

PRETERM BIRTH

Introduction

Preterm birth is defined as the birth of a baby <37 weeks completed gestation [12], with gestational age being defined as the number of completed weeks since the first day of the last menstrual period. If this date is unknown, ultrasound measurements may provide an estimate (+/- 1 week) if undertaken in the first 20 weeks of pregnancy.

Preterm deliveries comprise a heterogeneous group, which are often divided into three distinct categories [13]: (1) Idiopathic Preterm Births, where labour starts without apparent reason and without prior rupture of the membranes; (2) Preterm Premature Rupture of the Membranes, where the fetal membranes rupture prior the onset of labour, resulting in preterm delivery; and (3) Iatrogenic Preterm Births, where delivery is induced for a variety of reasons including pre-eclampsia, diabetes, and antepartum haemorrhage.

Internationally, there have been large increases in preterm birth rates during the past two decades, which have largely been in late preterm births (34-36 weeks gestation). These increases have been attributed to increasing obstetric intervention (e.g. induction of labour), higher rates of twins (as a result of assisted reproductive techniques), and delayed childbearing [14]. Similarly, New Zealand experienced increases in preterm birth rates during the 1980s and 1990s, with the most rapid increases being seen in those living in the most affluent (NZDep decile 1-2) areas and in European/Other women [6,15].

Infants born prematurely experience a range of adverse outcomes. Those born very prematurely (<32 weeks gestation) are disproportionately at risk of neonatal mortality and acquired developmental disabilities such as cerebral palsy, and intellectual disabilities [16]. Even those born between 34-36 weeks are at an increased risk of adverse outcomes, with some of the more common including respiratory distress syndrome, hypoglycaemia, hypothermia, prolonged jaundice and feeding problems [17].

The following section explores preterm birth rates using information from the Birth Registration Dataset. The section concludes with a brief review of policy documents and evidence-based reviews which consider how preterm birth might be addressed at the population level.

Data Sources and Methods

Indicator

1. *Preterm Birth Rates in Singleton Live Born Babies*

Numerator: Birth Registration Dataset: All singleton live born babies 20–36 weeks gestation

Denominator: Birth Registration Dataset: All singleton live born babies 20+ weeks gestation

Notes on Interpretation

Note 1: Year is year of registration, rather than year of birth.

Note 2: See **Appendix 4** for an overview of the Birth Registration Dataset

Note 3: 95% confidence intervals have been provided for the rate ratios in this section and where appropriate, the terms *significant* or not *significant* have been used to communicate the significance of the observed associations. Tests of statistical significance have not been applied to other data in this section, and thus (unless the terms *significant* or non-*significant* are specifically used) the associations described do not imply statistical significance or non-significance (see **Appendix 2** for further discussion of this issue).

New Zealand vs. South Island Distribution

South Island DHBs vs. New Zealand

In Nelson Marlborough during 2006–2010, preterm birth rates in singleton live born babies were *significantly* lower than the New Zealand rate, while in the West Coast, Canterbury, South Canterbury and Southland rates were similar. In Otago however, preterm birth rates were *significantly* higher than the New Zealand rate (**Table 16**).



Table 16. Preterm Birth Rates in Singleton Live Born Babies, South Island DHBs vs. New Zealand 2006–2010

DHB	Number: Total 2006–2010	Number: Annual Average	Percent of Live Births (%)	Rate Ratio	95% CI
Preterm Births					
Nelson Marlborough	401	80.2	4.9	0.83	0.75–0.91
West Coast	126	25.2	6.1	1.02	0.86–1.21
Canterbury	1,873	374.6	5.9	0.99	0.95–1.04
South Canterbury	176	35.2	5.7	0.95	0.83–1.10
Otago	703	140.6	7.0	1.18	1.10–1.27
Southland	507	101.4	6.5	1.09	1.00–1.19
New Zealand	18,358	3,671.6	5.9	1.00	

Source: Birth Registration Dataset

New Zealand Distribution by Ethnicity, NZDep Index Decile, Maternal Age and Gender

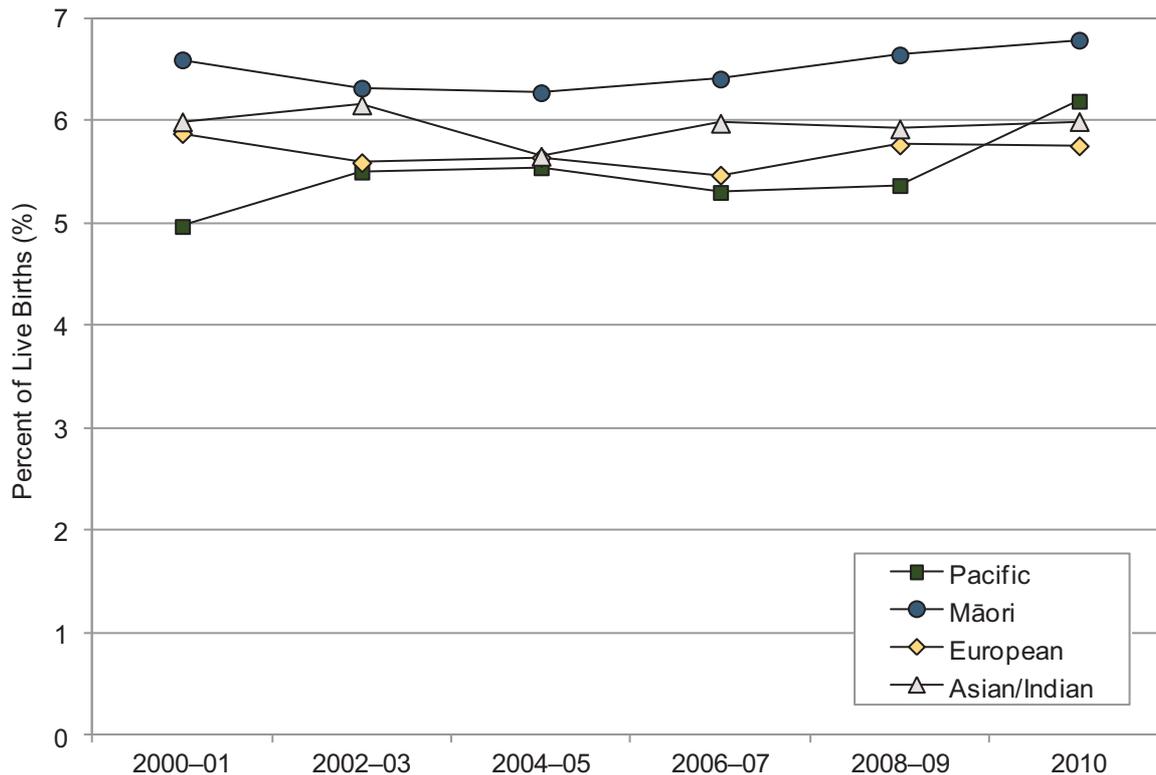
In New Zealand during 2006–2010, preterm birth rates were *significantly* higher for males, for Māori > Asian/Indian, European and Pacific babies, for those born into more deprived (NZDep decile 6–10) areas, and babies born to younger (<25 years) or older (35+ years) mothers (**Table 17**). Similar ethnic differences were seen during 2000–2010 (**Figure 5**).

