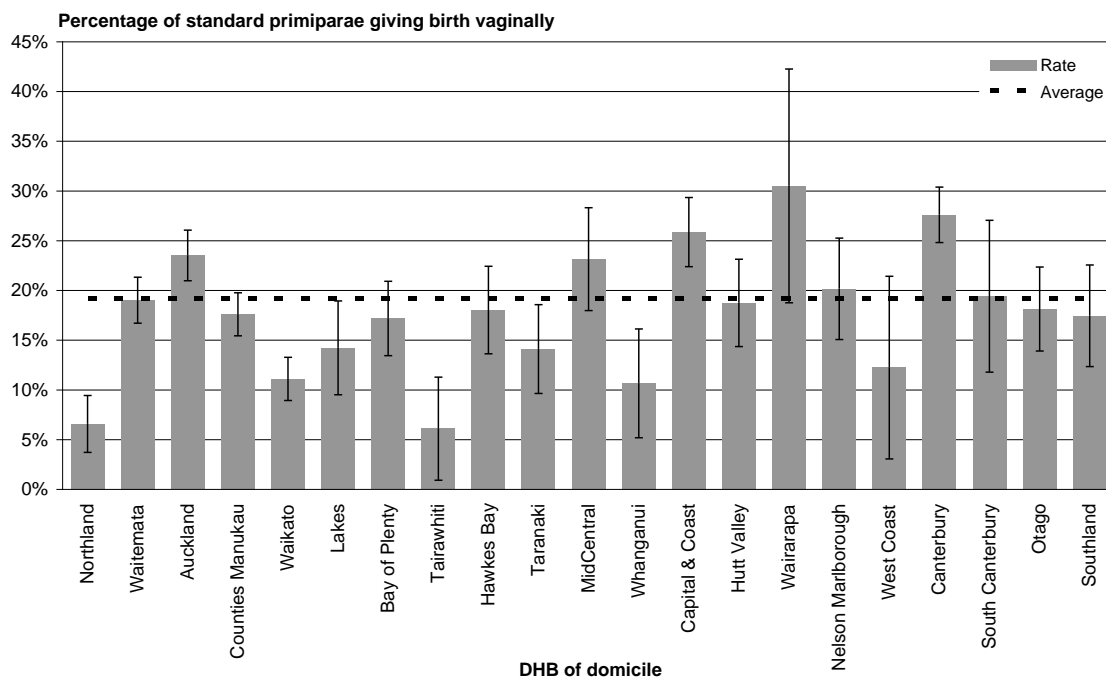
Black line represents average for all secondary and tertiary facilities
 Error bars represent 95% confidence interval

Indicator 6: Episiotomy and no third- or fourth-degree tear among standard primiparae giving birth vaginally, 2009

Table 12: Number and percentage of standard primiparae giving birth vaginally and undergoing episiotomy without mention of third- or fourth-degree tear, by DHB of domicile, 2009

DHB of domicile	Episiotomy without 3rd- or 4th-degree tear	Standard primiparae giving birth vaginally	Rate (%)
Northland	19	289	6.6
Waitemata	212	1115	19.0
Auckland	251	1067	23.5
Counties Manukau	211	1199	17.6
Waikato	89	802	11.1
Lakes	30	211	14.2
Bay of Plenty	67	390	17.2
Tairāwhiti	5	82	6.1
Hawkes Bay	53	294	18.0
Taranaki	33	234	14.1
MidCentral	59	255	23.1
Whanganui	13	122	10.7
Capital & Coast	157	607	25.9
Hutt Valley	57	304	18.8
Wairarapa	18	59	30.5
Nelson Marlborough	48	238	20.2
West Coast	6	49	12.2
Canterbury	273	989	27.6
South Canterbury	20	103	19.4
Otago	58	320	18.1
Southland	37	212	17.5
Unspecified	0	3	
New Zealand	1716	8944	19.2

Figure 11: Percentage of standard primiparae giving birth vaginally and undergoing episiotomy without mention of third- or fourth-degree tear, by DHB of domicile, 2009



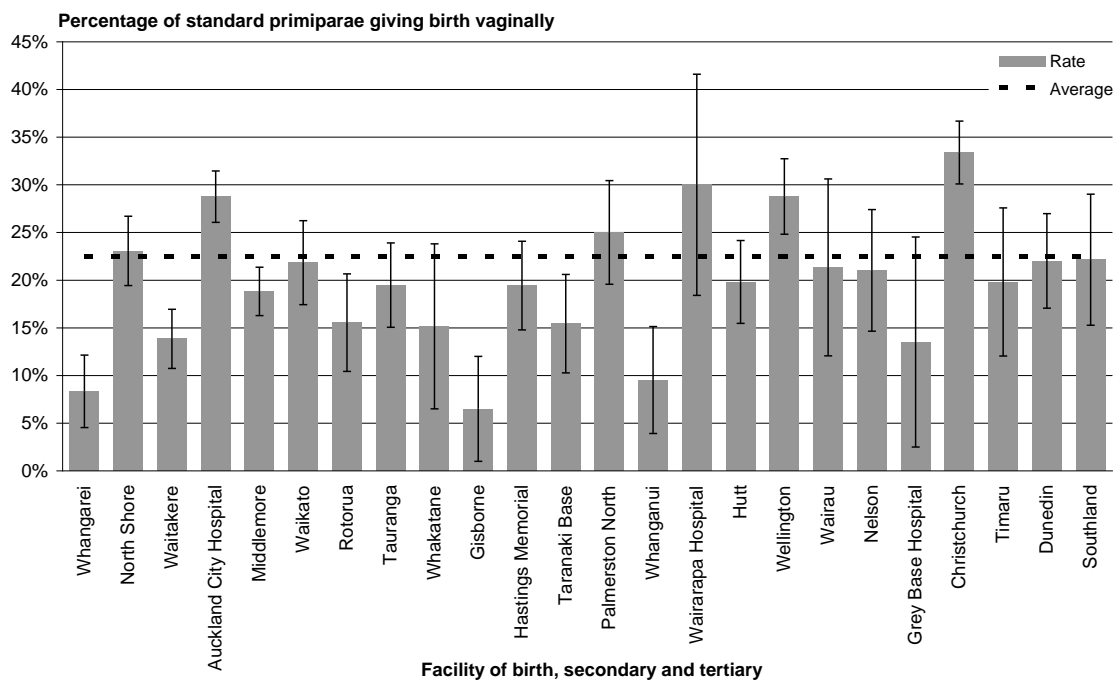
Black line represents national average

Error bars represent 95% confidence interval

Table 13: 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) 2009

Facility	Episiotomy without 3rd- or 4th-degree tear	Standard primiparae giving birth vaginally	Rate (%)
Whangarei	17	204	8.3
North Shore	119	516	23.1
Waitakere	66	477	13.8
Auckland City Hospital	312	1085	28.8
Middlemore	171	909	18.8
Waikato	74	339	21.8
Rotorua	30	193	15.5
Tauranga	60	308	19.5
Whakatane	10	66	15.2
Gisborne	5	77	6.5
Hastings Memorial	54	278	19.4
Taranaki Base	29	188	15.4
Palmerston North	61	244	25.0
Wanganui	10	105	9.5
Wairarapa Hospital	18	60	30.0
Hutt	64	323	19.8
Wellington	145	504	28.8
Wairau	16	75	21.3
Nelson	33	157	21.0
Grey Base Hospital	5	37	13.5
Christchurch	262	785	33.4
Timaru	20	101	19.8
Dunedin	59	268	22.0
Southland	31	140	22.1
All secondary and tertiary facilities	1671	7439	22.5

Figure 12: Percentage of standard primiparae giving birth vaginally and undergoing episiotomy without mention of third- or fourth-degree tear, secondary and tertiary facilities, 2009



