Findings from the Core Maternity Indicators Project funded by the Australian Council on Safety and Quality in Health Care and sponsored by the Department of Health, Western Australia

Report prepared by Women’s Hospitals Australasia

January 2007
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Acknowledgements

We particularly wish to acknowledge the time, effort and expertise contributed by the following individuals, organisations, government departments and statutory bodies who have assisted in the development of these core clinical indicators for maternity care. Extensive consultation and feedback is essential to the selection and ongoing relevance of any set of clinical indicators if they are to be effective in practice.

<table>
<thead>
<tr>
<th>Project Management Group (PMG)</th>
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<tbody>
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<td>Ms Joanna Holt</td>
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<td>Dr Andrew Child</td>
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<td>Dr Brian Lloyd / Dr Dorothy Jones</td>
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<td>Ms Brigid Ryan (Sept 2005 - March 2006) and Ms Jane Prain (April - Dec 2006)</td>
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<tr>
<th>Special thanks to the PMG Secretariat</th>
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<tr>
<td>Mr Babu Simon</td>
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<tr>
<td>Ms Naomi Prowse</td>
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## Expert Working Group (EWG)

<table>
<thead>
<tr>
<th>Name</th>
<th>Position and Representation</th>
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<tbody>
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<td>Mr John Amery</td>
<td>Chief Executive Officer, Mater Misericordiae Private Hospital, Townsville, representing the Australian Private Hospitals Association</td>
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<td>Dr Robert Buist</td>
<td>Visiting Medical Officer, Royal Hospital for Women, Randwick, representing, Women's Hospitals Australasia (WHA)</td>
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<td>Dr Annabelle Chan</td>
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<td>Acting Senior Director, Health Information Centre, Queensland Health, representing the Statistical Information Management Committee</td>
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<td>Ms Gil Dwyer</td>
<td>Senior Program Advisor, Acute Programs, Victorian Department of Human Services, representing the National Collaboration on Maternity Services Policy, an AHMAC sub-committee</td>
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<td>Ms Maureen Hutchinson</td>
<td>Clinical Midwife, Projects, King Edward Memorial Hospital for Women, Perth, representing the Department of Health, Western Australia</td>
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<td>Consultant in Perinatal Epidemiology, Royal Women’s Hospital, Melbourne and Chair of the Victorian Consultative Council on Obstetric and Paediatric Mortality and Morbidity</td>
</tr>
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</tr>
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<td>Mr Bruce Teakle</td>
<td>President, Maternity Coalition, Queensland Branch, representing consumers</td>
</tr>
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<td>Conjoint Associate Professor, School of Women’s and Children’s Health, UNSW, representing the Australian College of Midwives</td>
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**Special acknowledgement to the New Zealand participants on the EWG:**

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<thead>
<tr>
<th>Name</th>
<th>Position and Representation</th>
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<tr>
<td>Dr Denys Court</td>
<td>Director of Obstetrics and Gynaecology, National Women’s Hospital Auckland NZ representing the New Zealand branch of the Royal Australian College of Obstetrics and Gynaecology</td>
</tr>
<tr>
<td>Ms Karen Guilliland</td>
<td>Chief Executive Officer, New Zealand College of Midwives (NZCOM)</td>
</tr>
</tbody>
</table>
**Reference Group**

Nominees from a wide and varied group of stakeholders were sought at the commencement of this project to form a Reference Group who would provide critical feedback and constructive advice as the indicators were developed. The following list represents those stakeholders who accepted the invitation to participate in the project and who nominated a representative.

| Australian and New Zealand Neonatal Network (ANZNN) |
| Australian College of Midwives Incorporated (ACM) |
| Australian College of Rural and Remote Medicine (ACRRM) |
| Australian Council on Healthcare Standards (ACHS) |
| Australian Institute of Health and Welfare (AIHW) |
| Australian Neonatal Nurses Association (ANNA) |
| Australian Private Hospitals Association (APHA) |
| Commonwealth Department of Health and Aging (DoHA) |
| Department of Health, Australian Capital Territory |
| Department of Health and Community Services, Northern Territory |
| Department of Health, Queensland |
| Department of Health, South Australia |
| Department of Health and Human Services, Tasmania |
| Department of Human Services, Victoria |
| Department of Health, Western Australia (DoHWA) |
| National Centre for Classification in Health (NCCH) |
| National Collaboration on Maternity Services Policy (an AHMAC Sub-Committee) |
| National Perinatal Statistics Unit (NPSU), a collaborative unit of AIHW |
| New South Wales Department of Health |
| Perinatal Society of Australia and New Zealand (PSANZ) |
| Royal Australian College of General Practitioners (RACGP) |
| Royal Australasian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) |
| Royal Australasian College of Physicians (RACP), Paediatric and Child Health Division |
| Rural Doctors Association of Australia (RDAA) |
| Statistical Information Management Committee (SIMC -an AHMAC Sub-Committee) |
| Women’s Hospitals Australasia (WHA) |
**Glossary of terms and acronyms**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ABS</td>
<td>Australian Bureau of Statistics</td>
</tr>
<tr>
<td>ACHS</td>
<td>Australian Council on Healthcare Standards</td>
</tr>
<tr>
<td>ACM</td>
<td>Australian College of Midwives</td>
</tr>
<tr>
<td>ACS&amp;QHC</td>
<td>Australian Council (now Commission) on Safety and Quality in Health Care</td>
</tr>
<tr>
<td>AHMAC</td>
<td>Australian Health Ministers’ Advisory Council</td>
</tr>
<tr>
<td>AHMC</td>
<td>Australian Health Ministers’ Conference</td>
</tr>
<tr>
<td>AHRQ</td>
<td>Agency for Healthcare Research and Quality</td>
</tr>
<tr>
<td>AIHW</td>
<td>Australian Institute of Health and Welfare</td>
</tr>
<tr>
<td>AIMS</td>
<td>Association of Improvements in Maternity Services</td>
</tr>
<tr>
<td>Antenatal</td>
<td>The period of time prior to birth</td>
</tr>
<tr>
<td>APGAR</td>
<td>A numerical score taken at 1 and 5 minutes to evaluate the physical condition of an infant immediately following birth</td>
</tr>
<tr>
<td>APH</td>
<td>Antepartum haemorrhage</td>
</tr>
<tr>
<td>BFHI</td>
<td>Baby Friendly Hospital Initiative</td>
</tr>
<tr>
<td>CMIP</td>
<td>Core Maternity Indicators Project</td>
</tr>
<tr>
<td>CS</td>
<td>Caesarean section</td>
</tr>
<tr>
<td>CSR</td>
<td>Caesarean section rate</td>
</tr>
<tr>
<td>Denominator</td>
<td>Denotes the whole number of parts contained in the fraction</td>
</tr>
<tr>
<td>DoHWA</td>
<td>Department of Health Western Australia</td>
</tr>
<tr>
<td>EAS</td>
<td>External anal sphincter</td>
</tr>
<tr>
<td>EWG</td>
<td>Expert Working Group</td>
</tr>
<tr>
<td>HAPO</td>
<td>Hyperglycaemia and Adverse Pregnancy Outcome</td>
</tr>
<tr>
<td>HIE</td>
<td>Hypoxic Ischaemic Encephalopathy</td>
</tr>
<tr>
<td>IAS</td>
<td>Internal anal sphincter</td>
</tr>
<tr>
<td>ICD-10</td>
<td>International Classification of Diseases (version 10)</td>
</tr>
<tr>
<td>Intrapartum</td>
<td>The period of time during labour and birth</td>
</tr>
<tr>
<td>IOL</td>
<td>Induction of labour</td>
</tr>
<tr>
<td>Acronym</td>
<td>Full Form</td>
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<tr>
<td>IUGR</td>
<td>Intrauterine growth retardation</td>
</tr>
<tr>
<td>JCAHO</td>
<td>Joint Commission on Accreditation of Healthcare Organizations</td>
</tr>
<tr>
<td>KEMH</td>
<td>King Edward Memorial Hospital for Women</td>
</tr>
<tr>
<td>Maternity</td>
<td>Is defined as any condition relating to pregnancy</td>
</tr>
<tr>
<td>Maternity Care</td>
<td>Includes prenatal and postnatal care and care for the complications of pregnancy</td>
</tr>
<tr>
<td>Maternity Services(^1)</td>
<td>The provision of specialised health care to women from the time of conception up to and until six (6) weeks post birth</td>
</tr>
<tr>
<td>Multipara</td>
<td>A woman who has given birth to more than one child</td>
</tr>
<tr>
<td>NEBGAC</td>
<td>National Evidence Based Guideline for Antenatal Care project</td>
</tr>
<tr>
<td>NH&amp;MRC</td>
<td>National Health and Medical Research Council</td>
</tr>
<tr>
<td>NHDD</td>
<td>National Health Data Dictionary</td>
</tr>
<tr>
<td>NHIMG</td>
<td>National Health Information Management Group</td>
</tr>
<tr>
<td>NHIIMPC</td>
<td>National Health Information Management Principal Committee</td>
</tr>
<tr>
<td>NICU</td>
<td>Neonatal Intensive Care Unit</td>
</tr>
<tr>
<td>NPDCC</td>
<td>National Perinatal Data Development Committee</td>
</tr>
<tr>
<td>NPMDS</td>
<td>National Perinatal Minimum Dataset</td>
</tr>
<tr>
<td>NPSU</td>
<td>National Perinatal Statistics Unit</td>
</tr>
<tr>
<td>Nullipara</td>
<td>A woman who has never given birth (regardless of gravida) to an infant of at least 20 weeks gestation or 400gms birthweight</td>
</tr>
<tr>
<td>Numerator</td>
<td>Denotes the number (fraction) of the whole being counted to determine the rate</td>
</tr>
<tr>
<td>PDCU</td>
<td>Perinatal Data Collection Unit</td>
</tr>
<tr>
<td>Perinatal Care</td>
<td>Care provided to a woman and her fetus / infant from 20 weeks gestation of pregnancy to 28 days after birth (NHMRC, 1997d:200)</td>
</tr>
<tr>
<td>PMG</td>
<td>Project Management Group</td>
</tr>
<tr>
<td>Postpartum</td>
<td>The 6-week period of time immediately following birth</td>
</tr>
<tr>
<td>PPH</td>
<td>Postpartum haemorrhage</td>
</tr>
<tr>
<td>Primigravida</td>
<td>A woman who is pregnant for the first time</td>
</tr>
<tr>
<td>Primipara</td>
<td>A woman who has given birth to one child</td>
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\(^1\) Measuring Maternity Services, Victorian Government Publishing Service 2001
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>RANZCOG</td>
<td>Royal Australian and New Zealand College of Obstetrics and Gynaecology</td>
</tr>
<tr>
<td>RCOG</td>
<td>Royal College of Obstetricians and Gynaecologists (UK)</td>
</tr>
<tr>
<td>RDS</td>
<td>Respiratory distress syndrome</td>
</tr>
<tr>
<td>RG</td>
<td>Reference Group</td>
</tr>
<tr>
<td>SCN</td>
<td>Special Care Nursery</td>
</tr>
<tr>
<td>SIDS</td>
<td>Sudden infant death syndrome</td>
</tr>
<tr>
<td>SIMC</td>
<td>Statistical Information Management Committee</td>
</tr>
<tr>
<td>SPMR</td>
<td>Standardised Perinatal Mortality Rate</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations International Children’s Emergency Fund</td>
</tr>
<tr>
<td>VBAC</td>
<td>Vaginal birth after caesarean</td>
</tr>
<tr>
<td>WHA</td>
<td>Women’s Hospitals Australasia</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
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</tbody>
</table>
Foreword

There is no way of knowing the total number of people who ultimately provided input into the outcome of this national Project. The breadth and depth of expertise however, was truly remarkable and as such the Project Management Team would like to take this opportunity to thank everyone who contributed. You have our deepest gratitude.

Dr Andrew Child
Clinical Leader
Core Maternity Indicators Project
Executive Summary

The development of a national set of maternity clinical indicators has had a long gestation. The first recommendation for such indicators was made in the Report of the Douglas Inquiry published in 2001 (Inquiry into Obstetric and Gynaecological Services at King Edward Memorial Hospital 1990 – 2000, November 2001). Several agencies have since grappled with devising indicators that could be used to measure and evaluate safe and effective maternity care in a timely fashion. Following a grant from the Australian Council on Safety and Quality in Health Care (now the Commission) to the Department of Health in Western Australia, Women’s Hospitals Australasia was commissioned to manage the Core Maternity Indicators Project (CMIP).

This report describes the iterative process used by the CMIP Expert Working Group (EWG) to develop a set of maternity clinical indicators that address both process and outcome measures for each of the three phases of maternity care:

Antepartum

1. Smoking cessation advice during pregnancy

Intrapartum

2. Induction of labour rates for selected first births
3. Caesarean section rates for selected first births
4. Episiotomy rates for all first births
5. Third and fourth degree tears for all first births
6. Unassisted vaginal births following a spontaneous onset of labour for selected first births

Postpartum

7. APGAR score ≤ 6 at 5 minutes for live term infants
8. Death of baby around time of birth
9. Significant blood loss within 24 hours following a vaginal birth
10. Supporting breastfeeding

This report also outlines the conclusions and recommendations of the CMIP relating to implementation of the core maternity indicators across Australia.

The CMIP determined that the data required to populate the indicators should be sourced from state and territory midwives / perinatal data collection systems but reported nationally. There will be some changes required to midwives / perinatal collection forms and processes to enable all indicator data elements to be sourced and reported in a timely fashion. These changes will rely upon agreement being reached between states and territories.

In an effort to validate the core maternity indicators, a retrospective analysis of indicators was conducted at a national level for the latest available data (2003). Results were only available for six of the ten indicators, and then only as an aggregate for each state and territory, rather than by individual (or class of) maternity service. Nonetheless, the results showed significant variation between jurisdictions for the majority of indicators.
An independent expert was also commissioned to review the core set of indicators and to report on their utility and statistical validity in monitoring the performance of maternity services. The review confirmed the value of the majority of indicators selected; however it also recommended that a pilot study be undertaken to check on data collection methodology and the need for pre-risk adjustment for a number of the clinical indicators.

The CMIP EWG concluded that the core set of maternity indicators should be amenable to change according to emerging evidence, changes in clinical practice and consumer goals. Indicators that can no longer be supported by evidence or where the rate is consistently reported to be in accord with the evidence should be withdrawn and/or replaced with an indicator for an alternate area of practice where there is potential for improvement. Similarly, once a nationally agreed definition has been determined for ‘obstetric and medical complications’, the adoption of the term ‘selected primipara’ should be replaced with the ‘standard primipara’ definition as per the Victorian model for the purposes of risk adjustment.

Clinical indicators for maternity care should be used to monitor significant inter-unit variation and to detect both positive and negative trends over time with the aim of ultimately improving clinical outcomes. A national system, that ensures at least annual reporting of a core set of maternity indicators, needs to be enacted in Australia to monitor the safety and quality of hospital-based maternity care provision. Results should be reported by peer groups of hospitals in a format that shows the mean, variance around the mean, and gains to be made by shifting the mean in a positive direction. Each maternity service also needs to have in place a robust clinical governance framework to ensure that clinical teams have the capacity to review the outcomes for each indicator with the aim of improving clinical practice.

This report concludes that responsibility for leading work on the collection, collation and analysis of the national data should be assigned to a single lead agency – the Australian Commission on Safety and Quality in Health Care (ACS&QHC). Its prime roles would be to provide timely feedback of results to each maternity service and to assist clinicians in their endeavours to achieve change in clinical practice for the benefit of women and their newborn babies. Subject to agreement by the ACS&QHC and Government, the handover of this responsibility should occur simultaneously with the completion date of this project.
Recommendations of the Core Maternity Indicators Project:

1. Utilise the ‘selected primipara’ definition to pre-risk adjust the population under study for specified indicators where casemix variance would affect the validity of inter-unit comparisons (page 32).

2. Move to the ‘standard primipara’ definition (as per the Measuring Maternity Care Report) for pre-risk adjustment of specified indicators once agreement has been reached by the National Health Perinatal Data Development Committee (NHPDDC) on the definition of ‘medical and obstetric complications’ to be excluded (page 32).

3. To ensure the capacity to collect consistent data on all births from all maternity service providers and permit risk adjustment, the data should be sourced from state and territory midwives / perinatal data collection forms (page 43).

4. Request that state and territory health departments, via the NHPDDC, incorporate the data elements required for the collection of all core maternity indicators into their midwives / perinatal data collection forms (page 43).

5. Request that the National Health Information Management Principal Committee investigate the possibility of reducing the time delay between completion of midwives / perinatal collection forms and the provision of nationally collated data on the core maternity indicators back to hospital maternity services (page 43).

6. The core maternity indicator set for Australia is (page 57):

   **Antepartum**
   
   Smoking cessation advice during pregnancy

   **Intrapartum**
   
   Induction of labour rates for selected first births
   Caesarean section rates for selected first births
   Episiotomy rates for all first births
   Third and fourth degree tears for all first births
   Unassisted vaginal births following a spontaneous onset of labour for selected first births

   **Postpartum**
   
   APGAR score ≤ 6 at 5 minutes for live term infants
   Death of baby around the time of birth
   Significant blood loss within 24 hours following a vaginal birth
   Supporting breastfeeding

7. Request ACHS to facilitate a pilot of the Core Maternity Indicators during 2007. Any recommendations for change as a consequence of this collection and relevant analyses should be submitted to the expert advisory group convened to provide ongoing support and guidance on the National Core Maternity Indicator Set (page 121).
8. That a pilot study should be conducted during 2007 to trial the collection of the indicators and to investigate the issues raised in the report prepared by the Health Services Research Group (Page 121).

9. Subject to agreement by AHMAC / AHMC, the ACS&QHC should assume the governance role for the next phase of the CMIP and implementation of the proposed future work program as described in Chapter 10 of this report (page 128).

10. Given the complexity of maternity information systems, confidentiality requirements and the analyses required, the ACS&QHC should examine the potential for a specialised agency, under a formal agreement or contract, to assume the responsibility for data collection, validation, statistical analyses, and reporting of the indicators (page 128).
Introduction to the Core Maternity Indicators Project

1.1 Background

The final report of the Douglas Inquiry into obstetric and gynaecological services at King Edward Memorial Hospital for Women (KEMH) in Perth 1990-2000, recommended that the Department of Health in Western Australia (DoHWA) and KEMH work with other tertiary maternity service providers in Australia to establish and publish annual comparative analyses, benchmarks and / or performance indicators for obstetric and gynaecological practice and outcomes.

In April 2002, Australian Health Ministers gave in-principle agreement for a collaborative project enabling analysis of comparative clinical performance data from tertiary obstetric and gynaecological hospitals in Australian States and Territories. DoHWA agreed to coordinate the project.

In February 2003 DoHWA held a meeting of key stakeholders in Sydney that resulted in an agreement to seek funding from the Australian Health Ministers’ Advisory Council (AHMAC) for the establishment of a Steering Group to oversee the project. AHMAC considered the proposal and referred it to the then National Health Information Management Group (NHIMG), now known as the National Health Information Management Principal Committee (NHIMPC).

In July 2003 the DoHWA provided funds for a Project Officer to conduct a three-month pilot project. The pilot project demonstrated ‘proof-of-concept’ for maternity data benchmarking within an effective quality improvement framework with significant potential to improve the quality of maternity care. As a result of the findings, funding to develop the project at a national level was sought from the Australian Council on Safety and Quality in Health Care (ACS&QHC) in June 2004.

In March 2005, the National Maternity Services Collaboration on Health Policy noted to AHMAC that it would be necessary to identify and develop a set of national performance indicators with a view to aligning service and clinical indicators. During early 2005, the DoHWA was advised that funding would be forthcoming from the ACS&QHC in response to their submission. The DoHWA then consulted with a number of agencies that had an interest in maternity indicators to discuss the best way forward to develop a national set of risk adjusted maternity performance indicators. These discussions formed the basis for the Core Maternity Indicators Project being established. Women’s Hospitals Australasia was subsequently asked to manage the Project Plan developed by this group.
1.2 Context

Admission for the birth of a baby is one of the most common reasons for admission to an Australian hospital. There are around 250,000 deliveries annually. The majority of women in Australia give birth in hospital, either in conventional labour ward settings or in hospital birth centres. These hospital settings may be located in rural regions or in metropolitan or capital cities. They may be provided in specialist or generalist public hospitals or private hospitals. Women can choose whether to utilise their private health insurance to meet the costs of care or to elect to be a ‘public’ patient in which case care is provided free of charge under Australia’s national health insurance system, Medicare.

Depending upon the size of the maternity services available in their local area there are generally a range of ‘models of care’ for women who are pregnant to choose from. Antenatal care may be provided by their General Practitioner alone or in a shared care arrangement with the local maternity service. Alternatively they may choose to be cared for by a hospital team that comprises a midwife or team of midwives and a specialist obstetrician. Others choose to receive their antenatal care from a specialist private obstetrician who will also attend or supervise the birth. The variety of settings within which antenatal care is provided complicates the collection of performance information for this stage of pregnancy. However, as almost all births occur within a hospital setting there is an ideal opportunity to collect data and monitor the performance of all Australian maternity services.

Various agencies in Australia are already collecting clinical data or developing indicators in the area of maternity care. Some of these have a remit only within their state or territory or only for members of their organisation or only for public or private patients. For example, the Australian Council on Healthcare Standards (ACHS) has extensive experience in designing and collecting clinical indicators following the development of 18 sets of clinical indicators in the 1990’s. A feature of the ACHS collection is ongoing review and refinement of indicator sets “until a core group of the most valuable and responsive measures” are achieved (Collopy, 2000). These indicators are only collected and reported by the ACHS for hospitals that are members of their organisation.

Women’s Hospitals Australasia (WHA) has been collecting a broad range of obstetric and perinatal indicators for Australian and New Zealand member hospitals since 1997 and has published two reports for their use, the latest in 2004 with a third in press. The indicators collected are predominantly rate based process or outcome indicators that aim to draw the attention of contributing hospitals to practice issues that may warrant further investigation or action. WHA’s membership predominantly comprises larger, tertiary public women’s hospitals and maternity units.

The National Perinatal Statistics Unit (NPSU), a collaborative unit of the Australian Institute of Health and Welfare (AIHW), has done substantial work in perinatal data development as well as establishing and maintaining data collections on perinatal health, congenital malformations and assisted conception. The NPSU has recently evaluated the National Perinatal Minimum Data Set to refine existing data elements and add new elements for future collection. The NPSU has a mandate to receive, and report on, perinatal data from all state and territory perinatal data collections; however their role does not currently extend to the reporting of clinical indicators by maternity service provider.
Similarly, health departments in some states and territories have put considerable effort into developing health performance indicators. In particular, Victoria has developed a set of ten statewide indicators of maternity care. These ten indicators span a range of domains of care and address both process and outcome measures for the three phases of maternity care. While the process of developing and testing these indicators has been rigorous and highly successful, the Department of Human Services in Victoria was a willing and active participant in the development of a set of national maternity indicators to enable a broader comparison base.

1.3 Rationale

Maternity care providers have a responsibility to ensure that optimal care is provided to women and their babies. However it is difficult for individual maternity services or clinicians to be sure that they are providing comparable quality of care without the capacity to benchmark with each other and to compare performance on a range of key processes and outcomes.

A great deal can be done by individual services to facilitate the delivery of high quality care and safe birthing outcomes, including implementing evidence-based guidelines, clinical audit, credentialing and incident monitoring systems. However, without a system of comparison between adequate numbers of service providers with a similar casemix, there is no assurance that the provision of maternity care is of the highest standard.

It is well documented that clinical indicators are useful tools through which quality of care can be monitored and measured. The ACHS defines a clinical indicator as ‘an objective measure of the clinical management and outcome of care’ (Collopy and Balding 1993). However, indicators alone are not a direct measure of quality; rather they act as ‘flags’ to highlight possible problems or areas of practice that may need further review. There is a general consensus that performance indicators should either measure an outcome or a process of care. The components of process and outcome should not be considered as discrete but as being integrally linked to each other. Further, a clinical indicator should be based on evidence confirming the underlying causal relationship between a particular process or intervention and health outcome. It should be rate based (as opposed to sentinel event indicators); risk adjusted (where possible) and able to be influenced by active improvement of health care processes or interventions. The comparison of outcomes between maternity units within an area or district health service is certainly of value but even at the state or territory level there are often insufficient maternity units that have a similar casemix to enable valid conclusions to be drawn about the relative levels of quality and safety achieved when compared with their peers. Comparison of a core set of maternity indicators across Australia will provide a wealth of information to guide improvement activities within individual units as well as providing information and research material on national health system performance pertaining to maternity services.

Maternity care providers are also facing an increasing risk of litigation and rising insurance premiums. Providers need timely and relevant data to improve the quality of their care and meet the expectations of their patients. While there are several maternity data collections in operation in Australia, there is no nationally coordinated approach to provide regular, clinically relevant comparisons, between women’s hospitals or health services with appropriate adjustments for differences in catchment populations and casemix. Indeed concerns have been raised in recent times about the burden on hospitals that have to report to a number of agencies on similar indicators in different ways and at different times. This is particularly onerous for many hospitals, particularly those without effective electronic obstetric data collection and reporting systems.
This project considered performance indicators with good clinical evidence linking the measured outcome or process with an opportunity to improve maternity care. A ‘bottom-up’ approach, with active clinician involvement, ensured that the indicators were meaningful to clinicians. This project is the first national attempt to collaborate with all relevant stakeholders to achieve consensus and standardisation across jurisdictions for the purposes of improving the quality and timeliness of maternity data and linking it directly to improving health outcomes for women and babies.

1.4 Aim and Objectives

The overall aim of the project was to establish a national system for comparative analysis of clinical data that would assist clinicians, and the hospitals they worked within, to improve the quality and safety of maternity care.

The objectives of the Core Maternity Indicators Project Expert Working Group (CMIP EWG) were defined as follows:

- To develop recommendations on a core set of indicators arising from the literature review;
- To review and gain consensus on a set of criteria for assessing the value of each indicator proposed;
- To prepare a short list of maternity indicators which should be considered as ‘core’ and rank them according to the agreed criteria;
- To clearly and unambiguously define the numerator and denominator for each indicator meeting all criteria;
- To give consideration to feedback from the Reference Group including recommendations for standardisation or risk adjustment to enhance comparability;
- To propose a framework for data governance arrangements and sustainability and, most importantly, for ensuring effective utilisation of the information by hospitals and health professionals involved in the care of women and babies;
- To oversee a pilot collection of indicators at the nominated trial sites; and
- To provide a final report to the Project Management Group and Reference Group containing all recommendations.
Project Structure, Management and Process

2.1 Outline

The Project framework was developed after initial discussions between DoHWA and other interested stakeholders. In 2005, WHA was commissioned by DoHWA, on the advice of this group, to manage the Core Maternity Indicators Project (CMIP). The Project was to be supported by the input of an Expert Working Group (EWG) made up of clinical, data and policy experts in the areas of maternity / obstetric care and clinical indicator development. Representatives from all possible stakeholder groups were invited to form the CMIP Reference Group (RG) whose function was to provide guidance and feedback to the EWG and to assist the EWG to achieve consensus on the core set of maternity indicators and their associated definitions. The project was allocated a timeframe of sixteen months, to commence in September 2005 and finish in December 2006.

2.2 Committee Structure

2.2.1 Project Management Group

A small Project Management Group (PMG) was convened to oversee the Project consisting of:

- The Clinical Leader of the EWG;
- The Fundholder, namely the Department of Health, Western Australia (DoHWA);
- The Project Manager, Women's Hospitals Australasia

The line of reporting by the Project Management Group was to the funder, namely the Australian Council on Safety and Quality and in Health Care (ACS&QHC), now the Australian Commission on Safety and Quality in Health Care and the Australian Health Ministers’ Advisory Council (AHMAC). The role of the PMG was to oversee the administrative and financial aspects of the Project and to ensure that the aims and objectives were achieved. The PMG also assisted in the selection and appointment of the Senior Project Officer.

2.2.2 Expert Working Group

The Expert Working Group (EWG) was chaired by the Project Clinical Leader. The group comprised obstetricians and midwives as well as experts in maternity policy, perinatal epidemiology and data definition and consumer representatives.
The role of the EWG was to:

- To ensure that the health and wellbeing of Australian women and their babies is considered first and foremost in selecting indicators;
- To contribute their knowledge and experience to the development of a national core set of maternity indicators; and
- To ensure that the indicators selected are able to capture the essence of quality of care for all maternity units whether small or large; rural or metropolitan; generalist or specialist; private or public.

Members of the EWG were invited to participate on the basis of their expertise in the area of maternity / obstetric care generally, or maternity clinical indicators specifically. In addition, a number of key stakeholder groups, including the consumer body The Maternity Coalition, were approached to nominate a representative to ensure a balanced, multidisciplinary perspective.

Letters of invitation were sent by DoHWA to nominated experts or nominees of a group or organisation. Acceptance of the invitation to participate was an agreement of commitment. The EWG was then charged with the responsibility of managing the tasks of the project within the allocated timeframe. Further their role was to ensure that appropriate consultation occurred, and feedback incorporated, at key decision points in the Project Plan. Discussion was to be conducted without bias towards any one idea / group or organisation’s requirements.

Prior to any meeting or teleconference, relevant documentation and supporting documentation was provided with sufficient lead-time to ensure the opportunity for reading prior to discussion. Comments on the proposed indicators received from members of the group were collated by the Project Officer and where it could be supported, amendments made to the indicators to reflect the majority of the comments. A limitation of this process was the potential for the meaning or the emphasis of the language to be misinterpreted. Similarly, sentence and / or grammar construction had the potential to skew the interpretation and in doing so impact on the content of the changes to the indicators. To this end, amendments made to the indicators were supported by a summary of the comments with acknowledgement made to the source. Comments submitted by the Reference Group were similarly tracked and accounted for in the decision-making process.

2.2.3 Reference Group

The Reference Group (RG) was formed from representatives nominated by a range of agencies, associations, professional colleges, government and non-government departments /committees / organisations and jurisdictions with an interest in maternal and perinatal health. The role of the RG was to ensure that:

1. Broad consultation and feedback was available to the EWG as part of the decision-making process for selecting and defining the indicators prior to their inclusion as ‘core’.
2. That a framework for collection and reporting was developed which was consistent with state and territory clinical governance programs.

Correspondence with the RG nominee occurred via email, facsimile or mail. The nominee would then seek wider consultation within their group, organisation or department prior to submitting their response. This broader consultation gave strength and validation to any decision made by the EWG in the selection of the final core maternity indicator set.
Group composition

<table>
<thead>
<tr>
<th>Department / Organization</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Departments of Health</td>
<td>8</td>
</tr>
<tr>
<td>Medical Colleges / Associations</td>
<td>2</td>
</tr>
<tr>
<td>Midwifery Colleges / Associations</td>
<td>2</td>
</tr>
<tr>
<td>Private Hospital Associations</td>
<td>1</td>
</tr>
<tr>
<td>Rural Medicine</td>
<td>2</td>
</tr>
<tr>
<td>Neonatal Networks / Associations</td>
<td>2</td>
</tr>
<tr>
<td>Data / Policy Organisations</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total number of stakeholders</strong></td>
<td><strong>26</strong></td>
</tr>
</tbody>
</table>

Letters of invitation were sent by the DoHWA to relevant stakeholders seeking the nomination of a representative to participate in the CMIP. Where practicable, a nominated representative on the EWG was able to accept and combine their membership with their role on the Reference Group. However, the two roles were very distinct. RG members were expected to consult broadly and facilitate feedback from the collective organisation, agency or department that they represented. The advice received from the RG was collated and measured against the outcomes of the EWG’s deliberations for ‘likeness’ and ‘robustness’. All feedback was treated equally and used to develop the final set of core maternity indicators.

### 2.3 Reporting

As a requirement of the Project, the Project Manager provided regular progress reports to the project’s funder, DoHWA. In addition, reports were provided to AHMAC and its committees (Statistical Information Management Committee, National Health Information Management Principal Committee) and the Australian Commission on Safety and Quality in Health Care.

### 2.4 Project Funding and Expenditure

The total funds allocated to the project by the ACS&QHC was $120,000.00 with management of the funds to be undertaken by the DoHWA. The following table shows the overall budget for the period August 2005 – December 2006 inclusive:

<table>
<thead>
<tr>
<th>Cost Component</th>
<th>$ Allocation of Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salary – Project Officer – inclusive of 15% on-costs</td>
<td>91,000.00</td>
</tr>
<tr>
<td>Consultancies (external) – as required</td>
<td>7,000.00</td>
</tr>
<tr>
<td>Meeting travel and accommodation:</td>
<td>17,000.00</td>
</tr>
<tr>
<td>• CMIP Project Officer / Manager</td>
<td></td>
</tr>
<tr>
<td>• CMIP Clinical Leader</td>
<td></td>
</tr>
<tr>
<td>• CMIP Expert Working Group (where financial support required)</td>
<td></td>
</tr>
<tr>
<td>• Consumer Participation</td>
<td></td>
</tr>
<tr>
<td>Meeting room hire and catering</td>
<td>1,200.00</td>
</tr>
<tr>
<td>Miscellaneous administrative costs – including printing, postage, telephones, photocopying, computer leasing</td>
<td>3,800.00</td>
</tr>
<tr>
<td><strong>Total expenditure allocation</strong></td>
<td><strong>$120,000.00</strong></td>
</tr>
</tbody>
</table>
2.5 Core Maternity Indicator Project Quality ‘Iterative’ Cycles

The following diagram represents the quality cycle employed by the Project Team to ensure the systematic review and development of the core maternity indicators using the principles of the “Plan, Do, Study, Act” (PDSA) model for continuous improvement.

Once the Project had been defined and the framework established, a series of iterative cycles were progressed with the ultimate aim of developing an agreed set of core maternity clinical indicators. Each cycle is described in brief below:

Cycle 1

The first cycle involved an extensive literature review specifically related to maternity care performance indicators in use nationally and internationally. An initial list of 86 indicators was prepared by the Project Officer and put before the EWG. A round table discussion by the EWG on the scientific validity, robustness, data reliability and ease of collection for each indicator eventually saw the list of potential indicators (or ‘areas of practice’ where the indicator was not defined or where there were a number of similar indicators) reduced to 26.