Table 17. Preterm Birth Rates in Singleton Live Born Babies by Ethnicity, NZ Deprivation Index Decile, Gender and Maternal Age, New Zealand 2006–2010

Variable	Rate	Rate Ratio	95% CI	Variable	Rate	Rate Ratio	95% CI
New Zealand							
Preterm Births							
NZ Deprivation Index Decile				NZ Deprivation Index Quintile			
Decile 1	5.33	1.00		Decile 1–2	5.36	1.00	
Decile 2	5.39	1.01	0.94–1.09	Decile 3–4	5.57	1.04	0.99–1.09
Decile 3	5.38	1.01	0.94–1.09	Decile 5–6	5.77	1.08	1.02–1.13
Decile 4	5.74	1.08	1.00–1.16	Decile 7–8	6.14	1.15	1.09–1.20
Decile 5	5.61	1.05	0.98–1.13	Decile 9–10	6.41	1.20	1.14–1.25
Decile 6	5.89	1.11	1.03–1.19	Prioritised Ethnicity			
Decile 7	6.38	1.20	1.12–1.28	European	5.64	1.00	
Decile 8	5.95	1.12	1.04–1.19	Māori	6.58	1.17	1.13–1.20
Decile 9	6.34	1.19	1.11–1.27	Pacific	5.51	0.98	0.93–1.03
Decile 10	6.47	1.21	1.14–1.29	Asian/Indian	5.96	1.06	1.01–1.11
Maternal Age				Gender			
<20 Years	7.27	1.32	1.25–1.39	Female	5.52	1.00	
20–24 Years	6.10	1.11	1.06–1.15	Male	6.33	1.15	1.12–1.18
25–29 Years	5.54	1.00	0.96–1.05				
30–34 Years	5.52	1.00					
35+ Years	6.33	1.15	1.10–1.19				

Source: Birth Registration Dataset; Note: Rate is per 100 Live Births; Baby's Ethnicity is Level 1 Prioritised; Decile is NZDep2001

Figure 5. Preterm Birth Rates in Singleton Live Born Babies by Ethnicity, New Zealand 2000–2010



Source: Birth Registration Dataset; Note: Baby's Ethnicity is Level 1 Prioritised