Black line represents average for all secondary and tertiary facilities

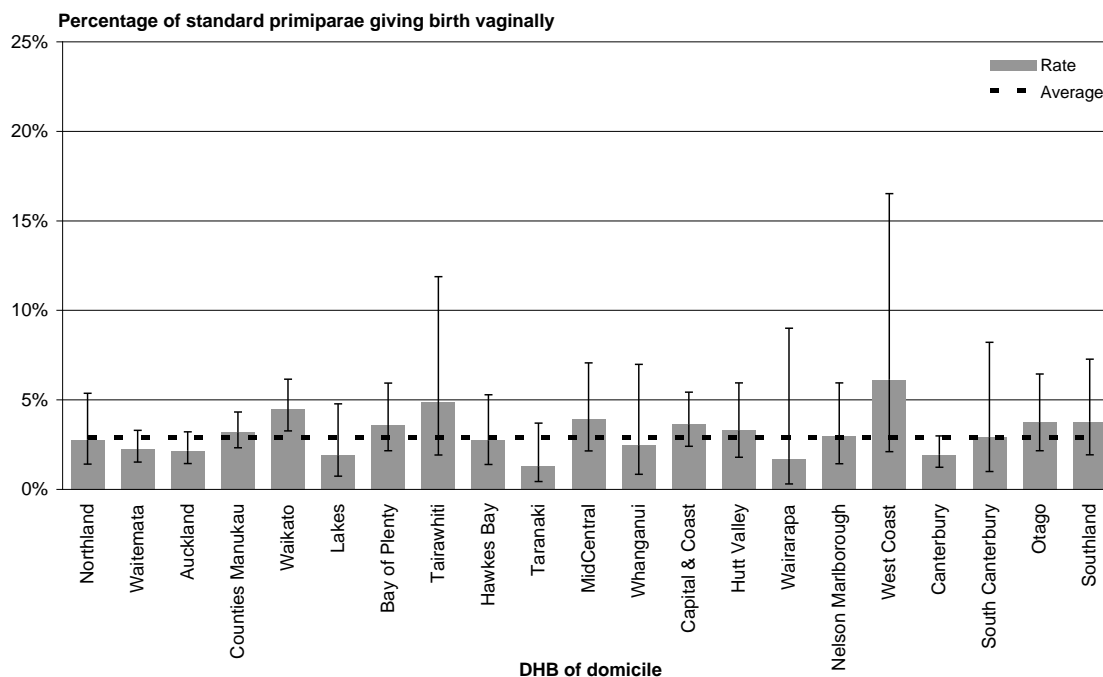
Error bars represent 95% confidence interval

Indicator 7: Third- or fourth-degree tear and no episiotomy among standard primiparae giving birth vaginally, 2009

Table 14: Number and percentage of standard primiparae giving birth vaginally sustaining a third- or fourth-degree tear and not undergoing episiotomy, by DHB of domicile, 2009

DHB of domicile	3rd- or 4th-degree tear without episiotomy	Standard primiparae giving birth vaginally	Rate (%)
Northland	8	289	2.8
Waitemata	25	1115	2.2
Auckland	23	1067	2.2
Counties Manukau	38	1199	3.2
Waikato	36	802	4.5
Lakes	4	211	1.9
Bay of Plenty	14	390	3.6
Tairāwhiti	4	82	4.9
Hawkes Bay	8	294	2.7
Taranaki	3	234	1.3
MidCentral	10	255	3.9
Whanganui	3	122	2.5
Capital & Coast	22	607	3.6
Hutt Valley	10	304	3.3
Wairarapa	1	59	1.7
Nelson Marlborough	7	238	2.9
West Coast	3	49	6.1
Canterbury	19	989	1.9
South Canterbury	3	103	2.9
Otago	12	320	3.8
Southland	8	212	3.8
Unspecified	0	3	
New Zealand	261	8944	2.9

Figure 13: Percentage of standard primiparae giving birth vaginally sustaining a third- or fourth-degree tear and not undergoing episiotomy, by DHB of domicile, 2009



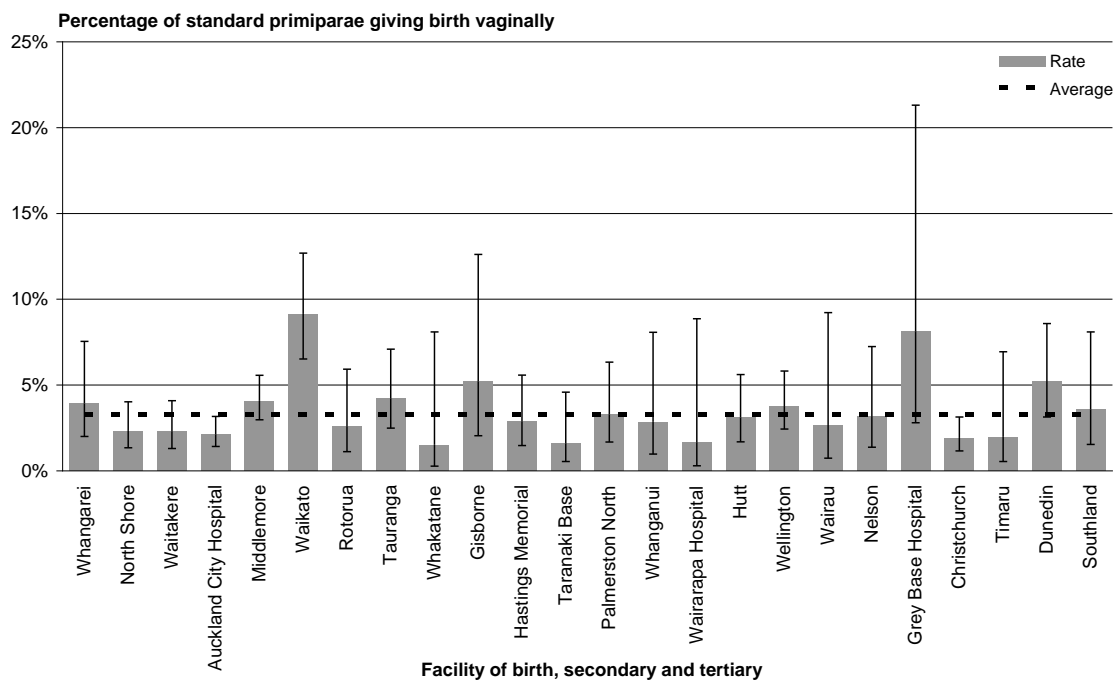
Black line represents national average

Error bars represent 95% confidence interval

Table 15: 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), 2009

Facility	3rd- or 4th-degree tear without episiotomy	Standard primiparae giving birth vaginally	Rate (%)
Whangarei	8	204	3.9
North Shore	12	516	2.3
Waitakere	11	477	2.3
Auckland City Hospital	23	1085	2.1
Middlemore	37	909	4.1
Waikato	31	339	9.1
Rotorua	5	193	2.6
Tauranga	13	308	4.2
Whakatane	1	66	1.5
Gisborne	4	77	5.2
Hastings Memorial	8	278	2.9
Taranaki Base	3	188	1.6
Palmerston North	8	244	3.3
Wanganui	3	105	2.9
Wairarapa Hospital	1	60	1.7
Hutt	10	323	3.1
Wellington	19	504	3.8
Wairau	2	75	2.7
Nelson	5	157	3.2
Grey Base Hospital	3	37	8.1
Christchurch	15	785	1.9
Timaru	2	101	2.0
Dunedin	14	268	5.2
Southland	5	140	3.6
All secondary and tertiary facilities	243	7439	3.3

Figure 14: Percentage of standard primiparae giving birth vaginally sustaining a third- or fourth-degree tear and not undergoing episiotomy, secondary and tertiary facilities, 2009



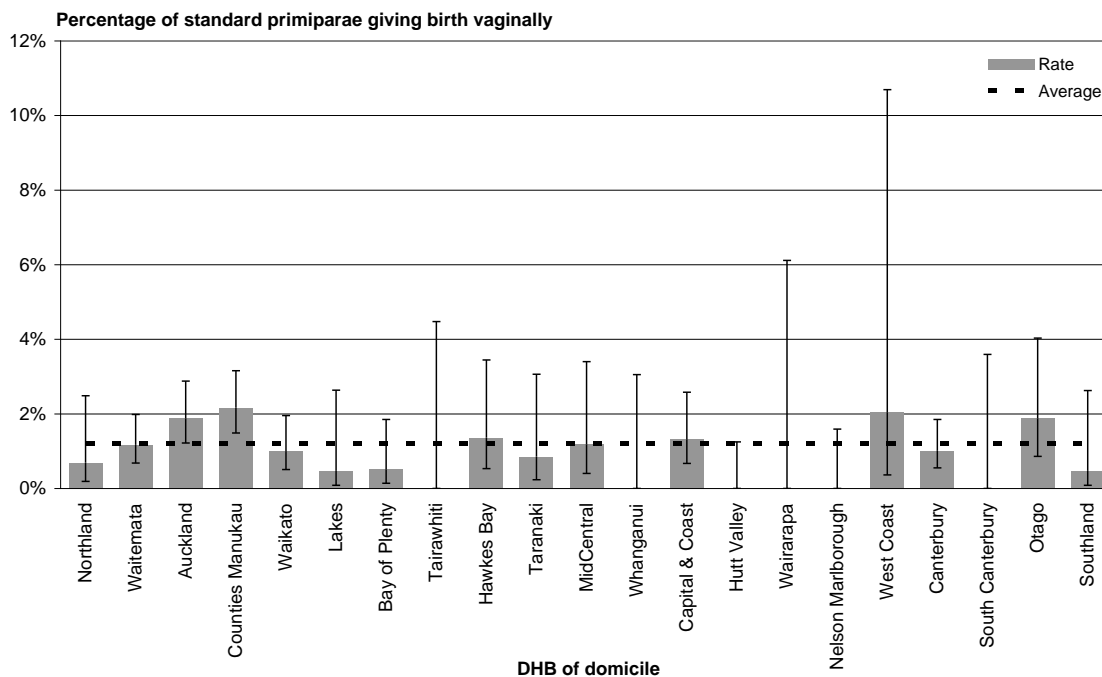
Black line represents average for all secondary and tertiary facilities
 Error bars represent 95% confidence interval