Cycle 2

The second cycle involved a request to the EWG to rank the proposed 26 indicators or areas of practice in priority order from one to ten, where each value could only be used once. This process facilitated the identification of those indicators or areas of practice that would be further reviewed in the literature. To strengthen the process, incomplete forms or forms submitted that did not comply with the rules of selection were withdrawn and given a ‘null’ value.
A minimum cut-off value of ‘100’ was used to determine the indicators or areas of practice that would form the initial draft list of indicators. Thirteen indicators or areas of practice were selected to be subject to a more extensive and rigorous literature review process. For some areas of practice more than one indicator option was provided. These included Induction of labour, initiation in the support of breastfeeding and APGAR score at 5 minutes.

The aim of this cycle was to ascertain whether there were gaps between current evidence and actual practice and whether monitoring of the indicator would be likely to positively influence improvements in a clinical process or outcome.

**Cycle 3**

The third cycle involved the rating of the 13 indicators on the working list based on strength of agreement with a set of selection criteria devised by the EWG (Appendix A). EWG members were asked to rank each indicator on a scale of 1 to 4 (where 1 represented ‘strongly disagree’ and 4 represented ‘strongly agree’) for each of the indicators in the working list (Appendix B). The group were also asked to include their personal perception on the content, relevance, evidence and practicality of each indicator as a free-text option.

A total score was calculated for responses that were submitted correctly. Scores were then matched against the maximum score of 32 for strong agreement and a minimum score of 8 for strong disagreement. As with the second cycle, incomplete or incorrectly submitted forms were excluded.

**Cycle 4**

The fourth cycle involved advice being sought from the CMIP Reference Group and co-opted external experts where a knowledge ‘gap’ was identified. The advice received was collated and measured against the feedback received from the EWG and compared for consistency of response. A limitation of the process was the delay in the return of responses from RG members. This was often influenced by the stakeholder’s commitment to seek as broad a consultation process as possible from within their own membership before submitting their response. This delay did not permit the EWG to discuss all comments ultimately received from the Reference Group at the scheduled meeting in June 2006.

Other indicators or areas of practice nominated by RG members were submitted to the EWG and considered for inclusion.

**Cycle 5**

The fifth cycle saw the development of the penultimate set of Core Maternity Indicators following a final call for comments by the EWG in July 2006, a consensus survey and a teleconference to discuss the results of the survey.

As a result of the discussions, nine indicators were selected for automatic inclusion into the Core Maternity Indicators set. A decision regarding the inclusion of a further two indicators was held over until a teleconference in August 2006 at which time the results of further research would be reviewed to determine the indicators relevance to the core set of indicators. Only two indicators from the initial 13 indicators or areas of practice considered by the EWG were re-classified as candidate indicators for future development.
Cycle 6

The sixth cycle saw the final list of recommended maternity indicators re-distributed to the CMIP Reference Group for final comment. Agreement or disagreement was sought for each indicator based on its title, technical definition, numerator and denominator and where relevant, any recommendations regarding risk adjustment. Responses from the RG were collated and compared with the responses from the EWG. Where a difference in opinion was found, further investigation was undertaken by the Project Team to establish the final rationale used to determine whether the indicator was included or excluded or placed on the future candidacy list.
Defining Indicators

Performance measurement in health care has been in existence for over 250 years. From as early as the middle 18th century, there is evidence to show that at least one hospital collected patient outcome data (Loeb, 2004). Collecting information on the quality of care provided by clinicians and healthcare organisations continues to be a challenge. The term ‘quality’ can be described as “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge” (McLoughlin and Leatherman, 2002). Such ways of providing information about performance can be attained through processes such as root cause analysis and clinical indicator use (Kazandjian, 2002).

In the past, clinical indicators were seen as a minor component in the management of health care but now are heavily relied upon to demonstrate accountability, safety, efficiency and quality (Gibberd, 2005). Health care organisations can no longer afford to remain complacent and assume that high quality care is delivered. Evidence that supports the delivery of quality care is now demanded by various stakeholders, including consumers, local and national authorities (Loeb, 2004).

Mannion and Davies (2002), caution that the process of simply collecting, processing, analysing, and disseminating comparative data is not enough. The challenge is how to engage the attention of those individuals and organisations in the utilisation of performance indicators to drive improvements in quality of care.

3.1 What is an indicator?

Indicators are seen as a metric or measure which screens for a particular event. The use of indicators enables professionals and organisations to monitor and evaluate how well professionals and organisational systems perform. A well-designed indicator should screen, flag or draw attention to a specific aspect of performance. In health care, an indicator is used to assess, compare and determine the potential to improve care and therefore assist in determining whether or not a standard in patient care is being met (Australian Council on Health Care Standards Clinical Indicators Users’ Manual 2004).

A ‘clinical’ indicator is specifically defined as a measure of the clinical management and outcome of care (ACHS, 1994). Clinical indicators have the ability to reflect the outcome(s) of the delivery of care or the processes by which care is delivered. Clinical indicators provide a means to reflect on and improve clinical practice; they are not a precise measure of quality of care (Ibrahim et al, 1999).
Indicators used in health care have variable functions including:

- Assessing and monitoring the differences in health status between population subgroups;
- Monitoring implementation and outputs of a program, over time;
- Evaluating the effectiveness and impact of a program by monitoring its progress towards the target it is trying to achieve; and
- Monitoring differences between health facilities across regional / geographical areas.

They can be expressed in terms of:

- Absolute numbers;
- Rates;
- Proportions;
- Averages; and
- Categorical variables (i.e. the presence or absence of a policy as an example).

They have the following requirements:

- That relevant data are available;
- That the indicator is relevant to the practice or service being measured;
- That it is achievable; and
- That it is acceptable to health providers as a reasonable measure of their performance (Maternal and Child Health Service Program Standards, 2004).

Rate-based indicators use data about events that are expected to occur with some frequency – expressed as a proportion or as a rate. Rate-based indicators require the existence of a numerator and a denominator that identify the population at risk for a particular occurrence and the period of time over which the event occurs. From this data, comparisons can be made and / or trends demonstrated. Sentinel events are often indicators of a rare outcome and as such are treated as an ‘individual’ event rather than one that foresees a ‘percentage’ of unfavourable rates around a given process or outcome. Unlike rate-based indicators, sentinel events are not measured against a numerator and a denominator (Mainz, 2003).

3.2 Outcome or Process Indicator: What’s the Fuss?

An outcome measure describes the effects of care on the health status of patients and populations by measuring positive or negative results of care provided. It is assumed that the result has been influenced by the care provided and that changes in care provision will affect performance in the outcome measure. A process measure denotes what is actually done in the giving and receiving of care requiring interaction between the clinical care provider and the patient.

When designing a clinical performance indicator system, one of the basic elements involved is making the decision about whether to focus on process or outcome measures of care. Health outcomes are more closely linked to the ultimate objectives of a health care system. As such they are therefore often more appealing. On the other hand, there may be legitimate reasons why, in the same context, a focus on process is more appropriate (Mannion and Davies, 2002). However, at the centre of this argument is the reality that the human body can accommodate poor care and yet still have a good outcome. Similarly good care does not always guarantee a good outcome (Ibrahim et al. 1999).
### 3.3 Process Indicators

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Readily measured: unlikely to be influenced by bias or error.</td>
<td>1. Salience: may have little meaning to patients unless the link to outcomes can be explained.</td>
</tr>
<tr>
<td>2. Easily interpreted: interpreted by reference to evidence rather than inter-unit comparisons.</td>
<td>2. Specificity: they are often quite specific to single disease or single type of medical care, so several process measures may have to occur to represent quality for a particular group of patients.</td>
</tr>
<tr>
<td>3. Sample size: can identify deficiencies with much smaller sample sizes.</td>
<td>3. Ossification: may stifle innovation.</td>
</tr>
<tr>
<td>4. Unobtrusive: can be assessed unobtrusively e.g. medical records.</td>
<td>4. Obsolete: usefulness may dissipate as technology and modes of care change.</td>
</tr>
<tr>
<td>5. Indicators for action: identification of failures in the process of care can be acted upon quickly.</td>
<td>5. Adverse behaviour – easily manipulated and may give rise to gaming and other adverse behaviour.</td>
</tr>
<tr>
<td>6. Coverage: can capture aspects of care (patient experience) that are valued by patients apart from health outcomes.</td>
<td></td>
</tr>
</tbody>
</table>

(Mannion and Davies, 2002)

### 3.4 Outcome Indicators

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Focus: attention towards the patient.</td>
<td>1. Attribution: may be influenced by many factors that are outside the control of the organisation.</td>
</tr>
<tr>
<td>2. Goals: represent the goals of the organisation.</td>
<td>2. Sample size: require large sample size to detect statistical difference.</td>
</tr>
<tr>
<td>3. Meaningful: tend to be more meaningful to users of clinical indicators.</td>
<td>3. Timing: may take a long period of time to observe.</td>
</tr>
<tr>
<td>4. Far-sighted: encourage providers to adopt long-term strategies e.g. health strategies.</td>
<td>4. Interpretation: may be difficult to interpret if the process that produced the outcome occurred far in the past.</td>
</tr>
<tr>
<td>5. Manipulation: are less likely to be manipulated although providers can influence risk-adjusted outcome by exaggerating the severity of patients.</td>
<td></td>
</tr>
</tbody>
</table>
3.5 Clinical indicators as defined by CMIP

For the purposes of this Project it was concluded that both clinical process and outcome indicators should be considered as both have their place in monitoring the quality of care and in fact are often inextricably linked.

The Expert Working Group, following review of the literature, agreed to the following definition to guide its deliberations during the life of the project.

‘A clinical indicator is a measure of clinical management that facilitates reflection upon the quality of care provided by a clinician or health service’.

Consistent with the Victorian Department of Human Services Report - Measuring Maternity Care: A Set of Performance Indicators, the EWG acknowledged the need to focus on rate-based measures of performance rather than on rare or sentinel events. In general, a prevalence rate of at least 5% was taken as a yardstick measure of appropriateness for inclusion. This would ensure that the indicators monitored a process or outcome pertinent to a reasonable proportion of the population under study.

3.6 Criteria used for selecting the Core Maternity Indicators

A review of the literature was undertaken by the Project Officer to assist the EWG in deciding on a set of selection criteria which could be used to screen potential maternity indicators – the rationale for each criterion is summarised below:

1. Important

1.1 Consumer

This criterion is in reference to the relevance and importance of the indicator to women in general. It also reflected the degree of consumer representation in the process of selection.

1.2 Useful

A ‘useful’ indicator is one that provides a marker of progress in the improvement of maternity care provision to those held accountable for its delivery. A useful indicator should be equally useful at the local level where a more immediate response to a local issue is likely to occur, as at an aggregated level (state or national) where comparative data may guide further analysis. A useful indicator is also one that empowers / enables clinicians to flag practices that are amendable to improvement – that is they support interventional and performance strategies; facilitate the ability to measure system-wide performance; are ‘clinically’ relevant and applicable to all levels of maternity service providers.

1.3 Understandable

An indicator that is understandable is one that can be easily defined, described and interpreted i.e. one that does not lend itself to misinterpretation.
2. Practical

2.1 Accessible

An accessible indicator is one where the data is readily available in a format that is usable and can be obtained at intervals or upon demand. Where practical, data that is common to more than one collection should be able to be sourced from a single data collection point. Accessibility should also take into account risk strategies aimed at minimising data redundancy and reducing the number of resources necessary to ensure the accurate collection and quality of the data.

3. Technical

3.1 Scientifically Robust

A scientifically robust indicator is one that is ‘valid, specific, sensitive and a reliable reflection’ of that which it purports to measure. That is:

‘Valid’ actually measures the issue or factor it is supposed to measure (field tested)
‘Specific’ reflects only changes in the issue or factor under study
‘Sensitive’ reveals changes, such as frequency rates, in the issue of interest
‘Reliable’ gives the same value if its measurement is repeated in the same way on the same population at the same time.

3.2 Standardisation

Standardisation refers to a process of normalisation or risk adjustment that can be applied to make the comparison of data between health services more meaningful. For the purposes of this project, and where applicable to the indicator, the use of the ‘selected primipara’ has been employed as the means of risk adjustment.

3.3 Representative

In general terms a representative indicator is able to encompass all the issues or population groups it is expected to cover.

4. Ethical

An ethical indicator refers to how data is gathered, processed and presented in a manner that is perceived as ethical – that is ‘in accordance with the accepted principles of right and wrong that govern the conduct of health and health professionals’. Ethical behaviour includes maintaining respect for an individual’s right to privacy; supporting ‘freedom of choice’ in the collection of the data; and obtaining informed consent relating to the nature and implications in the use of the data.

Using these criteria meant that a maximum score of eight was achievable for each indicator and a score of eight could therefore be assumed to represent a ‘strong’ indicator.
3.7 Risk Adjustment and Standardisation

Patient outcomes are a combination of patient and disease factors as well as quality of care. To make valid comparisons between the quality of care provided by maternity services with different populations and variations in casemix severity, it is important to take these factors into account. The decision to narrow the patient population (pre-risk adjust) or standardise the study population in some way to control for differences across hospitals, is one which needs careful thought as it can complicate definition and collection of an indicator and reduce the size of the population under study without any major gain in validity.

The concept of the ‘standard primipara’ as a basis for inter-unit comparisons has been recommended for the past few decades (Alfirevic et al, 2003). Using this concept, rather than the whole obstetric population as the basis for inter-unit comparisons, controls for the considerable difference in casemix seen in the different units and increases the validity of those comparisons (Cleary et al, 1996). This method of pre-risk adjustment was utilised by the Victorian Department of Human Services for a number of maternity indicators detailed in Measuring Maternity Care, 2001 Report. The ‘standard primipara’ is defined in this Report as:

- a woman who is 20-34 years of age,
- giving birth for the first time,
- baby not small for gestational age (birth weight greater than 10th percentile),
- singleton pregnancy,
- cephalic presentation,
- ‘at term’ (37-41 weeks’ gestation) and
- free of medical complications of pregnancy

Elliott et al (2004) also found that focussing on the nulliparous woman at term balanced outcomes other than caesarean section. They reported that health professionals had a resurgence of pride and job satisfaction in measures that were well done and have embraced the opportunity for improvement on measures not so well done. In addition, one of the recommendations from the final report of the Douglas Inquiry into obstetric and gynaecological services at King Edward Memorial Hospital for Women (KEMH) 1990-2000 was for organisations to explore the use of standardised primigravida when comparing hospitals (Douglas et al, 2001).

In the initial stages of the CMIP, the Project Officer undertook a literature review of risk adjustment methodologies and in particular compared existing national and international definitions for the ‘standard primipara’ (Appendix C). The EWG reviewed the results and debated the most appropriate population group to be targeted for indicators where results for different maternity services were affected by variations in casemix. After a great deal of discussion throughout the course of the Project, it was ultimately decided to proceed with the ‘selected primipara’ term as opposed to the ‘standard primipara’ term as currently used in Victoria.

The ‘selected primipara’ as defined by the EWG includes:

- a woman who is 20-34 years of age,
- giving birth for the first time,
- singleton pregnancy,
- cephalic presentation and
- at term (37-41 weeks gestation)
Whilst the committee was in agreement with the approach taken by Victoria to ‘provide the ability to analyse women with the same level of risk irrespective of which hospital they were attending’, a concern was expressed that to exclude women with obstetric and / or medical complications had the potential to diminish the ‘included’ population group to a significantly lower percentage rate. The main sticking point however lay in the definition of ‘free of medical complications of pregnancy’ and the lack of national agreement as to what constitutes a medical or obstetric complication. Currently Australian states and territories have slightly different approaches in how they define and report medical and obstetric complications.

The EWG expressed a preference to exclude women with obstetric and medical complications once those complications were consistently defined. However it was noted that this issue was currently under review at a national level. As such the EWG considered it preferable to await the outcomes of the review by the National Perinatal Data Development Committee (NPDDC) rather than attempt to define the complications within the current Core Maternity Indicators Project. It was also assumed that this process would ensure consistency of definitions between states and territories.

Once the decision to utilise the ‘selected primipara’ definition was reached there was further discussion amongst EWG and RG members as to whether ‘primipara’ or ‘nullipara’ was the technically correct term to be used in relation to the indicator to be pre-risk adjusted. The main purpose of the pre-risk adjustment was to select women giving birth for the first time whose labour should be, in the main uncomplicated; hence they were ‘nulliparous’ until they had given birth. However, after a great deal of debate it was considered that the source data for the indicators requiring pre-risk adjustment, was only documented and collected after the first birth. Consequently the indicator was providing retrospective results about the birth of the first baby whence the woman was then primiparous.

Recommendations:

To utilise the ‘selected primipara’ definition to pre-risk adjust the population under study for specified indicators where casemix variance would affect the validity of inter-unit comparisons.

To move to the ‘standard primipara’ definition (as per the Measuring Maternity Care Report) for pre-risk adjustment of specified indicators once agreement has been reached by the NHPDDC on the definition of ‘medical and obstetric complications’ to be excluded.
At the commencement of the Project, the Project Officer undertook an extensive literature review of national and international clinical indicators pertaining to the quality of maternity care.

The aim of this exercise was to determine:

- The range of maternity indicators which were currently in use in the English speaking world or which were recommended for future use;
- The relevance of those indicators to the aims and objectives of CMIP; and
- What could or could not be adapted from existing or proposed maternity indicator sets thereby lessening the need to “re-invent the wheel”.

4.1 Search strategy

The following databases and sources of information were used:

Cochrane Database: 2005 Issue 4

The OVID interface to search:

- MEDLINE electronic database 2000-September 2005
- CINAHL electronic database 2000-September 2005
- PsycINFO electronic database 2000-September 2005
- EBM electronic database 2000-September 2005

The Google search engine was used to undertake the Internet search.

4.2 Search terms

A comprehensive search of the electronic databases was conducted using the search terms displayed in Table 1. Through combining the search terms, citations were identified which might potentially inform the literature review. Results of the electronic database search using these terms are included in Tables 2 and 3.

In addition organisations / agencies with a remit for developing / collecting indicators of quality of care were also reviewed via the Internet to check for indicators relevant to the objectives of the CMIP, for example AHRQ, RCOG, BFHI and the National Clearinghouse Guidelines.
Table 1  Search domain

<table>
<thead>
<tr>
<th>Search domain</th>
<th>Search terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternity services</td>
<td>Maternal health services / maternal health / prenatal care / postnatal care / perinatal care / antenatal care / pregnancy / pregnan$ / newborn infant / newborn$ / obstetrics / midwifery / midwi$ / maternal welfare / infant, newborn</td>
</tr>
</tbody>
</table>

Table 2  Search domain terms

<table>
<thead>
<tr>
<th>Search domain terms</th>
<th>Medline</th>
<th>Premedline</th>
<th>CINAHL</th>
<th>PsycINFO</th>
<th>EBM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance indicator</td>
<td>30006</td>
<td>386</td>
<td>15934</td>
<td>1218</td>
<td>331</td>
</tr>
<tr>
<td>Maternity services</td>
<td>113544</td>
<td>5033</td>
<td>68041</td>
<td>6357</td>
<td>461</td>
</tr>
<tr>
<td>Performance indicator &amp; Maternity services</td>
<td>53/1869</td>
<td>1/15</td>
<td>10/667</td>
<td>0/13</td>
<td>0/48</td>
</tr>
</tbody>
</table>

The Cochrane Library was searched with the terms for potential additional indicators:

Table 3  Search terms

<table>
<thead>
<tr>
<th>Search terms</th>
<th>Cochrane Systematic Reviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>maternity / prenatal / postnatal / perinatal / antenatal / pregnancy / pregnan$ / obstetrics / midwi$</td>
<td>72/ 1045</td>
</tr>
</tbody>
</table>

4.3 Search findings

The following inclusion / exclusion criteria were applied to the citations identified in the initial search (as per Table 4).

Table 4  Inclusions / exclusions

<table>
<thead>
<tr>
<th>Inclusion</th>
<th>Exclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 2000- October 2005</td>
<td>Non -English</td>
</tr>
<tr>
<td>Existing performance indicator program</td>
<td>Too general, Non-maternity / pregnancy, Not focused on indicators / indicator program</td>
</tr>
</tbody>
</table>
4.4  **Key citation selection**

There were 64 citations identified in the original search. Citations were triaged into those:

- Possibly containing relevant information and / or authoritative opinion (45 citations); or
- Unlikely to contain relevant information or authoritative opinion (19 citations).

As a result of this exercise, 45 articles were classified as key citations and were reviewed by the Project Officer.

4.5  **National and international maternity indicators**

Ultimately 86 maternity / obstetric related indicators or areas of practice were submitted by the Project Officer for consideration by the CMIP Expert Working Group (Appendix D). These hospital-based areas or practice or indicators were divided into those **currently collected** by one or more organisation / agency (Table 6) and those **recommended** for collection by one or more organisation / agency (Table 7).

**Table 5  Organisation / agency code:**

<table>
<thead>
<tr>
<th></th>
<th>Organisation / agency code:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Department of Human Services, Victoria</td>
</tr>
<tr>
<td>2</td>
<td>Women’s Hospitals Australasia (WHA)</td>
</tr>
<tr>
<td>3</td>
<td>Australian Council on Healthcare Standards (ACHS)</td>
</tr>
<tr>
<td>4</td>
<td>Department of Health, Western Australia</td>
</tr>
<tr>
<td>5</td>
<td>PERISTAT Project, European Union</td>
</tr>
<tr>
<td>6</td>
<td>The Maryland Hospital Association Quality Indicator Project, (MHA’s QIP), United States</td>
</tr>
<tr>
<td>7</td>
<td>Maternity Services Standards Scotland, National Health Service, Quality Improvement Scotland</td>
</tr>
<tr>
<td>8</td>
<td>Joint Commission on Accreditation in Health Care Organisation (JCAHO), United States</td>
</tr>
<tr>
<td>9</td>
<td>Agency for Healthcare Research and Quality (AHRQ), United States Department of Health and Human Services</td>
</tr>
<tr>
<td>No.</td>
<td>Indicator</td>
</tr>
<tr>
<td>-----</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Caesarean section rate</td>
</tr>
<tr>
<td>2</td>
<td>Vaginal birth after caesarean section (VBAC) rate</td>
</tr>
<tr>
<td>3</td>
<td>Rate of third and fourth degree perineal tears</td>
</tr>
<tr>
<td>4</td>
<td>Incidence of intact lower genital tract</td>
</tr>
<tr>
<td>5</td>
<td>Degree of damage to lower genital tract</td>
</tr>
<tr>
<td>6</td>
<td>Induction of labour rate</td>
</tr>
<tr>
<td>7</td>
<td>APGAR score at 5 minutes</td>
</tr>
<tr>
<td>8</td>
<td>Transfers / admissions to special care nursery or neonatal intensive care unit for reasons other than birth defect</td>
</tr>
<tr>
<td>9</td>
<td>The rate of administration of antenatal corticosteroids to women delivered or transferred prior to 34 weeks</td>
</tr>
<tr>
<td>10</td>
<td>Birthweight standardised perinatal mortality</td>
</tr>
<tr>
<td></td>
<td>C1 Fetal mortality rate</td>
</tr>
<tr>
<td></td>
<td>C2 Neonatal mortality rate</td>
</tr>
<tr>
<td></td>
<td>C3 Infant mortality rate</td>
</tr>
<tr>
<td>11</td>
<td>Provision of appropriate breastfeeding support and advice</td>
</tr>
<tr>
<td>12</td>
<td>The proportion of women who receive timely hospital antenatal clinical services</td>
</tr>
<tr>
<td>13</td>
<td>The proportion of women from non-English speaking background (NESB) without proficiency in English who receive appropriate interpreter services</td>
</tr>
<tr>
<td>14</td>
<td>Referral to postnatal domiciliary care</td>
</tr>
<tr>
<td>15</td>
<td>Proportion of women offered appropriate interventions in relation to smoking</td>
</tr>
<tr>
<td>16</td>
<td>Rate of uterine rupture</td>
</tr>
<tr>
<td>17</td>
<td>Instrumental births against all vaginal births</td>
</tr>
<tr>
<td>18</td>
<td>Pregnant women &gt; 40 years/distribution of maternal age</td>
</tr>
<tr>
<td>19</td>
<td>Vaginal birth with epidural anaesthetic</td>
</tr>
<tr>
<td>20</td>
<td>Episiotomy rate</td>
</tr>
<tr>
<td>21</td>
<td>Postpartum haemorrhage rate</td>
</tr>
<tr>
<td>22</td>
<td>Blood transfusion rate</td>
</tr>
<tr>
<td>23</td>
<td>Rate of admission to ICU</td>
</tr>
<tr>
<td>24</td>
<td>Peripartum hysterectomy rate</td>
</tr>
<tr>
<td></td>
<td>Hypoxic Ischaemic Encephalopathy (HIE) rate</td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------</td>
</tr>
<tr>
<td>26</td>
<td>Rate of preterm births</td>
</tr>
<tr>
<td>27</td>
<td>Birthweight distribution</td>
</tr>
<tr>
<td>28</td>
<td>Gestational age distribution</td>
</tr>
<tr>
<td>29</td>
<td>Maternal mortality ratio</td>
</tr>
<tr>
<td>30</td>
<td>Multiple birth rate by number of fetuses</td>
</tr>
<tr>
<td>31</td>
<td>Distribution of parity</td>
</tr>
<tr>
<td>32</td>
<td>Teenage pregnancy rates</td>
</tr>
<tr>
<td>33</td>
<td>Depression and anxiety (indicator not defined)</td>
</tr>
<tr>
<td>34</td>
<td>Injury to neonate</td>
</tr>
<tr>
<td>35</td>
<td>Low birth weight babies</td>
</tr>
<tr>
<td>36</td>
<td>Obstetric trauma associated: with instrumental delivery without instrumental delivery with caesarean-section</td>
</tr>
</tbody>
</table>

### Table 7: ‘Other’ hospital-based areas of practice / indicators recommended for collection by one or more organisation / agency

<table>
<thead>
<tr>
<th></th>
<th>Administration of antibiotics to women where membranes ruptured &gt; 24 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>37</td>
<td>Administration of Anti-D to Rhesus negative women</td>
</tr>
<tr>
<td>38</td>
<td>An institution’s ability to effect c-section delivery within 30 minutes of an obstetric emergency</td>
</tr>
<tr>
<td>39</td>
<td>Antibiotic administration to women where Group B Strep was isolated</td>
</tr>
<tr>
<td>40</td>
<td>Attempted (unsuccessful) VBAC</td>
</tr>
<tr>
<td>41</td>
<td>Births attended by midwives</td>
</tr>
<tr>
<td>42</td>
<td>Births without medical intervention</td>
</tr>
<tr>
<td>43</td>
<td>Body Mass index (BMI)</td>
</tr>
<tr>
<td>44</td>
<td>Caesarean wound breakdown</td>
</tr>
<tr>
<td>45</td>
<td>Causes of perinatal death</td>
</tr>
<tr>
<td>46</td>
<td>Detection of breech presentation</td>
</tr>
<tr>
<td>47</td>
<td>Distribution of mother’s country of origin</td>
</tr>
<tr>
<td>48</td>
<td>Distribution of births by mode of onset of labour</td>
</tr>
<tr>
<td>49</td>
<td>Distribution of mother’s education</td>
</tr>
<tr>
<td>50</td>
<td>Distribution of place of birth</td>
</tr>
<tr>
<td>51</td>
<td>Distribution of timing of first antenatal visit</td>
</tr>
<tr>
<td>52</td>
<td>Indications and / or rate of elective labour induction</td>
</tr>
<tr>
<td>53</td>
<td>Indicator of maternal satisfaction</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>55</td>
<td>Indicator of support to women</td>
</tr>
<tr>
<td>56</td>
<td>Infant resuscitation required</td>
</tr>
<tr>
<td>57</td>
<td>Intra-operative prophylactic IV antibiotics during c-section</td>
</tr>
<tr>
<td>58</td>
<td>Labour duration &gt; 18 hours</td>
</tr>
<tr>
<td>59</td>
<td>Maternal LOS including excessive LOS</td>
</tr>
<tr>
<td>60</td>
<td>Maternal mortality by cause of death</td>
</tr>
<tr>
<td>61</td>
<td>Maternal transfer to perinatal centre</td>
</tr>
<tr>
<td>62</td>
<td>Midstream urine screening for asymptomatic bacteruria</td>
</tr>
<tr>
<td>63</td>
<td>Neonatal transfer to perinatal centre</td>
</tr>
<tr>
<td>64</td>
<td>Number of antenatal care visits</td>
</tr>
<tr>
<td>65</td>
<td>Number of women transferred from one birthing model to another</td>
</tr>
<tr>
<td>66</td>
<td>Percentage of all births following fertility treatment</td>
</tr>
<tr>
<td>67</td>
<td>Percentage of infants breastfeeding at birth</td>
</tr>
<tr>
<td>68</td>
<td>Percentage of very preterm births delivered in units without a NICU</td>
</tr>
<tr>
<td>69</td>
<td>Percentage of women who smoke during pregnancy</td>
</tr>
<tr>
<td>70</td>
<td>Perineal wound breakdown</td>
</tr>
<tr>
<td>71</td>
<td>Policies / procedures in place to ensure collaboration and consultation with community-based midwives</td>
</tr>
<tr>
<td>72</td>
<td>Postnatal follow-up for women with intrapartum or postpartum complications</td>
</tr>
<tr>
<td>73</td>
<td>Postpartum return to delivery room or operating room for management</td>
</tr>
<tr>
<td>74</td>
<td>Presence of prenatal record at time of admission</td>
</tr>
<tr>
<td>75</td>
<td>Preterm births occurring in service without a Level 2 or 3 nursery</td>
</tr>
<tr>
<td>76</td>
<td>Prevalence of cerebral palsy</td>
</tr>
<tr>
<td>77</td>
<td>Prevalence of faecal incontinence</td>
</tr>
<tr>
<td>78</td>
<td>Prevalence of selected congenital anomalies</td>
</tr>
<tr>
<td>79</td>
<td>Prevalence of severe maternal mortality</td>
</tr>
<tr>
<td>80</td>
<td>Prevalence of trauma to the perineum</td>
</tr>
<tr>
<td>81</td>
<td>Proportion of caesarean section with general anaesthetic</td>
</tr>
<tr>
<td>82</td>
<td>Rate of epidural</td>
</tr>
<tr>
<td>83</td>
<td>Rate of manual removal of the placenta</td>
</tr>
<tr>
<td>84</td>
<td>The provision of services responsive to the needs of women from Aboriginal background</td>
</tr>
<tr>
<td>85</td>
<td>Thromboprophylaxis for caesarean section</td>
</tr>
<tr>
<td>86</td>
<td>Use of external cephalic version</td>
</tr>
</tbody>
</table>
4.6 The selection process

The first of four face-to-face meetings of the EWG was conducted in Sydney on 20 October 2005. The EWG spent the majority of the first day reviewing and short-listing the 86 currently collected and ‘potential’ maternity indicators derived from the literature. By a process of elimination an indicator was excluded if they were deemed to be sentinel events (with a prevalence rate of less than 1%) or better collected by clinical audit, satisfaction surveys or by conducting targeted research. The EWG also concluded that if the occurrence of the outcome / intervention in the population under study was less than 5% it would be excluded from the ‘core’ set unless significant clinical value could be proven to warrant further consideration.

The design / methodology used for determining the initial list of indicators proposed from within the 86 indicators documented was based on dialogue between the members of the EWG. Each area of practice was discussed according to:

- Clinical relevance
- Consumer relevance
- Ease of collection
- Informal expert opinion / evidence
- Reliability
- Robustness
- Strength
- Usefulness

For each indicator a notation was made as to whether it was likely to be able to be derived from existing data collections such as hospital inpatient separation data or midwives’ notification systems. This process concluded with a ‘working list’ of 26 indicators or areas of practice (where the indicator was undefined or where there were a number of related indicators) being identified for further research and in-depth consideration by the group.

A further four indicators were placed on a possible candidacy list.

Table 8 – Working List of Indicators

<table>
<thead>
<tr>
<th>Antepartum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Distribution of timing of 1st antenatal visit/access to primary antenatal care</td>
</tr>
<tr>
<td>2 Presence of prenatal record at time of admission</td>
</tr>
<tr>
<td>3 The proportion of women who receive timely hospital antenatal services</td>
</tr>
<tr>
<td>4 High Body Mass Index</td>
</tr>
<tr>
<td>5 Smoking in pregnancy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intrapartum</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 Births without medical intervention</td>
</tr>
<tr>
<td>7 Rate of manual removal of placenta</td>
</tr>
<tr>
<td>8 Proportion of caesarean sections performed under general anaesthesia</td>
</tr>
</tbody>
</table>
### Intrapartum cont’d

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Caesarean section rate</td>
</tr>
<tr>
<td>10</td>
<td>Vaginal birth after caesarean section (VBAC)</td>
</tr>
<tr>
<td>11</td>
<td>Third and fourth degree perineal tears</td>
</tr>
<tr>
<td>12</td>
<td>Incidence of intact lower genital tract</td>
</tr>
<tr>
<td>13</td>
<td>Degree of damage to lower genital tract</td>
</tr>
<tr>
<td>14</td>
<td>Induction of labour</td>
</tr>
<tr>
<td>15</td>
<td>Vaginal birth with epidural pain relief</td>
</tr>
<tr>
<td>16</td>
<td>Instrumental births against all vaginal births</td>
</tr>
<tr>
<td>17</td>
<td>Episiotomy rate</td>
</tr>
<tr>
<td>18</td>
<td>PPH and/or blood transfusion</td>
</tr>
</tbody>
</table>

### Postpartum

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Depression and anxiety</td>
</tr>
<tr>
<td>20</td>
<td>Provision of appropriate breastfeeding support and advice</td>
</tr>
<tr>
<td>21</td>
<td>Referral to postnatal domiciliary care</td>
</tr>
<tr>
<td>22</td>
<td>Indicator regarding support to women and/or maternal satisfaction</td>
</tr>
<tr>
<td>23</td>
<td>Rate of urinary tract infection in women who are catheterised during birthing admission</td>
</tr>
</tbody>
</table>

### Neonatal

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>Term babies transferred / admitted to SCN or NICU for reasons other than birth defect</td>
</tr>
<tr>
<td>25</td>
<td>APGAR score at 5 minutes or need for resuscitation</td>
</tr>
<tr>
<td>26</td>
<td>Small for gestational age (SGA), intrauterine growth retardation (IUGR)</td>
</tr>
</tbody>
</table>

### Indicators for possible further consideration

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Women from non-English speaking background (NESB) without proficiency in English, who receive appropriate interpreter services</td>
</tr>
<tr>
<td>2</td>
<td>An institution’s ability to effect CS delivery within 30 minutes of an obstetric emergency</td>
</tr>
<tr>
<td>3</td>
<td>Birthweight standardised perinatal mortality ratio</td>
</tr>
<tr>
<td>4</td>
<td>Preterm births</td>
</tr>
</tbody>
</table>
Review of Data Sources

Whilst the priority in any clinical indicator selection process is to ensure that the indicator is meaningful to clinicians and consumers, the reality is that the source data required to populate the indicator must be available and easily retrieved. As the development of the indicators progressed and they were iteratively refined, the EWG frequently referred to the possible source of data for each indicator. The lack of an existing data source for an indicator, whilst important, did not prevent the EWG from including an indicator in the core set if they believed that it monitored an area of practice where clinical performance could be improved.