South Island Trends

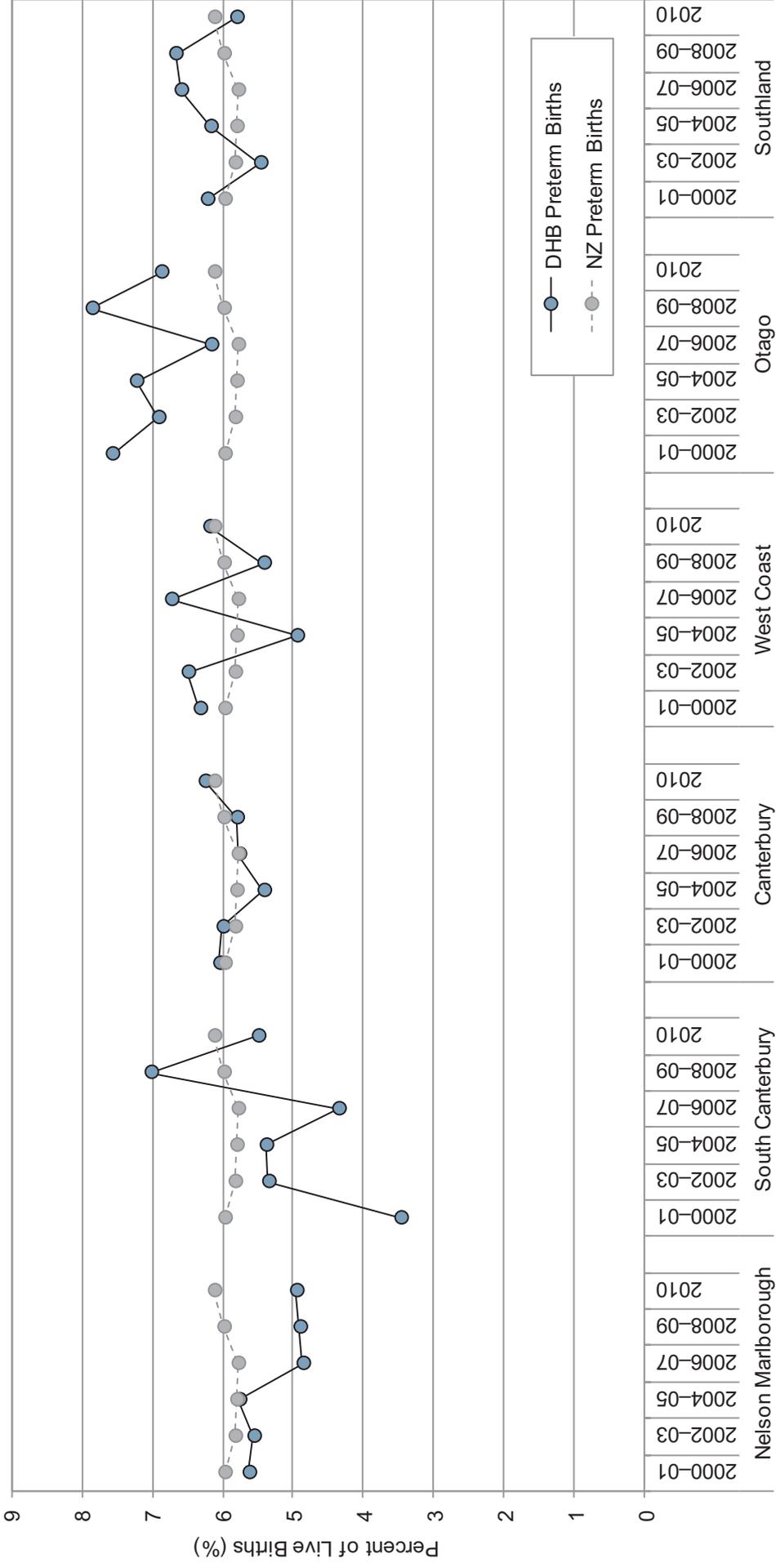
In Nelson Marlborough, preterm birth rates declined during the mid-2000s, with rates being lower than the New Zealand rate for the majority of 2000–2010, while in South Canterbury, rates exhibited a fluctuating upward trend. In Canterbury, the West Coast, Otago and Southland rates fluctuated, with rates in Otago being consistently higher than the New Zealand rate, and rates in the other three DHBs being similar (although in Southland rates were higher during the mid-2000s) (Figure 6).

South Island Trends by Ethnicity

In Nelson Marlborough and Otago during 2000–2010, there were no consistent differences in preterm birth rates between Māori and European babies, although in South Canterbury, the West Coast and Southland, rates were higher for Māori than for European babies during the late 2000s. In addition, preterm birth rates in South Canterbury and West Coast Māori babies increased during this period, although it is unclear whether this reflected changes in ethnicity coding or real increases in the incidence of preterm birth (Figure 7).