Indicator 8: Episiotomy and third- or fourth-degree tear among standard primiparae giving birth vaginally, 2009

Table 16: Number and percentage of standard primiparae giving birth vaginally undergoing episiotomy and sustaining a third- or fourth-degree tear, by DHB of domicile, 2009

DHB of domicile	Episiotomy with 3rd- or 4th-degree tear	Standard primiparae giving birth vaginally	Rate (%)
Northland	2	289	0.7
Waitemata	13	1115	1.2
Auckland	20	1067	1.9
Counties Manukau	26	1199	2.2
Waikato	8	802	1.0
Lakes	1	211	0.5
Bay of Plenty	2	390	0.5
Tairāwhiti	0	82	
Hawkes Bay	4	294	1.4
Taranaki	2	234	0.9
MidCentral	3	255	1.2
Whanganui	0	122	
Capital & Coast	8	607	1.3
Hutt Valley	0	304	
Wairarapa	0	59	
Nelson Marlborough	0	238	
West Coast	1	49	2.0
Canterbury	10	989	1.0
South Canterbury	0	103	
Otago	6	320	1.9
Southland	1	212	0.5
Unspecified	0	3	
New Zealand	107	8944	1.2

Figure 15: Percentage of standard primiparae giving birth vaginally undergoing episiotomy and sustaining a third- or fourth-degree tear, by DHB of domicile, 2009



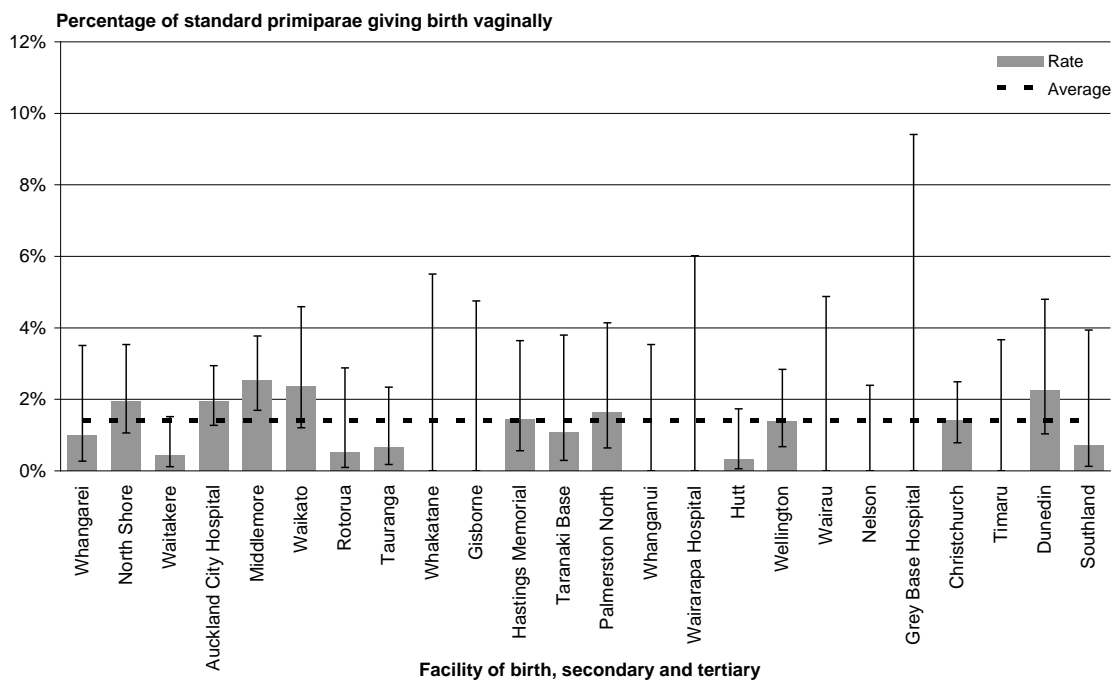
Black line represents national average

Error bars represent 95% confidence interval

Table 17: 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), 2009

Facility	Episiotomy with 3rd- or 4th- degree tear	Standard primiparae giving birth vaginally	Rate (%)
Whangarei	2	204	1.0
North Shore	10	516	1.9
Waitakere	2	477	0.4
Auckland City Hospital	21	1085	1.9
Middlemore	23	909	2.5
Waikato	8	339	2.4
Rotorua	1	193	0.5
Tauranga	2	308	0.6
Whakatane	0	66	
Gisborne	0	77	
Hastings Memorial	4	278	1.4
Taranaki Base	2	188	1.1
Palmerston North	4	244	1.6
Wanganui	0	105	
Wairarapa Hospital	0	60	
Hutt	1	323	0.3
Wellington	7	504	1.4
Wairau	0	75	
Nelson	0	157	
Grey Base Hospital	0	37	
Christchurch	11	785	1.4
Timaru	0	101	
Dunedin	6	268	2.2
Southland	1	140	0.7
All secondary and tertiary facilities	105	7439	1.4

Figure 16: Percentage of standard primiparae giving birth vaginally undergoing episiotomy and sustaining a third- or fourth-degree tear, secondary and tertiary facilities, 2009



Black line represents average for all secondary and tertiary facilities
 Error bars represent 95% confidence interval

Indicator 9: rate of general anaesthetic for women giving birth by Caesarean section, 2009

Rationale and purpose

Although the risks of general anaesthesia for Caesarean section have reduced greatly in recent decades, regional anaesthesia is still safer than general anaesthesia 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 anaesthesia because of factors such as patient preference, as well as some high-risk cases (such as pre-eclampsia) where only general anaesthesia can be used. General anaesthesia is more likely to be used when Caesarean sections are done urgently, which can be related to the configuration and organisation of obstetric and anaesthetic services (eg, whether a specialist anaesthetist is on site) or to the level of antenatal care received.

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

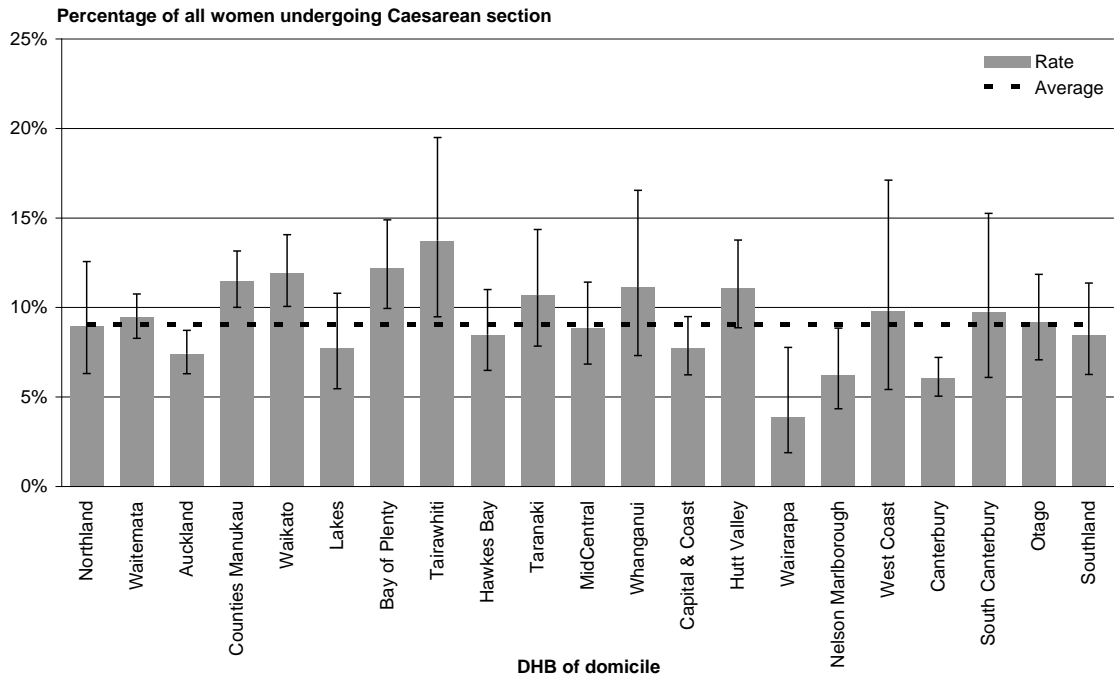
Comment on data for 1 January–30 December 2009

All DHBs should review their rates of general anaesthetic for Caesarean section and consider the impact of the ratio between acute and elective Caesarean section rates. The reasons for higher rates of general anaesthetic for acute Caesarean sections should be investigated further.