The following sources of hospital perinatal data were identified and reviewed for their potential to provide a source of data for the Core Maternity Indicators.

5.1 Midwives / Perinatal Data Collections

All states and territories collect a range of maternal and perinatal data using locally designed data collection forms currently labelled variably between states and territories. These forms facilitate the collection of demographic information as well as clinical and social information relating to current and previous pregnancies, obstetric and relevant medical conditions, obstetric procedures and outcomes, labour and birth, neonatal mortality and morbidity (including congenital abnormalities) and both the mother’s and infant’s status at discharge from hospital. A form is completed for every birth registered where the pregnancy carried to 20 weeks gestation or, where gestation is unknown, of at least 400 g birthweight.

The data elements are in some measure controlled by the mandated requirement, covered by legislation, for states and territories to comply with the National Perinatal Minimum Dataset (NPMDS). The National Perinatal Data Development Committee recommends definitions for perinatal data items which, once approved by the National Health Information Management Principal Committee are then included in the National Health Data Dictionary. States and territories can, however, also collect data elements according to local needs, though these data items do not take precedence over the requirements for all states and territories to submit core data to the National Perinatal Statistics Unit (NPSU) for eventual publication in Australia’s mothers and babies produced annually by the AIHW National Perinatal Statistics Unit. A number of states and territories also produce their own, state based mothers and babies report.

Prior to any data being submitted to the NPSU, each state and territory undertakes a rigorous process of quality data checks including visual screening of each form submitted, system–based logical edit checks, validation rules, manual intervention (for correcting errors), returning of incomplete forms to the place of origin and cross checking with alternate data sources or registries e.g. Births, Deaths and Marriages registries and morbidity and mortality data. The current compliance rate is 95-100%. 

- 41 -
Most states and territories align modifications to the forms with the release of national directives due to the considerable costs and educational requirements of producing and implementing a revised form. Thus any form modifications required to provide new data elements to populate the core maternity indicators could be aligned to this process. However it is noted that there may be a considerable time delay between the decision to include a data element on the form and the ability of any state or territory to actually collect that data element.

A limitation of utilising the midwives/perinatal data collection as a source of data for the core maternity indicators is that there is a considerable time lag between completion of the form and the collation of data at the national level. The annual publication of Australia’s mothers and babies occurs approximately two years after the year which it is reporting on. This time delay will not be conducive to encouraging clinicians to respond in a timely fashion to the comparative results of indicators and will limit their ability to take early action to investigate and correct practices for their hospital.

5.2 Electronic Obstetric Databases

Some hospitals and maternity services have electronic obstetric databases that support their ability to collect and report on data in line with various reporting requirements as well as meeting their own needs for data to monitor and improve individual clinical care and undertake systematic review. Electronic data systems are becoming more common in large tertiary hospitals and some states are considering state-wide implementation. However, at this time, few rural or regional maternity units are able to afford or justify such a system.

Some electronic obstetric data systems have been developed commercially while others have been developed ‘in-house’. Understandably there is often little uniformity in the programs nor the scope and fields that define the database.

The advantage of electronic systems is that data can be easily retrieved and they permit the flexibility to select women on the basis of gravida or specific risk factors. Most obstetric databases contain the data fields found on the midwives/perinatal data collections form and some allow for electronic submission. The disadvantage of utilising such systems as a national data source for clinical indicators is the low take up of such systems and the lack of control over their structure and specifications.

5.3 Hospital Separation Data

The National Hospital Morbidity Database is compiled by the Australian Institute of Health and Welfare (AIHW) from data provided by state and territory health authorities. The information is captured from record summaries for admitted patients separated (discharged, transferred, died, change in care type) from almost all public and private hospitals in Australia – including public acute, public psychiatric hospitals, private acute and psychiatric hospitals, and private free-standing day hospital facilities.

The National Health Data Dictionary (NHDD) definitions are used to standardise data and allow for greater data comparability between hospitals based on ICD10-CM coding. Hospital separation data provide useful measures of community morbidity and mortality. They measure the incidence rates of disease or procedures occurring within the hospital population and the effects of an adverse event caused by inappropriate treatment.
The limitation of this data source, in terms of the Core Maternity Indicators Project, is that whilst the data captures diagnostic and procedural information that can be coded, it does not capture data elements to which an ICD10-CM code cannot be assigned. In addition the database does not allow the filtering of sub-populations (such as the selected primipara), to allow for a more robust comparison of outcomes between hospitals with a different casemix.

**Recommendations**

To ensure the capacity to collect consistent data on all births from all maternity service providers and permit pre-risk adjustment, it is recommended that the data be sourced from state and territory midwives / perinatal data collection forms.

Request that state and territory health departments, via the National Health Perinatal Data Development Committee, incorporate the data elements required for the collection of all core maternity indicators into their midwives / perinatal data collection forms.

Request that the National Health Information Management Principal Committee consider investigating the possibility of reducing the time delay between completion of midwives/perinatal collection forms and the provision of nationally collated data on the core maternity indicators back to hospital maternity services.
Seeking Consensus

Gaining consensus amongst stakeholders on the indicators to be included in the core set was a critical objective of this Project. While no decision had been made at the outset as to how many indicators would form the core set, it was understood that the indicators should form a minimum national data set. Additional indicators may be selected and used by maternity services or states and territories to meet local needs, but the purpose of the CMIP was to recommend sufficient indicators which were relevant to the majority of providers and had the greatest potential to positively influence quality of maternity care.

The overall performance of a maternity unit cannot be predicted by just a few sentinel measures. Indicator rates are not all better or worse in one hospital; rather each unit has areas which may require further investigation and review of clinical practice. Too many indicators however can be burdensome, costly and confusing. Achieving consensus on the core set was vital if we were to reduce the reporting burden on maternity services whilst developing a robust national system of monitoring the quality of maternity care.

The CMIP Expert Working Group (EWG) used a number of techniques to achieve consensus as the indicators were iteratively refined. These are outlined below along with a more detailed description of the rounds of consultation undertaken during the course of the Project.

6.1 The Delphi Technique

By definition the Delphi Technique is a structured process for collecting and distilling knowledge from a group of experts by means of a series of questionnaires interspersed with controlled opinion feedback (Adler and Ziglio, 1996) to facilitate the formation of a group judgment (Helmer, 1977). When the technique is applied correctly, it elicits sound information and ‘group’ judgment from participants and facilitates problem solving, planning, and decision-making. A further advantage of this technique is that it does not require face-to-face interaction, preferring to elicit information from a ‘series of questionnaire rounds’ using media such as fax, email or mail to exchange ideas and manage responses.

A modified version of the Delphi model was adopted by the EWG to facilitate discussion between experts without the need to meet face-to-face and to reduce the risk of social behaviour hampering opinion-forming i.e. individuals were asked to rely on their own knowledge and the expertise of each member rather than on force of personalities (Wissema, 1982 cited in The Delphi Method: Definition and Historical Background). This concept assisted members without either clinical or epidemiology experience and where much of their decision-making would be based around expert opinion and evidence-based research. The Delphi Technique proved invaluable to the EWG by maximising discussion and decision-making in a timely manner with the least amount of disruption to members.
6.2 Likert Scaling

The Likert scale is a technique of scaling responses often used in questionnaires. It is the most widely used scale in survey research. Respondents are asked to specify their level of agreement to each of a list of series of statements.

Traditionally a five point scale is used to direct the respondent to providing a ‘degree’ of agreement for each statement proposed e.g.

1. Strongly disagree
2. Disagree
3. Neither disagree or agree
4. Agree
5. Strongly agree

For the purpose of the CMIP respondents were not given the choice of a middle option – that is the option to neither disagree nor agree was removed – forcing the respondent to make a decision.

Given the geographical location of the EWG members, face-to-face meetings were kept to a minimum and only convened when the need for active discussion was required. This often took place after a series of questionnaires had been completed; the responses collated for group discussion and prior to any final decision being made as to the relevance of the results and their effect on the future direction of the final set of indicators.

The Delphi Technique was consistently applied by the EWG and the RG to facilitate dialogue and decision-making out-of-session throughout the life of the project. The Likert Scaling technique was used to ascertain the degree (strength) of agreement against pre-defined selection criteria and to provide a rapid calculation of the results for timely dissemination to the EWG members.

Both methods reduced the potential for bias to occur; maintained a steady flow of ‘structured’ information between the EWG and the RG; allowed for the controlled feedback of the information by the Project Officer and facilitated anonymity of responses by presenting the results as a ‘group’ result rather than individually.

6.3 The process of consultation

Consultation was integral in the development of a set of maternity indicators aimed at ensuring consensus existed between all stakeholders and was achieved in an environment that was harmonious and fostered honest and open dialogue. The process of achieving consensus was viewed as a partnership where all participants consulted with each other in all decisions.

Historically, the clinician has been seen as the decision-maker for the consumer rather than a decision maker in consultation with the consumer. In the process of consultation adopted by the EWG, all participants remained without title and input was regularly sought by the Chairman from all members when it was felt that any one person, group or discipline was dominating discussions.

While there were no formal meetings of the Reference Group, their opinion was sought on two occasions to assist in the process of achieving consensus. The EWG considered the written feedback provided by the RG, including any free text responses, at each face to face meeting following each consultation round.
External consultations were undertaken when a gap in expertise was found to exist or where corroboration was needed within a particular specialist group that was unable to be met within the committee structure. These consultations were usually done on a one-off basis with the information being disseminated to the EWG as additional material for consideration.

Similarly, data trends were occasionally obtained from organisations currently collecting indicators (such as WHA, NPSU and state or territory perinatal data collection units) in order to test the robustness of a proposed indicator and / or to include or exclude an indicator based on prevalence rates.

6.4 Application of the modified Delphi Technique

Round 1:

Each EWG participant was asked to engage in an individual brainstorming session and to rank 26 pre-determined maternity indicators or areas of practice in order of 1 to 10, using each number only once, with ‘10’ representing the selector’s top preference. Responses that did not conform to the instructions were excluded from the final result. This first round of ranking yielded a total of 13 highly ranked indicators or areas of practice based on the sum of scores received.

Results of Round 1

<table>
<thead>
<tr>
<th>No.</th>
<th>Indicator or area of practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>*** PPH and ** blood transfusion</td>
</tr>
<tr>
<td>2</td>
<td>** Transfer of term infants to a Special Care Nursery / Neonatal Intensive Care Unit</td>
</tr>
<tr>
<td>3</td>
<td>Vaginal Birth following previous Caesarean Section (VBAC)</td>
</tr>
<tr>
<td>4</td>
<td>Third and fourth degree perineal tears</td>
</tr>
<tr>
<td>5</td>
<td>Induction of labour for clinical reasons</td>
</tr>
<tr>
<td>6</td>
<td>Caesarean section rates</td>
</tr>
<tr>
<td>7</td>
<td>Smoking in pregnancy</td>
</tr>
<tr>
<td>8</td>
<td>APGAR score of ≤ 3 at 5 minutes or need for resuscitation</td>
</tr>
<tr>
<td>9</td>
<td>Breastfeeding</td>
</tr>
<tr>
<td>10</td>
<td>Episiotomy rates</td>
</tr>
<tr>
<td>11</td>
<td>**** Births without medical intervention</td>
</tr>
<tr>
<td>12</td>
<td>***** Degree of damage to lower genital tract</td>
</tr>
<tr>
<td>13</td>
<td>** Maternal satisfaction</td>
</tr>
</tbody>
</table>

Symbol Code: Comment

** The area of practice does not appear in Round 1 and Round 2

*** **** ***** These symbols represent ‘pairs’ of areas of practice that were expressed slightly differently between Rounds 1 and 2
EWG members were then asked to participate in a second literature review process. The Project Officer undertook a review of the literature and other relevant sources of information for each of the 13 indicator areas to answer the following questions:

1. Does the literature suggest that current practice is NOT in accordance with recent evidence?
2. Is monitoring the rate likely to lead to improvement in the quality and safety of maternity care?
3. What are the options for defining this indicator?
4. What are the implications for monitoring this indicator in differing maternity settings (large, small, private, public, rural, metropolitan)?
5. Is the data able to be collected?

Members were then paired and tasked to review the topic literature provided to them by the Project Officer, or literature otherwise available to them and provide advice to the EWG regarding the indicator specifications (including numerator and denominator definitions). The pairs were selected based on their expert knowledge of the topic or data or where a particular interest had been expressed in a selected area of practice. Review of the literature was in accordance with the NH&MRC Guidelines for Evaluating Practice (Appendix E).

Round 2:

Round 2 required committee members to independently rank the working list of 13 indicators (and where relevant those areas of practice with multiple indicator options) based on ‘strength of agreement’ and personal views. Initially members were asked to rank the indicators according to a series of eight selection criteria under three group headers (Appendix B).

Results of Round 2

<table>
<thead>
<tr>
<th>No.</th>
<th>Indicator or area of practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Episiotomy rates</td>
</tr>
<tr>
<td>2</td>
<td>Caesarean section rates</td>
</tr>
<tr>
<td>3</td>
<td>***** No surgical repair of the lower genital tract</td>
</tr>
<tr>
<td>4</td>
<td>**** Unassisted vaginal birth</td>
</tr>
<tr>
<td>5</td>
<td>Induction of labour for clinical reasons / ** Induction of labour for non clinical reasons</td>
</tr>
<tr>
<td>6</td>
<td>Vaginal birth following previous Caesarean Section (VBAC)</td>
</tr>
<tr>
<td>7</td>
<td>Third and fourth degree perineal tears</td>
</tr>
<tr>
<td>8</td>
<td>Smoking in pregnancy</td>
</tr>
<tr>
<td>9</td>
<td>*** Blood loss ≥ 1000 mls</td>
</tr>
<tr>
<td>10</td>
<td>** Baby Friendly Hospital Initiative accreditation (BFHI)</td>
</tr>
<tr>
<td>11</td>
<td>APGAR score at 5 minutes</td>
</tr>
</tbody>
</table>
Limitations of the Indicator Selection Process following Round 2

The original intent in the selection of EWG members was to gather together expert individuals from diverse areas within maternity services (including clinical, consumer, data, policy). However there were consequent limitations on the effectiveness of the group in reviewing the literature due to varying levels of clinical knowledge and the diversity of backgrounds and interests. This diversity in skill-mix created robust debate but created a situation where there were inconsistencies in the priority and rankings of the indicators during Rounds 1 and 2 of the Project. This is an identifiable risk for groups that are not constituted as homogenous groups and where levels of understanding of technical or medical issues are inherently variable. With hindsight a better process may have been to separate the EWG in the early stages and ask those with clinical expertise to develop a working list of indicators which could be reviewed and refined iteratively by the larger EWG to ensure that consumer opinion and epidemiological, policy and data expertise was brought to bear on the final decision. However, this methodology would have involved a risk that some indicators highly valued by non-clinical members, such as consumer representatives or epidemiological experts, might not have been put forward for consideration.

A further limitation of the process was that the selection criteria were not weighted prior to the EWG being asked to rank the working list of indicators based on the selection criteria. If this had been done, the ranking of the indicators may have been more clear-cut and the decisions more robust.

Round 3:

Round 3 did not employ any of the techniques used in Rounds 1 and 2 but relied solely on discussion and consensus of opinion to determine the inclusion or exclusion of indicators.

At this stage the Reference Group were asked for the first time to express their agreement or disagreement and to provide comment on the 11 indicators (and sub-options) selected in Round 2. They were also asked to comment on a list of areas of practice which had not yet been researched or defined but for which there was some support. In addition, they were asked to list any other indicator areas which they would like the EWG to consider.

EWG members were asked to again review the 11 indicators or areas of practice based on the collated comments received from the EWG following Round 2 and the feedback received following consultation with the CMIP Reference Group. The principles of the group discussion were that:

- Each indicator was allocated a discussion time of 15 minutes;
- If at the end of the 15 minutes a consensus agreement had not been reached, the indicator was placed aside;
- At the end of the 15 minutes the Group was asked to summarise the findings to facilitate documentation of the discussion by the scribe;
- Every person’s opinion was valued equally – no ‘one’ person was allowed to dominate and all members present were asked to contribute; and
- The use of jargon or abbreviations was vetoed to minimise confusion for Group members who were not familiar with their use.

At the end of the time allocated for discussion of each indicator, the Chairman directed the Group to vote. Each person present at the meeting was allowed a single vote – that is, persons representing more than one group / organisation were still only eligible to a single vote. The decision to include an indicator or area of practice was decided by the majority.
Results of Round 3 (Note that the indicators are listed in alphabetical order as opposed to priority order as listed in Rounds 1 and 2)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>APGAR score at 5 minutes (level of score to be determined)</td>
</tr>
<tr>
<td>2</td>
<td>Blood loss of clinical significance associated with a vaginal birth</td>
</tr>
<tr>
<td>3</td>
<td>Induction of labour for first births</td>
</tr>
<tr>
<td>4</td>
<td>Number of selected primipara giving birth by caesarean section</td>
</tr>
<tr>
<td>5</td>
<td>Number of selected primipara who achieve a spontaneous vaginal birth</td>
</tr>
<tr>
<td>6</td>
<td>Perinatal mortality</td>
</tr>
<tr>
<td>7</td>
<td>Screening for gestational diabetes</td>
</tr>
<tr>
<td>8</td>
<td>Smoking cessation advice during pregnancy</td>
</tr>
<tr>
<td>9</td>
<td>Third and fourth degree tears for selected primipara</td>
</tr>
<tr>
<td>10</td>
<td>WHO’s 10 Steps to Successful Breastfeeding</td>
</tr>
<tr>
<td>11</td>
<td>Women who do not require surgical repair of the lower genital tract during their first birth</td>
</tr>
</tbody>
</table>

Round 4

It was agreed that for Round 4 the principles of Round 2 would be re-applied and each indicator was to be reviewed by the EWG in terms of its strength or weakness in relation to each of the selection criteria. However in an attempt to bring more meaningfulness to the process it was decided to not allocate a score to the categories of ‘ethical’ and ‘consumer’. The reason for the latter was that the intrinsic purpose of the core maternity indicators was to improve the quality and safety of care provided to women, the consumers of care. Clinical relevance to women was a key principle incorporated in the EWG’s Terms of Reference, therefore by default all the indicators can be conceived as relevant and important to the consumer and automatically given a score of ‘1’. Consumers were represented on both the EWG and the RG and therefore their opinions about the usefulness of each indicator for women were being captured. The ‘ethical’ category was considered redundant as the data collected for all indicators was to be aggregated and de-identified. Therefore all indicators conformed to the ‘ethical’ selection criteria making ranking unnecessary.

Additionally it was agreed to replace the selection criteria sub-category ‘Standardisation’ with ‘Comparability’. The reason for this was that a number of the indicators may not have required standardisation to ensure good comparability. It was felt that maintaining the definition of standardisation had the potential to falsely diminish the strength of those indicators which did not require risk adjustment.

Comparability was defined as ‘the ability of the data to be meaningfully compared between organisations with or without the need for risk adjustment’.
The level of strength of each indicator included in Round 4, when taking into consideration the withdrawal of the ethical and consumer categories was calculated using a maximum total score of 6 representing a ‘strong’ indicator and a minimum total score of zero representing a ‘weak’ indicator. The selection criteria used were:

1. Useful
2. Understandable
3. Accessible
4. Scientifically Robust
5. Comparable
6. Representative

Round 4 also saw the inclusion of two additional indicators (shaded in the table below) that, although not previously subjected to the same level of scrutiny, were included because of the feedback received from the EWG or the Reference Group.

A limitation of Round 4 was that a weighting was again not applied to each of the selection criteria.

### Results of Round 4

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Level of Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Access to antenatal services prior to 20 weeks (separated into Indigenous vs. Non-Indigenous)</td>
<td>5</td>
</tr>
<tr>
<td>2. APGAR score at 5 minutes for a live term infant</td>
<td>5</td>
</tr>
<tr>
<td>3. Blood loss of clinical significance associated with a vaginal birth</td>
<td>5</td>
</tr>
<tr>
<td>4. Caesarean section rates by anaesthetic type for all women</td>
<td>6</td>
</tr>
<tr>
<td>5. Caesarean section rates for ‘selected primipara’</td>
<td>6</td>
</tr>
<tr>
<td>6. Induction of labour rates for ‘selected primipara’</td>
<td>6</td>
</tr>
<tr>
<td>7. No surgical repair of the lower genital tract for ‘selected primipara’</td>
<td>6</td>
</tr>
<tr>
<td>8. Perinatal mortality</td>
<td>5</td>
</tr>
<tr>
<td>9. Screening for gestational diabetes</td>
<td>3</td>
</tr>
<tr>
<td>10. Smoking cessation advice during pregnancy</td>
<td>5</td>
</tr>
<tr>
<td>11. Spontaneous vaginal births for ‘selected primipara’</td>
<td>6</td>
</tr>
<tr>
<td>12. Third and fourth degree tears for ‘selected primipara’</td>
<td>6</td>
</tr>
<tr>
<td>13. WHO’s 10 Steps for successful breastfeeding</td>
<td>5</td>
</tr>
</tbody>
</table>
Round 5

Following Round 4 and a face to face meeting of the CMIP EWG in June 2006, a number of concerns or points of clarification remained which were unresolved at the conclusion of the meeting or were raised subsequent to the meeting. As a consequence of this outcome, the Project Management Group took the decision to re-assess by e-mail the degree of consensus for suggested changes to the included indicators or modifications to indicator specifications, prior to the next scheduled teleconference meeting of the EWG planned for 31 July 2006.

Each member of the EWG was asked to choose either “yes” or “no” for each line of text to confirm their agreement or disagreement as to the appropriateness or inappropriateness of each indicator or statement as applicable. Members were asked not to circle both responses and to try not to leave any line unanswered. Only if there was an absolute certainty that a definitive answer could not be provided was a line to be left blank. Disagreement with any line of text was not supported by allowing members to propose an alternate definition or indicator or to provide comments. This dialogue was left until the next meeting and was only to be raised should the issue remain unresolved following collation of all member responses. Terminology provided with multiple choices allowed members to choose the indicator definition which best represented their views.

Following the return and collation of the responses, a gap analysis was undertaken against the comments and the feedback provided by the CMIP Reference Group.

Consensus

Consensus is a decision that has been reached when most members of a group agree on a clear option and the few who oppose it believe they have had a fair and equitable opportunity to influence that choice. Regardless of an individual’s differing opinion to the final outcomes, all members of the group must ultimately support the decision as a group i.e. regardless of whether all participants like the decision at least all are willing to accept them and to be accountable for the results of those decisions (Richardson, 2004). Consensus exists within a group when each member can say:

- I have had the opportunity to voice my opinions;
- I believe the group has heard me; and
- I can actively support the group's decision as the best possible at this time, even if it is not my first choice (INNATE, 2004).

In order for the definition of consensus to work, a group would normally decide in advance what ‘most’ means. Typically for a small group this is:

- Between 75 and 80% (usually, more recently the general acceptance is greater than 50%)
- Where clear support amongst the majority of members can be shown.

For the purposes of the CMIP there was never a clear delineation of what would constitute consensus agreement. This has to some extent created an issue of where the line should be drawn for the inclusion or exclusion of an indicator. In order to ensure that there was some delineation it was agreed to present the indicators as those that could demonstrate:

- Clear consensus (2/3rds majority)
- Lack of clear consensus to form an opinion either way (less than 2/3rds)
Results of Round 5

Clear consensus

1. APGAR score ≤ 6 at 5 minutes for live term infants
2. Blood loss ≥ 1000 mls following a vaginal birth
3. Caesarean section rates for selected primipara
4. Caesarean section rates by anaesthetic type for all women
5. Induction of labour rates for selected primipara
6. Screening for gestational diabetes
7. Smoking cessation advice during pregnancy
8. Third and fourth degree tears
9. Unassisted spontaneous vaginal births

Lack of clear consensus

10. Access to antenatal services
11. No surgical repair of the lower genital tract
12. Perinatal mortality
13. Support in the initiation of breastfeeding

Results of discussion by the EWG

The CMIP EWG met via teleconference on 31 July 2006 to discuss the findings of the final response document noted above. In terms of consensus, nine of the proposed 13 indicators had met the conditions of clear consensus for inclusion while four lacked clear consensus. Each indicator was discussed in depth at the teleconference and members were asked to cast their final vote. Of the indicators where clear consensus was achieved, Indicators 1, 2, 3, 5, 7, 8 and 9 were accepted, although minor amendments were made to tighten definitions or titles. The discussions saw an agreement to defer the decision on the inclusion of Indicator 4: Caesarean section rates by anaesthetic type for all women, until further information was received from the Royal Australian College of Anaesthetists. It was also agreed to remove Indicator 6: Screening for gestational diabetes and place it on the list of indicators for future development pending the results of the international HAPO study and the National Evidence Based Guideline for Antenatal Care (NEBGAC) project.

Of the indicators where clear consensus was not achieved, Indicator 10: Access to antenatal services was placed on the list of indicators for future development for a variety of reasons including the inability of a maternity service to affect improvement in antenatal attendance, particularly for indigenous women. Issues such as transport, cultural barriers and socio-economic issues are known to affect a women’s decision to access hospital antenatal services. Accessing non-hospital based antenatal services may be appropriate for many women however this data could not be collected and would need to be in order to gain a true picture of access. In addition the EWG felt that it was worth awaiting the finalisation of the NEBGAC project to provide guidance on the number of antenatal visits recommended in the Guideline.

Indicator 11: No surgical repair of the lower genital tract, was replaced with an indicator which had been discarded earlier in favour of the more positive slant provided by Indicator 11. The reason for this change was the subjectivity surrounding the decision to repair damage to the lower genital tract. Collection of this indicator as it stands may discourage repair when in fact it would be appropriate. It was also felt that the literature was quite clear about the lack of evidence supporting routine use of episiotomy.
The combination of monitoring episiotomy rates as well as third and fourth degree tears was considered by the Group to provide more useful information to maternity service providers. It was agreed to place ‘No surgical repair of the lower genital tract on the list of indicators for future development or use pending reduction in episiotomy rates to a more consistent and acceptable level.

Whilst Indicator 12: Perinatal mortality, had also not achieved clear consensus, some members of the EWG felt strongly that excluding this indicator defied logic. Perinatal death was such a critical event that rates should be monitored over time and standardised nationally by gestation. The conclusion of the robust discussion on this indicator was to consult further with states and territories and to make a final decision at the next meeting. Discussions at a further teleconference on 21 August 2006 saw the inclusion of Indicator 12: Standardised Perinatal Mortality Ratio, bringing the total number of core maternity indicators to ten.

Monitoring breastfeeding rates or the capacity of a maternity service to support a women to breastfeed her infant had strong support from the EWG but there was significant debate about the formulation of an appropriate indicator, resulting in lack of clear consensus for this area of practice (Indicator 13). Monitoring the rate of exclusive breastfeeding had initially been proposed but given that many birthing women now stay in hospital for less than 48 hrs, suffered from a lack of validity. Women may successfully commence breastfeeding once discharged from hospital while others who had commenced breastfeeding whilst in hospital may cease. Other indicators proposed had included the achievement of Baby Friendly Hospital Initiative (BFHI) accreditation and the level of organisational compliance with WHO’s 10 Steps to Successful Breastfeeding. The International Lactation Consultants Association and the Australian College of Midwives were consulted to provide guidance to the EWG. The EWG concluded that achievement of Baby Friendly Hospital Initiative (BFHI) accreditation and the level of organisational compliance with WHO’s 10 Steps to Successful Breastfeeding should both be monitored as a two part indicator.
## Final Indicator Table following Round 5

### Antepartum

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Definition</th>
<th>Numerator</th>
<th>Denominator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Smoking cessation advice during pregnancy</td>
<td>The rate of women who smoked tobacco at any time during the first 20 weeks of pregnancy who were offered smoking cessation advice by a health care provider</td>
<td>The number of women who smoked tobacco at any time during the first 20 weeks of pregnancy who were offered smoking cessation advice by a health care provider</td>
<td>The number of women who smoked tobacco at any time during the first 20 weeks of pregnancy</td>
</tr>
</tbody>
</table>

### Intrapartum

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Definition</th>
<th>Numerator</th>
<th>Denominator</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Induction of labour rates for selected primipara</td>
<td>The rate of selected primipara having an induction of labour</td>
<td>The number of inductions of labour for selected primipara</td>
<td>The number of selected primipara who gave birth</td>
</tr>
<tr>
<td>3. Caesarean section rates for selected primipara</td>
<td>The rate of selected primipara who gave birth by caesarean section</td>
<td>The number of caesarean sections for selected primipara</td>
<td>The number of selected primipara who gave birth</td>
</tr>
<tr>
<td>4. Episiotomy rates for all first births</td>
<td>The rate of women having their first baby who had an episiotomy while giving birth vaginally</td>
<td>The number of episiotomies for women having their first baby while giving birth vaginally</td>
<td>The number of women having their first baby who gave birth vaginally</td>
</tr>
<tr>
<td>5. Third and fourth degree tears for all first births</td>
<td>The rate of women having their first baby who sustained a third or fourth degree tear while giving birth vaginally</td>
<td>The number of third and fourth degree tears for women having their first baby while giving birth vaginally</td>
<td>The number of women having their first baby who gave birth vaginally</td>
</tr>
</tbody>
</table>
### 6. Unassisted spontaneous vaginal birth for selected primipara

**Definition:** The rate of selected primipara who achieve a spontaneous unassisted vaginal birth

**Numerator:** The number of spontaneous unassisted births for selected primipara who gave birth vaginally

**Denominator:** The number of selected primipara who gave birth

### 7. APGAR score $\leq 6$ at 5 minutes for live term infants

**Definition:** The rate of live term infants with an APGAR score of $\leq 6$ at 5 minutes

**Numerator:** The number of live term infants with an APGAR score $\leq 6$ at 5 minutes

**Denominator:** The number of live term infants

### 8. Death of baby around time of birth

**Definition:** Gestation standardised perinatal mortality

**Numerator:** Observed perinatal deaths (of in-born babies)

**Denominator:** Expected national rate of perinatal deaths

### 9. Blood loss $\geq 1000$ mls following a vaginal delivery

**Definition:** The rate of women who sustained a blood loss $\geq 1000$ mls after giving birth vaginally

**Numerator:** The number of women who sustained a blood loss $\geq 1000$ml after giving birth vaginally

**Denominator:** The number of women who gave birth vaginally

### 10. Supporting breastfeeding

**Definition:** The rate of hospitals / organisations with BFHI accreditation and / or their compliance with the WHO’s 10 Steps to Successful Breastfeeding

**Process:** Is your hospital / organisation BFHI compliant? Yes / No

**If No,**

**Numerator:** The number of WHO’s 10 Steps to Successful Breastfeeding your hospital has achieved at the time of assessment

**Denominator:** The WHO’s 10 Steps to Successful Breastfeeding
There was also tentative agreement reached on the list of indicators earmarked for future development pending further feedback from the Reference Group.

**Indicators earmarked for future development or decision**

*Antepartum*

- Anti-D prophylaxis for Rh negative women
- Screening for gestational diabetes
- Screening for Group B streptococcus
- Women who present for confinement ‘unbooked’ or who have attended < 7 antenatal visits throughout the pregnancy

*Intrapartum*

- No surgical repair to the lower genital tract

**Round 6**

The final meeting of the EWG was held on 16 October 2006. The purpose of this meeting was to review the final feedback from the CMIP Reference Group and to finalise any outstanding issues relating to the proposed National Core Maternity Indicator Set. In addition the EWG discussed future governance arrangements for the Core Maternity Indicators and reviewed national data for those indicators for which data was available from the NPSU.

The final indicator statements are provided in full in the following chapter.
The Ten Recommended National Core Maternity Indicators

Following the final meeting of the EWG the following ten indicators achieved clear consensus for inclusion in the final Core Maternity Indicator Set. The following pages provide indicator statements for each of the ten indicators selected.

Antepartum (of or occurring in the period before birth)

1. Smoking cessation advice during pregnancy

Intrapartum (of or occurring during labour and birth)

2. Induction of labour rates for selected first births
3. Caesarean section rates for selected first births
4. Episiotomy rates for all first births
5. Third and fourth degree tears for all first births
6. Unassisted vaginal births following a spontaneous onset of labour for selected first births

Postpartum (of or occurring in the period after birth)

7. APGAR score ≤ 6 at 5 minutes for live term infants
8. Death of baby around time of birth
9. Significant blood loss during first 24 hours following a vaginal birth
10. Supporting breastfeeding

A summary of the current ability by states and territories to collect the required data elements for the indicators has been provided at the conclusion of Chapter 7.
Antepartum indicators
Indicator 1 – Smoking cessation advice during pregnancy

For the purposes of this indicator, smoking refers to the active inhalation of tobacco only i.e. it does not include passive smoking.

Rationale: Smoking during pregnancy is a serious and preventable cause of adverse maternal and fetal outcomes (Higgins, 2002 and Kramer 1987 cited in Lumley et al, 2006). In general, most women are familiar with the need to stop smoking once they are pregnant. However, many women find it difficult to stop (Abrahamsson et al, 2005).

Smoking during pregnancy is associated with maternal obstetric complications such as premature rupture of membranes, placental abruption and placenta praevia and fetal complications including low birth-weight, intrauterine growth restriction, prematurity, birth defects of the extremities, perinatal mortality and sudden infant death syndrome (SIDS) (Enkin, 2000; Lumley et al, 2004; McDermott et al 2002, DiFranza et al, 2004). These adverse outcomes may be prevented through the use of smoking cessation interventions (Lumley et al, 2004). Man and Chang (2006) also found that babies born to smokers had an increased risk of polydactyly (extra finger or toe), syndactyly (webbed fingers or toes), or adactyly (absence of fingers or toes) and interestingly the risk rose with the increased amount of cigarettes smoked during pregnancy. The group of women who were at greatest risk of these birth defects were women who smoked at least 21 cigarettes a day.