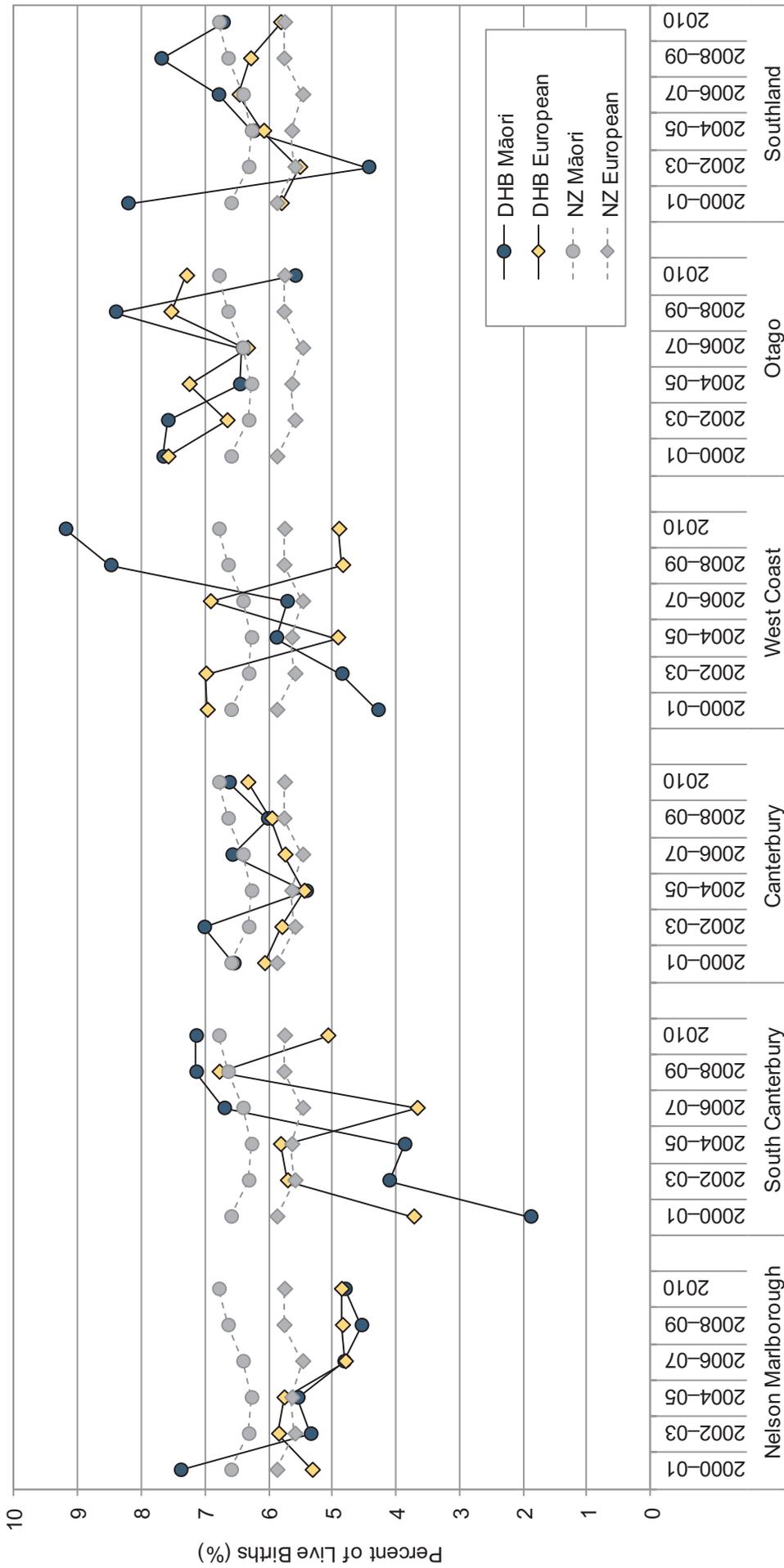


Figure 6. Preterm Birth Rates in Singleton Live Born Babies, South Island DHBs vs. New Zealand 2000–2010



Source: Birth Registration Dataset

Figure 7. Preterm Birth Rates in Singleton Live Born Babies by Ethnicity, South Island DHBs vs. New Zealand 2000–2010



Source: Birth Registration Dataset. Note: Baby's Ethnicity is Level 1 Prioritised

Summary

In New Zealand during 2000–2010, preterm birth rates were relatively static. During 2006–2010, preterm birth rates were *significantly* higher for males, for Māori > Asian/Indian, European and Pacific babies, for those born into more deprived (NZDep decile 6–10) areas, and babies born to younger (<25 years) or older (35+ years) mothers.

In Nelson Marlborough, preterm birth rates declined during the mid-2000s, with rates being lower than the New Zealand rate for the majority of 2000–2010, while in South Canterbury, rates exhibited a fluctuating upward trend. In Canterbury, the West Coast, Otago and Southland rates fluctuated, with rates in Otago being consistently higher than the New Zealand rate, and rates in the other three DHBs being similar (although in Southland rates were higher during the mid-2000s).

In Nelson Marlborough and Otago during 2000–2010, there were no consistent differences in preterm birth rates between Māori and European babies, although in South Canterbury, the West Coast and Southland, rates were higher for Māori than for European babies during the late 2000s. In addition, preterm birth rates in South Canterbury and West Coast Māori babies increased during this period, although it is unclear whether this reflected changes in ethnicity coding or real increases in the incidence of preterm birth.

Local Policy Documents and Evidence-Based Reviews Relevant to the Prevention of Spontaneous Preterm Birth

In New Zealand there are no policy documents which focus solely on the prevention of preterm births. However a range of Government documents exist which consider approaches to the provision of maternity services or the management of known risk factors (e.g. smoking, obesity) more generally. These are reviewed in other sections as follows:

- New Zealand publications which relate to the provision of maternity care are reviewed in **Table 15 on Page 68**
- Publications which relate to tobacco control/smoking are reviewed in **Table 47 on Page 168**

In addition, **Table 18** provides an overview of a range of evidence-based reviews which consider these issues in the overseas context, while **Table 15** reviews similar publications of relevance to the prevention of fetal deaths.

Table 18. Evidence-Based Reviews Relevant to the Prevention of Spontaneous Preterm Birth

International Guidelines
<p>National Collaborating Centre for Women's and Children's Health. 2011. Multiple pregnancy: the management of twin and triplet pregnancies in the antenatal period. London: National Institute for Health and Clinical Excellence. http://www.nice.org.uk/nicemedia/live/13571/56497/56497.pdf</p> <p>Women with twin and triplet pregnancies have a higher risk of preterm birth. This guideline is complementary to the NICE guideline 'Antenatal care: routine care for the healthy pregnant woman' (NICE clinical guideline 62) and it specifies the additional or different care that women with twin or triplet pregnancies should receive. Chapter 8 deals specifically with preterm birth. Following discussion of the research evidence, the following recommendations are made regarding the prevention of preterm birth and its associated risks:</p> <ul style="list-style-type: none">• Be aware that women who have had a previous premature singleton birth are at increased risk• Do not use fibronectin testing alone, home uterine activity monitoring, or routine cervical length measuring (with or without fetal fibronectin) to predict the risk of spontaneous preterm birth in twin and triplet pregnancies.• Do not use the following interventions (either alone or in combination) routinely to prevent spontaneous preterm birth in twin and triplet pregnancies: bed rest (either at home or in hospital), intramuscular or vaginal progesterone, cervical cerclage or oral tocolytics.• Inform women with twin and triplet pregnancies about the benefits of targeted (when birth is imminent) corticosteroids.• Do not use single or multiple untargeted (routine) courses of corticosteroids and inform women that there is no benefit from using untargeted corticosteroids. <p>The guideline appendices, which include the details of the evidence review (including the evidence tables) can be found at http://guidance.nice.org.uk/CG129/Guidance/Appendices</p>

Systematic and Other Reviews from the International Literature

McCormick MC, Litt JS, Smith VC, et al. 2011. **Prematurity: an overview and public health implications**. Annual Review of Public Health, 32, 367-79.

This review article explains that, largely because of the limited understanding of the basic biology underlying preterm delivery, there are few opportunities for prevention. Two strategies which could have a very small effect in reducing rates of preterm birth are decreasing higher-order multiple births resulting from the use of assisted reproductive technology and improving estimates of gestational age in early pregnancy in order to reduce the number of infants inadvertently delivered preterm because of inaccurate dates. Public health approaches to prematurity include ensuring that premature infants are delivered in a suitable facility able to deal with neonatal complications, minimising variations in quality of care between institutions, early developmental support for such infants and support for families.

Davey M-A, Watson L, Rayner Jo A, et al. 2011. **Risk scoring systems for predicting preterm birth with the aim of reducing associated adverse outcomes**. Cochrane Database of Systematic Reviews, 2011(11), Art. No.: CD004902. DOI:10.1002/14651858.CD004902.pub4.