Table 18: Number and percentage of women undergoing a Caesarean section under general anaesthetic, by DHB of domicile, 2009

DHB of domicile	General anaesthetic	All Caesarean sections	Rate (%)
Northland	29	324	9.0
Waitemata	202	2140	9.4
Auckland	134	1806	7.4
Counties Manukau	181	1576	11.5
Waikato	120	1007	11.9
Lakes	30	389	7.7
Bay of Plenty	82	672	12.2
Tairāwhiti	25	182	13.7
Hawke's Bay	50	590	8.5
Taranaki	37	347	10.7
MidCentral	53	598	8.9
Whanganui	20	180	11.1
Capital & Coast	80	1038	7.7
Hutt Valley	70	632	11.1
Wairarapa	7	181	3.9
Nelson Marlborough	28	450	6.2
West Coast	10	102	9.8
Canterbury	113	1871	6.0
South Canterbury	16	164	9.8
Otago	52	566	9.2
Southland	39	461	8.5
Unspecified	0	8	
New Zealand	1378	15,284	9.0

Figure 17: Percentage of women undergoing a caesarean section under general anaesthetic, by DHB of domicile, 2009

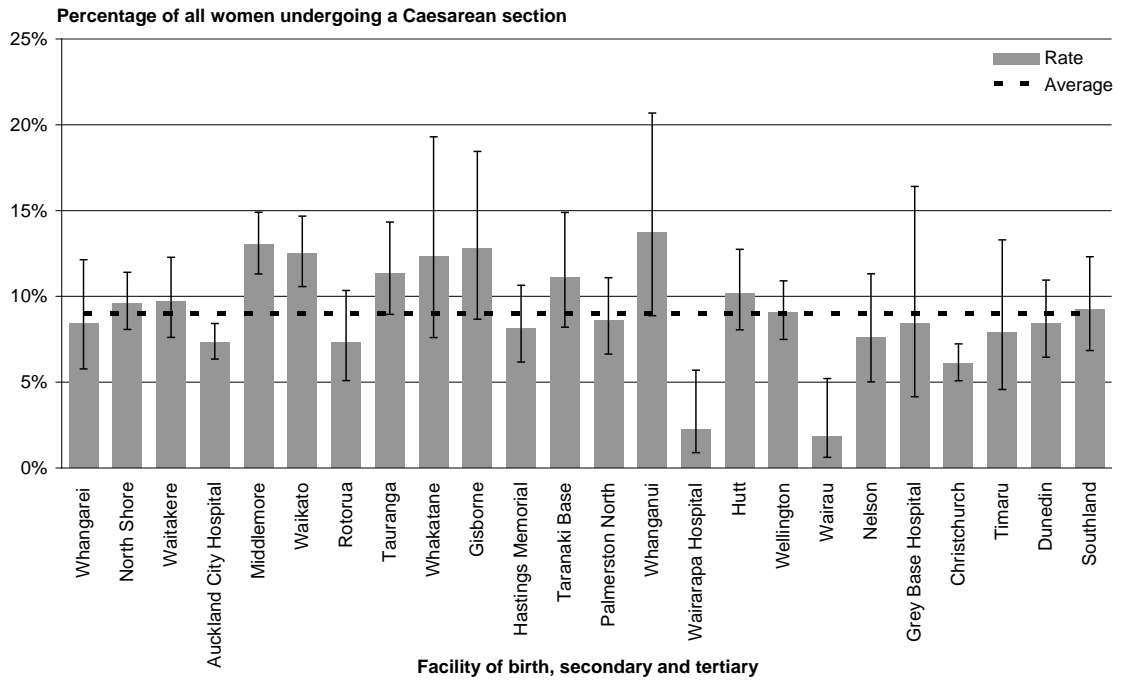


Black line represents national average
 Error bars represent 95% confidence interval

Table 19: Number and percentage of women undergoing a Caesarean section under general anaesthetic, by facility of birth (secondary and tertiary facilities), 2009

Facility	General anaesthetic	All Caesarean sections	Rate (%)
Whangarei Area Hospital	25	297	8.4
North Shore	116	1208	9.6
Waitakere	60	619	9.7
Auckland City Hospital	177	2421	7.3
Middlemore	174	1339	13.0
Waikato	124	994	12.5
Rotorua	28	384	7.3
Tauranga	61	537	11.4
Whakatane	15	122	12.3
Gisborne	23	180	12.8
Hastings Memorial	47	578	8.1
Taranaki Base	38	342	11.1
Palmerston North	53	616	8.6
Whanganui	18	131	13.7
Wairarapa Hospital	4	176	2.3
Hutt	65	640	10.2
Wellington	99	1094	9.0
Wairau	3	165	1.8
Nelson	21	277	7.6
Grey Base Hospital	7	83	8.4
Christchurch	115	1896	6.1
Timaru	12	152	7.9
Dunedin	50	593	8.4
Southland	40	434	9.2
All secondary and tertiary facilities	1375	15,278	9.0

Figure 18: Percentage of women undergoing a Caesarean section under general anaesthetic, secondary and tertiary facilities, 2009



Black line represents average for all secondary and tertiary facilities
 Error bars represent 95% confidence interval

Indicators 10–11: 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 percent of vaginal births [and] 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 the birth. This measurement is also not without difficulties, as there may be different tolerances for when a blood transfusion is required and refusal of blood transfusion due to religious or other beliefs. However, as a broad measure of excessive blood loss and potential long-term morbidity due to that blood loss, it is considered by many to be a useful measure of severe, life-threatening, post-partum haemorrhage.

This indicator aims to provide maternity services with an indicator of significant blood loss that will stimulate further investigation of risk-screening strategies and the clinical management of the birth process. National benchmarking will encourage clinicians to investigate prevention and management strategies used in services that have significantly lower rates (adapted from Women’s Hospitals Australasia 2007, p.104).

Comment on data for 1 January–30 December 2009

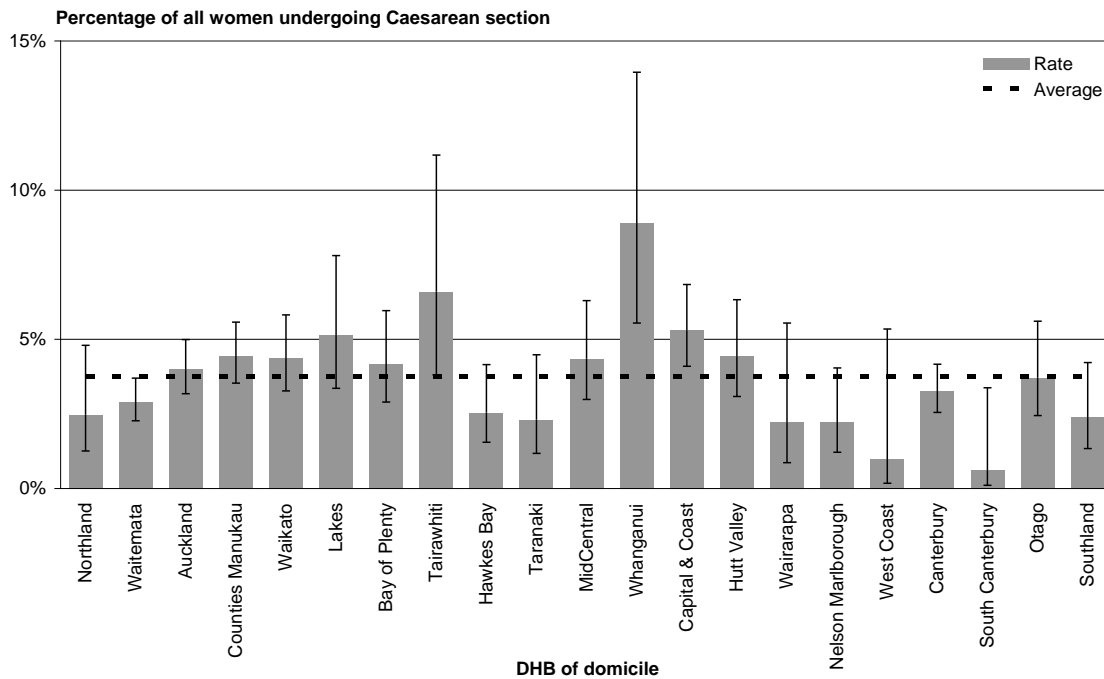
Overall, rates of blood transfusion are low and there is relatively low variation, although the range is greater for Caesarean sections. DHBs should investigate the reasons behind the greater variation in rates of blood transfusion for Caesarean section. Because this indicator is a marker for PPH, the focus should not be on changing this indicator in isolation but on understanding and addressing the underlying causes.