After birth the increased risk of childhood illness is well recognised in the literature. Exposure to environmental tobacco smoke is linked to increased respiratory tract infections, otitis media and childhood asthma with the severity of these problems increasing with increased exposure (DiFranza et al, 2004, Jaakkola et al 2004).

Pregnancy can be an important trigger for women to quit smoking. In many instances women are highly motivated to stop smoking at this time due to concerns relating to the well-being of their baby and secondly due to concerns regarding their own health (McDermott et al, 2002). Some women may spontaneously quit smoking as part of their pre-conceptual care and others may quit as soon as they become pregnant (Edwards et al, 1998; DiClemente et al, 2000). Unfortunately half of the women who do quit during pregnancy will recommence within six months of the baby’s birth and 70% will recommence within twelve months (Miller et al, 2001). There is compelling evidence from a large number of trials that tobacco smoking cessation ‘programs’ are an efficient method of reducing smoking rates among pregnant women and consequently in reducing the adverse effects on both women and their babies (Lumley et al, 2004; National Clearing House, 1999). Quitting is also a cost effective life change for the mother.

In summary, smoking is considered to be one of the most modifiable risk factors in pregnancy that can lead to an improvement in outcomes in both the short-term and long-term life of mother and child (Lumley et al, 2004). Pregnancy therefore provides health professionals with an opportune time to encourage and support women to make a life-changing decision that has the potential to produce a positive outcome beyond the term of the pregnancy.
Current status: There is currently no Australian national data element for the collection of data on smoking during pregnancy. In the latest figures released in *Australia’s mothers and babies report 2003* (Laws and Sullivan, 2005), the proportion of women who smoked while pregnant was available for only five states and territories:

- The Australian Capital Territory 12.2% (586),
- New South Wales 15.1% (12,875),
- Western Australia 18.9% (4,585),
- South Australia 24.6% (included women who quit before the first antenatal visit – 4,305), and the
- Northern Territory 29.1% (1,054) (Laws and Sullivan, 2005).

Internationally, in a recent study analysing all live births (8 million) in the US from the national database, there was information on maternal smoking for 6.8 million. Similarly the Canadian Task Force on preventative health care documented cigarette smoking as the principal cause of low birthweight (< 2500 gms) in developed countries with intrauterine growth retardation as the most strongly documented adverse effect of smoking during pregnancy (Moner, 1993).

Advice: Smoking cessation advice has been defined as ‘providing health education to tobacco-smoking pregnant women’. The underlying premise is that if women are made aware of the adverse effects that smoking tobacco has on the fetus, they would stop smoking. Evidence suggests that prenatal smoking cessation advice of around 10 minutes combined with simple written supporting material has the potential to increase cessation rates to 15% (Agency for Health Care Policy and Research 1996 cited in The University of York, 1998). Melvin et al (2000) recommends that a 5 to 15 minute counselling session provided by trained provider also significantly increases the rate of cessation. Smoking cessation programs need to reach women who smoke in pregnancy as early as possible. Sensitivity and tact are needed when providing support for these women to quit or reduce smoking. It is essential to provide this support throughout the remainder of the pregnancy and into the postpartum period. Therefore it is recommended that all health professionals include some level of smoking cessation advice as routine within their antenatal care service delivery.

Additional commentary / considerations by the Expert Working Group:

In terms of defining ‘advice’, the recommendations by the EWG are:

- To start with something simple as simple as ‘you need to stop smoking’;
- That there is good evidence to support that if the clinician tells the mother that she should not smoke that makes a difference; and
- ‘Cessation advice offered’ is only to be included in the numerator when that advice has been provided by a (midwifery or medical) clinician.

Future recommendation:

Aim towards moving to the 5A’s as per the Victorian Model

5A’s Model – Ask, Assess, Advise, Assist, Ask Again
Levels of evidence: Levels I, III – 2 and IV

Indicator type: Process

Title: Smoking cessation advice during pregnancy

Definition: The rate of women who smoked tobacco at any time during the first 20 weeks of pregnancy who were provided with smoking cessation advice

Aims: To identify whether any smoking cessation advice is given by hospital clinicians to pregnant mothers that self-nominate as smokers

To reduce the risk of fetal exposure to maternal smoking and the associated health risks for both mother and child

Indicator criteria met:

| Indicator Criteria | Useful, Understandable, Scientifically Robust, Comparable, Representative |

Strength of indicator:

| Strength of Indicator | 0 weak | 1 | 2 | 3 | 4 | 5 | strong 6 |

Indicator descriptor:

| Numerator | The number of women who smoked tobacco during the first 20 weeks of pregnancy who were offered smoking cessation advice by a health care provider |
| Denominator | The number of women who smoked tobacco during the first 20 weeks of pregnancy |

Exclusions: All non-tobacco-related smoking material and chewing tobacco

Passive ‘tobacco’ smoking
| Inclusions: | Tobacco that is inhaled – including cigarettes, cigars, cigarillos, pipes and water pipes |
| Limitations: | Self-reporting of smoking behaviour – this can be inaccurate |
|            | The woman needs to be motivated to want to stop smoking and to maintain this desire long-term before any cessation advice will be effective |
|            | The indicator does not capture exposure to passive smoking in the home |
|            | The indicator will not capture those women who receive smoking cessation advice from a source other than hospital staff unless re-confirmed at the antenatal clinic by the attending midwife |
|            | Some women may not access antenatal care before 20 weeks and would therefore miss the opportunity to receive advice (if they were a smoker) |
|            | Differing opinion in the level of advice that should be given and what is the minimum level that constitutes ‘cessation advice’ |
|            | The lack of a follow-up indicator to measure the effectiveness of the advice |
|            | The woman’s ethnicity and any associated cultural ‘norms’ |
| Expected benefits: | To encourage health professionals to identify women who smoke and assist them to quit, resulting in improved health status of the woman and her baby |
|            | To encourage women to maintain smoking cessation beyond the term of the pregnancy |
|            | Fiscal gains (to the woman) |
|            | Fiscal gains (to the health sector) through improved neonatal and long-term maternal health outcomes |
| Recommended Data source: | Midwives / Perinatal Data Collection Form |
Sample comments: “In my view the indicator should be the number of women given access to a smoking cessation program. I think this meets most of the criteria for a good indicator. For example, smoking in pregnancy requires further description prior to assessing whether it meets the criteria. No-one would argue that it isn’t an important issue, but how can we argue that is practical or technical or high order without knowing what is proposed to be measured”.

“There is high-level evidence of the deleterious effects on the fetus and that advice to quit by a clinician increases abstinence rates. An indicator such as the rate of women offered appropriate interventions in relation to smoking measures up well against the criteria, noting that ‘accessibility’ is an issue at least in the short term”.

“There remains the issue of accuracy in the data given that the information needs to be freely given by the woman”.

“Greater emphasis needs to be placed on the information being collected at the antenatal visit”.

“Smoking cessation education would need to be standardised in order to ensure that what is being measured is consistent. We would need to include any evidence of smoking cessation information”.
Current data availability from Midwives / Perinatal Data Collection Forms

**ACT Midwives Data Collection Form**
- Did mother smoke during pregnancy? Yes No
- If yes – average number of cigarettes per day during this pregnancy

**NSW Midwives Data Collection Form**
- Did the mother smoke at all during pregnancy? Yes No
- If yes, how many cigarettes each day on average in the second half of pregnancy
  - None
  - 10 per day
  - >10 per day
  - Unknown

**NT Midwives Collection Form**
- Was the mother smoking at the time of her first antenatal visit? Yes No Unknown
- Was the mother smoking at the time of her 36 week visit? Yes No Unknown

**Queensland Perinatal Data Collection Form**
- Did the mother smoke at all during the pregnancy? Yes No
- If yes, how many cigarettes were smoked each day on average after 20 weeks
  - None
  - ≤ 10 per day
  - > 10 per day
  - Unknown

**South Australia 2004 Supplementary Birth Record**
- Tobacco smoking status at first visit
  - 1 Smoker
  - 2 Quit in pregnancy before first visit
  - 3 Non smoker
  - 4 Unknown smoking status
- Average no. of tobacco cigarettes smoked per day in 2nd half of pregnancy
  - None
  - No. per day = < 1 (occasional)
  - Unknown no.

**Tasmania Perinatal Data Collection Form**
- Smoked tobacco? Yes No
- <10 per day > 10 per day

**Victoria Perinatal Morbidity Statistics Form A**
- Nil

**Western Australia Notification of Case Attended Form**
- Smoking during pregnancy Yes No

**Proposed changes to all Midwives / Perinatal data collection forms**
- Did the woman smoke tobacco during the first 20 weeks of pregnancy? Yes No
- Did the woman receive cessation advice by a health care provider? Yes No
Indicator 2 – Induction of labour rates for selected primipara

Rationale: Induction of labour (IOL) is undertaken by either medical and / or surgical methods to commence uterine contractions in the absence of spontaneous labour. This differs from augmentation which is performed when the progress of spontaneous labour is deemed inadequate and uterine contractions require stimulation by either medical and / or surgical methods (Summers, 1997).

The decision to bring pregnancy to an end before the spontaneous onset of labour is one of the most drastic ways of intervening in the natural process of pregnancy and childbirth. There are many reasons for elective delivery, either by inducing labour or by elective Caesarean Section, and these reasons can range from the life-saving to the trivial (Enkin et al, 2004). Unfortunately there has been very little sound research on the acceptable indications for elective delivery. Most of the research has been concerned with the various methods to achieve it. Enkin et al (2004), state that no attempts should be made to ripen the cervix unless there are valid grounds for ending pregnancy artificially. Disappointingly, with the introduction of cervical ripening agents some practitioners consider labour can now be induced more easily and valid grounds for ending the pregnancy artificially have been ignored (Glantz, 2001).

Currently, induction of labour is a common obstetric intervention and one that is often claimed to be unnecessarily high (ACHS, 2005). Although an acceptable level for the rate of induction has not yet been decided, efforts to reduce any unnecessary obstetric intervention should be made. Research focussing on outcomes associated with labour induction for specific indications and that characterise induction risk / benefit ratio is required (Glantz, 2003).

There are numerous medical indications why women are offered an IOL including but not limited to: pre-eclampsia, chorioamnionitis, diabetes mellitus in term pregnancy, and fetal compromise e.g. oligohydramnios (Harman and Kim, 1999). IOL should also be offered to women with uncomplicated pregnancies beyond 41 weeks (RCOG, 2001).

Induction of labour however is associated with a cascade of medical interventions including epidural anaesthesia, oxytocin augmentation, episiotomy, assisted birth with vacuum or forceps or emergency Caesarean Section (Cnattingius et al, 2005). Other associated risks include an increased risk of fetal distress, uterine hyper-stimulation and a greater likelihood of postpartum haemorrhage (Harman and Kim, 1999). A study undertaken by Dublin et al (2000) also found that there was an increase in the likelihood of caesarean section in nulliparous women when the indication for induction of labour was not identified.

In summary accumulating evidence shows that elective induction of labour provides no health care cost savings, while contributing to an excess of caesarean deliveries (Kaufman et al, 2002).
Current status: Figures released in *Australia’s mothers and babies report 2003* (Laws and Sullivan, 2005), show that the induction of labour rate has risen since 1991 from a rate of 19.5% to 26.1% of women. This represented a marginal decrease from the 26.6% reported in the previous year (Laws and Sullivan, 2004).

The ACHS also collects IOL data from some organisations in Australia and New Zealand. Their numerator definition includes “for indications other than those listed in the definitions as appropriate” and compares them to the number of women undergoing an IOL for any reason. The rate in 2004 was 21.9% compared to 23.4% in 1998 (ACHS, 2005). The ACHS exclusion criteria for inductions of labour include twins, antepartum haemorrhage (APH), diabetes, premature rupture of membranes, hypertensive disorders (including chronic renal disease), intrauterine growth retardation (IUGR), isoimmunisation, signs of fetal hypoxia (by cardiotocography, ultrasound or amnioscopy as documented by a clinician), fetal demise, chorioamnionitis, prolonged pregnancy (41 completed weeks or more).

There is sufficient evidence to support that induction of labour rates need monitoring and for comparison rates to be available by peer group. The ability to define those IOL’s that are undertaken for clinical reasons as opposed to those that are performed for non-clinical reasons should not influence the decision to monitor rates. The initial aim of the Core Maternity Indicators Project is to introduce evidence on how often the procedure is being performed without diluting the results through exclusions which may be ill-defined.

Additional commentary / considerations by the Expert Working Group:

The following options for this indicator were considered by the EWG:

- The inclusion of all inductions of labour;
- The inclusion of inductions for first births only; and
- The inclusion / exclusion of the ACHS exclusion criteria for inductions of labour.

Concerns raised related specifically to the ACHS exclusion criteria i.e. whether the criteria were robust enough to make the data reliable and how well are they currently collected and reported on. The agreement to use the ‘selected primipara’ creates a circumstance by which some of the ACHS criteria have already been made redundant. This would mean by the inclusion of the ACHS criteria the indicator would be subject to being risk adjusted twice. It was further agreed that the purpose of using the ‘selected primipara’ was to standardise the individual being looked at and therefore there was no rationale behind risk adjusting the individual again.

The aim is to keep this indicator simple by specifically looking at the number of women being induced (only). The trialing of the indicator will determine how reliable and meaningful the resulting data is to clinical practice. There was agreement to maintain IOL and augmentation rates separately as combining them ran the risk of changing the figures significantly.
There was also universal agreement that measuring IOL rates is a useful marker in understanding the difference in attitudes and practices between the public and private sectors.

To ensure a consistency in the interpretation of ‘labour’ and ‘induction’ it was decided to include formally accepted definitions and to amend the indicator definition to reflect ‘the rate of selected primipara having an induction of labour who are not in labour’.

The EWG also accepted that this indicator will remain sufficiently risk adjusted once the definition is moved to the ‘standard primipara’.

<table>
<thead>
<tr>
<th>Levels of evidence:</th>
<th>Levels III – 2 and V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator type:</td>
<td>Process</td>
</tr>
<tr>
<td>Title:</td>
<td>Induction of labour for selected first births</td>
</tr>
<tr>
<td>Definition:</td>
<td>The rate of induction of labour in selected primipara who are not in labour</td>
</tr>
<tr>
<td>Definition of labour:</td>
<td>Labour commences at the onset of regular uterine contractions, which act to produce progressive cervical dilatation and is distinct from spurious labour or pre-labour rupture of membranes (NHDD V12)</td>
</tr>
<tr>
<td>Definition of induction:</td>
<td>Induction of labour involves the intervention by a care provider to initiate labour in a pregnant woman in the absence of any existing signs of labour. Ruptured membranes alone, in the absence of contractions and cervical dilatation, are not in this case regarded as evidence of labour</td>
</tr>
<tr>
<td>Aims:</td>
<td>To measure induction of labour rates, for whatever reason, using a pre-risk adjusted population group</td>
</tr>
</tbody>
</table>

To provide maternity services with an indicator which 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, hospitals may need to examine the results of other indicators which can be affected by IOL such as CS, PPH and Episiotomy to ascertain whether there is any correlation

To provide organisations with evidence that inductions of labour were performed on the right women at the right place and at the right time – thereby reducing the risk of caesarean section for those women whose induction of labour fails

To improve maternal well-being and levels of satisfaction with the birthing process and to improve infant well-being by reducing exposure to risks associated with an unnecessary induction of labour
Indicator criteria met:

| Indicator Criteria | Useful, Understandable, Accessible, Scientifically Robust, Comparable, Representative |

Strength of indicator:

<table>
<thead>
<tr>
<th>Strength of Indicator</th>
<th>0 weak</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>strong 6</th>
</tr>
</thead>
</table>

Indicator descriptor:

<table>
<thead>
<tr>
<th>Numerator</th>
<th>The number of inductions of labour for selected primipara who are not in labour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denominator</td>
<td>The number of selected primipara who gave birth</td>
</tr>
</tbody>
</table>

Exclusions: All women who do not meet the criteria for the selected primipara

All women who are in labour

Inclusions: Selected primipara

Limitations: The indicator as defined does not distinguish inductions of labour undertaken for a clinical reason as opposed to those performed for non-clinical reasons such as social or maternal / physician interests

Expected benefits: To encourage benchmarking of IOL rates by peer group as there is currently no information about the ‘right’ rate of induction

Reduction in the rate of women at risk of a caesarean section due to an unnecessary induction of labour

Better insight into the appropriate rate for induction of labour within a pre-risk adjusted population

Significantly higher rates may influence hospitals with a high rate of maternal request for induction to review their practice

An improvement in the rate of maternal satisfaction with the birthing experience
Sample Comments: “Rates of induced labour is an important indicator and should be included”.

“I would love to see induction of labour rates extended to multiparae”.

“Risk adjustment moves closer towards being able to benchmark for health services to be motivated to improve and for women to have some idea how interventionist a health service is. However if there is no adjustment to compensate for casemix it’s not possible to compare tertiary health services with other health services”.

“In terms of the criteria it is important to compare like with like hence the power of some form of standardisation”.

Recommended Data source: Midwives / Perinatal Data Collection Form

Data availability from the recommended data source

Currently all State and Territory midwives / perinatal data collection forms collect the data elements required to meet the conditions of this indicator. Collection on this indicator can commence immediately.
Indicator 3 – Caesarean section rates for selected first births

Rationale: The purpose of monitoring caesarean section rates is to improve quality of care by providing health care providers with benchmark data that can be used as an impetus for continuous quality improvement efforts (Gregory, 2000). Steadily increasing global rates of caesarean section have resulted in this being one of the most widely debated topics relating to maternity care (Walker et al, 2005). Although an appropriate caesarean section rate (CSR) has never been formally determined, the rise in rates has been condemned almost universally and is now viewed as a major public health issue (Dietz and Peek, 2004).

In 1995 the World Health Organisation (WHO) responded to concern over the rising rates of caesarean section organising a consensus conference to review this issue. At this conference it was concluded that there were no additional health benefits associated with a CSR above 15%. By 1999 most developed countries surpassed this figure and concern continues in 2006 about the rising rates and the health impact on women and their babies (Thomas and Paranjothy, 2001). An article in 2002 reported that the United States and Australia had the highest caesarean section rates in the developed world at 22% and 21% respectively (Walker et al, 2002). What is of particular concern is that the trend of increasing CSR shows no sign of reversing and there appears to be a lack of serious attempts to address this issue (Dietz and Peek, 2004).

There is agreement amongst professionals that whilst caesarean section deliveries are safer today than they were in the past, there are still psychological and physiological morbidity and mortality considerations for both the mother and the child associated with the procedure (Walker et al, 2005).

Many people continue to view low caesarean section rates as a marker of obstetric quality. However it has been well established that risk-adjusted caesarean delivery rates are a more appropriate marker of quality than actual caesarean delivery rates.

In many instances the decision to offer a primary caesarean delivery is at the discretion of the physician. Therefore measuring the rate of primary caesareans is often used as a marker of physician behaviour (Bailit et al, 2003).

There are studies that have shown that there is a higher patient satisfaction rate with a lower caesarean delivery rate (Cohen, 2005) as well as those that have shown that reducing the rate of primary caesarean sections will proportionally reduce the number of future repeat caesarean deliveries (Fischer et al, 2005) and improve the long-term well-being of the mother.

The question therefore is ‘can we reduce caesarean section rates?’ Whilst assuming that the answer is yes, more accurate and timely information is needed using a standard methodology and / or a specific group of women that is reportable to the level of the hospital. It is only then that caesarean rates can be fairly judged as to whether they are appropriate or not (Robson, 2001).
What is the right caesarean section rate?

To date no consensus has been reached on the right CSR because of lack of information about the difference in birth outcomes associated with higher or lower CSR (Li et al, 2003 and Enkin et al, 2004). Some data suggests that lowering the CSR may increase the occurrence of adverse maternal and infant outcomes, especially uterine rupture and birth injury. On the other hand, a higher CSR is not necessarily associated with better perinatal outcomes (Li et al, 2003). Sachs et al (1999) contended that efforts to reduce the CSR should focus not on a specific percentage per se but on reducing the number of primary CS deliveries.

Possible reasons for rising caesarean section rates

There have been many reasons cited in the literature about the rising CSR. These include: earlier interventions in labour due to threat of litigation, routine CS for breech presentation, widespread use of electronic fetal monitoring, the need for repeat CS, the socio-economic status of the woman, expectations of the woman and convenience for both the obstetrician and the woman (Enkin et al, 2004). Labour dystocia and fetal distress are just two of the most common reasons for performing CS, yet the definitions for both are unclear (Enkin et al, 2004). Over the past decade there has been an increase in requests from women to birth by caesarean section. In the UK 7% of the CS performed were from maternal request alone (National Collaborating Centre for Women’s and Children’s Health, 2004).

Risks associated with caesarean section

While caesarean sections performed for necessary indications have the ability to save the lives of women and babies, there are risks associated with this surgical procedure. The maternal risks include: surgical and anaesthetic complications, urinary tract injury, increased blood loss, need for blood transfusion, pulmonary embolism, infections such as endometritis, wound infection, urinary tract infection, gastrointestinal complications, and lactation delay. There are also increased risks for future pregnancies including placental abnormalities and / or uterine rupture (for women attempting VBAC), and an increased risk of stillbirth (Lavender et al, 2006, ALSO, 2001, Smith, 2004).

The risks for the baby include scalp laceration during the operation, iatrogenic prematurity, Respiratory Distress Syndrome (RDS), delay in skin to skin contact with mother, and delay in breastfeeding (Dietz et al, 2004, National Collaborating Centre for Women’s and Children’s Health, 2004 and Gerten et al, 2004).

Current status: Figures released in Australia’s mothers and babies report 2003 (Laws and Sullivan, 2005), indicate that 28.5% of all births were by caesarean section compared to 19.4% in 1994 and 18.0% in 1991.

In 2005 the ACHS reported the rate as 19.9% compared to 20.4% in 2004. WHA reported the average CS rate for their member hospitals as 25% in 2002 / 03 compared to 23.7% in 2001 / 02 and 23% in 2000 / 01 (Buist and Cahill, 2004).
Additional commentary / considerations by the EWG:

**Elective versus emergency caesarean section**

Considerable debate occurred as to the value of separating elective from emergency caesarean section rates. Given the range of definitions of ‘elective’ and ‘emergency’ currently used by the states and territories it was decided that the division would not elicit reliable results. It was felt that the EWG needed to work towards looking at the reasons for caesarean section before bringing in any issues of what constitutes an elective versus emergency caesarean section.

**Caesarean section under general anaesthetic**

Consideration was given as to whether reporting of this indicator would have any effect on improving clinical practice. It was generally accepted that this was a good indicator that could be used as a marker for the quality of both obstetric and anaesthetic service provision. Similarly, that maternal outcome is improved when caesarean section is performed under alternate methods of anaesthesia such as regional block. It was finally agreed to wait until an official statement has been received from the Royal Australian and New Zealand College of Anaesthetists (RANZCA) and confirmation that this indicator does not duplicate what is already being collected.

**Future recommendations:**

- To measure the rate of elective versus emergency caesarean section
- To aim towards developing an indicator aimed at gaining a better understanding of the reasons for caesarean section e.g. maternal request versus clinical requirement
- To reconsider the inclusion of caesarean section rates performed under general anaesthetic once advice has been received from RANZCA

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**Levels of evidence:** Levels I, III – 2, III – 3 and IV  
**Indicator type:** Outcome  
**Title:** Caesarean sections for selected first births  
**Definition:** The rate of selected primipara who gave birth by caesarean section
Aims: To measure caesarean section rates, for whatever reason, using a pre-risk adjusted population group

To provide organisations with evidence that caesarean sections were performed on the right women at the right place and at the right time – thereby reducing the risk of repeat caesarean sections for this group of women

To improve maternal well-being and levels of satisfaction with the birthing process and to improve infant well-being by reducing exposure to risks associated with an unnecessary caesarean section

If rates are significantly higher than their peer group at a national level, hospitals may need to examine the results of other indicators which can be affected by CS such as PPH, maternal and neonatal morbidity and mortality rates, to ascertain whether there is any correlation

Indicator criteria met:

| Indicator Criteria         | Useful, Understandable, Accessible, Scientifically Robust, Comparable, Representative |

Strength of indicator:

| Strength of Indicator | 0 weak | 1 | 2 | 3 | 4 | 5 | strong 6 |

Indicator descriptor:

| Numerator | The number of caesarean sections for selected primipara |
| Denominator | The number of selected primipara who gave birth |

Exclusions: All women who do not meet the criteria for the selected primipara

Inclusions: Selected primipara
Limitations: The indicator as defined does not distinguish caesareans undertaken for clinical reasons as opposed to those performed for non-clinical reasons such as social or maternal / physician interests – however this has been flagged as a recommended future indicator.

This indicator will not apply to a large number of hospitals who do not have anaesthetic services and therefore do not have the capacity to perform caesarean sections.

Rates may not be able to be influenced by maternity hospitals with a high volume of maternal request for caesarean section.

Expected benefits: Maternity service performance can be measured against national peer groups which may guide hospitals to achieve a more appropriate rate of caesarean section for this low-risk population.

- Reduction in the number of women at risk of a subsequent caesarean section and other morbidity associated with caesarean section.
- A reduction in the number of women who experience difficulties with their second and subsequent births as a consequence of a primary caesarean section.
- Reduced maternal length of stay and improved maternal satisfaction, infant bonding and breastfeeding.

Recommended Data source: Midwives / Perinatal Data Collection Form
Sample comments:

“C-Section is a crucial indicator”.

“Risk adjustment moves closer towards being able to benchmark health services against their peers”.

“Information can be used to motivate health services to improve and for women to have some idea how interventionist a health service is”.

“In terms of the criteria it is important to compare like with like hence the power of some form of standardised population group”.

“Borderline patients with some risk factors to justify C-Section problematic”.

“Patient request for C-Section not picked up in the primipara definition”.

“Using the selected primiparous woman will allow for like comparisons between institutions”.

“I am concerned regarding 'best' method of pre-risk adjustment / standardisation as well as the mixed messages it gives to clinicians / services that have a high rate but assiduously do perform CS for the right reason on the right woman at the right time and place”.

“I am concerned that this indicator only applies to a proportion of maternity services that have the capacity to perform CS”.

“It is important to continue to monitor rate of CS in 1st pregnancies given the evidence of affect on current and subsequent births”.

Data availability from the recommended data source

Currently all State and Territory midwives / perinatal data collection forms collect the data elements required to meet the conditions of this indicator. Therefore no adjustment is required to the existing forms and collection on this indicator can commence immediately.
Indicator 4 – Episiotomy rates for all first births

Rationale: Whilst the use of episiotomy is still considered by some as the ‘norm’, current evidence does not support maternal benefits traditionally ascribed to this routine practice. Evidence shows that the outcomes of an episiotomy can be considered worse since a proportion of these women would have sustained a lesser injury if the birthing process was left to proceed without surgical intervention (Hartmann et al, 2005).

In the past there have been some successful attempts to reduce episiotomy rates through raising awareness and the implementation of quality improvement programs targeted at reducing rates (Reynolds, 1995). Sadly despite these attempts, the practice still remains quite common. Practice patterns also continue to vary widely amongst clinicians as does professional opinion on the maternal risks and benefits associated with its routine use (Hartmann et al, 2005 and Viswanathan et al, 2005). However there is clear evidence from several randomised controlled trials that routine use of episiotomy should be avoided (Dannecker et al, 2004).

In 2005, the Agency for Healthcare Research and Quality (AHRQ) completed a systematic review and found that there were no health benefits to be gained from an episiotomy. Episiotomy does not prevent immediate postpartum perineal trauma. Rather, it is a major independent risk factor associated with significant early perineal trauma (Lowenstein et al, 2005). Routine use of episiotomy can be harmful to the degree that it creates a surgical incision of greater extent than many women might have experienced had the episiotomy not been performed.

Maternal risks associated with genital tract trauma either through tearing or episiotomy, include minor temporary discomfort to severe pain, bleeding, dyspareunia (painful intercourse), infection, urinary incontinence, interference in the establishment of breastfeeding and the negative impact of pain on the experience of motherhood experiences (Shorten et al, 2002, Hedayati et al, 2003 and Schytt et al, 2005).

Of these risks it is the degree of perineal pain and discomfort women experience with perineal trauma which is often underestimated (Dodd et al, 2004). Preventing perineal trauma reduces the risks of: excessive blood loss, perineal pain, infection, dysuria, bowel problems and the inability to mobilise (walking, sitting) – all of which inhibit a mother’s ability to care for their babies ‘comfortably’ (Renfrew et al 1998, Hedayati et al, 2003, Schytt et al, 2005 and Karacam et al, 2003). Similarly there may be a delay in mother-infant bonding and the establishment of breastfeeding during the time and immediately post the repair being undertaken (Murphy, 1998, Karacam et al, 2003).

Preventing unnecessary surgically induced perineal trauma will not only reduce the associated morbidity risks to the mother but it will also avoid the discomfort and pain often associated with this procedure. This in turn will improve maternal satisfaction with the birthing process and enhance mother-infant bonding (Karacam 2002).
Current status: Figures released in *Australia’s mothers and babies report 2003* (Laws and Sullivan, 2005) indicate that 16.1% of women had an episiotomy when compared to 16.2% in 2002 (excluding Tasmania) (Laws and Sullivan, 2004). The rate of episiotomy for NSW in 2004 was 13.8% with a range from 5 – 33%.

WHA reported the average episiotomy rate for their member hospitals as 17.4% in 2002 / 03 compared to 18.3% in 2001 / 02 and 20.9% in 2000 / 01 (Buist and Cahill, 2004).

Additional comments / considerations by the EWG:

Originally ‘no surgical repair of the lower genital tract’ was considered in preference to the episiotomy rates due to its more positive slant. However the issue of ‘surgical repair’ is so subjective that the rates provided may not have been as true an indicator as was intended. The issue was then raised as to which indicator would have the greater influence over clinical practice.

It was decided that for the indicator to be useful, it had to influence how care is provided. When looking at ‘no surgical repair of the lower genital tract’ the question posed by the group was ‘what can be done about tears and can they be influenced by change in practice’? As a result of this discussion the EWG agreed that the more robust evidence related to the rate of episiotomy in that it points directly to practice. Also episiotomy rates are easy to collect, are objective and evidence-based.

Future recommendations:

Once episiotomy rates reach an acceptable level the indicator should be further developed to include all rates of repair.

Following a request from consumers the EWG considered means by which this indicator could be expanded to measure the rate of tears / episiotomy in women who have undertaken tear prevention strategies. As a result of discussions, the EWG recommends that future consideration be given to the rates of episiotomy being used to measure the effectiveness of birthing techniques that have the specific purpose of maintaining the integrity of the perineum. This could be achieved through analysing the model of care adopted by the mother during pregnancy and birth (as an example).

Levels of evidence: Levels I, II, III – 2 and III – 3

Indicator type: Process

Title: Episiotomy rates for all first births
Definition: The rate of women having their first baby who had an episiotomy while giving birth vaginally

Aims:
To measure the rate of episiotomy for all first births

To provide organisations with evidence that episiotomies were performed on the right women at the right time - thereby reducing the risks of morbidities associated with this procedure

To provide maternity services with an indicator which may encourage further investigation to ensure that restrictive episiotomy policy is being followed

To improve maternal well-being and levels of satisfaction with the birthing process

If rates are significantly higher than their peer group at a national level, hospitals may need to examine the results of other indicators which can be affected by episiotomy such as bleeding, infection, urinary incontinence and maternal morbidity rates (as examples), to ascertain whether there is any correlation

To improve mother-infant bonding by reducing maternal exposure to the pain and discomfort often associated with this procedure

Indicator criteria met:

<table>
<thead>
<tr>
<th>Indicator Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Useful, Understandable, Accessible, Scientifically Robust, Comparable, Representative</td>
</tr>
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</table>

Strength of indicator:

<table>
<thead>
<tr>
<th>Strength of Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 weak</td>
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Indicator descriptor:

<table>
<thead>
<tr>
<th>Numerator</th>
<th>Denominator</th>
</tr>
</thead>
<tbody>
<tr>
<td>The number of episiotomies for women having their first baby while giving birth vaginally</td>
<td>The number of women having their first baby who gave birth vaginally</td>
</tr>
</tbody>
</table>

Exclusions: Multiparae
**Inclusions:**

All women having their first baby who gave birth vaginally – includes unassisted and instrumental births

All women who gave birth vaginally to more than one baby and who were pregnant for the first time

**Limitations:**

In its current form this indicator does not differentiate between episiotomies undertaken for good clinical reason, such as maternal / fetal compromise, and those that are performed ‘routinely’

Entrenched culture and the acceptance of episiotomy as the ‘norm’ amongst a proportion of clinicians

**Expected benefits:**

To reduce genital tract trauma and its associated maternal morbidity

Significantly high rates of episiotomy may influence hospitals to review their policy and / or their practice

To encourage the assessment of risks to the mother as well as the infant prior to an episiotomy being performed

Reduced maternal length of stay

Improved maternal satisfaction, infant bonding and establishments of breastfeeding

**Recommended Data source:**

Midwives / Perinatal Data Collection Form

**General Comment:**

Episiotomy rates are easy to collect, are objective, evidence based and have a greater possibility of influencing practice. It was agreed by the EWG to include episiotomy rates as the first target with the recommendation that once rates reach an acceptable level, to further develop the indicator to include all rates of repair. It was further agreed to measure episiotomy rates for all first births rather than just against the selected primipara. There was universal consensus on the inclusion of this indicator in light of the evidence that supports restrictive use of this surgical procedure.

**Data availability from the recommended data source**

Currently all State and Territory midwives / perinatal data collection forms collect the data elements required to meet the conditions of this indicator. Therefore no adjustment is required to the existing forms and collection of this indicator can commence immediately.
Indicator 5 – Third and fourth degree tears for all first births

Rationale: A third degree tear is an injury to the perineum involving the anal sphincter or rectovaginal septum (NSW mothers and babies report, 2005). A fourth degree tear is an injury to the perineum involving the anal sphincter complex i.e. the External Anal Sphincter (EAS), Internal Anal Sphincter (IAS) and anal epithelium (RCOG, 2004). Recognising the differences in classification of perineal tears and reporting anal sphincter injury are problematic in data collection and as such the various rates of occurrence reported in the literature may be related to the lack of recognition and reporting of anal sphincter damage (Norderval et al, 2004).

Vaginal delivery is the most common cause of anal sphincter injuries in women (Norderval et al, 2004) and as such obstetric anal sphincter injury is considered a major complication of vaginal birth – a complication that can have a significant impact on a woman’s quality of life.