There have been many scoring systems designed to facilitate prediction of preterm birth so that appropriate interventions might reduce the incidence of preterm and very preterm birth and the associated adverse outcomes. Extensive searching by the authors of this review failed to reveal any RCTs evaluating such scoring systems. The value of scoring systems is thus unknown. Prospective studies are needed, followed by RCTs of promising systems.

Whitworth M, Quenby S, Cockerill Ruth O, et al. 2011. **Specialised antenatal clinics for women with a pregnancy at high risk of preterm birth (excluding multiple pregnancy) to improve maternal and infant outcomes**. Cochrane Database of Systematic Reviews, 2011(9), Art. No.: CD006760. DOI: 10.1002/14651858.CD006760.pub2.

Previous preterm delivery is strong predictor of preterm delivery and for this reason specialised care for women with a previous history of preterm delivery is common practice. This review considered three RCTs conducted in the 1980s comparing specialised care with standard care in women with a singleton pregnancy who were considered to be at high risk of preterm labour (3400 women all in the U.S.). The authors reported that overall there was very little difference in outcomes between specialised and standard care groups, but due to differences in study designs most outcomes were only reported by one study which limited statistical power to detect significant differences. All three studies reported on preterm birth before 37 weeks and a pooled analysis of the results suggested that there may have been fewer preterm births in the specialised care mothers but the difference was not statistically significant (RR 0.87, 95% CI 0.69 to 1.08).

Raynes-Greenow Camille H, Roberts Christine L, Bell Jane C, et al. 2011. **Antibiotics for ureaplasma in the vagina in pregnancy**. Cochrane Database of Systematic Reviews, 2011(9), Art. No.: CD003767. DOI: 10.1002/14651858.CD003767.pub3.

Heavy vaginal colonisation with ureaplasma is suspected of playing a role in preterm rupture of membranes and preterm birth but the benefits of antibiotic treatment are unclear. Based on a review of one RCT of 3 types antibiotic treatment vs. placebo in 1105 pregnant women (between 22 and 33 weeks gestation), which did not report on rates of preterm birth, the authors concluded that there was insufficient evidence to either support or refute the use of antibiotics for ureaplasma infection to prevent preterm birth.

Rubens Craig E , Victora Cesar G, Gravett Michael G, et al. 2010. **Global report on preterm birth & stillbirth: the foundation for innovative solutions and improved outcomes**. BMC Pregnancy and Childbirth, 10(Suppl 1), <http://www.biomedcentral.com/bmcpregnancychildbirth/10?issue=S1>.

This series of seven reviews provides a global perspective on preterm birth. The third review in the series is:

Barros F, Bhutta Z, Batra M, et al. 2010. **Global report on preterm birth and stillbirth (3 of 7): evidence for effectiveness of interventions**. BMC Pregnancy and Childbirth, 10(Suppl 1), S3.

This systematic review discusses the evidence for the effectiveness of interventions to prevent preterm birth and to improve survival among preterm newborns, particularly those applicable to low-to-middle income countries. Recommendations are rated in four categories (from strong in favour to strong against) based on the quality of evidence, how the evidence may be translated to practice in a specific setting such as low-to-middle income countries, the level of baseline risk, and on potential trade-offs between expected benefits, harms and costs. The two interventions strongly recommended for preventing preterm births are smoking cessation and the use of progesterone. The authors note that since specialised clinics are now an accepted part of antenatal services in many countries it is unlikely that further RCTs will be carried out. They suggest that further research should focus on service development.

Hodnett ED, Fredericks S, Weston J. 2010. **Support during pregnancy for women at increased risk of low birthweight babies**. Cochrane Database of Systematic Reviews, 2010(6), Art. No.: CD000198. DOI: 10.1002/14651858.CD000198.pub2.

Numerous studies have consistently shown a relationship between social disadvantage and low birthweight (<2500g). Many countries have programmes to assist women who are thought to be at risk of having a low birthweight baby and these may include advice and counselling, practical assistance (e.g. transport to clinic appointments or help with household responsibilities and care of other children), and emotional support. This review included 17 RCTs (12,264 women) of additional support, provided by either a professional (social worker, midwife or nurse) or a trained lay person, compared to routine care. Programmes of extra support made no difference to rates of either low birthweight or preterm births but they were associated with a reduced likelihood of antenatal hospital admission (3 trials, 737 women, RR = 0.79, 95% CI 0.68-0.92) and of caesarean birth (9 trials, 4522 women, RR = 0.87, 95% CI 0.78-0.97).