Indicator 10: Rate of blood transfusion during birth admission for caesarean section delivery, 2009

Table 20: Number and percentage of women giving birth by caesarean section and undergoing blood transfusion during birth admission, by DHB of domicile, 2009

DHB of domicile	Blood transfusions	All Caesarean sections	Rate (%)
Northland	8	324	2.5
Waitemata	62	2140	2.9
Auckland	72	1806	4.0
Counties Manukau	70	1576	4.4
Waikato	44	1007	4.4
Lakes	20	389	5.1
Bay of Plenty	28	672	4.2
Tairāwhiti	12	182	6.6
Hawke's Bay	15	590	2.5
Taranaki	8	347	2.3
MidCentral	26	598	4.3
Whanganui	16	180	8.9
Capital & Coast	55	1038	5.3
Hutt Valley	28	632	4.4
Wairarapa	4	181	2.2
Nelson Marlborough	10	450	2.2
West Coast	1	102	1.0
Canterbury	61	1871	3.3
South Canterbury	1	164	0.6
Otago	21	566	3.7
Southland	11	461	2.4
Unspecified	0	8	
New Zealand	573	15,284	3.7

Figure 19: Percentage of women giving birth by Caesarean section and undergoing blood transfusion during birth admission, by DHB of domicile, 2009



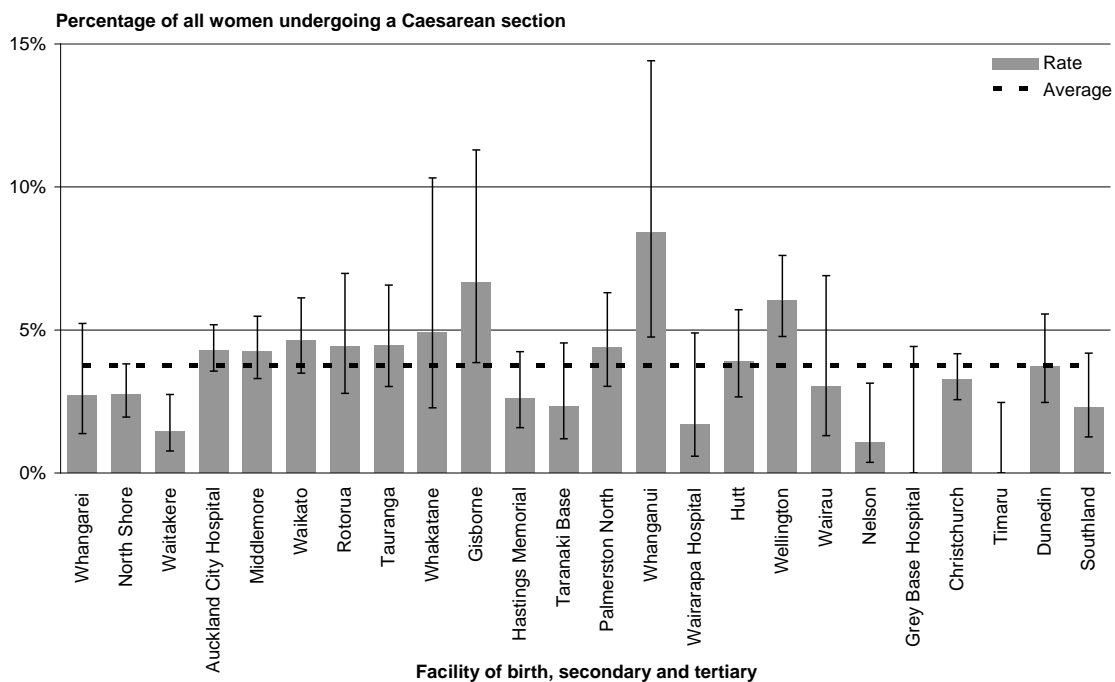
Black line represents national average

Error bars represent 95% confidence interval

Table 21: 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), 2009

Facility	Blood transfusions	All Caesarean sections	Rate (%)
Whangarei Area Hospital	8	297	2.7
North Shore	33	1208	2.7
Waitakere	9	619	1.5
Auckland City Hospital	104	2421	4.3
Middlemore	57	1339	4.3
Waikato	46	994	4.6
Rotorua	17	384	4.4
Tauranga	24	537	4.5
Whakatane	6	122	4.9
Gisborne	12	180	6.7
Hastings Memorial	15	578	2.6
Taranaki Base	8	342	2.3
Palmerston North	27	616	4.4
Whanganui	11	131	8.4
Wairarapa Hospital	3	176	1.7
Hutt	25	640	3.9
Wellington	66	1094	6.0
Wairau	5	165	3.0
Nelson	3	277	1.1
Grey Base Hospital	0	83	
Christchurch	62	1896	3.3
Timaru	0	152	
Dunedin	22	593	3.7
Southland	10	434	2.3
All secondary and tertiary facilities	573	15,278	3.8

Figure 20: Percentage of women giving birth by Caesarean section and undergoing blood transfusion during birth admission, secondary and tertiary facilities, 2009



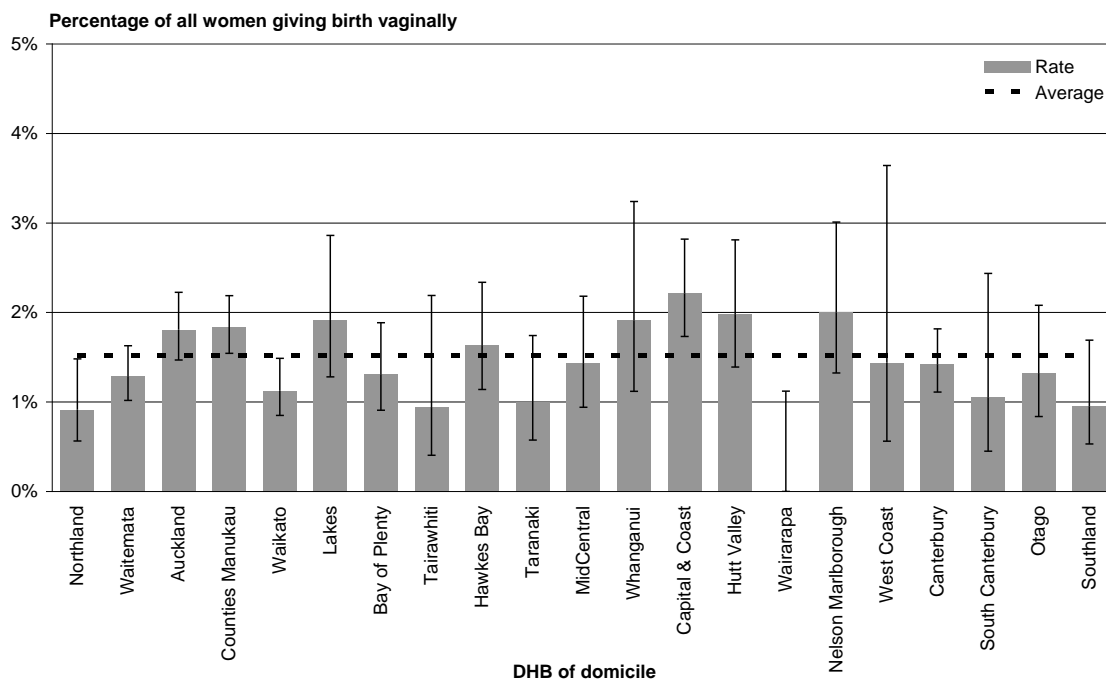
Black line represents average for all secondary and tertiary facilities
 Error bars represent 95% confidence interval

Indicator 11: Rate of blood transfusion during birth admission for vaginal birth, 2009

Table 22: Number and percentage of women giving birth vaginally and undergoing blood transfusion during birth admission, by DHB of domicile, 2009

DHB of domicile	Blood transfusions	All vaginal births	Rate (%)
Northland	16	1750	0.9
Waitemata	68	5284	1.3
Auckland	87	4811	1.8
Counties Manukau	124	6748	1.8
Waikato	48	4270	1.1
Lakes	23	1200	1.9
Bay of Plenty	28	2140	1.3
Tairāwhiti	5	530	0.9
Hawke's Bay	29	1775	1.6
Taranaki	12	1199	1.0
MidCentral	21	1465	1.4
Whanganui	13	681	1.9
Capital & Coast	63	2849	2.2
Hutt Valley	30	1516	2.0
Wairarapa	0	339	
Nelson Marlborough	22	1100	2.0
West Coast	4	278	1.4
Canterbury	62	4363	1.4
South Canterbury	5	476	1.1
Otago	18	1362	1.3
Southland	11	1160	0.9
Unspecified	0	12	
New Zealand	689	45,308	1.5

Figure 21: Percentage of women giving birth vaginally and undergoing blood transfusion during birth admission, by DHB of domicile, 2009