Known risk factors associated with third and fourth degree tears include women who have never given birth (primipara), fetal presentation such as a persistent occipitoposterior position and face and brow presentations, induction of labour, duration of labour – particularly second stage, birthweight and instrumental deliveries (de Leeuw et al, 2001, Gupta et al, 2003, Sultan et al, 2001 and Jandér and Lyrenäs, 2001). Even so the ability of clinicians to predict tears in individual women continues to be inaccurate. Byrd et al (2005) states that awareness of the risk factors does not always help to predict which women will sustain a sphincter tear and which will not i.e. tears do occur in women without risk factors.

However there are practices that clinicians can use to reduce or minimise the risk of severe perineal trauma. These include accurate antenatal determination of the baby’s weight; monitoring the position of the baby’s head throughout the labour (Byrd et al, 2005); teaching women how to self massage the perineum in the antenatal period (Shipman et al, 1997 and Labrecque et al, 1999); being aware of the baby’s head position at all times; selective use of mediolateral episiotomy (de Leeuw et al, 2001); maternal positioning during the second stage of labour e.g. Shorten et al (2002) suggests delivering women in the lateral position has the lowest incidence of perineal trauma; controlled use of oxytocics to augment the second stage of labour (Poen et al, 1997 and Jandér and Lyrenäs, 2001); the appropriate choice of instrument for assisted deliveries e.g. vacuum (ventouse) extraction has been shown to cause less trauma to the pelvic floor than obstetric forceps (Fitzpatrick et al, 2003) and the exclusive use of one instrument rather than a combined use of instruments (de Leeuw et al, 2001 and Fitzpatrick et al, 2000).

The morbidity associated with anal sphincter disruption can be devastating for the woman. Incontinence, flatus and decreased anal pressures have been reported as common problems among women with anal sphincter rupture (Fornell et al, 2005). Between 30-50 percent of women will suffer faecal incontinence, urgency, dyspareunia or perineal pain for several years following primary sphincter repair (Norderval et al, 2004). These women will also suffer varying degrees of perineal pain, difficulties with mobilisation, limitations on feeding positions, sexual dysfunction and bowel and urinary dysfunction (Renfrew et al, 1998 and McCandlish, 2001).
Women who have sustained a perineal trauma are also 3.4 times as likely to sustain further third and fourth degree tears in subsequent vaginal deliveries (Payne et al, 1999).

Childbirth should be a time for joy and celebration. Most women however, will sustain some degree of trauma to the genital tract after vaginal birth, with higher rates especially after first vaginal births and instrumental births (Renfrew et al, 1998). The accurate identification and reporting of perineal tears is crucial for ensuring that the perineal trauma is managed in the optimal way. Regardless of the incidence rates, these tears have a long-term impact on the women and should be monitored and the results used to protect the well-being of the mother and reduce maternal morbidities.

Current status: The reported incidence rate of anal sphincter injury varies in the literature. Rieger et al (2004) reported an incidence of up to 1.2% yet there has also been reference to incidence rates being as high as 9%. An objective study by Dandolu et al (2005) identified a 7.3% rate of third and fourth degree tears from a total of 168,337 deliveries. While this may not appear to be a significant percentage, when looked at in whole numbers this figure represented 18,888 women. While accepting the wide variance in the reported incidence rates there appears to be a general acceptance of the rates for third and fourth degree tear as being between 0.5 and 2.5% (Norderval et al, 2004, Gupta et al, 2003 and Byrd et al, 2005).

Figures released in Australia’s mothers and babies report 2003, stated 1 in 100 vaginal births (1%) resulted in a third or fourth degree perineal laceration. The same figure was reported in the Australia’s mothers and babies report 2002. The ACHS also collects data on third and fourth degree perineal lacerations from some organisations in Australia and New Zealand. The data collection also only involves primiparous women. A combined result of 3.26% was obtained for both third and fourth degree perineal laceration (3.0% third degree and 0.26% fourth degree).

WHA reported the average rate for third and fourth degree tears for their member hospitals as 2.1% in 2002 / 03 compared to 1.8% in 2001 / 02 and 1.9% in 2000 / 01 (Buist and Cahill, 2004).

Additional commentary / considerations by the Expert Working Group:

Additional debate for this indicator related to which population groups should or should not be considered for inclusion. Following a request by the ACM, the EWG considered the inclusion of a separate indicator to measure the number of multiparae who sustained a third or fourth degree tear. Given that the overall national figures are relatively low, it was decided to not fractionate them further and risk making meaningfulness less likely. Similarly while the original intent of this indicator was to measure third and fourth degree tears against the ‘selected primipara’ the EWG agreed to amend the indicator to include all first births. There was also agreement not to differentiate between women who are pregnant with more than one fetus or those women presenting with a breech and to keep the degrees of these tears combined due to blurring in the categorisation and reporting of third and fourth degree tears.
<table>
<thead>
<tr>
<th>Levels of evidence:</th>
<th>Levels I, III – 2, III – 3 and IV</th>
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<tbody>
<tr>
<td>Indicator type:</td>
<td>Outcome</td>
</tr>
<tr>
<td>Title:</td>
<td>Major perineal tears during first births</td>
</tr>
<tr>
<td>Definition:</td>
<td>The rate of women having their first baby who sustained a third or fourth degree tear while giving birth vaginally</td>
</tr>
<tr>
<td>Aims:</td>
<td>To measure the rate of third and fourth degree tears in women giving birth vaginally to their first baby</td>
</tr>
<tr>
<td></td>
<td>To provide maternity services with an indicator which may encourage further investigation of labour management amongst women having their first baby if rates are significantly different from their peer group at a national level. In particular, the use of induction, instrumental delivery and management of second stage labour</td>
</tr>
<tr>
<td></td>
<td>To improve maternal well-being and levels of satisfaction with the birthing process and to improve mother-infant bonding by reducing maternal exposure to the pain and discomfort often associated with this degree of tear</td>
</tr>
</tbody>
</table>

**Indicator criteria met:**

| Indicator Criteria | Useful, Understandable, Accessible, Scientifically Robust, Comparable, Representative |

**Strength of indicator:**

<table>
<thead>
<tr>
<th>Strength of Indicator</th>
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<th>3</th>
<th>4</th>
<th>5</th>
<th>strong 6</th>
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</table>

**Indicator descriptor:**

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<tr>
<th>Numerator</th>
<th>The number of third and fourth degree tears for women having their first baby while giving birth vaginally</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denominator</td>
<td>The number of women having their first baby who gave birth vaginally</td>
</tr>
</tbody>
</table>
Exclusions: Multiparae

Women who sustained a documented perineal tear of a lesser degree

Inclusions: All women having their first baby who gave birth vaginally – includes unassisted births and instrumental births

Women pregnant for the first time with more than one fetus who gave birth vaginally

Limitations: Ability to accurately predict and document the degree of the tear by the clinician

Some associated risk factors for major perineal tears e.g. difficult fetal presentations such as a persistent occipitoposterior position and face and brow presentations are beyond the capacity of the clinician to control and thus reduce the rate of tears

Expected benefits: To reduce genital tract trauma and its associated maternal morbidity

To encourage maternity service providers to consider this indicator in conjunction with episiotomy rates and to review, evaluate and make necessary changes to labour management policy and / or practices

To facilitate further analyses of the data to ascertain the risk factors associated with third and fourth degree tears and to assist with the development of prevention strategies

Reduced maternal length of stay and improved maternal satisfaction

Sample comments: “There is robust evidence as to what can be achieved and how it can be achieved. Also, many Australasian centres are way below international best practice. I think it is understandable, useful and relevant to women”.

“These are the tears that are associated with later morbidity. While ascertainment is an issue it is not insolvable”.

“Subjective opinion and an expected competency in the determination of a 3rd / 4th degree tear for all practitioners. Therefore this indicator should be collected regardless of the level of frequency”.

“I am concerned that differences in recognition and classification of perineal tears, and the reporting of anal sphincter injury are problematic and may lead to inconsistencies in the data collected”. 
Recommended
Data source: Midwives / Perinatal Data Collection Form

Data availability from the recommended data source

With the exception of Western Australia all State and Territory midwives / perinatal data collection forms collect the data elements required to meet the conditions of this indicator. **WA will need to adjust their current collection form to include the option of a fourth degree tear.**

No adjustment is required to the existing forms for States / Territory’s other than WA. Therefore collection of this indicator can commence immediately for all States other than WA.
**Indicator 6**
Unassisted vaginal birth following a spontaneous onset of labour for selected first births

**Rationale:**
WHO (1996) defines normal birth as: spontaneous in onset, low-risk at the start of labour and remaining so throughout the labour and delivery. The infant is born spontaneously in the vertex position between 37 and 41 completed weeks of pregnancy. After the birth mother and infant are in good condition.

The Association of Improvements in Maternity Services (AIMS) has extended this definition to exclude any births where labour has been altered by technological intervention i.e. induction of labour; acceleration of labour through the use of drugs; artificial augmentation of labour e.g. amniotomy; use of epidural anaesthesia; and episiotomy.

In defining normal birth two factors must be taken into consideration: the risk status of the pregnancy and the course of labour and birth. A pregnant woman who is at low-risk when labour starts may eventually have a complicated birth. On the other hand, many high-risk pregnant women ultimately have an uncomplicated course of labour and birth (WHO, 1996). The support of healthcare personnel in labour, the provision of information and maternal involvement in decision-making are central in achieving a positive childbirth experience (Dickinson et al, 2003). It is well documented that obstetric intervention during labour such as induction or augmentation of labour, episiotomy and instrumental birth causes short-term and long-term sequelae for the woman and her baby (Fraser et al, 1998, Thompson et al, 2002, Johanson, 1997 and Smith, 2004). It can also be costly to the health system (Tracy et al, 2003).

Ideally, a safe birth and optimal health of the new mother are both necessary goals, for which spontaneous vaginal birth and intact genital tract are key elements (Albers, 2005). This type of birth will see women experiencing better postnatal health, including fewer hospital admissions for birth related morbidity, less perineal pain, better sexual functioning and better overall physical functioning (Thompson et al, 2002). Infant well-being is also intrinsically linked to the mother’s health and the functional status that enables her to undertake the complex and demanding task of mothering an infant. Therefore the optimal physical and emotional health of women after childbirth should be a high priority for all caregivers.

Midwifery is a profession based on promoting normality in pregnancy and childbirth. Industrialised countries in which midwives are the primary caregivers for healthy childbearing women have more favourable maternal and neonatal outcomes. Technical advances have become more complex and with these advances an increasing number of women with normal pregnancies are being cared for by specialist obstetricians. In a qualitative study conducted by Olsson et al (2000) one of the themes arising from their research was ‘Interfering with the natural process’. This was understood as a mechanistic and medicalised view of childbirth. The women in this study experienced childbirth as a risky process that needed to be controlled and they had to conform to the situation.
Outcomes of midwifery care can be measured in terms of client satisfaction with the care received, the number of vaginal births and perineal lacerations, perinatal mortality and morbidity and caesarean sections. Mortality and severe morbidity are rare events in Western countries therefore midwifery care has to be measured in another way. The observation of interventions performed to promote normal birth, enables the midwifery process to be measured (Bojo et al, 2004). Nonetheless the rate of women achieving a spontaneous normal birth with intact perineum has continued to decline in Australia from 68.4% in 1995 to 60.3% in 2003 (Australia’s mothers and babies report, 2003).

All maternity service providers therefore need to focus on supporting women to achieve normal birth with the least amount of intervention. This support and care will prevent the morbidities associated with birth interventions and women will experience a greater satisfaction and confidence that will enhance their abilities to care for their babies.

The difficulty however of developing an indicator to monitor unassisted (normal) birth is the lack of objectivity surrounding the definition of what constitutes a normal birth. There appears little precedent in the literature upon which to base a definition. The use of the term 'unassisted' vaginal birth in this indicator refers to a birth without medical intervention for ‘selected primipara only’. This pre-risk adjustment enables comparison between all types and sizes of maternity services.

Current status: Figures released in Australia’s mothers and babies report 2003 showed that 60.3% of women had a spontaneous vaginal birth. Of these 34.7% of women had an intact perineum and 21.2% had a first degree laceration / vaginal graze.

In the previous year 61.7% of women had a spontaneous vaginal birth, 35.3% had an intact perineum and 21.1% had a first degree laceration / vaginal graze.

Additional commentary / considerations by the EWG:

There was universal agreement by the CMIP Expert Working Group to exclude induction of labour, augmentation, epidural anaesthesia, instrumental births and episiotomies as per the AIMS definition. Manual removal of the placenta was deemed to be beyond the control of clinicians and therefore it was agreed should not be excluded. It was further agreed that inclusion into the dataset was not dependent upon whether the infant was born alive or stillborn. The rationale being that although the current pregnancy may result in a stillbirth, the indicator was still important as a measure of any future childbirth experience.

The EWG also felt that the indicator could be used as a surrogate indicator for a measure of maternal satisfaction.

Levels of evidence: Levels I, II and III – 2
Indicator type: Outcome

Title: Unassisted vaginal births following a spontaneous onset of labour for selected first births

Definition: The rate of selected primipara who achieve a spontaneous onset of labour with an unassisted vaginal birth

Aims: To measure the rate of unassisted vaginal birth in a pre-risk adjusted population

To provide maternity services with an indicator which may encourage further investigation of labour management practices and policies amongst women having their first baby. If rates are significantly lower than their peer group at a national level, clinicians may be challenged to review their use of all obstetric interventions

To provide an indicator that could be utilised to monitor comparative rates of ‘normal birth’ as a result of different maternity models of care

To monitor the fetal outcomes associated with these types of births, such as APGAR score, to determine the impact of this mode of delivery on the well-being of the fetus

To improve maternal well-being and levels of satisfaction with the birthing process and to improve mother-infant bonding

Indicator criteria met:

| Indicator Criteria | Useful, Understandable, Accessible, Scientifically Robust, Comparable, Representative |

Strength of indicator: 5 strong
Indicator descriptor:

<table>
<thead>
<tr>
<th>Numerator</th>
<th>The number of unassisted births following a spontaneous onset of labour for selected primipara who gave birth vaginally</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denominator</td>
<td>The number of selected primipara who gave birth</td>
</tr>
</tbody>
</table>

Exclusions: The term ‘spontaneous vaginal birth’ excludes selected primiparae who underwent the following:

- Augmentation
- Epidural Anaesthesia
- Episiotomy
- Induction of Labour
- Instrumental Births

Inclusions: Selected primipara

Stillbirths

Limitations: Hospital resource constraints may strongly influence the capacity of the mother and the clinician to achieve an ‘unassisted birth’

- Haste to deliver – e.g. employing the use of instruments without a valid clinical rationale for doing so e.g. fetal distress
- External influences such as family pressure and the mother’s pain threshold and physical stamina (both unknown at the outset of the labour)

Expected benefits: To encourage maternity service providers to review, evaluate and make necessary changes to clinical practice aimed at supporting women to achieve an unassisted birth and thereby reduce the decline in ‘unassisted births’

- A more rapid return to home and the normal activities of life for mother and infant
- Reduced maternal morbidities associated with medical interventions
- Improved maternal satisfaction with the birthing process, including infant bonding and establishment of breastfeeding
- Improved levels of satisfaction for maternity service care providers
Recommended
Data source: Midwives / Perinatal Data Collection Form

Samples comments: Unanimous agreement for the inclusion of this indicator by the EWG meant that its acceptance was achieved with nominal comment from Group Members.

Data availability from the recommended data source

Currently all State and Territory midwives / perinatal data collection forms collect the data elements required to meet the conditions of this indicator.

Therefore no adjustment is required to the existing forms and collection on this indicator can commence immediately.
Postpartum indicators
Indicator 7 – APGAR score at 5 minutes for live term infants

Rationale: Dr Virginia Apgar proposed the APGAR score in 1952 as a means of evaluating the physical condition of babies at birth. The APGAR score provides a basis for the uniform assessment of the condition of the infant at specific time periods after the infant is born. It is not however intended to be an accurate predictor of long-term outcome (Fox, 1993).

The APGAR score is determined at one and five minutes after birth. It identifies five characteristics of the baby – heart rate, respiratory effort, muscle tone, reflex irritability and colour. These characteristics are assessed and assigned a value of 0 to 2. The total score is the sum of the five components.

The one-minute APGAR score measures how well the newborn tolerated the birthing process while the five-minute APGAR score measures how well the infant is adapting to the environment (Martin, 2004; Bharti and Bharti, 2004 and Leuthner and Das, 2004). A score of 7 or higher at either time period indicates that the baby’s condition is good to excellent. A depressed APGAR score at 5 minutes, i.e. ≤ 6, is a marker for perinatal insults, including neurological damage (Ehrenstein et al, 2005). A score of less than 7 indicates that the infant needs some level of clinical assistance to make the transition from life inside the womb to life outside the womb (Steube, 2005).

The five-minute score remains an easy method for assessing the effectiveness of resuscitation and to some degree, the vitality of the infant (Finster and Wood, 2005). The APGAR scoring system is also regarded as the better predictor of survival in infancy.

The APGAR scoring system

<table>
<thead>
<tr>
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<th>0 points</th>
<th>1 point</th>
<th>2 point</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Activity and muscle tone</td>
<td>Limp</td>
<td>Arms and legs flexed – little movement</td>
</tr>
<tr>
<td>P</td>
<td>Pulse rate</td>
<td>Absent</td>
<td>&lt; 100 beats per min.</td>
</tr>
<tr>
<td>G</td>
<td>Grimace (reflex activity)</td>
<td>No response</td>
<td>Grimace</td>
</tr>
<tr>
<td>A</td>
<td>Appearance (skin colour)</td>
<td>Blue or pale</td>
<td>Extremities blue and body pink</td>
</tr>
<tr>
<td>R</td>
<td>Respiration</td>
<td>Absent</td>
<td>Slow, irregular</td>
</tr>
</tbody>
</table>

3 or below

Severely depressed infant

4 to 6

Moderately depressed infant

7 to 10

Good and healthy infant
A low APGAR score is, by itself, no evidence of intrapartum asphyxia. Conditions such as congenital anomalies, prematurity, perinatal infections and maternal sedation or anaesthesia can result in low scores, not reflective of asphyxia. Nevertheless a study by Casey in 2001 did show that the five-minute APGAR score was a better predictor of neonatal outcome than alternate measures such as umbilical-artery blood pH, even for new born babies with severe acidaemia. The study that for both preterm and term babies rates of survival increased as APGAR scores increased. They concluded that the APGAR score remains as relevant for the prediction of neonatal survival today as it was almost 50 years ago.

One of the most important objectives of the care of women in labour is the recognition of fetal compromise (followed by appropriate birth of the infant avoiding neonatal mortality and morbidity). An audit reviewing the intrapartum-related deaths of 873 babies conducted in the United Kingdom in 2000 found that more than 75% of these cases had evidence of suboptimal care such that alternative management ‘might’, or ‘would reasonably be expected to’ have made a difference to the outcome. The most frequent criticism related to failures was the use and interpretation of cardiotocograph (CTG) tracings (CESDI, 2000). The use of CTG during labour has good sensitivity but poor specificity. If the trace of the CTG is suspicious then close monitoring is required and if it becomes pathological then additional diagnostic tests of fetal well-being such as fetal scalp lactate are required to identify the need for intervention.

Increasingly ‘abnormal’ fetal heart rate changes are associated with fetal acidosis and an APGAR score of less than 7 at 5 minutes. The longer the recognition of fetal compromise and / or if inappropriate action is taken, the more likely that the infant will remain physiologically depressed for more than 5 minutes, require prolonged resuscitation and may develop hypoxic-ischaemic encephalopathy [HIE] (Draycott et al, 2006).

A low APGAR score of ≤ 6 in a term infant may suggest that the labour was not managed optimally and / or that signs of fetal compromise may have been overlooked (Chalmers et al, 2001). A significantly higher number of term babies born with an APGAR score of ≤ 6 may provide hospitals with sufficient evidence to warrant a review of existing clinical practices and / or educational programs and to implement strategies aimed at reducing the rate.

**Current status:** The APGAR score at 5 minutes for all live births is collected and reported on by all states and territories in Australia. Figures released in *Australia’s mothers and babies report 2003* show that 1.3% of live born babies had a low APGAR score (between 0 and 6) at five minutes, 1.0% had scores of 4-6 and 0.3% had scores of 0-3 (Laws and Sullivan, 2005). These figures have decreased slightly on some of the previous years results, where 1.4% of live born babies had a low APGAR score (between 0 and 6) at 5 minutes, 1.1% had scores of 4-6 and 0.3% had scores of 0-3 (Laws and Sullivan, 2004).
The ACHS also collects APGAR scoring data from member organisations in Australia and New Zealand. They collect two indicators separating data relating to term and preterm babies. The rate for term babies with an APGAR score of ≤4 at five minutes has shown a constant decline from 0.88% in 1998 to 0.28% in 2005. The rate for preterm babies with an APGAR score of ≤4 at five minutes was 1.36% in 2005 – five times that of term babies (ACHS, 2005).

Additional commentary / considerations by the EWG:

At the beginning of the project the EWG considered the value of using an APGAR score ≤3 as the preferred measure of infant well-being. The shift to an APGAR score of ≤6 was as a result of advice from Neonatologists; a further review of the prevalence rates for both scores (0.5% and 1.3% respectively in 2003, NPSU) and the need to minimise the risk of increasing subjectivity by using the lower end of APGAR scoring. The EWG also saw no justification in excluding term infants with congenital malformation or cerebral palsy as these infants do not always present with poor APGAR scores.

Levels of evidence: Level III – 2

Indicator type: Outcome

Title: Infant well-being at birth

Definition: The rate of live term infants with an APGAR score of ≤6 at 5 minutes

Definition of ‘term’: From 37 completed weeks to less than 42 completed weeks (259 – 293 days) of gestation (NHDD V12)

Aims: To measure the rate of low APGAR scores in live term infants around the time of birth

To monitor infant well-being in the context of other indicators recommended for monitoring the quality and safety of maternity care to ensure that the health of the newborn is not being compromised

To provide maternity services with an indicator of infant well-being that may encourage further investigation of the clinical management of the birth process. If rates are significantly higher than their national peer group, clinicians may be challenged to review labour management practices to ensure that signs of fetal compromise are not overlooked and if present are monitored and managed in a timely fashion.
Indicator criteria met:

| Indicator Criteria | Useful, Understandable, Accessible, Scientifically Robust, Comparable, Representative |

Strength of indicator:

| Strength of Indicator | 0 weak | 1 | 2 | 3 | 4 | 5 | strong 6 |

Indicator descriptor:

| Numerator | The number of live term infants with an APGAR score ≤ 6 at 5 minutes |
| Denominator | The number of live term infants |

Exclusions: Stillbirths

Inclusions: All live term infants

Limitations: Capacity of clinicians to accurately and consistently assess APGAR scores

- Tendency to assess a newborn with an APGAR score which is borderline 6-7 as 7 in order to avoid inclusion in the numerator for this indicator
- The use of APGAR scores alone, as a measure of infant well-being at birth, without other supporting information such as Cord pH

Expected benefits:

To raise awareness of the number of term babies born with a low APGAR score

Comparing the rate of low APGAR scores by peer group enables maternity service providers to ensure that the health of the newborn is not being compromised at the expense of changes in clinical management of the birth process (for example reducing CS rates)

Improved neonatal outcomes by encouraging awareness of the need to proactively recognise and monitor fetal distress

Improvement in training / education programs regarding the assessment of APGAR scores as a consequence of monitoring rates
Recommended Data source: Midwives / Perinatal Data Collection Form

Sample comments:
“The paper by Casey is interesting and supportive of this indicator including only term babies – has made a big difference to ACHS indicators”.

“Low frequency”.

“Support the indicator of < 7”.

“Setting the score as < 7 is in-line with current international standards”.

“Subjective indicator – however this is the most objective measure available”.

Data availability from the recommended data source

Currently all State and Territory midwives / perinatal data collection forms collect the data elements required to meet the conditions of this indicator therefore no adjustment is required to the existing forms. Collection on this indicator can commence immediately.
Indicator 8 – Death of baby around time of birth

Rationale:
A neonatal death is the death of a live born infant occurring during the first 28 days of life (National Perinatal Statistics Unit, 2006). A fetal death (stillbirth) is a death prior to the complete expulsion or extraction from its mother of a product of conception of 20 or more completed weeks of gestation or of 400 g or more birthweight (Australian Bureau of Statistics, 1997). Death is indicated by the fact that after such separation the fetus did not breathe or show any other evidence of life, such as the beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles. Perinatal deaths include both fetal and neonatal deaths.

The perinatal mortality definition recommended by the World Health Organisation (WHO) has a slightly higher limit of at least 500 g birthweight, or at least 22 weeks gestation where birthweight is unknown, and a shorter neonatal period of up to 7 days. However the definitions used in the above paragraph are accepted by most states and territories and are reported by the NPSU in their Australia’s mothers and babies annual report.

The survival of the newborn baby is one of the primary objectives of any maternity service. While perinatal deaths have declined sharply in Australia to 7.5 deaths per 1,000 births (NPSU, 2004), the death of a baby is a sentinel event and one that should be investigated thoroughly by clinical managers by methods such as Root Cause Analysis (RCA). The purpose of collecting the rate of perinatal deaths as part of the Core Maternity Indicator Set is to ensure that rates are within a safe range and that hospitals that are outside this range (outliers) are identified as soon as possible. This can only be effectively achieved by using a risk-adjusted calculation where those hospitals with higher proportions of low birthweight infants can be more validly compared with hospitals having a different casemix, over a reasonable period of time.

Unfortunately there is no strong evidence that monitoring perinatal death rates encourages those with high rates to change practice and improve outcomes. However risk adjusted comparisons are likely to be more meaningful to clinicians than those that do not take casemix into account (Measuring Maternity Care, 2002).

Following extensive discussion and advice sought from neonatal experts and the Department of Human Services, Victoria, the CMIP Expert Working Group agreed to adopt the Standardised Perinatal Mortality Ratio as described in Measuring Maternity Care (2002). This agreement included the principle, the purpose, the exclusions and the rationale as defined by the Victoria SPMR indicator; however CMIP adopted a subsequent amendment recommended by Victoria that is: to standardise by gestation rather than birthweight. In 2005, the Victorian Performance Indicator Sub-Committee of the Maternity Services Advisory Committee refined the indicator to Gestation Standardised Perinatal Mortality Ratio (GSPMR) excluding infants less than 20 weeks gestation or where gestation unknown weighing less than 400gms and excluding terminations of pregnancy (ToP’s) and deaths due to congenital malformations. The EWG decided to adopt this method of standardisation and risk adjustment.
A further change occurred in relation to this indicator, and following the final meeting of the EWG. There had been vigorous discussion about whether hospitals with less than 5 perinatal deaths during the year under study should be excluded as per the Victorian definition. It was further suggested that hospitals with less than 500 births should also be excluded. However, following an independent expert review of the indicators and opinion expressed by the Neonatology representative of the EWG, it was decided by the PMG to include all perinatal deaths occurring in all maternity services irrespective of birth or death numbers.

We acknowledge with our deepest thanks, the permission of the Department of Human Services, Victoria, to replicate much of the following information

Current status: According to the NPSU figures for 2003, there were 2,601 perinatal deaths recorded in the perinatal data collection throughout Australia. This represents a rate of 10.1 deaths per 1,000 total births

Levels of evidence: There is currently no high level evidence that addresses the utility of this indicator in reducing perinatal death

Indicator type: Outcome

Title: Death of a baby around time of birth

Definition: Gestation standardised perinatal mortality rate (GSPMR)

Definition of terms:

Live birth: The complete expulsion or extraction from its mother of a baby of at least 20 weeks gestation (if known) or 400gms birthweight who, after being born, breathes or shows evidence of life such as a heartbeat

Stillbirth: The complete expulsion or extraction from its mother of a baby of at least 20 weeks gestation (if known) or 400gms birthweight who did not, at anytime after birth, breathe or show any evidence of life such as a heartbeat

Neonatal death: A death occurring within 28 days of birth of a live born baby of at least 20 weeks gestation (if known) or 400gms birthweight
Aims: To ensure that perinatal mortality rates are within an acceptable range and to identify trends, variations and outliers. (Pooling data over five years adds stability to the data and reduces the risk of over-interpretation of chance fluctuations)

To promote the survival of newborn babies

To provide a valid comparison of perinatal mortality rates between maternity service providers so that clinicians can take early action to investigate any unusual departure from expected rates or the emergence of an upward trend

Indicator criteria met:

| Indicator Criteria | Useful, Understandable, Accessible, Scientifically Robust, Comparable, Representative |

Strength of indicator:

<table>
<thead>
<tr>
<th>Strength of Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 weak</td>
</tr>
</tbody>
</table>

Indicator descriptor:

<table>
<thead>
<tr>
<th>Numerator</th>
<th>Observed perinatal deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected perinatal deaths</td>
<td></td>
</tr>
</tbody>
</table>

Observed deaths: Number of perinatal deaths which occur in a maternity service (see exclusions)

Expected deaths: Multiply the number of births that occurred for each gestation group for the maternity service by the national perinatal death rate for that gestation group. Then add the deaths to derive total expected deaths

Exclusions:

- Infants less than 20 weeks gestation (where gestation known)
- Infants weighing less than 400gms (where gestation unknown)
- Perinatal deaths due to congenital malformations
- Terminations of pregnancy
- Births and perinatal deaths of women transferred to another hospital for care
<table>
<thead>
<tr>
<th>Inclusions:</th>
<th>All perinatal deaths, including still births, where the infant was more than 20 weeks gestation or where gestation is unknown, weighing 400gms or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limitation:</td>
<td>Delay in the provision of the data to facilitate timely intervention strategies. This indicator can only reveal trends. Maternity services should ensure that every perinatal death is treated as a sentinel event and subject to RCA</td>
</tr>
<tr>
<td>Expected benefits:</td>
<td>Provides the capacity for maternity service providers to measure their performance against a national standard. Encourages more detailed evaluation of clinical practice should GSPMR be consistently raised or develop a sharp increase</td>
</tr>
<tr>
<td>Recommended Data source:</td>
<td>National Perinatal Statistics Unit, Australian Institute of Health and Welfare</td>
</tr>
</tbody>
</table>
Indicator 9 – Significant blood loss within 24 hours following a vaginal birth

Rationale: Postpartum haemorrhage (PPH) is a potentially life-threatening complication of childbirth that occurs in about 3-5% of vaginal births and as such continues to be a leading cause of maternal morbidity and mortality (Warkus et al, 2005).

Primary PPH is classically defined as blood loss from the genital tract of 500mls or more, within 24 hours of birth. This definition is of limited practical use as accurate quantification of blood loss is seldom possible, and the average blood loss at birth is 500 to 600mls (Harrison and Park-Kivell, 1998). Therefore a blood loss between 500 and 600mls is considered by most practitioners as within normal physiological limits.

Secondary PPH is blood loss that occurs between 24 hours and 12 weeks postpartum (Alexander et al, 2002).

Blood loss ≥ 1000mls is a more useful definition as this corresponds to the 95th percentile for blood loss associated with spontaneous vaginal delivery (Riggs and Blanco, 1996). Severe or major PPH has been defined as a blood loss of ≥ 1000mls or as blood loss sufficient to cause haemodynamic instability / compromise (Anderson et al, 2000). Blood loss of ≥ 1000ml has also been referred to in the literature as ‘massive primary postpartum haemorrhage’. The reporting of this level of blood loss is quite sparse in the literature but an incidence of 1 – 2% of all births has been reported (Rizvi et al, 2004).

At a recent PPH forum conducted by Women’s Hospitals Australasia (WHA), there was general agreement that current estimations of blood loss are significantly variable and often inaccurate as demonstrated by various hospital audits. At the forum the following blood loss definitions were agreed upon for benchmarking purposes and it was recommended that the use of the subjective term ‘PPH’ be dropped:

- **Category A**: < 500mls blood loss
- **Category B**: 500mls – 1499mls blood loss
- **Category C**: ≥ 1500mls (WHA, 2005)

A study conducted in 2003 demonstrated that midwives and other health professionals often misjudged maternal blood loss at delivery by 30 – 50% (Glover, 2003). The underestimation of blood loss may also be exacerbated if the haemorrhage is concealed (NSW Dept. of Health Policy PD2005-264).

Consequences of significant blood loss include:

- Anaemia;
- Blood transfusion and its associated risks e.g. exposure to blood products;
- Coma;
Blood loss $\geq 1000\text{mls}$ is associated with significant maternal morbidity and a small but consistent maternal mortality rate. Unfortunately maternal mortality has not declined substantially over the past 10 years with postpartum haemorrhage being a common cause of maternal death in the developing and developed world (Geller et al, 2006; Warkus et al, 2005).

The risk factors for postpartum haemorrhage include: pre-eclampsia, nulliparity, multiple gestation, previous caesarean birth, previous PPH, augmented labour, arrest of descent, retained placenta, episiotomy, instrumental birth (vacuum or forceps), lacerations of the cervix, vagina or perineum (Anderson et al, 2000).

Unfortunately a significant proportion of women will develop intrapartum complications that cause severe haemorrhage (McLintock, 2005) making it vital that organisations ensure that labour and / or birth suite staff have appropriate training in the prevention, recognition and treatment of PPH. This training should include familiarity of multidisciplinary guidelines (Ferrazzani et al, 2005 and Rizvi, 2004).

In the immediate postpartum period, PPH may cause significant maternal morbidity. This includes iron deficiency anaemia, lactation failure or delay, pituitary infarction, shock, exposure to blood products, haemorrhagic shock and hypotension, coagulopathy, acute tubular necrosis, coma and the need for surgical interventions (including hysterectomy) as well as a lengthened hospital stay (Anderson et al 2000). There are few available data on the effects of PPH on a woman’s physical and emotional health during the postpartum recovery period and beyond. In general, women for whom a birth experience is traumatic may develop post-traumatic stress disorder (PTSD) (Reynolds 1997 and Ayers and Pickering, 2001). Case reports indicate that a traumatic birth may also affect a woman’s ability to breastfeed, bond with her child and resume sexual activity (Reynolds 1997).

One of the main contributing factors in morbidity and mortality rates associated with PPH is the delayed and inappropriate correction of hypovolaemia (NSW DoH, Policy PD2005-264). Therefore monitoring blood loss of clinical significance becomes a major factor for ensuring the well-being of the mother during delivery and for the prevention of maternal morbidity and mortality associated with this level of blood loss.
Current status: There has been varying range of primary PPH rates reported in the literature pertaining to Australia from 5 to 10% (Henry et al, 2005). There has been increasing concern regarding the increased rates of obstetric haemorrhage in Australia and where PPH was the leading cause of direct maternal mortality in the triennium 1997 – 1999 (Ford et al 2001 and Slayter et al, 2004).

