

Evidence Table for Primary Birth Outcomes

NB due to ethical complexity of designing Randomised Controlled Trials in relation to place of birth, since women are entitled to autonomy over birth place decisions, based on clinical suitability and informed choice and consent, this evidence table includes one systematic review, one structured literature review and several cohort/observational studies as the best means to assess outcomes for primary birth settings.

Year, authors, name of study	Study design	Research question/ aims of study	Sample and study setting	Findings	Conclusions and comments
<p>(2011). Planned place of birth in New Zealand: Does it affect mode of birth and intervention rates among low risk women?</p> <p>Davis, Baddock, Pairman, hunter, Benn, Wilson, Dixon, & Herbison.</p> <p>See file BH1 below</p>	<p>Cohort study</p>	<p>In low risk women under midwifery care in New Zealand, does the planned place of birth affect intervention rates and mode of birth?</p>	<p>New Zealand. Low risk women who gave birth in 2006 and 2007. Low risk determined by the following exclusion criteria:</p> <p>EXCLUDED: previous C/S, PPH >1000 mls, stillbirth, severe pre-eclampsia, GDM, Rh sensitization or ABO incompatibility. Also excluded any essential hypertension, diabetes, thyroid disease, drug/alcohol abuse, heart disease, pulmonary disease/asthma, any haematological, neurological, renal/urinary tract or musculo-skeletal disorders. Also excluded any consultation/transfer antenatally in current pregnancy, multiple pregnancy, and antepartum fetal death. Also excluded preterm labour (<36 completed weeks), labour after 42 weeks, IOLs' malpresentations, elective LSCS.</p> <p>Total sample n=39677. After exclusions applied: n= 16 210 low risk women remained and planned place of birth at labour onset as follows Home: 1830 (11.3%) Primary unit: 2877 (17.7%) Secondary hospital: 7380 (45.5%) Tertiary hospital: 4123 (25.4%)</p>	<p>Primary Unit outcomes: n= 2873 SVB n= 2722 (94.7%) Em LSCS n= 91 (3.2%) Instrumental n= 58 (2.08%)</p> <p>Compared to low risk women birthing in tertiary hospitals: Adjusted RR (95% CI) for secondary outcomes: Augmentation 1.87 (1.68-2.08) $p < 0.001$ ARM 1.51 (1.31-1.7) $p < 0.001$ Pharmacological pain management 1.64 (1.47-1.82) $p < 0.001$ Episiotomy 2.91 (2.37-3.57) $p < 0.001$ Perineal trauma 0.91 (0.82-1.02) $p = 0.98$ EBL > 1000ml 1.39 (0.9-2.16) $p = 0.138$ 5 min Apgar < 7 1.58 (0.95-2.61) $p = 0.77$ Admission to NICU 1.78 (1.31-2.42) $p < 0.001$</p>	<p>Study not statistically powered to enable comparison re PNMR due to rarity of outcome.</p> <p>Cohort prior to exclusions represents about 32% of total birthing population of New Zealand during this timeframe.</p> <p>Authors conclude that potential harm may be caused to low risk women giving birth in secondary and tertiary settings.</p>