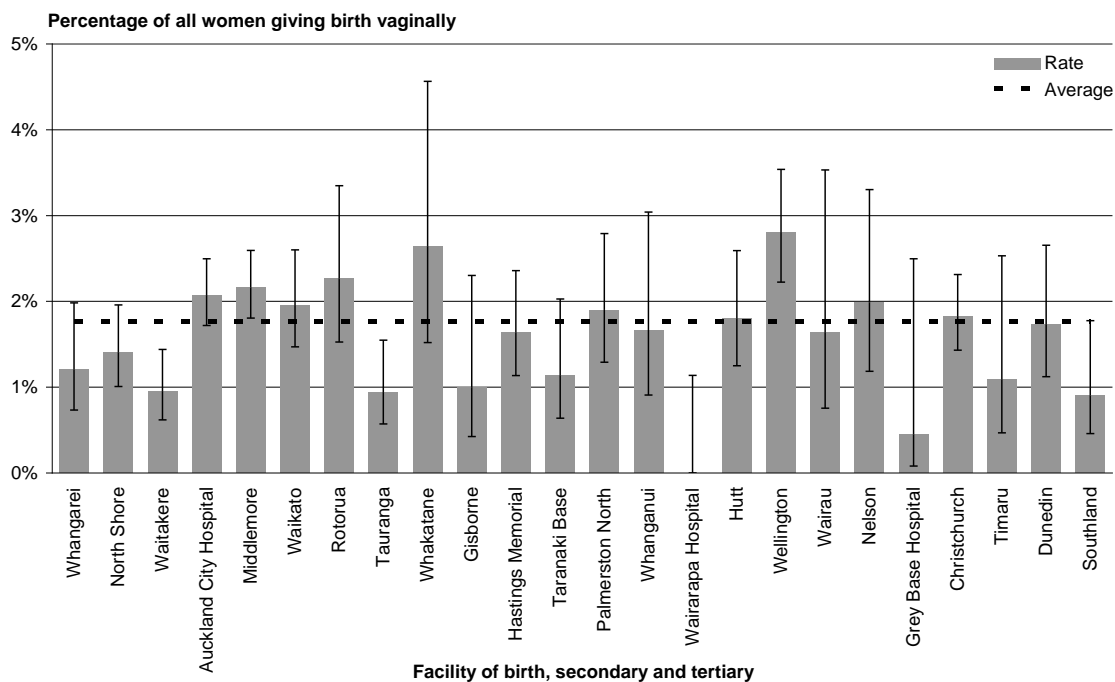
Black line represents national average

Error bars represent 95% confidence interval

Table 23: Number and percentage of women giving birth vaginally and undergoing blood transfusion during birth admission, secondary and tertiary facilities, 2009

Facility	Blood transfusions	All vaginal births	Rate (%)
Whangarei Area Hospital	15	1243	1.2
North Shore	34	2418	1.4
Waitakere	21	2224	0.9
Auckland City Hospital	108	5214	2.1
Middlemore	114	5269	2.2
Waikato	46	2352	2.0
Rotorua	24	1060	2.3
Tauranga	15	1594	0.9
Whakatane	12	454	2.6
Gisborne	5	504	1.0
Hastings Memorial	28	1710	1.6
Taranaki Base	11	966	1.1
Palmerston North	25	1316	1.9
Whanganui	10	600	1.7
Wairarapa Hospital	0	334	
Hutt	28	1554	1.8
Wellington	69	2458	2.8
Wairau	6	366	1.6
Nelson	14	706	2.0
Grey Base Hospital	1	223	0.4
Christchurch	65	3572	1.8
Timaru	5	458	1.1
Dunedin	20	1158	1.7
Southland	8	885	0.9
All secondary and tertiary facilities	684	38,638	1.8

Figure 22: Percentage of women giving birth vaginally and undergoing blood transfusion during birth admission, secondary and tertiary facilities, 2009



Black line represents average for all secondary and tertiary facilities
 Error bars represent 95% confidence interval

Indicator 12: rate of premature birth

Rationale and purpose

Premature birth is a significant contributor to perinatal mortality and neonatal morbidity, especially for those born under 32 weeks' gestation. Moderate prematurity from 32 to 36 weeks' gestation makes up between 5 and 7 percent of births and may be under-recognised as a contributor to neonatal morbidity. Spontaneous preterm birth, premature rupture of membranes, multiple pregnancy and pregnancy-induced hypertension are the most common causes for premature birth in this group. Reporting on premature births between 32 and 36 weeks of pregnancy provides a baseline for further reporting on perinatal and neonatal infant outcomes.

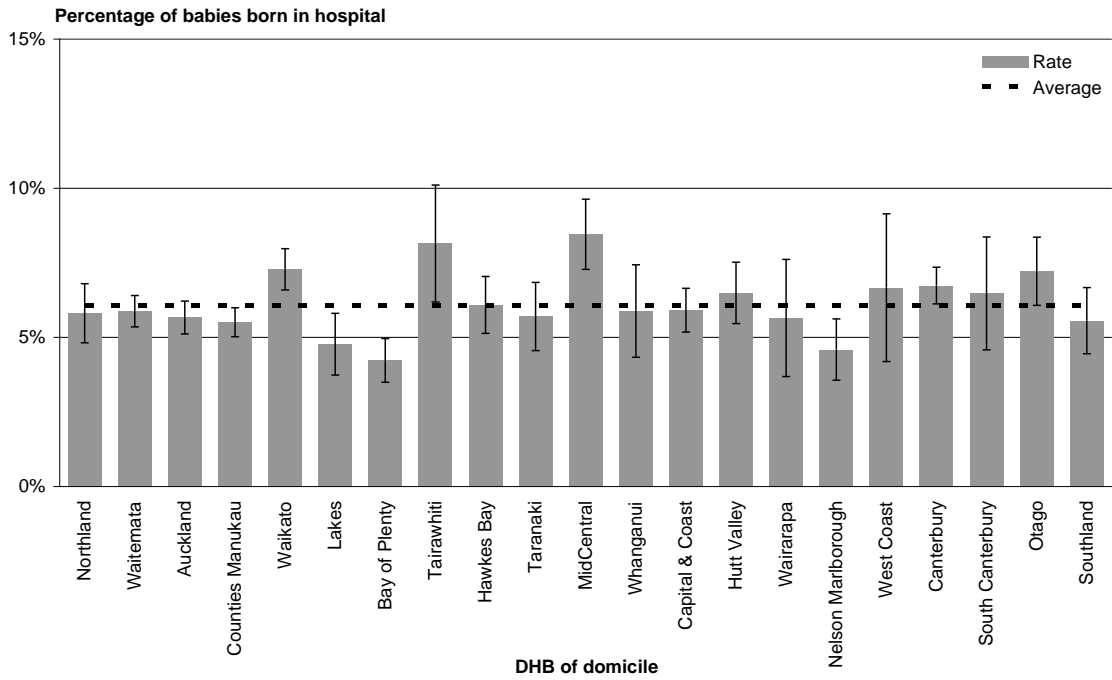
Comment on data for 1 January–30 December 2009

There is some variation in rates of premature birth across DHBs. All DHBs should consider their outcomes in the context of their population demographics.

Table 24: Percentage of premature births, by DHB of domicile, 2009

DHB of domicile	Babies born at 32–36 weeks' gestation	All babies born in hospital	Rate (%)
Northland	124	2135	5.8
Waitemata	452	7691	5.9
Auckland	383	6760	5.7
Counties Manukau	471	8554	5.5
Waikato	392	5386	7.3
Lakes	78	1635	4.8
Bay of Plenty	122	2887	4.2
Tairāwhiti	61	749	8.1
Hawke's Bay	147	2415	6.1
Taranaki	90	1579	5.7
MidCentral	182	2153	8.5
Whanganui	52	884	5.9
Capital & Coast	234	3960	5.9
Hutt Valley	143	2204	6.5
Wairarapa	30	531	5.6
Nelson Marlborough	73	1591	4.6
West Coast	26	390	6.7
Canterbury	432	6414	6.7
South Canterbury	42	649	6.5
Otago	142	1969	7.2
Southland	91	1637	5.6
Unspecified	4	28	14.3
New Zealand	3771	62,201	6.1