Difficulty in obtaining PPH data due to imprecise estimation / measurement of blood loss and exhaustive discussion about the definition saw the omission of the “blood loss greater than 500mls” indicator in the Women’s Hospitals Australasia Benchmarking in Obstetrics 2000-2003 collection. This indicator was replaced with a primary PPH ≥ 1.5 litres following vaginal birth.

The WHA average for blood loss ≥ 1500mls was 2% in 2000/01, 2.06% in 2001/02 and 1.91% in 2002/03 (Buist et al, 2002).

Whilst the emphasis in the literature specifically relates to the term ‘postpartum haemorrhage’, the CMIP EWG took the decision to remove any confusion in the definition of what constitutes either a minor or a major PPH and to replace the term with any blood loss ≥ 1000mls.

Additional commentary / considerations by the EWG:

Blood loss ≥ 1000mls PPH post caesarean section

There was early discussion in the project by the EWG on the value of including blood loss ≥ 1000mls post caesarean section. The rationale for exclusion was:

- That the woman was already at the final destination for managing the haemorrhage; and
- The primary aim of the indicator is to improve the control of blood loss at the time and place of a ‘vaginal’ birth

Additional considerations

Consideration was also given to:

1. Women who sustained a blood loss ≥1500 mls; whose Hb was < 7g/dl or who sustained a drop of ≥ 4g/dl – regardless of the amount of blood loss. Given that the primary aim of the indicator is the prevention and control of blood excessive, the EWG agreed that the indicator did not have to be aligned with any level of haemodynamic compromise

2. Treatment with blood transfusion. It was noted that the term ‘offered’ is difficult – ‘given’ is another issue. The reason however for its exclusion was that the need for transfusion is not wholly dependent upon the volume of blood loss. It is very individual and may occur with small blood losses in women with pre-existing conditions.
Levels of evidence: Levels I, III – 2, III – 3 and IV

Indicator type: Outcome

Title: Significant blood loss within 24 hours following a vaginal birth

Definition: The rate of women who sustained a blood loss $\geq 1000$ mls within 24 hours following a vaginal birth

Aims: To measure the rate of blood loss $\geq 1000$ mls and its relationship to maternal and fetal well-being within 24 hours of a vaginal birth

To provide maternity services with an indicator of serious blood loss that may stimulate investigation of risk screening strategies and the clinical management of the birth process. If rates are significantly higher than their national peer group, clinicians may be challenged to review screening of women to better identify risk factors and labour management practices to ensure that blood loss is identified and acted upon rapidly or at least minimised by taking appropriate action

To stimulate an interest in comparative rates of major blood loss and their trends and encourage clinicians and researchers to further investigate prevention and management strategies used in hospitals with significantly lower rates

Indicator criteria met:

| Indicator Criteria | Useful, Understandable, Scientifically Robust, Comparable, Representative |

Strength of indicator:

| Strength of Indicator | 0 weak | 1 | 2 | 3 | 4 | 5 | strong 6 |

Indicator descriptor:

<p>| Numerator | The number of women who sustain a blood loss $\geq 1000$ mls within 24 hours after giving birth vaginally |
| Denominator | The number of women who gave birth vaginally |</p>
<table>
<thead>
<tr>
<th>Exclusions:</th>
<th>Women who delivered by caesarean section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inclusions:</td>
<td>All women giving birth vaginally regardless of parity</td>
</tr>
<tr>
<td>Limitations:</td>
<td>Underestimation and / or overestimation of blood loss</td>
</tr>
<tr>
<td></td>
<td>Tendency to record &lt;1000mls even if estimate was around 1000mls or slightly more in order to exclude from numerator</td>
</tr>
<tr>
<td></td>
<td>Specificity may be a problem as some women are haemodynamically compromised without reaching 1000mls blood loss while others who loose a great deal more blood than this appear to be clinically unaffected</td>
</tr>
<tr>
<td>Expected benefits:</td>
<td>To raise the importance of regularly reviewing policy and practice in preventing and managing major blood loss</td>
</tr>
<tr>
<td></td>
<td>Improved understanding in the importance of accurately and consistently estimating blood loss</td>
</tr>
<tr>
<td></td>
<td>Earlier management of a suspected major blood loss</td>
</tr>
<tr>
<td></td>
<td>Improved maternal outcomes</td>
</tr>
<tr>
<td></td>
<td>Fiscal benefits to the health system through the prevention of associated co-morbidities and reduced length of stay</td>
</tr>
<tr>
<td></td>
<td>Reduction in the risk of subsequent maternal physical and emotional ill health and delay in the process of bonding and breastfeeding</td>
</tr>
<tr>
<td>Sample comments:</td>
<td>“The biggest problem will be in the estimation of the blood loss”.</td>
</tr>
<tr>
<td></td>
<td>“Small numbers are not always an indicator of quality”.</td>
</tr>
<tr>
<td></td>
<td>“More scientifically robust than 500mls”.</td>
</tr>
<tr>
<td></td>
<td>“Regardless of the frequency, PPH is a primary maternity outcome that must be measured”.</td>
</tr>
<tr>
<td>Recommended Data source:</td>
<td>Midwives / Perinatal Data Collection Form</td>
</tr>
</tbody>
</table>
Data availability from the recommended data source

**ACT Midwives Data Collection Form**

Complications of labour and birth: PPH

**NSW Midwives Data Collection Form**

Postnatal: PPH requiring blood transfusion Yes / No

**NT Midwives Collection Form**

Complications of labour and birth: PPH

**Queensland Perinatal Data Collection Form**

Labour and delivery complications: Primary PPH (> 600 mls)

**South Australia 2004 Supplementary Birth Record**

Complications of labour, delivery and puerperium: PPH (Primary 600 mls or more)

**Tasmania Perinatal Data Collection Form**

Labour and delivery complications: Primary PPH (> 500 mls in first 24 hrs)

**Victoria Perinatal Morbidity Statistics Form A**

Complications of labour, birth or postnatal: PPH – primary

**Western Australia Notification of Case Attended Form**

Complications of labour and delivery: PPH (≥ 500 mls)

**Proposed changes to all current Midwives / Perinatal data collection forms**

Estimated blood loss (in millilitres) ___________ mls
Indicator 10 – Supporting breastfeeding

Rationale: Research has provided evidence that breastfeeding increases a baby's resistance to infection and disease and is particularly suited to the growth and requirements of the infant (Marks et al, 2001). Breastfeeding has also been shown to protect babies against a number of infections.

Positive implications for women's health have also been recognised. Breastfeeding helps a mother's body recover to its pre-pregnant state more quickly, and lactation protects against premenopausal breast cancer and osteoporosis. Psychological benefits between a mother and an infant when breastfeeding, such as encouraging a close bond, have also been recognised (Lawrence 1999, Riordan et al, 1999 and ABA, 2003).

The emotional and physical challenges women encounter in the postpartum period can be overwhelming. In a study conducted by Sword et al (2005), breastfeeding was one of the most frequently identified topics of concern for women in their new roles. Providing an environment where health professionals are providing the same information which is based on best practice is vital.

The Baby Friendly Hospital Initiative (BFHI) was developed jointly by WHO and UNICEF, and launched in 1991. It is an international project that aims to give every baby the best start in life by creating a health care environment where breastfeeding is protected, promoted and supported. The Ten Steps to Successful Breastfeeding is the global standard by which hospitals are assessed and accredited (Appendix F). BFHI is a quality improvement measure that demonstrates an organisations commitment to providing a high standard of care to women and their babies. To achieve the standard, health professionals are required to undertake extra breastfeeding education which increases their knowledge on infant feeding and enables them to provide consistent breastfeeding information and support to women (WHO, 1989).

Tarrant et al (2002) discusses the multi-layered concept of supportive breastfeeding environments. These concepts include the value and support society places on breastfeeding, organisational policies and practices and the support from family and friends.

In 1991 the Commonwealth Government declared support of the BFHI which is administered in Australia by the Australian College of Midwives (ACM). Financial support from the Government has enabled the ACM to promote this Initiative more widely throughout Australian hospitals. Unfortunately this funding was withdrawn in 2005-06.

In 1993 the breastfeeding targets for the year 2000 were to increase the proportion of babies breastfed following hospital discharge to 90%; to increase the proportion among babies up to 3 months being fully breastfed to 60% and partially breastfed to 80%; and to increase the proportion among babies up to 6 month proportion fully breastfed to 50% and partially breastfed to 80% (Nutbeam et al, 1993). There was no targets defined set for babies fully breastfed (Webb et al, 2001).
Unfortunately lack of a consistent and standardised approach to defining and measuring breastfeeding practices has limited Australia’s capacity to calculate rates that are comparable internationally and within Australia (Nutbeam et al, 1993 and Webb et al, 2001).

In addition, the capture of exclusive breastfeeding rates on discharge is compromised by the very short hospital stay (< two days) experienced by many women.

A Swiss study conducted by Merten et al (2005) has provided more evidence for the effectiveness of the BFHI implementation as a mechanism to improve breastfeeding rates. The authors conclude that the general increase in breastfeeding in Switzerland since 1994 can be interpreted in part as a consequence of the growing implementation of the BFHI. Other countries such as Scotland, US and China have also seen an increase in the breastfeeding initiation rates as a result of the implementation of BFHI (Broadfoot, 2005 and Phillip et al, 2001). Low breastfeeding rates in Hong Kong have been attributed to the lack of breastfeeding support in maternity services. In 2002 no hospitals in Hong Kong were able to comply with BFHI standards for care of the breastfeeding woman and infant. Interestingly more than 7000 hospitals on the Chinese mainland have received ‘Baby Friendly’ accreditation (Tarrant et al, 2002).

The estimated costs of not breastfeeding or breastfeeding exclusively for a short duration were estimated as $20-40 million a year in NSW and $1-2 million per year in the ACT for illnesses such as gastrointestinal illness, lower respiratory infection, otitis media, eczema and necrotizing enterocolitis (Hector et al, 2004). There is also good evidence that breastfeeding may prevent coeliac disease and other bowel disorders such as Crohn’s disease and ulcerative colitis (Hanson et al, 2002).

Accreditation with the Baby Friendly Hospital Initiative utilising the “Ten Steps to Successful Breastfeeding”, provides an opportunity for an organisation to demonstrate its commitment to best practice and to providing a high standard of care to women and their babies. Collecting data on the breastfeeding status on discharge may be helpful when looking at the population as a whole but it does not really measure quality of care provided by the maternity service in the postpartum period. All maternity units should be encouraged to work through the ‘Ten steps’ and ultimately achieve and maintain BFHI status as a demonstrated commitment to best practice.

Current status: Breastfeeding rates internationally and in Australia have received increased attention as a focus for improving public health. Breastfeeding has increasingly been recognised as the optimal form of infant feeding (WHO 2001). Current Australian and World Health Organization (WHO) guidelines outline optimal breastfeeding practices, in terms of initiation, the extent that breastfeeding is a dominant source of nutrition and total duration. Results from National Health Surveys in Australia show that in 2001, 87% of infants aged 0-3 years had, at some stage, obtained nutrition from breast milk. This was similar to the 1995 figure of 86%.
There are currently 55 hospitals in Australia that are BFHI accredited (Bub Hub, June 2006).

Breakdown by State / Territory:

<table>
<thead>
<tr>
<th>State</th>
<th>Total Maternity Hospitals</th>
<th>BFHI Accredited</th>
<th>Australian Compliancy Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT</td>
<td>2 of a total of 4</td>
<td>1</td>
<td>50%</td>
</tr>
<tr>
<td>NSW</td>
<td>2 of a total of 68</td>
<td>1</td>
<td>2.9%</td>
</tr>
<tr>
<td>NT</td>
<td>3 of a total of 6</td>
<td>1</td>
<td>50%</td>
</tr>
<tr>
<td>QLD</td>
<td>7 of a total of 59</td>
<td>4</td>
<td>11.9%</td>
</tr>
<tr>
<td>SA</td>
<td>10 of a total of 39</td>
<td>6</td>
<td>25.6%</td>
</tr>
<tr>
<td>TAS</td>
<td>4 of a total of 7</td>
<td>2</td>
<td>57.1%</td>
</tr>
<tr>
<td>VIC</td>
<td>25 of a total of 78</td>
<td>13</td>
<td>32.1%</td>
</tr>
<tr>
<td>WA</td>
<td>2 of a total of 43</td>
<td>1</td>
<td>4.7%</td>
</tr>
</tbody>
</table>

Accreditation Australia-wide:
- Total maternity hospitals: 304
- Total BFHI Accredited: 55
- Australian Compliancy Rate: 18.1%

Additional commentary / considerations by the Expert Working Group

The predictive value of monitoring breastfeeding rates at discharge is compromised by the decreasing length of stay experienced in Australia by women admitted for the birth of a baby. Those women exclusively breastfeeding while in hospital may not continue once they are discharged while women who were not exclusively breastfeeding at discharge may do so once they return to their home.

Ideally breastfeeding rates should be monitored in infants at between 3-6 months of age. In fact a recent report entitled Headline Indicators for Children's Health, Development and Wellbeing recommends that an indicator showing the number of infants exclusively breastfed at 4 months be included in a suite of Australian indicators to monitor child health and wellbeing. As a consequence, the CMIP chose to monitor the number of hospitals who had received Baby Friendly Hospital Initiative (BFHI) accreditation or, for those that hadn't, the number of WHO 10 steps to successful breastfeeding that were in place. This decision was based on the important role maternity services should play in creating an environment where breastfeeding is protected, promoted and supported.

Levels of evidence: Levels III – 2, III – 3 and IV

Indicator type: Process

Title: Supporting breastfeeding
Definition:

Part 1:
Achievement and maintenance of BFHI accreditation by a maternity service (Yes / No), and if not,

Part 2:
The number of WHO’s Steps to Successful Breastfeeding that they have achieved from a total score of 10

Aims:

To increase the national rate of breastfeeding to greater than 90% following hospital discharge

To encourage all maternity services to adopt the BFHI process and to seek accreditation as part of ‘best practice’

To encourage maternity services not yet BFHI accredited to commence the utilisation of the WHO’s 10 Steps to Successful Breastfeeding in the interim

To encourage hospitals to implement strategies aimed at improving the understanding of the importance of breastfeeding amongst women and midwives

To reduce the cost of illnesses preventable by breastfeeding

Indicator criteria met

<table>
<thead>
<tr>
<th>Indicator Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Useful, Understandable, Scientifically Robust, Comparable, Representative</td>
</tr>
</tbody>
</table>

Strength of indicator

<table>
<thead>
<tr>
<th>Strength of Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 weak   1  2  3  4  5 strong 6</td>
</tr>
</tbody>
</table>

Indicator descriptor:

<p>| Part 1 | Is your hospital / maternity service BFHI accredited? Yes / No |
| Part 2 | If No: |
| Numerator | The number of WHO’s 10 Steps to Successful Breastfeeding your hospital has achieved at the time of assessment (score between 0-10) |
| Denominator | The WHO’s 10 Steps to Successful Breastfeeding (out of 10) |</p>
<table>
<thead>
<tr>
<th>Exclusions:</th>
<th>Nil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inclusions:</td>
<td>All maternity services</td>
</tr>
<tr>
<td>Limitations:</td>
<td>Capacity of a hospital to devote resources towards preparing for, and meeting the requirements of, BFHI accreditation</td>
</tr>
<tr>
<td></td>
<td>Lack of Commonwealth funding to support hospitals wishing to undertake BFHI accreditation</td>
</tr>
<tr>
<td></td>
<td>The subjectivity of self-assessment and the inability of the indicator to determine how well a maternity service has met the requirements of each step of the WHO’s 10 Steps to Successful Breastfeeding</td>
</tr>
<tr>
<td></td>
<td>In its current form this indicator does not describe the rate of an outcome or process for women; rather it provides an indicator of hospital structure via a yes / no answer. This in itself has limitations.</td>
</tr>
<tr>
<td>Expected benefits:</td>
<td>Encouragement of hospitals to work towards &amp; achieve BFHI accreditation</td>
</tr>
<tr>
<td></td>
<td>Increase in the number of women and their families receiving advice, care and support consistent with WHO 10 steps to Successful Breastfeeding</td>
</tr>
<tr>
<td></td>
<td>Enhancement in breastfeeding initiation rates and possibly continuation rates</td>
</tr>
<tr>
<td></td>
<td>Improvement in breast milk administration for babies separated from their mothers due to illness / prematurity</td>
</tr>
<tr>
<td></td>
<td>Improved infant well-being (for the healthy term infant) and improved maternal satisfaction</td>
</tr>
<tr>
<td></td>
<td>Complements the Child Headline Indicator for ‘exclusive breastfeeding at 4 months’</td>
</tr>
<tr>
<td></td>
<td>Improved hospital staff satisfaction levels having achieved BFHI accreditation</td>
</tr>
<tr>
<td>Data source:</td>
<td>Annual survey / audit of maternity services</td>
</tr>
</tbody>
</table>
Sample comments:  “The Australian College of Midwives strongly supports use of BFHI accreditation as an indicator as the accreditation involves a number of quality assurance and data collection and reporting requirements that together help determine rates of successful establishment of breastfeeding”.

“Agree that a successful breastfeeding indicator is desirable – whether via the BFHI or a more flexible benchmark is debatable”.

“Although a hospital may have a BFHI status it doesn’t tell us anything about the kind of day to day breastfeeding support that women receive, but it is an easier item to collect”.

“Measuring the WHO 10 Steps in isolation only tells maternity service providers what they already know”.

“Breastfeeding accreditation is important in giving information back to hospitals about the level of education and training that they provide. Accreditation is also a means by which a standard can be set”.

“The WHO 10 Steps can be used by hospitals to improve their services and to aspire towards accreditation”.

<table>
<thead>
<tr>
<th>Proposed data elements required to measure this indicator within an annual audit process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does your hospital have BFHI accreditation?</td>
</tr>
<tr>
<td>If Yes: Year of accreditation</td>
</tr>
<tr>
<td>If No or Unknown:</td>
</tr>
</tbody>
</table>

The number of WHO’s 10 Steps to Successful Breastfeeding your hospital / organisation currently complies with

This would be reflected as a numeric value (out of 10) i.e. xx / 10
Table 9: Summary table of data availability for Core Maternity Indicators from Midwives / Perinatal Data Collection Forms by State and Territory

<table>
<thead>
<tr>
<th>No</th>
<th>Indicator</th>
<th>ACT</th>
<th>NSW</th>
<th>NT</th>
<th>QLD</th>
<th>SA</th>
<th>TAS</th>
<th>VIC</th>
<th>WA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Antepartum</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Smoking cessation advice during pregnancy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Intrapartum</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Induction of labour rates for selected first births</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>3</td>
<td>Caesarean section rates for selected first births</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>4</td>
<td>Episiotomy rates for all first births</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>5</td>
<td>Third and fourth degree tears for all first births</td>
<td>✓</td>
<td>✓</td>
<td>?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>6</td>
<td>Unassisted vaginal births following a spontaneous onset of labour for selected first births</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td><strong>Postpartum</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>APGAR score ≤ 6 at 5 minutes for live term infants</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>8</td>
<td>Death of baby around time of birth</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>9</td>
<td>Significant blood loss within 24 hours following a vaginal birth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Supporting breastfeeding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Indicators Recommended for Future Consideration or Further Development

Throughout the deliberations of the EWG and the RG, the option to place an indicator on a list for future development or collection (known as ‘future candidates’) was always available. The reason for this is that clinical indicators by definition must be clinically relevant. Therefore any set of indicators must remain fluid and dynamic and be responsive to emerging research, evidence-based guidelines and the achievement of goals - for example, if all maternity services achieved BFHI accreditation or a screening tool was taken up 100% of the time. Consequently a number of indicators need to be placed on a list for regular review to ascertain appropriateness for future inclusion while others are awaiting research results and still others have yet to be fully researched but have sufficient merit to warrant further consideration.

A list of future ‘candidate indicators’ can be found below with a brief description of the purpose and rationale and the reason it has been put aside for the time being. It is recommended that these indicators be considered by the expert advisory group which is convened to support the ongoing collection and reporting of this set of Core Maternity Indictors.

Table 10 Areas of practice / indicators recommended by the EWG as future candidates

<table>
<thead>
<tr>
<th>Area of practice / indicator</th>
<th>Deferred pending results of an active study</th>
<th>Rationale for deferral by the EWG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antenatal corticosteroid administration</td>
<td>Difficulty of collection for women transferred to a tertiary hospital. Perceived high rates of compliance with the evidence.</td>
<td></td>
</tr>
<tr>
<td>Anti-D prophylaxis for Rh negative women</td>
<td>Should be considered as a future indicator once there is sufficient evidence-based research to support its inclusion</td>
<td></td>
</tr>
<tr>
<td>Breastfeeding outcomes (initiation rates)</td>
<td>Child Health Headline Indicators</td>
<td>This indicator was considered favourably by the EWG however it was discarded in favour of BFHI</td>
</tr>
<tr>
<td>Caesarean section rates performed under general anaesthesia</td>
<td>Awaiting advice from RANZCA</td>
<td></td>
</tr>
<tr>
<td>Screening for gestational diabetes</td>
<td>Hyperglycaemia and Adverse Pregnancy Outcome (HAPO) study</td>
<td></td>
</tr>
<tr>
<td>Screening for Group B streptococcus</td>
<td>Evidence to support this indicator is currently being reviewed by the National Evidence based Guidelines for Antenatal Care (NEBGAC)</td>
<td></td>
</tr>
</tbody>
</table>
### Vaginal birth after caesarean (VBAC)

**Rationale for deferral by the EWG**

Conclusive evidence is not yet available on the use and success of VBAC, in terms of the final outcome following the attempt at VBAC and maternal wellbeing and satisfaction. The literature will need to be continually reviewed to assess the value of including an indicator(s) relating to VBAC.

Currently there is no agreement in the literature as to what a ‘good’ VBAC rate is. There is also debate in the literature about what clinicians should or should not be advising women to do. A successful VBAC is not always indicative of a successful outcome for the infant or maternal satisfaction with the process. Whilst the value of this indicator for inclusion was supported by the EWG, it was generally agreed that the primary driver in this regard is to discourage unnecessary inductions and caesarean sections amongst first time mothers.

### Women who present for confinement ‘unbooked’ or who have attended < 7 antenatal visits

**Rationale for deferral by the EWG**

This indicator was considered by the EWG of particular importance with regard to monitoring timely access to antenatal care within Australia’s indigenous population.

**National Evidence Based Guideline for Antenatal Care (NEBGAC) project**

The CMIP Reference Group’s proposed areas of practice / indicators for future consideration

The following additional areas of practice / indicators were recommended or proposed by one or more members of the CMIP RG. After extensive discussion the EWG did not believe that any of the areas or practice / indicators warranted inclusion in the Core Set of Maternity Indicators at this stage due to either a problem with:

- Formulation of the indicator; and / or
- Collection of the data; and / or
- Validity of the results; and / or
- Low rates of applicability to a too small sub-population of women / babies.

The EWG acknowledges that each area of practice or indicator proposed by the RG is important with the potential for quality improvement to occur in the future.

**Areas of practice / indicators proposed by more than one member of the RG:**

**Antepartum**

1. Hepatitis B, Hepatitis C, Rubella and HIV testing as baseline investigation for pregnancies
2. Models of care available to women and proportion who use each option
3. Prenatal testing for patients at risk of depression and other major psychiatric illnesses
4. Rate of mothers delivering with illicit drug use when that use was unknown antenatally

**Intrapartum**

5. Length of first and second stage of labour
Postpartum

6. Blood loss $\geq$ 1000 mls associated with caesarean section
7. Maternal morbidity and mortality
8. Number of women transfused as a consequence of delivery
9. Number of women undergoing unplanned hysterectomy following caesarean section birth
10. Uterine rupture from attempted VBAC

Areas of practice / indicators proposed by one member of the RG:

Antepartum

11. Access to advanced obstetric care in the bush – What is feasible?
12. Antenatal / postnatal care in rural remote areas
13. BMI (maternal weight by morbidity)
14. Failure to deliver the growth restricted fetus before 40 weeks gestation

Intrapartum

15. Time spent in the labour ward with cervical dilatation less than 3 cms in selected first births
16. Rates and timing of augmentation
17. Selected primipara undergoing caesarean section for failure to progress / no progress / delay etc who have not been augmented with Syntocinon
18. Selected primipara undergoing caesarean section for fetal distress with no fetal blood sampling

Postpartum

19. Attachment / bonding (risk of)
20. Number of term babies delivered by caesarean section admitted to SCU / NICU elective vs. non-elective
21. Number of preterm infants delivered inappropriately in non-tertiary units
22. Perinatal mortality in indigenous population compared to non-indigenous population
23. Perinatal autopsy
24. Placental pathology
25. Postpartum maternal admission to ICU
26. Rate of admission of term infants for jaundice associated with poor feeding
27. The rate of admission of babies to a nursery with a diagnosis of respiratory distress following planned caesarean section at term
28. Unexpected admission to SCN in term infants without any congenital abnormality.
Validating the National Core Maternity Indicators

Whilst it was the original intent of the Project to undertake a formal trial or pilot of the indicators to test them for: ease of collection; robustness; and relevancy, the process by which this could be achieved was more problematic than first anticipated.

One of the main difficulties related to the fact that, for the majority of maternity services, two of the Core Maternity Indicators (No. 1, Smoking cessation advice during pregnancy and No. 9, Significant blood loss within 24 hours following a vaginal birth) are not currently collected or recorded in the format required. Where the required information is recorded it is often only in the patient notes requiring an audit to extract the required information. The need to ensure that the data elements required for these indicators are included on all midwives / perinatal data collection forms has been previously noted in this Report and would resolve this problem. Another difficulty that arose for the remaining indicators recommended was due to the decision to pre-risk adjust a number of them. For hospitals without obstetric electronic databases, the only other means of collecting the data to populate the indicators was by manual collection and calculation. The decision to pre-risk adjust, removed the option of utilising the Hospital’s Inpatient Separation Database.

A number of options were considered by the Project Team that included:

1. A retrospective audit of indicators currently able to be collected through the midwives / perinatal data collection forms.

   Problems encountered:
   
   a. Only six of the ten indicators could be reviewed.
   b. Permission was required from all states and territories to access their aggregated data and report on the results.
   c. Inability to access and display data for individual hospitals by peer group.
   d. Data from 2003 was the latest complete data set that was available.

   Outcome: This option was progressed but only for aggregate state and territory data.

2. A prospective trial of a sample of hospitals representing tertiary / secondary, metropolitan / rural and public / private maternity care providers.

   Problems encountered:
   
   a. Time did not permit the selection of a sample of hospitals and the prospective collection of the full set of core maternity indicators.
   b. Size of the sample required to properly validate the indicator set.
   c. Concern as to the motivation and capacity of sample hospitals to undertake the pilot study.
Outcome: This option could not be progressed within the time or budgetary constraints of the Project. However, in order to test data collection options and processes, the existence of data variation between units and the response of clinicians to the results for their unit, it will be important to proceed with some form of pilot. This is particularly the case for Indicators 1, 9 and 10 for which there is no established data collection and reporting system.

3. Trial of the indicators during the first year of collection.

This method of piloting the indicators had been suggested early in the Project given the possibility that some of the indicators selected for the core set may not have identified data sources. ACHS currently utilises this methodology when introducing new indicators into their clinical performance monitoring service.

Outcome: Assuming ACHS adopts the recommended set of Core Maternity Indicators, it is possible that ACHS could monitor the results in the first round of collection from member organisations and consult with the expert advisory group convened to support this Project to modify any indicators if required.

4. Independent expert review of the recommended Core Maternity Indicator Set

The difficulties of conducting a prospective pilot of the indicators led the Project Management Group to consider other options such as seeking an independent expert to review the conclusions reached by the EWG and the RG. Professor Robert Gibberd, Health Services Research Group, Faculty of Health, University of Newcastle was approached to undertake this task.

Outcome: With assistance from Mr Stephen Hancock (Statistician, Health Services Research Group), Professor Gibberd agreed to review the National Core Maternity Indicators. A full report is due by the end of January 2007 (attached as Appendix G).

Discussion of results:

Option 1:

Discussions with state and territory perinatal data units yielded valuable insight into the process of how information from midwives/perinatal data collection forms is currently processed and reported at state and territory level. Discussions with the NPSU provided the Project Team with a clearer understanding of the process of aggregation and reporting of perinatal data at the national level. It became apparent that conducting a retrospective audit of core maternity indicators as described in Option 1, (and for which data was available) could only be done for the year 2003 and was not able to be presented at the hospital level, by peer group. Rather, the best that could be achieved was an analysis of six of the indicators at the state and territory aggregate level assuming permission could be obtained from state and territory health authorities.

At the last meeting of the EWG, NPSU kindly provided a ‘commercial-in-confidence’ document displaying state and territory-aggregated data for each of the six indicators for the collection year 2003. The data demonstrated a significant variance in the rates of performance between states and territories, suggesting that monitoring these indicators may have intrinsic value in the drive to improve the quality of maternity care.
As a further result of these discussions, it was agreed to seek approval for data to be presented according to a pre-defined peer group structure that would support intra and interstate comparisons between ‘like’ organisations.

Although this could not be accomplished in the time available, aggregate state and territory data on the six indicators for 2004 are to be included in the 2005 Australia’s mothers and babies Report.

Option 3:

The ACHS has agreed to facilitate the testing of the Core Maternity Indicators by incorporating the core maternity indicators into the ACHS indicator sets proposed for collection in 2007.

Option 4:

The Health Services Research Group was commissioned to undertake a review of the statistical validity of the Core Maternity Indicators including assessment of the following statements:

1. The indicators represent high quality with regard to clinical relevance.
2. The risk-adjusted criterion accurately represents the expected outcomes of the numerators and denominators (for only those indicators reported against the selected primipara criteria).
3. There are factors within the indicators that have the ability to change clinical practice / clinical outcomes.
4. The indicators have epidemiological value and the ability for statistical validity to be proven.
5. The indicators have the ability to provide a reasonable spread in the results and therefore detect outliers at either end of the spectrum.
6. The indicators have the ability to support manipulation that can be used to determine whether the indicators are useful from a quality perspective.
7. The terminology for each of the indicators and the risk-adjusted criteria is appropriate.
8. The indicators have the ability to support ‘statistical’ manipulation for future comparative studies.
9. The indicators are ‘scientifically robust’ i.e. that they are valid, specific, sensitive and a reliable reflection of that which they purport to measure.
10. The use of the term ‘selected primipara’ is scientifically appropriate.
11. The indicators have been appropriately risk-adjusted / not risk-adjusted for optimal results as per the design of the numerators and denominators.

The Report is provided in full at Appendix G; the Executive Summary is reproduced below:

“This report reviews the ten National Core Maternity Indicators. Two of these may not be within the control of the maternity staff in the hospital, since they relate to preventing smoking and accrediting the hospital for breast-feeding. While these aspects of care are important and would be supported and influenced by the maternity staff, the report identifies issues that reduce their utility. The remaining eight indicators consist of three process measures and five outcome measures and they cover the core components of outcomes for the baby and mother and the processes in delivering care. Although these indicators are similar to maternity indicators used by the ACHS and the State Departments of Health, the differences need to be assessed as to whether the changes provide a more useful indicator. This requires further pilot studies and analyses of existing data, particularly looking at the use of primipara births. A summary of each indicator is given below.
1. **Smoking cessation advice during pregnancy.**

Score: 52%. This is a low score since the methods to collect the data need to be assessed in a pilot project. The pilot should also assess whether the indicator will influence change in pre-natal clinics. If it is assumed that most clinics provide cessation advice and that the quit rate is low, then the indicator may be targeting the wrong process. What types of cessation help are the clinics offering smokers should be assessed in the pilot program?

2. **Caesarean Section for first births meeting the selected primipara criteria**

Score: 94%. This indicator scores well and has produced changes in hospitals with high rates. The use of selected births, while reducing the potential for confounding variables to bias the rate at some hospitals, substantially increases the standard error for all hospitals and justification that this is an appropriate approach should be undertaken.

3. **Episiotomies performed during first birth**

Score: 98%. Given the high score and the above recommendations, this is an important indicator. Hospitals have used this indicator to change the culture in their units.

4. **Induction of labour for first births meeting the selected primipara criteria**

Score: 92%. A high score but a comparison of the rates for all and selected primipara births should be carried out.

5. **Significant perineal tears during first birth**

Score: 92%. The main concern is whether this outcome indicator has the statistical power and the evidence from a systematic review of EBM to lead to changes in the care provided.

6. **Unassisted vaginal births following a spontaneous onset of labour for first births but excluding augmentation, epidural anaesthesia, episiotomy, induction of labour and instrumental births.**

Score: 84%. This indicator has a lower score and should be calculated and tested on existing data. The aim of the indicator should clearly identify whether it is likely to provide results that can be used to improve the care provided.

7. **Apgar score of six or less at five minutes**

Score: 89%. A decision on whether a new indicator should be adopted, or whether two clinical indicators should be used is required.
8. Significant blood loss following vaginal births

Score: 75%. There is concern as to how blood loss will be measured and a pilot study of its feasibility and comparisons to other indicators such transfusion rates are required.

9. Gestation standardised perinatal mortality ratio

Score: 95%. How are these data to be recorded: from unit record data, or as a table as shown below? We recommend that all units be included in reporting the data and that only in-hospital deaths are used.

10. Supporting breast-feeding.

Score: 64%. This is not a clinical indicator but a structural measure that provides a yes/no answer for each hospital. A pilot study to determine differences in breast-feeding rates between those units that are accredited and those that are not should be carried out.”

Professor Gibberd's report concludes by noting the importance of determining how the data are going to be collected and reported and suggests two options: using ACHS to provide the tools for collection and analysis or utilising midwives/perinatal statistics collections. Whichever option is chosen he notes the importance of continuing the collection for many years as the value of the data often lies in the trends.

Recommendations:

*That ACHS is requested to facilitate a pilot of the Core Maternity Indicators during 2007. Any recommendations for change as a consequence of this collection and relevant analyses should be submitted to the expert advisory group convened to provide ongoing support and guidance on the National Core Maternity Indicator Set.*

*That a pilot study should be conducted during 2007 to trial the collection of the indicators and investigate the issues raised in the report prepared by the Health Services Research Group.*
Governance Arrangements for the National Core Maternity Indicators

One of the final objectives of the CMIP was to propose a framework for data governance arrangements and sustainability and, most importantly, for ensuring effective utilisation of the information by hospitals and health professionals involved in the care of women and babies.