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<p>(2012). <i>What evidence supports the use of free-standing midwifery-led units (primary units) in New Zealand / Aotearoa?</i></p> <p>Dixon, Prileszky, Guilliland, Hendry, Miller & Anderson</p> <p><i>See file BH2 below</i></p>	Structured literature review.	To determine the evidence that contributes to assessments of safety of using freestanding midwifery-led units and which may be useful in the New Zealand context.	<p>3 studies published in 2011 were included in the review.</p> <p>UK (BPE) study: FLMU n= 11 280 OU n= 19 688</p> <p>Danish Study FLMU n= 839 OU n= 839</p> <p>NZ Study FLMU n= 2873 OU (sec) n= 7353 OU (tert) n= 4095</p> <p>All studies included only low risk women in the cohorts, and compared FMLUs with Obstetric Units (OU).</p>	<p>Outcome measures included perinatal and maternal mortality, morbidity, interventions, mode of birth.</p> <p>Overall outcomes from synthesising data for 14998 FMLU women compared with 24522 OU women: Women planning birth in FLMU had increased rates of spontaneous vaginal birth, less augmentation, less instrumental birth, less caesarean section, less episiotomy. Neonatal health: babies born to women planning FMLU birth had higher Apgar scores, less admission to NNU, and no differences in mortality.</p>	<p>Rarity of mortality events makes it difficult to reliably establish OR for this outcome. BPE used a composite for the primary outcome which included stillbirth after labour commencement, early neonatal death, NE, meconium aspiration syndrome, brachial plexus injury and fractured humerus or clavicle. This made comparison of mortality/morbidity data across studies unfeasible.</p> <p>For this study, for women without complicating factors at the start of labour, rates for the primary outcome were 3.2 per 1000 (95% CI 2.3-4.6) for FMLU babies and 3.1 per 1000 (95% CI 2.2 – 4.2) for OU babies.</p>
<p>(2014). <i>Place of birth and outcomes for a cohort of low risk women in New Zealand: A Comparison with Birthplace England.</i></p> <p>Dixon, Prileszky, Guilliland, Miller & Anderson.</p> <p><i>See file BH3 below</i></p>	Retrospective observational design	To determine demographic differences, transfer rates, and neonatal outcomes between planned birthplace settings, for a cohort of low risk women in NZ (COMCORD cohort) and to compare these data to the outcomes of the Birthplace in England (BPE) study.	<p>COMCORD cohort n= 61072 16.6% planned birth in primary unit and 75.3% planned birth in secondary/tertiary setting.</p> <p>BPE study* n= 64538. 43% planned birth in primary setting and 30.5% planned for tertiary setting.</p> <p>All women were low risk.</p>	<p>Demographics: higher proportion of indigenous/ethnic minority women planned to give birth in primary setting in NZ cohort. Transfer rates were lower in the NZ cohort (12.6% from primary unit to sec/tert hospital) than for BPE cohort (21.9%).</p> <p>New Zealand (COMCORD) Perinatal mortality was low and comparable across all settings Primary units 1.9/1000 Secondary units 3/1000 Tertiary units 3/1000 Homebirth 2/1000 p<0.14</p> <p>Apgar scores < 7 @ 5 mins</p>	<p>*BPE study was a prospective design, so the recruitment strategy aimed for equal numbers in each setting.</p> <p>COMCORD cohort: unable to exclude stillbirth prior to labour or babies with congenital anomalies from cohort, so meaningful comparisons cannot be made with BPE composite primary outcome.</p> <p>Increased adverse neonatal outcomes for transferred-in-labour babies on COMCORD cohort probably reflects appropriate transfer decisions based on concerns identified during labour, and potentially longer transfer</p>

				<p>Primary: 1.7% Secondary: 2.3% Tertiary: 2.8% Home: 1.5% p<0.0001</p> <p>Admission to NNU Primary: 2.2% Secondary: 3.1% Tertiary: 3.8% Home: 1.8% p< 0.0001</p> <p>Rates of perinatal mortality, Apgar < 7 @ 5 mins and NNU admission were lower for women who gave birth in their planned place of birth than for those who transferred in labour: Planned primary and birthed primary 0.1%, Planned primary but transferred in labour 0.6% p<0.001 UK (BPE) Composite primary outcome Primary units: 3.2 per 1000 Obstetric units: 3.1 per 1000</p>	<p>times from remote rural locations.</p> <p>Further research is required to reflect altered data collection following this study, as pre-labour stillbirth and congenital anomaly information has been collected since 2013.</p>
<p>(2012). Alternative versus conventional institutional settings for birth.</p> <p>Hodnett, Downe & Walsh</p> <p>See file BH4 below</p>	Systematic review.	Primary objective; to assess effects of care in alternative vs conventional settings for birth	10 trials including 11725 women. Settings included the UK, Canada, Scandinavia and Australia.	<p>Allocation to an alternative setting increased the likelihood of: no intrapartum analgesia/anaesthesia (six trials, n = 8953; RR 1.18, 95% CI 1.05 to 1.33); spontaneous vaginal birth (eight trials; n = 11,202; RR 1.03, 95% CI 1.01 to 1.05); breastfeeding at six to eight weeks (one trial, n = 1147; RR 1.04, 95% CI 1.02 to 1.06); and very positive views of care (two trials, n = 1207; RR 1.96, 95% CI 1.78 to 2.15). Allocation to an alternative setting decreased the likelihood of epidural analgesia (eight trials, n = 10,931; RR 0.80, 95% CI 0.74 to 0.87); oxytocin</p>	<p>Overall there were higher levels of satisfaction and lower levels of medical intervention for women giving birth in alternative settings, with no increased risk of adverse events for mother or babies.</p> <p>Standard methodology for Cochrane Systematic review followed; robust design and analysis.</p>