Figure 23: Percentage of premature births, by DHB of domicile, 2009

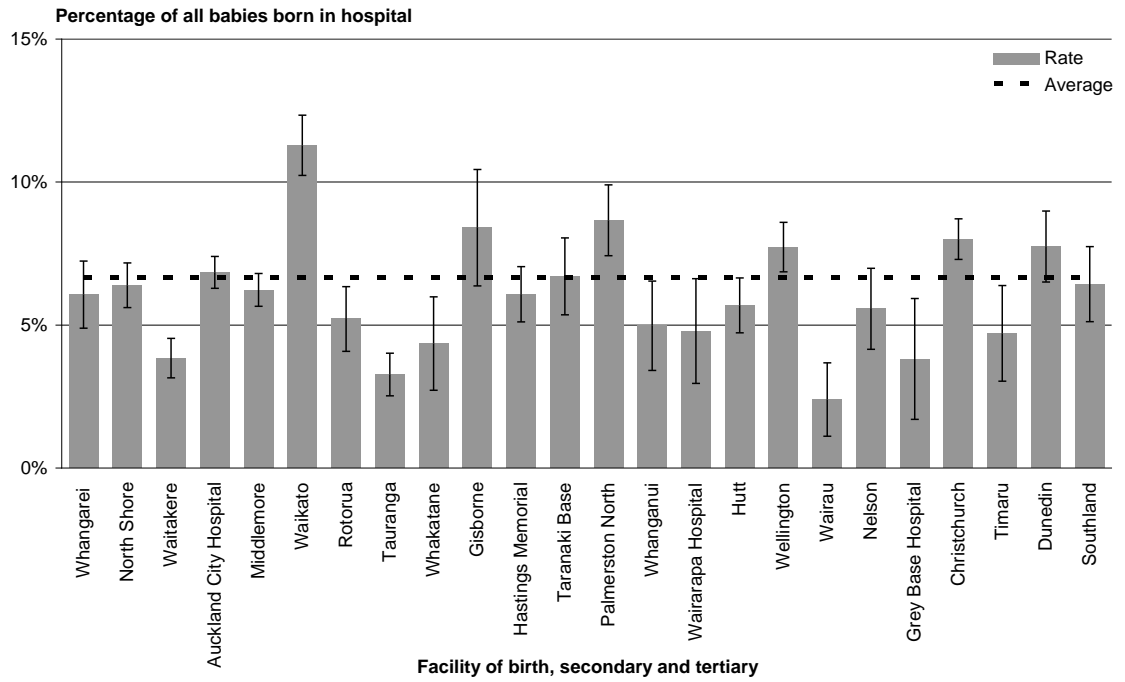


Black line represents national average
 Error bars represent 95% confidence interval

Table 25: Percentage of premature births, secondary and tertiary facilities, 2009

Facility	Babies born at 32–36 weeks' gestation	All babies born in hospital	Rate (%)
Whangarei	96	1584	6.1
North Shore	240	3757	6.4
Waitakere	114	2968	3.8
Auckland City Hospital	535	7823	6.8
Middlemore	425	6828	6.2
Waikato	390	3457	11.3
Rotorua	77	1478	5.2
Tauranga	71	2174	3.3
Whakatane	26	598	4.3
Gisborne	60	714	8.4
Hastings Memorial	142	2338	6.1
Taranaki Base	89	1328	6.7
Palmerston North	172	1986	8.7
Whanganui	37	744	5.0
Wairarapa Hospital	25	522	4.8
Hutt	127	2234	5.7
Wellington	281	3638	7.7
Wairau	13	544	2.4
Nelson	56	1006	5.6
Grey Base Hospital	12	315	3.8
Christchurch	449	5611	8.0
Timaru	29	616	4.7
Dunedin	138	1782	7.7
Southland	86	1338	6.4
All secondary and tertiary facilities	3690	55,383	6.7

Figure 24: Percentage of premature births, secondary and tertiary facilities, 2009



Black line represents average for all secondary and tertiary facilities
 Error bars represent 95% confidence interval

References

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Australian Council on Healthcare Standards. 2011. *Clinical Indicator Program Information 2011*. Ultimo, NSW: Australian Council on Healthcare Standards. Available from: <http://www.achs.org.au>

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Appendices

Appendix 1: Technical notes

Clinical codes and definitions

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

- aged between 20 and 34 (inclusive) at delivery
- pregnant with a single baby presenting in labour in cephalic position (Tables A1, A2)
- have no known prior pregnancy of 20-plus weeks' gestation
- have no recorded obstetric complications in the present pregnancy that are indications for specific obstetric interventions (Table A4)
- deliver a live or stillborn baby at term gestation: 37 to 41 weeks inclusive (Table A3).

Table A1: 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
3047004	Breech extraction with forceps to after-coming head
O640–O649	Labour and delivery affected by malposition and malpresentation of fetus

Table A2: 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 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

Table A4: Obstetric complications exclusion criteria

Clinical code (ICD-10-AM)	Description
O100–O16	Hypertension, proteinuria, pre-eclampsia, eclampsia
O240–O249	Diabetes mellitus
O360, O361, O363, O364, O365	Known or suspected fetal problems
O411, O420–O429	Infection 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), identified by the presence of a spontaneous vaginal birth clinical code with no concurrent instrumental/caesarean section code (Table A5). These may include births where labour has been induced or augmented.

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 (Table A5). Failed trial of forceps or vacuum extraction are excluded (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 includes emergency and elective, lower segment and classical, and it is identified by the presence of any caesarean section clinical code (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 (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 (ARM)
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 unspecified degree) (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 (Table A8).

Third- and fourth-degree tear: a third- or fourth-degree perineal laceration during birth, identified by the presence of a third or fourth degree of tear clinical code (Table A8).

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, unspecified

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

Table A9: General anaesthetic procedure codes

Clinical code (ICD-10-AM)	Description
92514XX	General anaesthesia

Blood transfusion during birth admission: identified by clinical codes for selected blood transfusion procedures.

Premature birth: the birth of a baby born between 32 weeks 0 days and 36 weeks 6 days gestation.

Other technical notes

Facility graphs: all facility graphs in this report present maternity events occurring in secondary and tertiary hospitals only. The aim of this is to enable the comparison of deliveries or births for which clinicians have access to similar clinical facilities and interventions. Indicators for DHBs include data for all facilities, including primary facilities. Data for individual primary facilities is provided in the appendix tables. Care should be taken when making comparisons, because many primary units have only a small number of maternity events, meaning that in many cases differences between rates will not be statistically significant.

Presentation of confidence intervals: the error bars on the charts in this document represent 95 percent confidence intervals for the sample proportion, which have been calculated using the Wilson score (see Newcombe RG, 1998, Two-sided confidence intervals for the single proportion: Comparison of seven methods, *Statistics in Medicine* 17: 857–72).

Presentation of Southern DHB data: as of May 2010, Otago and Southland DHBs were merged into a single entity (Southern DHB). Southern DHB began reporting to the Ministry of Health National Collections in 2011. For this report, which presents 2009 data, Otago and Southland are presented separately as this represents the service provision model at the time of the events.

Christchurch and Christchurch Women's data merge: 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 this report, Christchurch Women's Hospital and Christchurch Hospital events are summed.

Appendix 2: Secondary and tertiary facilities

Facility	All vaginal births (N)	Standard primiparae (N)	Standard primiparae giving birth vaginally (spontaneous or instrumental) (N)	All Caesarean sections	Spontaneous vaginal birth among standard primiparae	Induction of labour among standard primiparae	Instrumental vaginal births among std primiparae	Standard primiparae giving birth by Caesarean section	Standard primiparae giving birth vaginally with an intact lower genital tract	Standard primiparae giving birth vaginally and undergoing an episiotomy with no third- or fourth-degree tear	Standard primiparae giving birth vaginally experiencing a tear with no episiotomy	Standard primiparae giving birth vaginally experiencing a third- or fourth-degree tear and undergoing an episiotomy	Women giving birth by Caesarean section and undergoing general anaesthetic	Women giving birth vaginally and receiving a blood transfusion during birth admission	Women giving birth by Caesarean section and receiving a blood transfusion during birth admission	All babies born in hospital	Babies born between 32 weeks and 36 weeks 6 days
Auckland City Hospital	5214	1334	1085	2421	827	118	258	247	177	312	23	21	177	108	104	7823	535
Christchurch	3572	1010	785	1896	513	46	272	219	209	262	15	11	115	65	62	5611	449
Dunedin	1158	341	268	593	207	14	61	68	82	59	14	6	50	20	22	1782	138
Gisborne	504	90	77	180	67	2	10	13	47	5	4	0	23	5	12	714	60
Grey Base Hospital	223	49	37	83	30	5	7	12	16	5	3	0	7	1	0	315	12
Hastings Memorial	1710	341	278	578	230	14	48	61	95	54	8	4	47	28	15	2338	142
Hutt	1554	419	323	640	281	12	42	95	123	64	10	1	65	28	25	2234	127
Middlemore	5269	1060	909	1339	749	25	160	141	158	171	37	23	174	114	57	6828	425
Nelson	706	191	157	277	134	7	23	34	42	33	5	0	21	14	3	1006	56
North Shore	2418	701	516	1208	402	37	114	158	146	119	12	10	116	34	33	3757	240
Palmerston North	1316	308	244	616	198	7	46	64	67	61	8	4	53	25	27	1986	172
Rotorua	1060	221	193	384	170	9	23	27	100	30	5	1	28	24	17	1478	77
Southland	885	183	140	434	104	25	36	43	47	31	5	1	40	8	10	1338	86
Taranaki Base	966	228	188	342	167	8	21	40	78	29	3	2	38	11	8	1328	89
Tauranga	1594	357	308	537	261	15	47	49	100	60	13	2	61	15	24	2174	71
Timaru	458	119	101	152	93	3	8	17	45	20	2	0	12	5	0	616	29
Waikato	2352	406	339	994	242	25	97	66	103	74	31	8	124	46	46	3457	390
Wairarapa Hospital	334	84	60	176	48	4	12	24	25	18	1	0	4	0	3	522	25
Wairau	366	101	75	165	69	6	6	26	21	16	2	0	3	6	5	544	13
Waitakere	2224	598	477	619	415	11	62	81	180	66	11	2	60	21	9	2968	114
Whanganui	600	118	105	131	93	2	12	13	58	10	3	0	18	10	11	744	37
Wellington	2458	596	504	1094	404	47	100	91	96	145	19	7	99	69	66	3638	281
Whakatane	454	80	66	122	60	0	6	14	41	10	1	0	15	12	6	598	26
Whangarei Area Hospital	1243	240	204	297	177	8	27	36	83	17	8	2	25	15	8	1584	96