It is recognised that many quality improvement processes already exist, as does work on indicators and performance measures, led by clinicians, health services, State and Territory Health Departments and by various national agencies and committees. Therefore, the national governance arrangements for progression of the National Core Maternity Indicator Set should be integrated with and, where appropriate, supplement the work being undertaken at all these levels.

A governance structure is required to ensure that the original aim of the CMIP in developing a core set of evidence-based performance indicators for timely, comparative analysis of maternity care practice and outcomes in Australia is supported and adequately resourced in the future.

The development of a clinical governance framework would lend integrity to the project and reinforce to hospitals the commitment to support clinicians to continually improve maternity care services. It would also encourage clinicians to adopt the indicators and to use the information in an atmosphere that encourages change for quality improvement rather than one that is perceived as punitive. Ideally the handover of responsibility from this ‘project’ phase to the recommended governance framework would occur simultaneously with the completion date of this project.

Defining Clinical Governance

Clinical Governance is the framework through which health organisations are accountable for continuously improving the quality of their services and safeguarding high standards of care by creating an environment in which excellence in clinical care will flourish (The Clinician’s Toolkit, 2001). It aims to assemble systems and processes that have been specifically designed to review, monitor and measure, and improve the quality of care that clinicians provide. It supports the proposition that all providers of care are equally responsible for that care and as such are accountable for that care.

Principles of Governance Relating to CMIP

The principal responsibilities that need to be resolved to ensure the effective implementation and ongoing sustainability of the CMIP relate to the following:
• Determining the most appropriate agency to provide overall leadership in all aspects relating to the role of the indicators in clinical practice
• Defining the reporting framework and component responsibilities to oversee the national implementation and effective management of the indicator set
• Defining the accountability for reporting and response at state, territory and hospital levels
• Defining the policies that will drive the implementation and review processes
• Defining means to measure the effectiveness of the implementation process – including quality cycles, sustainability and continuing relevance of the indicators
• Defining standards and developing educational programs that will enhance the meaningfulness of the indicators to clinicians at the front-line

Leadership for the National Core Maternity Indicators – Criteria for Assessment

The criteria used to assess the selection of the recommended governing agency for the implementation of the national core maternity indicators related to an organisation’s ability to:

• Encompass a national (or possibly trans-Tasman) remit for the quality improvement of maternity care;
• Facilitate implementation of the recommended national maternity indicators and oversee their further development;
• Oversee data collection and have the capacity to review data in a technically competent, clinically meaningful and timely manner;
• Facilitate release of data in a timely manner to the level of the hospital / maternity service provider;
• Support performance assessment at appropriate levels and work with relevant agencies, government health departments, maternity service providers and clinicians to close the loop between information and action at the front-line of service provision;
• Assist in the management of technical enquiries and deal with complaints; and
• Involve stakeholders, including consumers, in its activities.

Agencies considered for Future Governance of the National Core Maternity Indicators

As part of the governance review process, existing organisations and agencies with experience in performance indicator and clinical data management were examined against their current role and the criteria previously defined.

The organisations and agencies reviewed were:

1. Australian Commission on Safety and Quality in Health Care (ACS&QHC)
2. The Australian Council on Healthcare Standards (ACHS)
3. State and Territory Maternal / Perinatal departments
1. **Australian Commission on Safety and Quality in Health Care**

**Relevant Roles:**

- Lead and coordinate improvements in safety and quality of health care in Australia by identifying issues and policy directions, recommending priorities for action, disseminating knowledge and advocating for patient safety and quality;
- Report publicly on the state of patient safety and quality, including performance against national standards;
- Recommend national data sets for safety and quality working with current multilateral governmental arrangements for data development, standards collecting and reporting; and
- Recommend nationally agreed standards for safety and quality improvement.

**Considerations:**

- Undergoing the transition from the Australian Council for Safety and Quality in Health Care to the Australian Commission on Safety and Quality in Health Care;
- Awaiting the release of the new Commission’s governance arrangements, line of reporting and terms of reference;
- Charged with overseeing the safety and quality interests of both health sector consumers and health service providers; and
- Will have its focus not so much in the ‘how’ and ‘why’ of the data collection but in the outcomes of the data and to ensure that what is being collected is reported publicly.

2. **The Australian Council on Healthcare Standards (ACHS)**

**Relevant Roles:**

- Is dedicated to improving the quality of health care in Australia through continually reviewing performance, assessment and accreditation;
- Leading independent authority on the measurement and implementation of quality improvement systems for Australian health care facilities; and
- Standards for evaluation, assessment and accreditation are determined by a council drawn from peak bodies in health and representatives of the Commonwealth Government, State Governments and consumers.

**Considerations:**

- Only covers data provided by contributing member hospitals;
- Timeliness of reporting may not meet the needs of the project within current resources; and
- Has a wealth of experience and competency in clinical indicator collection, analysis and reporting.
3. State / Territory Departments of Maternal / Perinatal Health

Considerations:

Whilst State and Territory maternity services currently collect and submit data to State / Territory Perinatal Data Collection Units, this does not deal with the requirement for a national perspective to be provided. A suitable national vehicle will involve consideration by AHMAC.

4. National Perinatal Statistical Unit (NPSU)

Relevant Roles:

- To monitor and interpret national data in reproductive and perinatal morbidity and mortality;
- To provide a reproductive and perinatal epidemiology service;
- To conduct epidemiological research;
- To enhance national reproductive and perinatal health data systems; and
- To establish high quality reproductive and perinatal health.

The NPSU publishes national reports on reproductive and perinatal health which cover pregnancy outcomes, maternal morbidity and mortality, assisted reproduction and birth defects.

Considerations:

- The perinatal data collection system is the one system that is common to all States / Territories;
- Midwives / perinatal data collection forms are coordinated at a National level. Regardless of this, the forms still facilitate local flexibility to meet the unique needs of the State / Territory and their component hospitals;
- The NPSU would embrace the indicators at a national level;
- Facilitates changes to the midwives / data collection forms at a national level by bringing changes to data element requirements under the auspices of the NPSU;
- Reports against the Perinatal National Minimum Dataset (NMDS);
- The NPSU is a collaborating unit of the Australian Institute of Health and Welfare (AIHW);
- Data protected under the AIHW Act and stringent governance processes are in place to ensure security of the data;
- The NPSU has existing working relationships with the State and Territory data providers and other relevant stakeholders and a previous working relationship with the former Australian Council for Safety and Quality in Health Care for maternal reporting; and
- Being a part of the AIHW, the NPSU has access to other data sources such as the National Hospital Morbidity Database.
Limitations:

- Timeliness of reporting does not currently meet the needs of the project but it is understood that plans are in place to provide more timely reporting to States / Territories;
- Currently does not report to the level of the hospital / organisation;
- Has not been involved in quality improvement processes;
- Cross-State comparative data analysis may be delayed until all the required data are made available by States and Territories; and
- Currently is limited in its ability to support inclusion of data submitted by New Zealand.

Conclusion:

Following extensive consideration it is recommended that the ACS&QHC take on the leading governance role for the next phase of the CMIP. Among the reasons for this recommendation are that the ACSQHC has a national role to lead and coordinate improvements in safety and quality of health care in Australia, recommend priorities for action, disseminate knowledge on the state of patient safety and quality, including performance against national standards, and advocate for patient safety and quality. It has recently undergone a transition from the Australian Council for Safety and Quality in Health Care to the current Australian Commission on Safety and Quality in Health Care and reports to the Health Ministers through the Australian Health Ministers’ Advisory Council. It is therefore well placed to lead the next phase of this initiative. However the actual task of collecting, collating and reporting on the core maternity indicators at a national level could be tasked to an agency such as the NPSU that has the required experience and knowledge to undertake this task.

In the meantime it is also recommended that national organisations such as WHA and ACHS be encouraged to include the core maternity indicator set in their Obstetric Clinical Indicator program to ensure there is consistency and standardisation of the core indicators recommended for collection by maternity services.

‘Closing the Loop’

Anecdotally, there has been a perceived failure in the timely release of clinical information to hospitals and clinicians regarding areas of under performance within their practice and a lack of capacity within health services to do something about the problem even once they have been informed. It is envisaged that the governance structure for managing the core maternity indicators will ensure that processes are adopted that facilitate the provision and use of timely feedback with proactive change an integral part of a continuing and evolutionary quality cycle.

To achieve this, maternity services require feedback on their performance with respect to each of the core indicators within a reasonable time frame (within one year of collection if not more frequently). The feedback needs to be in a similar format to that provided by the ACHS showing mean rates and 20th and 80th centile rates and potential gains. Despite the fact that a number of the core maternity indicators have been pre-risk adjusted to allow more meaningful comparison between services with different casemix and population profiles, it is also important that results are presented using a simple, national peer group structure. This structure needs to provide a broad grouping based on the number of births as well as taking into account the public or private nature of the service provided and possibly the existence of anaesthetic obstetric services and Neonatal Intensive Care Units. Development of an appropriate national peer group structure will require further analysis to ensure that groupings are as homogenous as possible.
In addition, it is also recommended that an annual or biennial conference be held that provides the opportunity for maternity care services to showcase any innovative quality improvement initiatives or clinical processes that have improved the quality of maternity care outcomes within their organisation.

**Future Work to be Undertaken and Outcomes to be Achieved**

In order to further the objectives of the Core Maternity Indicators Project it is vital that further support and resources are provided to achieve the following:

1. Provide capacity within the lead agency to drive implementation of the indicator set and to develop support mechanisms to assist clinicians and health services.

2. Undertake a pilot study to review aspects of data recording and collection and assess the need for pre-risk adjustment as documented in ‘Appraisal of the National Core Maternity Indicators’ prepared by Professor Gibberd.

3. Development of statistically robust strata for maternity services / hospitals to be grouped for national comparison and reporting purposes.

4. Commissioning of an organisation or agency to oversee the data collection, collation, analysis and reporting of the indicator set.

5. Facilitation and support of processes at various levels including at hospital level, to collect and report the indicators and utilise the results for the purpose of improving maternity outcomes.

6. Establishment of an advisory committee structure with appropriate stakeholder participation (including clinicians, information and policy specialists and consumers, akin to the CMIP Expert Working Group) for managing the on-going review process and progression of the indicators in line with current and emerging evidence (biennial review is recommended).

7. A regular opportunity for maternity services to come together to share information and innovations in practice arising from the results of the core maternity indicators.

8. Agreement by the NPDDC and states and territories to modify and standardise the midwives / perinatal data collection form in line with the numerators and denominators required for each of the core maternity indicators.

9. Agreement by States and Territories to report data at the hospital level in a de-identified manner (at least initially).

10. Agreement by all Private Hospitals providing maternity care to report data at the hospital level in a de-identified manner.


12. Development of education and information dissemination programs directed at maternity services to guide their understanding of the collection process and assist with the interpretation of results.

13. Deployment of sufficient resources to ensure that support is available to those hospitals significantly under-performing according to their peer group.
Recommendations

*It is recommended that, subject to agreement by AHMAC / AHMC, the ACS&QHC assume the governance role for the next phase of the CMIP and implementation of the proposed future work program described above.*

*Given the complexity of maternity information systems, confidentiality requirements and the analyses required, it is recommended that the ACS&QHC examine the potential for a specialised agency, under a formal agreement or contract, to assume the responsibility for data collection, validation, statistical analyses, and reporting of the indicators.*

An outline of the proposed governance structure and reporting relationships is presented below:
Findings from the Core Maternity Indicators Project funded by the Australian Council on Safety and Quality in Health Care and sponsored by the Department of Health, Western Australia

Appendix to Report prepared by Women’s Hospitals Australasia

January 2007
# Appendix

## Criteria for Selecting Core Maternity Indicators

<table>
<thead>
<tr>
<th>Broad Category</th>
<th>Specific Category</th>
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<th>No</th>
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<td>Important</td>
<td>Consumer</td>
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<td></td>
<td>Relevant and important to women</td>
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<td>Understandable</td>
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<td></td>
<td>Describes a clinical event/outcome which can clearly be defined</td>
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<td>Practical</td>
<td>Accessible</td>
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<td>Data is able to be retrieved in the right format at the right time</td>
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<td>Scientifically robust</td>
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<td>Standardisation</td>
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<td>Representative</td>
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<td>Relevant in a substantial proportion of the study population (frequency &gt;5%)</td>
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<td>Ethical</td>
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<td></td>
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## Indicator Evaluation Form

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<th>2 Disagree</th>
<th>3 Agree</th>
<th>4 Strongly Agree</th>
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National and International Definitions for the ‘Standard Primipara’

**Standard Primipara (National Women’s, Auckland)**
A woman with no prior birth ≥ 20 weeks
Age 20-34 years
Singleton pregnancy
Cephalic presentation
Gestation 37-41 completed weeks
No medical or obstetric complications

**Standard Primipara (WA)**
First birth at greater than or equal to 20 weeks gestation
Aged 20-34 years of age
Infant not small for gestational age (SGA) (birth weight greater than 10th percentile)
Singleton pregnancy
37-41 weeks gestation
Cephalic presentation
Free of medical complications of pregnancy

**Standard Primiparae (Vic)**
20–34 years of age,
Not small for gestational age (SGA) (greater than 10th percentile),
Singleton pregnancy
Term (37–41 weeks gestation)
Cephalic presentation
Free of medical complications of pregnancy

**Douglas Report**
Used the following ‘standard primiparae’ in conducting the analyses on “obstetric measures”:

No previous pregnancy ≥ 20 weeks gestation
Maternal age 20-34 years
No significant pre-existing medical conditions (diabetes, hypertension, epilepsy, cardiac disease, renal disease)
No obstetric complications (gestational diabetes, pregnancy induced hypertension or pre-eclampsia, antepartum haemorrhage, premature rupture of the membranes, prolonged rupture of the membranes)
Cephalic presentation at delivery
Live singleton birth
Delivery between 37-41 weeks gestation inclusive
Robson – Group 1 Classification for CS
Nulliparous
Single cephalic
> 37 weeks
Spontaneous labour

Standard Primipara (Cleary et al, 1996)
> 37 weeks
Singleton cephalic
White
Aged 20-34 years
Over 155cm
Excludes medical complications pre-pregnancy and pregnancy

Low-Risk Primigravida (Alfirevic et al, 2003)
First pregnancy (no spontaneous abortions or termination of pregnancy)
Singleton fetus with cephalic presentation
Spontaneous onset of labour after 37 + 0 weeks and less than 42 + 0 weeks
No maternal disease
No antenatal complications
No hospital admissions during pregnancy for greater than 24 hr

Standard Multipara (WA)
Second or third birth at greater than or equal to 20 weeks gestation
Aged 20-34 years of age
Infant not small for gestational age (SGA) (birth weight > than 10th percentile)
Singleton pregnancy
37-41 weeks gestation
Cephalic presentation
Free of medical complications of pregnancy
No previous caesarean section
No previous stillbirth
No previous preterm birth
Established national and international maternity performance indicator programs

Victoria

In June 2000, the Victorian Department of Human Services contracted the Royal Women’s Hospital in Melbourne to develop a set of performance indicators for the state’s public sector acute hospital–based maternity services. The project was conducted between June 2000 and February 2001.

Development of the Indicators

During this period there were several key phases of the project including:

1. An extensive review of the literature (both peer-reviewed and non peer-reviewed) resulting in the compilation of a list of potential indicators, issues, and associated evidence
2. The project team critically appraised the literature and selected indicators against a set of criteria resulting in the selection of twenty indicators
3. An independent advisory group was established to complement the work of the project team and it was here that ten additional topics were identified as having potential for indicator development
4. An iterative process of discussion and seeking consensus on each of the indicators was gained using the following criteria:
   a. Robust
   b. Useful
   c. Accessible
   d. Feasible

Once consensus regarding the indicators had been reached, specification of what was to be measured as a numerator and denominator was then determined for each indicator. A three month state-wide consultation process took place to ensure the relevance and feasibility of the indicators to the various stakeholders, including consumers and providers. The project team continued to refine and select the final nine indicators from the draft set of twenty indicators, and reviewed the ten topics that had potential for development as indicators. Later, an existing indicator was added to complete the set (DHS, 2001).
The objectives of the implementation phase were to:

- Enable performance to be compared
- Promote discussion between hospitals as to the performance against the indicators
- Promote discussion as to what level of performance should be achieved in a given area
- Promote discussion and shared learning as to how to achieve improvements in the quality of maternity care” (DHS, 2001).

Although five of the recommended indicators could be implemented immediately, four of the nine indicators were identified as necessitating changes in service design or the design of specific audit systems (DHS, 2002). State-wide implementation of the indicators was completed in 2003. Comparative indicator data for all Victorian public maternity services is now published on the internet. [http://www.health.vic.gov.au/maternitycare/perfind0405.pdf](http://www.health.vic.gov.au/maternitycare/perfind0405.pdf)

**Western Australia**

In August 2003, the DoHWA commissioned the Maternity Data Collaboration project as a result of the Douglas Inquiry and the perceived need for a system to benchmark outcomes in maternity care. The aim of the project was to scope the requirements for national maternity data collaboration within an effective quality improvement framework.

The small project group, consisting of two midwives and an obstetrician, was supported by a state and national reference group. The objectives of the project included:

1. Developing a list of clinically meaningful indicators and the required data elements (with definitions) that would enable comparative analyses of maternity care practice and outcomes in Australian hospitals
2. Identifying the linkages between the information collected and effective quality improvement processes in maternity care
3. Pilot this system in one or more maternity centres in WA
4. Identify any issues including any major gaps in existing data collections, in promoting the use of these clinical indicators in Australian maternity hospitals
5. Make recommendations for the governance of a national maternity data collaboration.

Considerations about data collection included access to data provided, collated and stored through the available systems which included:

- ICD-10 coding of separations
- Midwives' Notification System
- Other electronic data collection systems.

In determining the final list of indicators the reference group had to ensure that the following two questions could be answered:

1. Is there evidence that links the outcome or process being measured with an opportunity to improve maternity care?
2. Are these indicators able to be reported in WA from current data sources?
One of the recommendations in the final report concluded that:

“The indicators devised and presented in this project were used as tools. They are not claimed to be the best, most comprehensive or most useful. They do prove that evidence based maternity care can be measured in some instances where the data is available in an appropriate form” (Hutchinson, Humphrey & Collins, 2003). These indicators are not being collected.

The Australian Council on Health Care Standards

The Australian Council on Healthcare Standards (ACHS) was established in 1974 and is the largest accreditation provider in Australia. It is an independent, not for profit organisation, dedicated to improving the safety and quality of health care in Australia through continual review of performance, assessment and accreditation. The ACHS is responsible for accrediting around 67% of all hospitals in Australia. The ACHS has also been accredited for both its standards and accreditation program by the International Society for Quality in Health Care (ISQua) (ACHS, 2005).

The Performance and Outcomes Service (POS) coordinates the development, collection, collation, analysis, and reporting of clinical indicators. These clinical indicators were developed in conjunction with Australian and New Zealand Medical Colleges and Associations since 1989. There are over 259 clinical indicators that are able to be collected. The Obstetric and Gynaecology clinical indicator set was originally piloted in 1990. The main purpose of these indicators included using them as the first tier for a quality assurance or continuous improvement process. They would also be used to ‘flag’ areas which may require a more detailed audit (ACHS, 1994). At present there are seven obstetric indicators available for organisations to collect and currently around 217 hospitals are submitting data to the POS. The service provides comparative reports on processes and outcomes of health care to the participating organisations. This enables them to compare their results with peer organisations (ACHS, 2004).


Women’s Hospitals Australasia

Women’s Hospitals Australasia has facilitated the collection of a broad range of obstetric and neonatal indicators for Australia and New Zealand member hospitals since 1997. The purpose of this collection was to assist women’s hospitals in Australia and New Zealand to monitor and improve their clinical performance on a range of maternal and neonatal clinical indicators. To date there have been two reports published with the latest being in 2004 (Buist & Cahill, 2004). These reports are for the use of member hospitals only and are not publicly available.

The clinical indicators are selected and defined by a working group of clinicians drawn from member hospitals. A clinical leader coordinates this process and ensures that both the numerator and denominator for each indicator are unambiguously expressed. The survey is constructed on a web-based database and released to hospitals for completion. The survey covers three years of clinical care for each indicator. Once all hospitals have completed the survey, the results are electronically collated and an average ‘benchmark’ for each indicator is calculated. The results are then graphed and analysed, and a report published and distributed to member hospitals. The identity of hospitals is protected using a random numbering system in all published reports. While the indicators have become better defined over the six years, there are still a number of women’s hospitals and health units who do not have the electronic data systems or the staffing resources to collect and report on these important indicators of clinical care.
Nonetheless, there are now enough contributors and sufficient agreement about the validity of indicators to make this collection a valuable resource for women’s hospitals in their pursuit of clinical excellence. Individually, hospitals can focus on areas of care where they differ significantly from the WHA Benchmark. Collectively, WHA can target areas of common concern through its Clinical Forum process. www.wcha.asn.au/index.cfm/spid/1_46.cfm

Europe

The aim of the PERISTAT project (2000 – 2003) was to develop valid and reliable indicators for monitoring and evaluating perinatal health in Europe. Their focus was orientated towards the health issues associated with pregnancy, delivery and the postpartum period. Their challenge was to define indicators that cover common concerns and have the same meaning within the different health care systems in the community.

The four specific objectives of the project included:

1. Definition of relevant measures of perinatal health and the determinants of perinatal health
2. Development of methods, definitions and guidelines for the construction and publication of reliable and comparable indicators
3. Assessment of the extent to which existing data collection systems could be used to construct reliable perinatal health indicators; and

Components of the Project:

1. Background review of the scientific literature and existing recommendations on perinatal health indicators
2. A consensus process by which the advisory committee and a panel of midwives identified a working list of indicators
3. A study of the availability of national statistics covering the proposed indicator set to test its feasibility.

Recommendations for Indicator Selection:

| Importance | assessed by terms such as **significant, useful and relevant**. Importance is determined both in relation to the prevalence of the problem and its amenability to change |
| Technical  | broad agreement on the need for **scientifically robust** indicators that are **valid, reliable, sensitive and specific**. |
| Practical  | in relation to the data currently collected in each country (Zeitlin et al, 2003) |

Selecting the List of Indicators

The final ten core indicators were chosen after the second Delphi round with at least 80% of the participants agreeing which indicators should be in a core set. Another list of twenty indicators were shortlisted into ‘recommended’ and ‘for further development’ indicators. After the selection of the core indicators, the PERISTAT scientific committee and members of the scientific advisory committee commented on the under representation of midwives in the selection process.
An additional Delphi process was conducted to assess consensus on the core indicators. The results of this process was a consensus of the ten core indicators and another three indicators being added to the list of recommended indicators for further development to now total twenty three indicators.

Unfortunately, many countries cannot provide these indicators. At present only three or four countries can provide data for most of the indicators recommended for immediate implementation. There is a need for most of the countries to make significant investments in their data collection systems (Zeitlin & Wildman, 2003).


The Maryland Hospital Association Quality Indicator Project, United States

The Maryland Hospital Association’s (MHA’s) Quality Indicator Project® (QIP) is an indicator-based performance measurement system used worldwide, that is now in its 20th year of existence. The project originally commenced to provide a small number of hospitals in Maryland with information that would provide them with an understanding of their own performance. Their burning questions were: “Are we doing the right things? Are we doing them well?” (Conn, 2005). At present, there are over 1000 acute care hospitals and other healthcare facilities that participate in the QIP, with more than 200 hospitals in nine countries outside of the US such as Austria, Canada and the UK. This project is considered by these organisations as a critical resource in their efforts to oversee patient care quality and identify opportunities for improvement. The project is mainly concerned with the measurement of performance with the main purpose focusing on the identification of the most frequent, significant and representative aspects of care provided by the various health organisations. There are only two obstetric and neonatal indicators and the various hospitals are free to choose the indicators they would like to report on. This data is submitted to the QIP on a quarterly basis and then aggregated for the entire calendar year. This information is reported in a format which compares national rates with overall international and regional rates (Kazandjian et al, 2003). www.qiproject.org/

UK Quality Indicator Project (UK QIP)

The UK Quality Indicator Project® (UK QIP) is the largest component of the US based International Quality Project® (IQIP), derived from the longstanding Maryland Hospital Association Quality Indicator Project. It provides healthcare organisations with a large amount of comparative data to facilitate clinical governance and improvements to clinical care. The UK QIP began as a pilot project in the National Health Service (NHS) public sector in 1991, and currently over 90 UK hospitals participate in the project. The project provides its participants with access to the largest international data base of clinical outcomes information. The UK QIP now includes about two-thirds of UK private sector acute hospitals (Thomson et al, 2004). www.ncl.ac.uk/qip/

Scotland

Indicators have been collected and published in Scotland since 1993. In 2003, NHS Quality Improvement Scotland established a Special Health Board to coordinate this activity. Its purpose is to help improve the quality of healthcare in Scotland. It does this by setting standards and monitoring performance. The various health services provide information and then a comparative report is produced. Each year different clinical outcome indicators are reported on. Publishing this data is one way that NHS can be transparent and accountable to the public about the various health topics (NHS, 2003). www.nhshealthquality.org
AHRQ Quality Indicators, United States

The Agency for Healthcare Research and Quality (AHRQ) Quality Indicators (QIs) are one organisation that has responded to the need of many health organisations by providing multidimensional and accessible quality indicators. They have published three modules:

- Prevention Quality indicators
- Inpatient Quality indicators
- Patient Safety Quality indicators.

The rationale in developing these indicators is to help address the saying ‘that which cannot be measured is difficult to improve’. These indicators were developed to provide a tool for providers, consumers and policy makers to improve the quality of health care. The indicators are accessible, reliable indicators of quality that they can use to flag potential problems or successes; follow trends over time; and identify disparities across regions, communities and providers. Maternity related indicators are found in all indicator sets. The measure of quality is through analysis of inpatient discharge data.

A report is developed with a graphic presentation of the risk-adjusted data to show how a hospital performs on each indicator compared with: its peer group; the state as a whole; and other comparable states. National and regional averages are also provided as external benchmarks. Trend data are included to allow the hospital to examine any changing patterns in its performance (ARHQ, 2004). www.ahrq.gov

Joint Commission on Accreditation in Health Care Organisations

The Joint Commission on the Accreditation of Healthcare Organisations (JCAHO) was responsible for developing one of the most prominent clinical indicator programs in the USA. The organisation is responsible for accrediting thousands of health care organisations and programs in the USA. It is one of a number of groups in the USA that have embraced the idea that systematic and ongoing measurement of performance is a necessary component of accreditation (Kazandjian, 2002). In 1987, JCAHO announced the Agenda for Change, which was aimed at modernising the accreditation process. One of the key components of the Agenda for Change was the integration of performance measurement data into the accreditation process through the implementation of the ORYX initiative. In 2002, the introduction of four sets of standardised health care quality indicators allowed for first time comparison of results of care across hospitals. One of these four sets included pregnancy and related condition indicators. The sets were comprised of evidence-based indicators that address a specific disease or condition. These indicators have undergone rigorous assessment for performance indicator reliability with funding to the Joint Commission by the Agency for Healthcare Research and Quality (AHRQ). This testing has been successful in identifying a number of data quality concerns (Williams et al, 2003). www.jointcommission.org
Population based maternity indicator collections

Canadian Perinatal Health Report

The Canadian Perinatal Surveillance System (CPSS) contributes to improving health for pregnant women, mothers, and infants in Canada through the extensive monitoring and reporting of perinatal health determinants and outcomes. A steering committee ranked forty three possible indicators for reporting perinatal outcomes. The highest ranked indicators are the twenty seven perinatal health indicators currently collected to provide information on perinatal health.


The National Perinatal Statistics Unit, Australia

The National Perinatal Statistics Unit (NPSU), a collaborative unit of the Australian Institute of Health and Welfare (AIHW), has done substantial work in perinatal data development as well as establishing and maintaining data collections on perinatal health, congenital malformations and assisted conception. The NPSU aims to improve the health of Australian mothers and babies by monitoring reproductive and perinatal health. It is also involved in perinatal data collection and epidemiological research. Recently the NPSU evaluated the National Perinatal Minimum Data Set to refine existing data elements and add new elements for future collection (Laws & Sullivan, 2002). www.npsu.unsw.edu.au
### National Health and Medical Research Council – Quality of Evidence Ratings

#### Designation of levels of evidence

<table>
<thead>
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<th>Level</th>
<th>Description</th>
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| Level I | Systematic review of randomised controlled trials  
Large multi-centre randomised controlled trial |
| Level II | One or more randomised controlled trial |
| Level III | Controlled trials without randomisation  
III – 1 Evidence obtained from well-designed pseudo-randomised controlled trials (alternate allocation or some other method)  
III – 2 Evidence obtained from comparative studies with concurrent controls and allocation not randomised (cohort studies), case control studies or interrupted time series with a control group  
III – 3 Evidence obtained from comparative studies with historical control, two or more single-arm studies or interrupted time series without a parallel control group |
| Level IV | Other observational studies |
| Level V | Opinions of respected authorities based on clinical experience, descriptive studies or reports of expert committees |
Appendix

The WHO’s Ten Steps to Successful Breastfeeding

1. Have a written breastfeeding policy that is routinely communicated to all health care staff

A written breastfeeding policy based on the “Ten Steps to Successful Breastfeeding” should be developed and made available to all health professionals (Vallenas et al, 1998).

2. Train all health care staff in the skills necessary to implement this policy

Midwives / nurses will participate in an eight-hour breastfeeding education program on the breastfeeding policy based around the “Ten Steps to Successful Breastfeeding”. A further four hours of breastfeeding education per year is required as part of the staff’s ongoing commitment to breastfeeding education. Other health professionals working in the maternity unit will be given an education package explaining the breastfeeding policy (Vallenas et al 1998).

3. Inform all pregnant women about the benefits and management of breastfeeding

All women will be provided with information on the benefits and management of breastfeeding in antenatal classes. It is advised that the antenatal classes addressing breastfeeding should be based on the “Ten Steps to Successful breastfeeding” (Vallenas et al 1998).

4. Help mothers to initiate breastfeeding within a half hour of birth

All women are encouraged to have skin-to-skin contact with their babies to initiate breastfeeding within half hour of birth. During this period the baby is alert, its sucking reflex is most vehement and it is most willing to suck. Early breastfeeding stimulates the uterus to contract, therefore aiding in the expulsion of the placenta and controlling blood loss after birth. The "imprinting process" starts to take place at the first feed and this is important for future breastfeeds. The mother / baby relationship (attachment and bonding) is positively influenced. Women will usually breastfeed for a longer duration if breastfeeding is initiated early (Vallenas et al 1998).

5. Show mothers how to breastfeed and how to maintain lactation even if they should be separated from their infants

All women are shown breast expression and breastfeeding positioning and attachment techniques both antenatally and postnatally. They are also given information about the safe storage of breastmilk. Women separated from their babies are given assistance and support to initiate lactation and maintain their breastmilk supply (Vallenas et al, 1998).
6. **Give newborn infants no food or drink other than breast milk unless medically indicated**

Breast milk is the appropriate food for newborn babies and no other type of food or drink should be given to them unless medically indicated. Maternity units should also comply with the WHO International Code of Marketing of Breast milk Substitutes.

The unit should not display or give women any promotional material for infant food, drink or products.

The purchase of infant formula should be at least 80% of the wholesale price (Vallenas et al, 1998).

7. **Practice rooming in - allow mothers and infants to remain together 24 hours a day**

Rooming in is a practice where babies are not separated from their mothers. They stay with their mothers both day and night. Rooming in facilitates bonding and attachment, frequent suckling, the learning of baby’s patterns of behaviour, reduces breast engorgement, helps to prevent cross-infection and is associated with earlier initiation and successful breastfeeding. The hormone oxytocin is released as the baby stirs therefore milk availability is increased as the baby attaches to the breast. This hormone also elicits relaxation enabling a woman to sleep between breastfeeds (Vallenas et al, 1998 and Svensson et al, 2005).

8. **Encourage breastfeeding on demand**

Demand feeding or “baby led” feeding are terms used to describe a method of feeding where there are no restrictions placed on how long and how often a baby should feed. Women are encouraged to feed their babies whenever the baby shows signs of wanting a feed. Demand feeding or “baby led” feeding encourages early milk production and maintenance of milk production (the autocrine system), facilitates early passage of meconium and therefore decreases the likelihood of jaundice, is associated with better weight gain in babies and with longer and more successful lactation (Vallenas et al, 1998 and Yamauchi, 1991).

9. **Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants**

Health professionals should explain to women why artificial teats and dummies are not encouraged, particularly in the early postpartum period. Baby pacifiers/dummies are associated with breastfeeding problems such as poor lactation, sore nipples and engorgement (Righard and Alade 1992).

Dummies are often substituted for a breastfeed resulting in decreased breast stimulation and a missed feed for the baby. Daily use of dummies is associated with a reduction in breastfeeding duration (Vogel, 2001). Nommesen-Rivers (2001) caution that health professionals need to focus on women’s underlying concerns and inappropriate breastfeeding practices for which pacifier use may be a “red flag” rather than simply discouraging pacifier use.

10. **All mothers are routinely informed about breastfeeding support groups.**

All women should be provided with information about where to obtain advice and support with breastfeeding after discharge from hospital (Vallenas et al, 1998).
Appendix

Appraisal of the National Core Maternity Indicators

The draft final report prepared by the Health Services Research Group follows:
Appraisal of the National Core Maternity Indicators

R Gibberd and S Hancock
Health Services Research Group,
Faculty of Health, University of Newcastle

Final Report 3 May 2007
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Executive summary

This report reviews the ten National Core Maternity Indicators. Two of these may not be within the control of the maternity staff in the hospital, since they relate to preventing smoking and accrediting the hospital for breast-feeding. While these aspects of care are important and would be supported and influenced by the maternity staff, the report identifies issues that reduce their utility. The remaining eight indicators consist of three process measures and five outcome measures and they cover the core components of outcomes for the baby and mother and the processes in delivering care. Although these indicators are similar to maternity indicators used by the ACHS and the State Departments of Health, the differences need to be assessed as to whether the changes provide a more useful indicator. This requires further pilot studies and analyses of existing data, particularly looking at the use of primipara births. A summary of each indicator is given below.

1. Smoking cessation advice during pregnancy.

Score: 52%. This is a low score since the methods to collect the data need to be assessed in a pilot project. The pilot should also assess whether the indicator will influence change in pre-natal clinics. If it is assumed that most clinics provide cessation advice and that the quit rate is low, then the indicator may be targeting the wrong process. The types of cessation help the clinics are offering smokers should be assessed in the pilot program.