<p>Alexander S, Boulvain M, Ceysens G, et al. 2010. Repeat digital cervical assessment in pregnancy for identifying women at risk of preterm labour. Cochrane Database of Systematic Reviews, 2010(6), Art. No.: CD005940. DOI:10.1002/14651858.CD005940.pub2.</p> <p>Based on a review of two RCTs (7163 women) the authors of this review concluded that there was no evidence to support the use of repeat digital cervical assessment to reduce numbers of preterm births.</p>
<p>Abdel-Aleem H, Shaaban OM, Abdel-Aleem MA. 2010. Cervical pessary for preventing preterm birth. Cochrane Database of Systematic Reviews, 2010(9), Art. No.: CD007873. DOI: 10.1002/14651858.CD007873.pub2.</p> <p>Cervical incompetence is a common contributor to preterm birth. The use of a cervical ring pessary to hold the cervix closed is a simple non-invasive alternative to cervical cerclage ("stitch") and it does not require the use of anaesthetic. The authors of this review did not identify any well designed RCTs comparing cervical pessary with either cervical cerclage or expectant management for the prevention of preterm birth. They state that there is some evidence of benefit from non-randomised trials and that there are three on-going trials of the use of cervical pessary in women with short cervix. The results of these may either confirm or refute the benefits of cervical pessary in preventing preterm birth.</p>
<p>Crowther CA, Han S. 2010. Hospitalisation and bed rest for multiple pregnancy. Cochrane Database of Systematic Reviews, 2010(7), Art. No.: CD000110. DOI: 10.1002/14651858.CD000110.pub2.</p> <p>Bed rest used to be commonly advised for women with multiple pregnancy. This review included seven trials (713 women and 1452 babies) comparing outcomes in women who were offered bed rest in hospital with those in women who were only admitted to hospital if complications occurred. There was no reduction in the risk of preterm birth or perinatal death but there may have been a decrease in the number of low birthweight (<2500g) infants in the bed rest women (risk ratio 0.92, 95% CI 0.85-1.0) although there was no difference in the number of very low birthweight infants (<1500g). There was no difference in the proportions of mothers developing hypertension or needing a caesarean. When the results for subgroups of women were analysed, there were no differences between the bed rest and the controls groups in any of the groups. The results of this review indicate that there is no benefit to be obtained from routine bed rest for women with an uncomplicated twin pregnancy.</p>
<p>Honest H, Forbes CA, Duree KH, et al. 2009. Screening to prevent spontaneous preterm birth: systematic reviews of accuracy and effectiveness literature with economic modelling. Health Technology Assessment (Winchester, England), 13(43), 1-627. http://www.hta.ac.uk/fullmono/mon1343.pdf</p> <p>This is the report for a very sizeable project which aimed to identify combinations of tests and treatments to predict and prevent preterm labour. It includes two systematic reviews and a decision analysis (health economic evaluation). One systematic review aimed to determine the accuracy of 22 different tests for the prediction of preterm birth in asymptomatic women in early pregnancy and in women symptomatic with threatened preterm labour in later pregnancy. The other review assessed the effectiveness of interventions with potential to reduce spontaneous preterm births in asymptomatic women in early pregnancy and to reduce spontaneous preterm births or improve neonatal outcomes in women with a viable pregnancy and symptoms of threatened preterm labour. The economic evaluation incorporated the combined effects of test and treatments and costs in a model-based analysis.</p>
<p>Berghella V, Baxter JK, Hendrix NW. 2009. Cervical assessment by ultrasound for preventing preterm delivery. Cochrane Database of Systematic Reviews, 2009(3), Art. No.: CD007235. DOI: 10.1002/14651858.CD007235.pub2.</p> <p>While measurement of cervical length by trans-vaginal ultrasound (TVU) can be used to predict preterm birth (the shorter the cervical length, the higher the risk) it is uncertain if it is useful as a screening test for the prevention of preterm birth. This review assessed the effect of knowledge of cervical length on the effectiveness of antenatal management in preventing preterm birth. The review included five RCTs (507 women) of knowledge of cervical length (obtained by TVU) vs. no knowledge of cervical length. In the three trials (290 women) involving singleton gestations with preterm labour, knowledge of cervical length was associated with a non-significant decrease in preterm birth at < 37 weeks (22.3% versus 34.7%, respectively; risk ratio 0.59, 95% CI 0.26 to 1.32) and delivery occurred on average 0.64 weeks later (95% CI 0.03 to 1.25 weeks). There were no differences in other outcomes measured. One trial in singleton gestations with premature rupture of membranes (92 women) evaluated the safety of TVU in this situation and found no difference in maternal or neonatal infection rates between the group that had TVU and the group that did not. In the one trial in twin gestations (125 women, with or without preterm labour) there was no difference between the TVU and no TVU groups in preterm birth at 36, 34 or 30 weeks, or in gestational age at delivery or other perinatal and maternal outcomes. Life table analysis showed significantly less (p= 0.02) preterm birth at < 35 weeks in the TVU group compared to the no TVU group. The authors concluded that there is insufficient evidence to recommend routine screening of either symptomatic or asymptomatic pregnant women with cervical length measurement via TVU.</p>

Berghella V, Hayes E, Visintine J, et al. 2008. **Fetal fibronectin testing for reducing the risk of preterm birth.** Cochrane Database of Systematic Reviews, 2008(4), Art. No.: CD006843. DOI: 10.1002/14651858.CD006843.pub2.

Fetal fibronectin (FFN) is a protein which is localised at the maternal-fetal interface of the amniotic membranes and is normally found only at very low levels in cervico-vaginal secretions. Levels greater ≥ 50 ng/l at or after 22 weeks have been associated with an increased risk of preterm birth and high FFN levels have been found to be one of the best predictors of preterm birth in all populations studied to date. This review assessed the effectiveness of management based on knowledge of FFN levels, compared to management without such knowledge, for the prevention of preterm birth. This review included five RCTs (474 women) of knowledge vs. no knowledge of FNN. There was a significant decrease in preterm birth at < 37 weeks in the knowledge group compared to the no-knowledge group (15.6% vs.28.6%, Risk ratio 0.54, 95% CI 0.34 - 0.87). All other outcomes measured were similar in both groups (preterm birth at < 34 , 32, or 28 weeks; gestational age at delivery; birthweight < 2500 grams; perinatal death; maternal hospitalisation; tocolysis; steroids for fetal lung maturity; and time to evaluate i.e. time between hospital arrival and a management decision being made). The authors concluded that, although FFN measurements are commonly used in labour and delivery units, there is currently little evidence to recommend such measurements. Given the associations between knowledge of FNN results and a lower incidence of preterm birth before 37 weeks, further research is worthwhile and should be encouraged.

Swadpanich U, Lumbiganon P, Prasertcharoensook W, et al. 2008. **Antenatal lower genital tract infection screening and treatment programs for preventing preterm delivery.** Cochrane Database of Systematic Reviews, 2008(2), Art. No.:CD006178. DOI: 10.1002/14651858.CD006178.pub2.