Appendix 3: Primary facilities

Facility	All vaginal births (N)	Standard primiparae (N)	Standard primiparae giving birth vaginally (spontaneous or instrumental) (N)	All Caesarean sections	Spontaneous vaginal birth among standard primiparae	Induction of labour among standard primiparae	Instrumental vaginal births among std primiparae	Standard primiparae giving birth by Caesarean section	Standard primiparae giving birth vaginally with an intact lower genital tract	Standard primiparae giving birth vaginally and undergoing an episiotomy with no third- or fourth-degree tear	Standard primiparae giving birth vaginally experiencing a tear with no episiotomy	Standard primiparae giving birth vaginally experiencing a third- or fourth-degree tear and undergoing an episiotomy	Women giving birth by Caesarean section and undergoing general anaesthetic	Women giving birth vaginally and receiving a blood transfusion during birth admission	Women giving birth by Caesarean section and receiving a blood transfusion during birth admission	All babies born in hospital	Babies born between 32 weeks and 36 weeks 6 days
Ashburton	131	33	33	2	32	0	1	0	18	0	1	0	2	0	0	135	4
Bay of Islands	222	38	38	0	38	0	0	0	27	1	0	0	0	1	0	233	3
Birthcare Huntly	175	23	23	0	23	0	0	0	23	0	0	0	0	0	0	177	2
Birthcare Parnell	390	127	127	0	127	0	0	0	126	0	1	0	0	0	0	400	1
Botany Downs Maternity Hospital	349	61	61	0	61	0	0	0	22	4	0	0	0	1	0	359	2
Buller	19	4	4	0	4	0	0	0	4	0	0	0	0	0	0	20	1
Burwood	200	48	48	0	48	0	0	0	32	3	0	0	0	0	0	205	0
Charlotte Jean Maternity Unit	94	31	31	0	31	0	0	0	31	0	0	0	0	0	0	94	3
Clutha Health First	51	12	12	0	12	0	0	0	6	1	0	0	0	1	0	53	0
Dannevirke Community Hospital	50	10	10	0	10	0	0	0	5	0	0	0	0	0	0	50	3
Darfield	6	2	2	0	2	0	0	0	1	0	0	0	0	0	0	9	0
Dargaville	5	1	1	0	1	0	0	0	1	0	0	0	0	0	0	5	0
Elizabeth R Hospital and Rest Home	94	21	21	0	21	0	0	0	21	0	0	0	0	0	0	94	0
Golden Bay Community Hospital	12	4	4	0	4	0	0	0	2	0	0	0	0	0	0	12	0
Gore Health Centre	95	13	13	0	13	0	0	0	4	1	1	0	0	0	0	97	1
Hawera	116	22	22	0	21	0	1	0	10	3	0	0	0	0	0	120	1
Helensville Birthing Unit	67	18	18	0	18	0	0	0	18	0	0	0	0	0	0	68	0
Hokianga	49	13	13	0	12	0	1	0	13	0	0	0	0	0	0	49	1
Horowhenua	155	19	19	0	18	0	1	0	12	0	2	0	0	0	0	157	2
Kaikoura	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Kaitaia	170	22	21	0	21	0	0	0	14	1	0	0	0	0	0	172	8
Kapiti Medical Centre	160	46	46	0	45	1	1	0	18	4	1	0	0	0	0	159	1

Facility	All vaginal births (N)	Standard primiparae (N)	Standard primiparae giving birth vaginally (spontaneous or instrumental) (N)	All Caesarean sections	Spontaneous vaginal birth among standard primiparae	Induction of labour among standard primiparae	Instrumental vaginal births among std primiparae	Standard primiparae giving birth by Caesarean section	Standard primiparae giving birth vaginally with an intact lower genital tract	Standard primiparae giving birth vaginally and undergoing an episiotomy with no third- or fourth-degree tear	Standard primiparae giving birth vaginally experiencing a tear with no episiotomy	Standard primiparae giving birth vaginally experiencing a third- or fourth-degree tear and undergoing an episiotomy	Women giving birth by Caesarean section and undergoing general anaesthetic	Women giving birth vaginally and receiving a blood transfusion during birth admission	Women giving birth by Caesarean section and receiving a blood transfusion during birth admission	All babies born in hospital	Babies born between 32 weeks and 36 weeks 6 days
Kenepuru	235	42	41	1	40	0	1	0	13	2	1	0	0	0	0	238	1
Lakes District	60	12	12	0	12	0	0	0	4	0	1	0	0	0	0	64	1
Lincoln	86	20	20	0	20	0	0	0	7	0	1	0	0	0	0	87	0
Matariki	88	22	22	0	22	0	0	0	17	1	2	0	0	0	0	90	3
Maternity Services Ltd	12	4	4	0	4	0	0	0	4	0	0	0	0	0	0	12	0
Murupara	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0
Northern Southland Birthing Centre	44	16	16	0	16	0	0	0	14	0	0	0	0	0	0	45	0
Oamaru	87	20	20	0	20	0	0	0	10	1	0	0	0	0	0	88	2
Opotiki	43	12	12	0	12	0	0	0	9	0	1	0	0	0	0	45	0
Papakura Obstetric	438	78	78	1	78	0	0	0	40	5	0	1	0	1	0	445	4
Pohlen Trust	114	25	25	0	24	1	1	0	24	0	1	0	0	0	0	118	1
Pukekohe	404	78	78	0	78	0	0	0	49	2	0	1	0	0	0	417	6
Rangiora	88	21	21	0	21	0	0	0	10	5	1	0	0	0	0	91	0
Rhoda Read	99	14	14	0	14	0	0	0	12	0	1	0	0	0	0	101	1
River Ridge (East) Birthing Centre	571	157	157	0	157	20	0	0	100	6	0	0	0	0	0	568	9
St Georges	318	86	86	2	85	4	1	0	40	4	1	0	1	0	0	336	1
Taumarunui	68	10	10	0	10	0	0	0	9	0	0	0	0	1	0	72	0
Taupo General	172	29	29	0	29	0	0	0	17	1	0	0	0	0	0	186	2
Te Kuiti	71	22	22	0	22	0	0	0	16	0	0	0	0	0	0	75	1
Te Whare Hauora o Ngati Porou	31	8	8	0	8	0	0	0	8	0	0	0	0	0	0	36	0
Thames	99	23	22	0	22	0	0	0	19	0	0	0	0	0	0	103	3
Tokoroa	104	10	10	0	10	0	0	0	6	0	0	0	0	0	0	104	3
Tuatapere Maternity Hospital	14	5	5	0	5	0	0	0	4	0	0	0	0	0	0	15	1
Waihi Hospital	65	8	8	0	8	0	0	0	8	0	0	0	0	0	0	66	0
Waimarino Health Centre	15	4	4	0	4	0	0	0	1	0	0	0	0	0	0	15	0

Facility	All vaginal births (N)	Standard primiparae (N)	Standard primiparae giving birth vaginally (spontaneous or instrumental) (N)	All Caesarean sections	Spontaneous vaginal birth among standard primiparae	Induction of labour among standard primiparae	Instrumental vaginal births among std primiparae	Standard primiparae giving birth by Caesarean section	Standard primiparae giving birth vaginally with an intact lower genital tract	Standard primiparae giving birth vaginally and undergoing an episiotomy with no third- or fourth-degree tear	Standard primiparae giving birth vaginally experiencing a tear with no episiotomy	Standard primiparae giving birth vaginally experiencing a third- or fourth-degree tear and undergoing an episiotomy	Women giving birth by Caesarean section and undergoing general anaesthetic	Women giving birth vaginally and receiving a blood transfusion during birth admission	Women giving birth by Caesarean section and receiving a blood transfusion during birth admission	All babies born in hospital	Babies born between 32 weeks and 36 weeks 6 days
Wairoa	53	11	11	0	11	0	0	0	9	0	2	0	0	0	0	54	1
Warkworth Birthing Centre	133	36	36	0	36	0	0	0	23	0	0	0	0	0	0	133	1
Waterford Birth Centre	461	142	142	0	142	0	0	0	142	0	0	0	0	0	0	459	7
Wellesford Birthing Unit	39	10	10	0	10	0	0	0	10	0	0	0	0	0	0	39	0
Winton Birthing Centre	40	15	15	0	15	0	0	0	15	0	0	0	0	0	0	40	0