				augmentation of labour (eight trials, n = 11,131; RR 0.77, 95% CI 0.67 to 0.88); instrumental vaginal birth (eight trials, n = 11,202; RR 0.89, 95% CI 0.79 to 0.99), and episiotomy (eight trials, n = 11,055; RR 0.83, 95% CI 0.77 to 0.90). There was no apparent effect on other adverse maternal or neonatal outcomes.	
<p>(2014).A comparison of frequency of medical interventions and birth outcomes between the midwife-led unit and the obstetric unit in low risk primiparous women.</p> <p>Prelek, Verenik & Poat</p> <p>See file BH5 below</p>	Prospective case-controlled study.	To compare birth, maternal and neonatal outcomes between an obstetric unit and midwifery-led unit.	<p>Slovenia</p> <p>MLU n=154 OU n= 343</p> <p>Low risk: singleton, cephalic, spontaneous labour onset, normal foetal heart rate.</p>	<p>Women giving birth in MLU had significantly more SVB, less CS, less augmentation, less assisted birth, less use of analgesia, less episiotomy, and more exclusive breastfeeding (all p-values <0.001).</p> <p>No differences were found for PPH, perineal trauma, neonatal admission to NNU, Apgar <6 at one or five minutes or need for resuscitation.</p>	Study design acknowledges potential for selection bias, this was mitigated by careful inclusion criteria that were straightforward and double checked on admission.
<p>(2010). Informing choices: Outcomes for women at a stand-alone birthing centre.</p> <p>Rogers, Pickersgill, Palmer & Broadbent</p> <p>See file BH6 below</p>	Prospective cohort study	To determine outcomes for women booking to birth at a stand-alone birthing centre (SABC).	<p>UK study.</p> <p>All women who booked to deliver at SABC between March 2000 and April 2008 (by definition low risk).</p> <p>n=5099</p>	<p>Antenatal transfers 30% In-labour transfers 14% Postpartum transfers 5%</p> <p>Transfer rate nulliparous women 35.9% vs 4.61% multiparous.</p> <p>Mode of birth information available for 3476 women admitted to SABC in labour: 89.35% had SVB, 5.6% has LSCS and 5.06% had instrumental birth.</p> <p>PNMR for those admitted in labour 1.1/1000</p>	<p>Non-medical indications for antenatal transfer accounted for 12.8% of the sample, so transfer rate antenatally does not wholly reflect clinical unsuitability to birth at SABC.</p> <p>Many women who transferred during pregnancy were lost to follow-up, but a strength of this study is good case ascertainment and complete dataset for those who presented at the SABC in labour.</p>

				3% (n=78) of neonates were transferred to obstetric centre postnatally; all had paediatric assessment, 28 (0.98% of total sample of babies born at SABC) went to postnatal ward and 50 (1.7%) were admitted to NNU.	
<p>(2007) Self-rated “no” and “low” risk pregnancy: A Comparison of outcomes for women in obstetric-led and midwife-led units in England.</p> <p>Symon, Paul, Buchart, Carr & Dugard.</p> <p>See file BH7 below</p>	Retrospective survey.	To compare outcomes for women who intended to give birth in midwife-led or obstetric-led units and whose self-rating for risk was “no” or “low” risk.	UK study Quota sample of 294 women in midwife-led (ML) and 198 obstetric-led (OL) units who gave birth in 2004/5	Women who gave birth in the ML units were more likely to have SVB ($p < 0.01$), used less analgesia ($p < 0.01$) spent less time in labour in the unit ($p < 0.01$), and had fewer interventions ($p < 0.01$).	<p>Self-rating of perceived risk is ‘unsophisticated’ and was completed postnatally; the birth outcome might have influenced the women’s perception of how ‘at risk’ they were.</p> <p>Survey return rate was 53%</p> <p>Data collection relies on women’s accurate recall of labour events, but as only 8 days postpartum this is not likely to create such a high degree of bias.</p>
<p>(2004). Outcomes of midwife-led, freestanding birth centres: A Structured review.</p> <p>Walsh & Downe</p> <p>See file BH8 below</p>	Structured review using Cochrane Systematic Review guidelines.	To establish the current evidence base for midwife-led, freestanding birth centres.	5 studies included: 3 from the USA, 1 from Germany and 1 from the UK, published between 1986 and 2000, both retrospective and prospective data analysed. All studies included women of all parities. All studies had birth centre (BC) and hospital comparison group (HCG). Total numbers of women (all studies) BC n=1786 and HCG n= 23199.	<p>Normal birth (4 studies) range BC 85.6 - 93.1%, HCG 72 - 88.7%</p> <p>Caesarean section (4 studies) range BC 3 – 6.5%, HCG 4.6 – 14%</p> <p>Episiotomy (3 studies) BC 5.1 – 47%, HCG 18.9 – 78.1%</p> <p>Intact perineum (4 studies) range BC 22.0 – 46.7%, HCG 6.3 – 43.3%</p> <p>Stillbirth rate (1 study) BC 2:1000, HCG 4:1000</p> <p>Transfer rate (3 studies) BC range 14.6 – 22%</p>	<p>Authors conclude no good grounds to reject free-standing midwifery-led units on the grounds of adverse events, and potentially indicate that hospital environment may pose risk of harm in relation to the mortality risk for babies.</p> <p>Study does not report instrumental birth outcomes. “Normal birth’ included augmentation, epidural, foetal blood sampling and episiotomy; these may all have implications for ongoing health compared with spontaneous births with no interventions.</p>