Genital tract infection is a cause of preterm birth and infection screening has been used as a means of preventing preterm birth. There are some adverse effects from treating such infections including cost and increased antibiotic resistance. The authors identified one high quality RCT (4155 women). In the intervention group the results of screening for bacterial vaginosis, trichomonas vaginalis and candidiasis were reported and women received treatment if tests were positive, and in the control group results of tests were not reported. There were significantly fewer preterm births in the intervention group (3% vs. 5%, relative risk 0.55, 95% CI 0.41-0.75) and also fewer preterm very low birthweight (<1500 g) infants (RR 0.34, 95% CI 0.15-0.75) and preterm low birthweight (<2500 g) infants (RR 0.48, 95% 0.34-0.66). The authors concluded that infection screening and treatment programmes in pregnant women before 20 weeks gestation reduce both preterm births and preterm low birth weights.

Othman M, Neilson JP, Alfirevic Z. 2007. **Probiotics for preventing preterm labour.** Cochrane Database of Systematic Reviews, 2007(1), Art. No.: CD005941. DOI: 10.1002/14651858.CD005941.pub2.

Probiotics contain live microorganisms that are believed to be beneficial to the host by restoring the normal bacterial flora (and hence displacing pathogenic bacteria) and they are used to treat infections. Maternal infections are thought to increase the risk of preterm labour by 30 - 50%. This review included two RCTs in women diagnosed with bacterial vaginosis in early pregnancy which assessed the effect of probiotics on urogenital infections. One trial in women at 34 weeks+ used fermented milk taken orally and the other used commercially available yoghurt applied vaginally. Pooled results of these two trials showed an 81% reduction in genital infection with the use of probiotics (risk ratio 0.19; 95% CI 0.08 to 0.48). The authors concluded that, although probiotics appear to be beneficial for treating vaginal infections in pregnancy, there is currently no data with which to assess their effect on preterm births.

McDonald Helen M, Brocklehurst P, Gordon A. 2007. **Antibiotics for treating bacterial vaginosis in pregnancy.** Cochrane Database of Systematic Reviews, 2007(1), Art. No.: CD000262. DOI: 10.1002/14651858.CD000262.pub3.

Bacterial vaginosis has been associated with preterm birth (PTB) and other poor perinatal outcomes. This review assessed the effects of antibiotic treatment of bacterial vaginosis in pregnancy. Fifteen good quality RCTs (5888 women) were included and the authors calculated Peto odds ratios from pooled results where the trials were sufficiently non-heterogeneous. Antibiotic therapy was effective at eradicating bacterial vaginosis during pregnancy (10 trials, 4357 women, Peto odds ratio (POR) 0.17, 95% CI 0.15 to 0.20). Treatment did not reduce the risk of PTB at < 37 weeks (15 trials, 5888 women, POR 0.91, 95% CI 0.78 to 1.06), or the risk of preterm pre-labour rupture of membranes (four trials, 2579 women, POR 0.88, 95%CI 0.61 to 1.28). Treatment at < 20 weeks' gestation may reduce the risk of preterm birth at < 37 weeks (5 trials, 2387 women, POR 0.72, 95% CI 0.55 to 0.95). In women with a previous PTB, treatment did not affect the risk of a subsequent PTB (five trials, 622 women, POR 0.83, 95% CI 0.59 to 1.17) but it may decrease the risk of preterm prelabour rupture of membranes (POR 0.14, 95% CI 0.05 to 0.38) and low birthweight (2 trials, 114 women, POR 0.31, 95% CI 0.13 to 0.75). In women with abnormal vaginal flora (intermediate flora or bacterial vaginosis) treatment may reduce the risk of PTB at < 37 weeks (2 trials, 894 women, POR 0.51, 95% CI 0.32 to 0.81). Clindamycin did not reduce the risk of PTB before 37 weeks (6 trials, 2406 women, POR 0.80, 95% CI 0.60 to 1.05).The authors concluded that antibiotic treatment can eradicate bacterial vaginosis in pregnancy but there is little evidence that screening and treating all pregnant women for vaginosis is an effective means of preventing preterm birth and its consequences. There is, however, limited evidence that treatment before 20 weeks may reduce the risk of PTB.

Sosa C, Althabe F, Belizan J, et al. 2004. **Bed rest in singleton pregnancies for preventing preterm birth.** Cochrane Database of Systematic Reviews, 2004(1), Art. No.: CD003581. DOI: 10.1002/14651858.CD003581.pub2.

Bed rest, either at home or in hospital, is widely recommended for preventing preterm birth in high risk women however it may increase the likelihood of venous thrombosis and it can also be stressful for the mother if, for example, she has to arrange care for other children or take time off work. The authors of this review identified one RCT (1266 women) , of uncertain methodological quality, in which 432 women were prescribed bed rest at home, 412 received a placebo intervention and 422 received no intervention. Preterm birth, the only outcome reported, was similar in the bed rest and control groups (7.9% vs. 8.5%, relative risk 0.92, 95% CI 0.62 to 1.37). The review authors concluded that there was no evidence to either support or refute the benefits of bed rest for women at increased risk of preterm birth.

Smaill F, Vazquez JC. 2007. **Antibiotics for asymptomatic bacteriuria in pregnancy**. Cochrane Database of Systematic Reviews, 2007(2), Art. No.: CD000490. DOI: 10.1002/14651858.CD000490.pub2.

Asymptomatic bacteriuria is relatively common in pregnancy (2-10% of women) and, if untreated, about 30% of those affected will develop acute pyelonephritis. Asymptomatic bacteriuria has been associated with both low birthweight and preterm birth. This review assessed the effect of antibiotic treatment on bacteriuria detected by screening in asymptomatic pregnant women. It included 14 RCTs of generally poor quality comparing antibiotics to placebo. Compared to placebo, antibiotics were effective at clearing symptomatic bacteriuria (risk ratio (RR) 0.25, 95% CI 0.14 to 0.48) and reducing the incidence of pyelonephritis (RR 0.23, 95% CI 0.13 to 0.41). Antibiotic treatment was also associated with a reduction in the proportion of low birthweight babies (RR 0.66, 95% CI 0.49 to 0.89) but not in the proportion of deliveries that were preterm. The authors concluded that antibiotics were effective in reducing the risk of pyelonephritis in pregnancy and that, although the observed effect on reducing low birthweight is consistent with accepted theories about the role of infection in adverse pregnancy outcomes, this association should be viewed cautiously in view of the poor quality of the included studies.

Dodd Jodie M, Flenady V, Cincotta R, et al. 2006. **Prenatal administration of progesterone for preventing preterm birth in women considered to be at risk of preterm birth**. Cochrane Database of Systematic Reviews, 2006(1), Art. No.: CD004947. DOI:10.1002/14651858.CD004947.pub2. Content updated after new search for studies (no change to conclusions), assessed as up to date in December 2008, published in Issue 2, 2009

Progesterone has a role in maintaining pregnancy probably via the inhibition of uterine smooth muscle contraction. It may be given by intramuscular injection or as a vaginal pessary. There is little long term safety data and little information about the optimal dose, route of administration, gestation to begin therapy, or duration of therapy. This review included 11 RCTs (2714 women and 3452 infants) involving comparison of progesterone vs. placebo in a variety of situations. In women with past history of spontaneous preterm birth progesterone was associated with a statistically significant reduction in the risk of preterm birth at < 34 weeks (1 study, 142 women; risk ratio (RR) 0.15; 95% CI 0.04 to 0.64), preterm birth at < 37 weeks (4 studies; 1255 women; RR 0.80; 95% CI 0.70 to 0.92), and infant birthweight < 2500 grams (2 studies; 501 infants; RR 0.64; 95% CI 0.49 to 0.83). For women with a short cervix identified on ultrasound, progesterone was associated with a statistically significant reduction in the risk of preterm birth < 34 weeks (1 study; 250 women; RR 0.58; 95% CI 0.38 to 0.87), and neonatal sepsis (1 study; 274 infants; RR 0.28; 95% CI 0.08 to 0.97). In women with a multiple pregnancy, progesterone was associated with a statistically significant reduction in the use of antenatal tocolysis (1 study; 654 women; RR 0.75; 95% CI 0.57 to 0.97). In women presenting with threatened preterm labour, progesterone was associated with a statistically significant reduction in the risk of preterm birth < 37 weeks (1 study; 60 women; RR 0.29; 95% CI 0.12 to 0.69), infant birthweight < 2500 grams (1 study; 70 infants; RR 0.52; 95% CI 0.28 to 0.98); and respiratory distress syndrome (1 study; 70 infants; RR 0.30; 95% CI 0.11 to 0.83). In women with "other" risk factors for preterm birth progesterone was associated with no statistically significant differences in reported outcomes. The authors state that further research is required to assess the benefits and harms of progesterone use in women at risk of preterm labour, especially to assess longer term outcomes in infancy and childhood and also to determine the optimal timing, mode of administration and dose of administration of progesterone.

Drakeley AJ, Roberts D, Alfirevic Z. 2003. **Cervical stitch (cerclage) for preventing pregnancy loss in women**. Cochrane Database of Systematic Reviews, 2003(1), Art. No.: CD003253. DOI: 10.1002/14651858.CD003253.

In women who have had previous second trimester pregnancy losses, a cervical stitch can be used to keep the cervix closed with the aim of preventing pregnancy loss. This review assessed the effectiveness and safety of both elective cerclage (before the cervix has dilated) and emergency cerclage (when the cervix has started to shorten and dilate) and also considered whether any one technique of stitch insertion is better than any other. This review included six RCTs (2175 women). Four trials compared prophylactic cerclage with no cerclage and data from these showed no overall reduction in pregnancy loss and preterm delivery rates, although there was a small reduction in births at < 33 weeks' gestation in the largest trial (relative risks 0.75, 95% CI 0.58 to 0.98). Cervical cerclage was associated with mild pyrexia, increased use of tocolytic therapy and increased hospital admissions but no serious morbidity. Two trials examined the role of therapeutic cerclage when a short cervix had been detected on ultrasound examination. Pooled results from these trials did not show a reduction in total pregnancy loss, early pregnancy loss or preterm delivery before 28 and 34 weeks in women assigned to cervical cerclage. The authors concluded that cervical cerclage should not be offered to women at low to medium risk of mid trimester loss whatever the cervical length measured via ultrasound. Small numbers in the RCTs did not allow any conclusions about the role of cervical cerclage for women who have a short cervix on ultrasound.

A more recent paper which addresses this issue is :

Berghella V, Rafael TJ, Szychowski JM, et al. 2011. **Cerclage for short cervix on ultrasonography in women with singleton gestations and previous preterm birth: a meta-analysis**. *Obstetrics & Gynecology*, 117(3), 663-71.

This review considered 5 RCTs and the authors' meta-analysis was confined to women with a singleton pregnancy, previous spontaneous preterm birth and a cervical length of < 25mm before 24 weeks' gestation. There were significantly fewer preterm (<35 weeks) births in the women who had cerclage: 28.4% vs. 41.3% (RR 0.70, 95% CI 0.55-0.89). There were also significantly fewer preterm births in the cerclage group at 37, 32, 28 and 24 weeks' gestation and a significant reduction in composite perinatal mortality and morbidity (15.6% vs. 24.8%, RR 0.64, 95% CI 0.45-0.91). The authors concluded that, in these particular women, cerclage significantly reduces preterm birth and composite perinatal mortality and morbidity.