2. Caesarean Section for first births meeting the selected primipara criteria

Score: 94%. This indicator scores well and has produced changes in hospitals with high rates. The use of selected births, while reducing the potential for confounding variables to bias the rate at some hospitals, substantially increases the standard error for all hospitals and justification that this is an appropriate approach should be undertaken.

3. Episiotomies performed during first birth

Score: 98%. Given the high score and the above recommendations, this is an important indicator. Hospitals have used this indicator to change the culture in their units.

4. Induction of labour for first births meeting the selected primipara criteria

Score: 92%. A high score but a comparison of the rates for all and selected primipara births should be carried out.

5. Significant perineal tears during first birth

Score: 92%. The main concern is whether this outcome indicator has the statistical power and the evidence from a systematic review of EBM to lead to changes in the care provided.

6. Unassisted vaginal births following a spontaneous onset of labour for first births but excluding augmentation, epidural anaesthesia, episiotomy, induction of labour and instrumental births.

Score: 84%. This indicator has a lower score and should be calculated and tested on existing data. The aim of the indicator should clearly identify whether it is likely to provide results that can be used to improve the care provided.
7. Apgar score of six or less at five minutes

Score: 89%. A decision on whether a new indicator should be adopted, or whether two CIs should be used is required.

8. Significant blood loss following vaginal births

Score: 75%. There is concern as to how blood loss will be measured and a pilot study of its feasibility and comparisons to other indicators such as transfusion rates are required.

9. Gestation standardised perinatal mortality ratio

Score: 95%. How are these data to be recorded: from unit record data, or as a table as shown below? We recommend that all units be included in reporting the data and that only in-hospital deaths are used.

10. Supporting breast-feeding.

Score: 64%. This is not a clinical indicator but a structural measure that provides a yes/no answer for each hospital. A pilot study to determine differences in breast-feeding rates between those units that are accredited and those that are not should be carried out.
Introduction

The Core Maternity Indicators Project Expert Working Group, CMIP EWG, has undertaken the task of developing National Maternity indicators. Ten indicators have been identified, with one additional one pending further review. These are listed in Appendix A. The EWG wishes to determine the ‘statistical validation’ of the indicators and in particular to determine the following aspects.

1. The indicators represent high-quality with regard to clinical relevance
2. The risk-adjusted criterion accurately represents the expected outcomes of the numerators and denominators (for only those indicators reported against the selected primipara criteria)
3. There are factors within the indicators that have the ability to change clinical practice / clinical outcomes
4. The indicators have epidemiological value and the ability for statistical validity to be proven
5. The indicators have the ability to provide a reasonable spread in the results and therefore detect outliers at either end of the spectrum
6. The indicators have the ability to support manipulation that can be used to determine whether the indicators are useful from a quality perspective
7. The terminology for each of the indicators and the risk-adjusted criteria is appropriate
8. That the indicators have the ability to support ‘statistical’ manipulation for future comparative studies
9. That the indicators are ‘scientifically robust’ i.e. that they are ‘valid, specific, sensitive and a reliable’ reflection of that which they purport to measure
10. That the use of the term ‘selected primipara’ is scientifically appropriate
11. That the indicators have been appropriately risk-adjusted / not risk-adjusted for optimal results as per the design of the numerators and denominators

The request also noted that the above may not be well expressed or cover all aspects required when appraising indicators. We will try to summarise the key elements of the 11 points above, as well as including those that we think should also be addressed.

The use of indicators in health care is increasing and has been summarised by the Royal Statistical Society report in ‘Performance Measures: the good, bad and ugly’. This report identifies the misuse of indicator data, and the limitations that they have. We cannot review all that has been written on indicators, but we have published our view as to how they can be used to monitor the quality of care provided. The starting point is that indicators are screening tools that identify areas where improvements may be possible. As a screening tool, the indicators may identify positive and negative results. A positive result suggests that the indicator should be studied further to determine whether there are systematic causes giving the positive result. This could be undertaken as a Clinical Process Improvement study.

The manner in which an indicator may be found to be positive has been summarised as follows:

1. there is large variation between the units that report the data
2. there is large variation between the strata that units belong to, such as, the States in Australia, whether they are public or private hospitals and whether the unit is metropolitan or non-metropolitan
3. there are large differences in some units compared to the average rate
The development of statistical methods to identify whether the indicator is positive or negative have been developed for the ACHS indicators, and similar methods could be applied to the CMIP. The ACHS results have shown that the most common criterion for an indicator to be classified as positive is item one above: large variation between the units, which is quantified by comparing the mean rate to the 20th and 80th centiles and determining the impact on patients if the mean could be shifted to the better centile. The centile is not a target, since the overall mean is shifted, thus allowing units to vary about the new mean. If the better centile is one-half of the overall mean then the indicator suggests that there is potential to determine the causes and improve the overall mean. An example from the ACHS report is given in Appendix B.

It also is worth noting that this approach does not support the use of performance indicators for ranking hospitals, even though it quantifies the variation in rates. Further, it does not make sense to use the data to set targets.

It is also important to realise that one year’s data do not usually reveal important quality problems. This can be seen from the KEMH report that required 6 or more years to obtain statistical significance for excess neonatal deaths. Further, the study also found large variation between the 13 units involved in that study, which would fall into the category of point one above. When indicators are collected over several years, then important trends can be found. In the ACHS report, 75% of indicators had improved with statistical significance, p < 0.05. The key findings from using indicators are that:

1. the measures should be designed on the assumption that they will be useful for quality over many years
2. that validity and reliability while necessary, often cannot be obtained without undue costs
3. the standard errors (related to reliability) for individual units will be large for many indicators, especially outcome indicators, but with several years of data, significant variation can be seen in units
4. the adjustment for patient factors (validity) is likely to change results by less than the standard error, and hence is not cost effective except for perinatal mortality

Deliveries are one of the most common reasons for admission to hospital in Australia. The number carried out per year is about 250,000. Most deliveries are in obstetric units. The rates for maternal and perinatal deaths have been declining, and improved methods and techniques have lead to changes in how deliveries are managed. The aim of the literature review was to determine whether there have been studies that help to identify the criteria for monitoring these trends in practice and the variation between units.
Methods for review the literature on indicators

The search was limited to developed countries that have used indicators as a routine data collection. The reports from NSW (2004 midwives collection) and SA (2003 pregnancy outcome report) were used. There are fifteen ACHS clinical indicators for obstetrics and the results for the years 1998 – 2005 are provided as a separate document. The safety indicators developed by AHRQ in the US are provided in Appendix C with estimates of the rates for NSW based on the in-patient data. Appendix D lists the indicators used by the WHA. A review of potential indicators in 2000 by HSRG for NSW Department of Health examined 572 Clinical Indicators from 10 organizations in Australia, UK or USA. A range of obstetric indicators that were identified are summarized in Appendix E. The general finding was that there are CIs that focus on public health (smoking, breastfeeding), report the outcome of the baby (Apgar score and perinatal mortality), and processes that relate to the delivery of care (induction rates, episiotomy rates, caesarean section rates). Finally the outcomes of the delivery on the mother are reported (blood loss, infection rates).

The MEDLINE database was found to be not very useful in identifying the indicators used. There are numerous articles documenting the problems with indicators, and an example is given by Inkelas et al (Appendix F) in which they find that adjusting for patient factors for low birth weight did not change the rates enough to warrant the extra cost.

The information obtained from the KEMH enquiry was used to provide background rates for perinatal mortality.

Gibberd et al and a more recent proposal by a Dutch research group have tried to score indicators to assess their relative value for monitoring the quality of care. The Dutch group has identified 20 items that are scored from 1 to 4 and the sum used as a measure. The items are listed in Appendix I, and the score that we gave. It is recommended that the committee also uses this method to identify those indicators that have poorer appraisal.

---

1 A Review of Potential Phase 2 Clinical Indicators (2002), Report for NSWDOH by Health Services Research Group, University of Newcastle
Results

We look at the 10 proposed definitions for the National Core Maternity Indicators, NCMI. We summarise the indicator in terms of its dimension, desired rate, structure / process / outcome and whether it is likely to change clinical care.

1. Smoking cessation advice during pregnancy.

Dimension: Effectiveness
Desired Rate: High
Expected rates: Unknown but could be about 90%
Variation between units: Unknown
Process indicator

May change the rate for giving smoking cessation advice in prenatal clinics if large differences in rates are found between clinics

The indicator reflects the quality of prenatal care before 20 weeks of pregnancy. It is a rate-based indicator, and the numerator is the number of women offered smoking cessation advice and the denominator is the number of women smoking during the first 20 weeks of pregnancy. The indicator does not specify the type of advice offered, and will be interpreted in different ways by the health care provider. Further, the denominator is likely to be less than the actual number, since it requires the provider to determine smoking status. It could be assumed that both the detection of smokers and the offer of a cessation advice will vary between providers, and that the variation will be due to two sources: vagueness in the definition of cessation advice, and the detection of smokers. The results should be used to compare prenatal units rather than obstetric units, since that is where the cessation process is carried out.

The reported rate for smoking in the second half of pregnancy is about 15% (NSW Health) and only about 4% of smokers quit during pregnancy. Thus, a significant problem exists and while providing advice is necessary, it may not be very effective.

The collection of these data could be carried out at the prenatal clinic or at the hospital. Collecting the numerator and denominator at the hospital would require reviewing the medical records, and would provide rates that cover care delivered across several prenatal clinics. This is not seen as very appropriate. The prenatal clinics should obtain the data, and the clinics should ensure that their intervention programs are as effective as possible. Since the prenatal clinics do not provide data to the midwives data collections, this will require advice on how the health care providers are to collect the data (check-sheets?), and over what time periods should the data be reported (6-monthly?). Women who are cared for outside clinics by GPs or obstetrician will not be included, but the aim of this indicator is to target the clinics and hence it is only required for clinics.

A pilot study should be carried out at 20 prenatal clinics that can test the feasibility of data collection. This would involve assessing their current medical records and determining whether the numerator and denominator are available. If they are not available, then additional items would need to be included, as well as methods to summarise the data very week or month. Further, the type of intervention should be obtained: verbal, written, feedback required, other methods?

Score: 52%. This is a low score since the methods to collect the data need to be assessed in a pilot project. The pilot should also assess whether the indicator will influence change in pre-natal clinics. If it is assumed that most clinics provide cessation advice and that the quit rate is low, then the indicator may be targeting the wrong process. What types of cessation advice the clinics offer smokers should be assessed in the pilot program.
2. Caesarean Section for first births meeting the selected primipara criteria

**Dimension:** Appropriateness, Safety  
**Desired Rate:** N/A  
**Expected rates:** 20%  
**Variation between units:** 15% - 30%

**Outcome indicator for emergency cases, process for elective caesareans**

Benchmarking between units has previously resulted in units with high rates to review their processes. Monitoring trends is important.

Many countries report this indicator, and the overall rate is increasing in most countries. The optimal rates are not known, and this indicator combines both elective caesareans and emergency caesareans. Attempts to separate these two components are common. The NSW Public Health Bulletin (December 2004) found that for all births, the elective rates increased from 11% to 15%, while the emergency rates increased from 9% to 12% over the four years, 1999-2003. The ACHS classifies caesareans by dilation greater than or less than 3 centimetres, and whether there is foetal distress. There are problems in separating these different components. For example, elective caesareans or foetal distress may not be consistently defined. To overcome this difficulty, the overall rate as proposed above by the NCMI may be the best screening tool. If any trends or differences are found that require review then they can be investigated further in terms of the role that elective caesareans may have. The proposed indicator has the advantage that the statistical power is greater for the combined indicator than for the two indicators (elective and emergency caesarean rates).

The caesarean rate is known to increase with age from approximately 22% to 30% for ages 20-24 and 30-34 respectively. These rates were estimated from the following plot from the AIHW.

![Figure 3.7: Caesarean section deliveries, by maternal age and hospital sector, 2003 (per cent)](image)

The rates could be age standardized but the impact of the adjustment is not likely to be significant compared to the standard error for individual hospitals. The restriction to selected primipara births is an attempt to control for patient factors. A list of the conditions for primiparas is given in Appendix G.

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The denominator is restricted to first births, pregnancies that are singleton, cephalic and 37-41 weeks gestation inclusive. These restrictions in principle exclude births with complications that results in a higher rate of caesareans. This reduces the size of the denominator substantially: 42% of births are first births, 10% are outside the gestational age range and about 15% of first births could be outside the age range. The net effect may be to exclude up to 70% of births (the exact number can be determined if required). The reason for these exclusions is to reduce any bias to a hospital resulting from them having more or less complex cases than the average. The disadvantage is that the standard error in estimating the rates will be increased by 75%. Or to put it into another context, to get the same standard error as would be obtained using all births in one year would take three years. It would be a useful exercise to calculate both rates (all births and selected births as denominators) for hospitals with the required data, to determine the impact of the exclusions. In my experience, the potential bias that is being controlled for is not large, and would be less than one fifth of the standard error. If this is the case, then it could be argued that both of these indicators would be appropriate.

VBAC is also a commonly used indicator, but has not been included in the NCMI.

Score: 94%. This indicator scores well. It has been known to produces changes in hospitals with high rates. The use of selected births, while reducing the potential for confounding variables to bias the rate at some hospitals, substantially increases the standard error for all hospitals and justification that this is an appropriate approach should be undertaken.

3. Episiotomies performed during first birth

**Dimension:** Appropriateness, Effectiveness  
**Desired Rate:** Low  
**Expected rates:** 30%  
**Variation between units:** 8% - 90%  
**Process indicator**

Allows benchmarking between units and to identify to what extent units are following the guidelines from the AHRQ systematic review.

Increasing the rate of intact perineum after delivery has benefits to mothers. The use of episiotomy varies significantly between countries, with Sweden having low rates, and some African countries high rates. This indicator is sometimes combined with perineal tears, as some studies have found that 3rd and 4th degree tears may increase with an episiotomy. This indicator can be extended by classifying the outcome as either: intact perineum, episiotomy only, tear only and having both an episiotomy and tear. The indicator can also be extended by including the degree of the tear. The difficult question is which indicator to use. The simplest indicator is to provide a single measure: the rate of intact perineum. The next simplest measure is that in the NCMI proposal: rates for tears and episiotomy reported separately. Combining these two measures into four categories has some benefits, although the plot of the rates for each separately may show that reducing episiotomies reduces tears as shown in Figure 1 below. The NCMI only reports tears of 3rd and 4th degree.

The following figure depicts the change in the rates of tear and intact perineum during an intervention at Wollongong Hospital
Figure 1: The Outcome of Change for Women Birthing at Wollongong Hospital

The ACHS summarised the results of their indicator measuring intact perineum as:

“Similarly, there was a large variation in the proportion of patients requiring surgical repair after their first birth, with an average of 70% and the centiles ranging from 58% to 83%. If the mean rate were reduced to the better rate of 58%, there would be about 10,000 fewer patients requiring surgical repair after their first birth in Australia each year. Although patient factors may cause some of the differences between the public units (65%) and the private (82%), much of the variation is due to the different protocols and cultures in the units. A national approach to addressing these issues through the Royal Australian and New Zealand College of Obstetricians and Gynaecology and researchers is recommended. In particular, the report on episiotomy from the Agency for Healthcare Research and Quality3 found that routine episiotomy, common in many practice settings, does not achieve any of the goals it is commonly believed to achieve.”

Score: 98%. Given the high score and the above recommendations, this is an important indicator. At least one hospital (Wollongong) has used this indicator to change the culture in the unit during the late 1990’s.

4. Induction of labour for first births meeting the selected primipara criteria

Dimension: Appropriateness
Desired Rate: Low
Expected rates: 10%
Variation between units: 4% - 15%
Process indicator

Allows benchmarking between units and to identify appropriate practice.

Induction of labour can be required because of the pregnancy (two weeks over due; other specified complications) or it may be regarded as inappropriate or unnecessary. The criteria for appropriate inductions that are used by the ACHS are given in Appendix H. The NCMI indicator includes all inductions for all selected primipara births. These differ from the ACHS but the denominator is less likely to be biased by the coding of appropriate inductions.

However, the use of selected first births has the same impact as outlined in indicator number two. The impact of increasing the standard error while reducing potential biases needs to be quantified explicitly by using existing data to compare the rates for selected births against all births.

Score: 92%. A high score but a comparison of rates for all and selected births could be carried out.

5. Significant perineal tears during first birth

**Dimension:** Effectiveness, Safety  
**Desired Rate:** Low  
**Expected rates:** 3.3%  
**Variation between units:** 2.2% - 4.4%  
**Outcome indicator**

An important outcome measure but it may not reveal significant variation or lead to changes in clinical practice.

The rates for 3rd and 4th degree tears are relatively low and the variation between the 20th and 80th centiles is two-fold. The number of excess tears in a unit will be relatively small for most units within the expected range. The methods to prevent 3rd and 4th degree tears, would need to be determined if the rates were to be reduced. Swedish publications in the late 1990’s found that rates were reduced by not doing episiotomies.

Score: 92%. The main concern is whether this outcome indicator has the statistical power and the evidence from a systematic review of EBM (please expand) to lead to changes in the care provided. Statistical significance determines the extent to which the indicator can detect differences in rates between hospitals. Assuming that statistically significant differences between hospitals rates are detected then the potential gains will depend on the overall number of tears. Further, a method to reduce tears must be established before recommendations could be made that would lead to the achievement of those potential gains.

6. Unassisted vaginal births following a spontaneous onset of labour for first births but excluding augmentation, epidural anaesthesia, episiotomy, induction of labour and instrumental births.

**Dimension:** Effectiveness  
**Desired Rate:** high  
**Expected rates:** 60%  
**Variation between units:** large  
**Outcome indicator**

It is not clear how this indicator will influence change, except to monitor assisted deliveries.

The role of this indicator is to determine the number of first births that were unassisted, and did not have any of the above interventions. The aim of the indicator is not clear, since it provides rates for where no interventions were performed during the delivery. It is more common to report the type of interventions used as comparisons may lead to identifying differences that are quite specific: use of forceps etc. Thus, to change clinical care, it is not clear that this indicator will provide evidence to allow a focussed review of the results. The purpose of this indicator could be compared to ones that report augmentations, epidurals, induction and instrumental births. These may be more effective CIs as they identify the specific process rather than the lack of several processes.

Score: 84%. This indicator has a lower score and should be calculated and tested on existing data. The aim of the indicator should clearly identify whether it is likely to provide results that can be used to improve the care provided.
7. Apgar score of six or less at five minutes

**Dimension:** Effectiveness  
**Desired Rate:** low  
**Expected rates:** 2%  
**Variation between units:** low  
**Outcome indicator**

Not likely to be a powerful indicator for screening areas for improvement but is the only available measure of baby well-being.

Reporting Apgar scores has been standard practice in the ACHS, and other collections. The usual cut point is 4 or less, which since Apgar is based on five criteria with scores 0, 1 and 2, requires at least one criteria to be zero. The number with scores of four or less has been declining over the last 8 years from 0.8% to 0.3% for term babies. Shifting the cut-point to six will increase the rate by about 1%, and to obtain a six, at least one of the criteria must score two. The advantage of a cut point of six is that the rates are higher (slightly), but the disadvantages are that it is not commonly used. One way around this is to report two indicators: the number of Apgar scores 0 – 4, and 5 - 6 separately. An APGAR score of 7 or higher at either 1 or 5 minutes indicates that the baby’s condition is good to excellent. A depressed APGAR score at 5 minutes, i.e. ≤ 6, is a marker for perinatal insults, including neurologic damage (Ehrenstein et al, 2005). A score of less than 7 indicates that the infant needs some level of clinical assistance to make the transition from life inside the womb to life outside the womb (Steube, 2005). Increasingly ‘abnormal’ foetal heart rate changes are associated with foetal acidosis and an APGAR score of less than 7 at 5 minutes. The longer the recognition of foetal compromise and / or if inappropriate action is taken, the more likely that the infant will remain physiologically depressed for more than 5 minutes, require prolonged resuscitation and may develop hypoxic-ischaemic encephalopathy [HIE] (Draycott et al, 2006).

Score: 89%. A decision on whether a new indicator should be adopted, or whether two CIs should be used is required.

8. Significant blood loss following vaginal births

**Dimension:** Effectiveness, Safety  
**Desired Rate:** low  
**Expected rates:** unknown  
**Variation between units:** unknown  
**Outcome indicator**

As an outcome indicator with low rates, it has less opportunity to influence clinical practice. The ability to measure the amount of blood loss will vary between units, and may not be as useful as reporting the number of blood transfusions or the haemoglobin score: say number of women with value < 10. The problems with estimating blood loss can be carried out using a pilot study of 20 units. Developing a systematic methodology for estimating whether loss is greater or less than 1,000 ml may have an issue in that estimates will possibly be rounded down to be 1,000, even when the initial estimate might be for `1,000 – 1,100. To identify this, the pilot study should collect the actual estimates (to the nearest 50 ml), and using a histogram determine whether there is a lack of scores just above 1,000. The pilot study should also collect data on Hb and transfusions, thus allowing a comparison between these measures and blood loss. This may help to determine whether there are advantages in using blood loss compared to the blood transfusion rates.

Score: 75%. There is concern as to how blood loss will be measured and a pilot study of its feasibility is required.
9. Gestation standardised perinatal mortality ratio

**Dimension:** Safety, effectiveness

**Desired Rate:** high

**Expected rates:** unknown

**Variation between units:** unknown

**Outcome indicator**

An important monitoring indicator, with six or more years of data required to obtain statistical significance

The perinatal mortality rate varies with gestational age and birth weight as shown in Figures 2 and 3. Gestational age less than 30 weeks and birth weight less than 1000 grams both have mortality rates greater than 10%. Further, there are differences in a hospital’s rate for the number of births with low gestational age or birth weight, with referral hospitals having more preterm babies. Thus, it has been observed that this is one of the few CIs that need risk adjustment. This can be done with birth weight or gestational age. To carry out the calculations with gestational age, it is necessary to have unit record data: that is for each birth their gestational age and whether born alive. These can be obtained from the hospital inpatient statistics collection. Alternatively, for each gestational age in weeks (22 – 44) the number of births and the number of deaths would need to be provided, and the data from all hospitals would be used to calculate the expected number of deaths. Thus, this indicator requires a decision on how the data should be presented for analyses. A table like that presented below would be required for the time period used is one option and alternatively, the indicator could be calculated by the AIHW that has the inpatient data. The results are likely to be reported more quickly if the table below is provided for analyses, since the AIHW obtains the data after the completion of each year.

The deaths should include stillbirths and live births that die in hospital. Deaths that occur outside hospital within 30 days from the date of birth could be used, but this requires linking the data to the death certificate data. This would result in delays, extra cost and little benefit. We recommend that the numerator should only involve in-hospital deaths. Neonatal deaths due to congenital malformations should be excluded from the numerator and the denominator.

The other factor that influences perinatal mortality is women’s age, but this is not as important as gestational age.

The potential uses of these data are limited by the large standard errors in a hospital's annual rates. When combined over many years significant differences can be seen. The Figure in Appendix J shows the adjusted observed over expected rates for 13 hospitals used in the KEMH review. There are between hospital variations as well as within hospital variation. To assess how these can be used, the KEMH report should be read. It is a fairly blunt tool, but when the rate is statistically significant it provides support for other information that may suggest care has been compromised.

The committee has recommended that only hospitals with 500 or more births or more than five deaths be included. This use of five or more deaths is not appropriate, since those hospitals with an expected rate of five who have 5 or more are included and those with less than five are excluded, thus distorting the expected calculations and the inclusion or not of a hospital will be random rather than based on strata. Victoria should be advised that the criteria should be based on the expected number, not the observed. Excluding small units also is not appropriate, since although they will have less data to identify whether they are significantly different or not, they do provide data in which to calculate the expected rates. If the adjustment for gestational age reveals that smaller hospitals are different, then a further study is required to determine the causes. This would be an important finding.

Score: 95%. How are these data to be recorded: from unit record data, or as a table as outlined below? The score is based on all units reporting the data. If small units are excluded, the score would be less.
<table>
<thead>
<tr>
<th>Gestational age (weeks)</th>
<th>Number of births</th>
<th>Number of deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
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<td>25</td>
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<td>26</td>
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<td>27</td>
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<td>28</td>
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<td>29</td>
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<td>31</td>
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<td>34</td>
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<td>35</td>
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<td>43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>44</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 2: Rate of perinatal deaths, stillbirths and neonatal deaths by gestational age in thirteen hospitals, 1994-1999 combined.
10. Supporting breast-feeding.

**Dimension:** Effectiveness  
**Desired Rate:** High  
**Expected rates:** Above 90%  
**Variation between units:** Unknown  
**Structure**

May encourage hospitals to obtain WHO accreditation

This indicator is a measure that will be either ‘yes’ or ‘no’ for whether a hospital is BFHI accredited and if not accredited then a score from 0 to 10 for achieving some of the 10 WHO Steps is collected. This indicator is a score for the hospital rather than a rate for the number of women who are breastfeeding at discharge or 3 months. It will not require information on breastfeeding by women, but it rather represents a measure of structure for the hospital. It is necessary to have two numbers reported: accredited or not, and if not accredited the number of WHO steps achieved. The latter score from 0 to 10 may be subject to different reporting methods. In using this indicator, it may be most useful to focus on accreditation rather than the score for those not accredited. The indicator does not determine the relative successes of the program, but could be assumed to be similar to those based on other studies.

New Zealand has made it a requirement to be accredited, and about 18% of Australian hospitals are currently accredited. The State Departments of Health could also make it a policy to be accredited if the significant benefits were found to result from accreditation. Before including this indicator, a review of how those units that are accredited achieve breast-feeding compared to those that are not could be carried out in a pilot study. Further, the benefits of scoring the non-accredited hospitals from 0 – 10 do not seem appropriate until this review is carried out. The aim of this indicator is to encourage hospitals to be accredited, but this should only be done when there is evidence that there are significant benefits.

Score: 64%. This is not a clinical indicator but a structural measure that provides a yes/no answer for each hospital. A pilot study to determine differences in breast-feeding rates between those units that are accredited and those that are not should be carried out.
Conclusion

Selecting CIs is not a rigorous science, and involves a balance between costs, their potential impact on changing or monitoring clinical care, the timeliness in which the results can be reported and their validity and reliability. Their primary role is to be a screening tool to identify areas where care could be further reviewed with an aim of improvement. This role helps to minimise the potential to distort the results (gaming or manipulating the data). The value of indicators usually lies from recording trends and the differences between units (comparisons). As such, it is necessary that the results are reported over a long time scale (four or more years), and that when measuring differences between hospitals, account of the different sample sizes is made (adjusting rates using 'shrinkage' methods). For some measures it is also necessary to adjust for patient factors.

There is also disagreement about the number of indicators that should be used. One view is that a few sentinel CIs are required, while another suggests that many CIs are needed if all areas that may have the potential to improve are to be screened. Sentinel indicators are based on a probably false assumption that the overall performance of a unit can be predicted from a few measures. The evidence from indicators is that these measures are not correlated, and hence selecting only a few indicators will only identify those aspects that they measure. The evidence that the CIs are not correlated: that is the rates are not all better or worse in one hospital, but rather that each unit has areas where they could be required to investigate their rates and clinical practice is shown in Appendix K for the ACHS obstetric CIs. The deviation from the average rate is expressed as z-scores, and the units have better and poorer rates.

For the NCMI, ten indicators have been chosen. Two of these may be outside of the control of the maternity staff in the hospital, since they relate to preventing smoking and accrediting the hospital for breast-feeding. While these aspects of care are outside the direct control of the maternity staff, they are important and would be supported and influenced by the staff. The remaining eight consist of three process measures and five outcome measures. The process measures are more likely to influence clinical practice. Thus, it could be thought that the core indicators are just that: a minimum requirement. As such, they should also be amenable to including the other indicators that are commonly used.

As obstetric indicators are already collected by many hospitals (over 180 hospitals use the ACHS indicators), it is necessary that additional costs are not added to this collection by making the indicators different. Further, any changes need to be maintained over many years, and hence building onto existing indicators has many advantages. The key concerns are changing the cut point for Apgar, and including primipara births for caesarean, induction and unassisted births. The advantages of these changes can be assessed in a pilot study and in the case of Apgar it could be resolved by having 2 CIs. The use of primipara births, as defined in the Appendix, needs to be assessed as to whether this extra refinement in appropriate: some of the issues in terms of standard errors and bias are discussed above when assessing indicator 2. Further discussion and review of the options will be possible when the indicators are tested in the pilot studies or additional analyses are carried out. The estimate that the use of primipara may include only 30% of births needs to be checked, and the association between rates for all births versus primipara determined.

The most important way to determine how to resolve which version of the indicators should be used is to specify how the data are going to be collected, and how they will be reported. Two of the options that exist are listed below.

1. **Midwives or perinatal statistics collections.**
   These data allow many of the NCMI indicators to be reported, and they also can be used for indicators not included in the NCMI. These data collections are State based, and to what extent they can be combined into a national data set with consistent fields needs to be assessed. Further, how they are reported by the States or a national body needs to be specified. A national report along the lines of the ACHS annual reports should be used. Further, individual hospital reports should be provided annually or biennially (the ACHS provides six-monthly reports and biennially a summary of all data for years since 1998). If there is a mechanism to carry out the above, this needs to ensure that it will continue for many years, as the value of the data often lies in the trends.
2. **ACHS to provide the tools for data collection and analyses.**
   The ACHS has been involved in collecting and analysing CIs for more than 10 years and has more experience than most organisations. They provide many advantages including:
   
   - it is a National collection, including New Zealand
   - the data are provided every 6-months and reported back within short deadlines
   - the annual report uses the most up to date statistical methods to identify areas for improvement
   - individual hospital reports are sent that include a summary of the hospital’s data for all years that they have been provided
   - the CIs are reviewed by the Colleges regularly
   - the ACHS has strict confidentiality guidelines that ensure the data are not used inappropriately.

   The disadvantage is that the collection does not require unit record data to be provided, although it has been suggested that collections such as the NSW Midwives collections and others in the remaining States could be forwarded to the ACHS for reporting.

   Further discussion on these issues is required before the NCMI are finalised.
<table>
<thead>
<tr>
<th>Indicator name</th>
<th>Indicator definition</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Selection (inclusion/exclusion) criteria</th>
</tr>
</thead>
</table>
| 1. Smoking cessation advice during pregnancy | The rate of women who smoked tobacco at any time during the first 20 weeks of pregnancy who were offered smoking cessation advice by a health care provider                                                                                          | The number of women who smoked tobacco at any time during the first 20 weeks of pregnancy who were offered smoking cessation advice by a health care provider                                                   | The number of women who smoked tobacco at any time during the first 20 weeks of pregnancy                                                                                                                     | Excl. All non-tobacco-related smoking material and chewing tobacco  
Incl. Tobacco that is inhaled – including cigarettes, cigars, cigarillos, pipes and water pipes                                                                                                           |
| 2. Caesarean sections for selected first births | The rate of selected primipara who gave birth by caesarean section                                                                                                                                                     | The number of caesarean sections for selected primipara                                                                                                                                                  | The number of selected primipara who gave birth                                                                                                                                                           | Incl. All women meeting the selected primipara criteria                                                                                                                                                     |
| 3. Episiotomies performed during first births | The rate of women having their first baby who had an episiotomy while giving birth vaginally                                                                                                                              | The number of episiotomies for women having their first baby while giving birth vaginally                                                                                                            | The number of women having their first baby who gave birth vaginally                                                                                                                                       | Excl. Multiparae  
Incl. All women having their first baby who gave birth vaginally – includes unassisted births and instrumental births  
Incl. Women pregnant for the first time with more than one foetus who gave birth vaginally                                                                                                         |
| 4. Induction of labour for selected first births | The rate of selected primipara having an induction of labour                                                                                                                                                           | The number of inductions of labour for selected primipara                                                                                                                                               | The number of selected primipara who gave birth                                                                                                                                                           | Incl. All women meeting the selected primipara criteria                                                                                                                                                     |
| 5. Major perineal tears during first births | The rate of women having their first baby who sustained a third or fourth degree tear while giving birth vaginally                                                                                                       | The number of third and fourth degree tears for women having their first baby while giving birth vaginally                                                                                                 | The number of women having their first baby who gave birth vaginally                                                                                                                                       | Excl. Multiparae and women who sustained a documented perineal tear of a lesser degree  
Incl. All women having their first baby who gave birth vaginally – includes unassisted births and instrumental births  
Incl. Women pregnant for the first time with more than one foetus who gave birth vaginally                                                                                                             |
| 6. Unassisted vaginal births following a spontaneous onset of labour for selected first births | The rate of selected primipara who achieve a spontaneous onset of labour with an unassisted vaginal birth                                                                                                            | The number of unassisted births following a spontaneous onset of labour for selected primipara who gave birth vaginally                                                                                   | The number of selected primipara who gave birth                                                                                                                                                           | Excl. Induction of Labour, Augmentation, Instrumental Births, Episiotomy and Epidural Anaesthesia  
Incl. All women meeting the selected primipara criteria  
Incl. Stillbirths                                                                                                                                  |
<table>
<thead>
<tr>
<th>Indicator name</th>
<th>Indicator definition</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Selection (inclusion/exclusion) criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Infant well-being at birth</td>
<td>The rate of live term infants with an APGAR score of ≤ 6 at 5 minutes</td>
<td>The number of live term infants with an APGAR score ≤ 6 at 5 minutes</td>
<td>The number of live term infants</td>
<td>Excl. Stillbirths</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Incl. All live term infants without major congenital malformations</td>
</tr>
<tr>
<td>8. Significant blood loss within 24 hours following a vaginal birth</td>
<td>The rate of women who sustained a blood loss ≥ 1000 mls within 24 hours following a vaginal birth</td>
<td>The number of women who sustain a blood loss ≥ 1000 mls within 24 hours after giving birth vaginally</td>
<td>The number of women who gave birth vaginally</td>
<td>Excl. Women who delivered by caesarean section</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Incl. All women regardless of parity</td>
</tr>
<tr>
<td>9. Death of a baby around time of birth</td>
<td>Gestation Standardised Perinatal Mortality Ratio</td>
<td>Observed perinatal deaths</td>
<td>Expected perinatal deaths (x100)</td>
<td>Excl. Deaths due to congenital malformations; Infants &lt; 20 weeks gestation or where gestation is not known &lt; 400 gms; Terminations of pregnancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Incl. All infant deaths, including still births, where the infant was more than 20 weeks gestation or where gestation is unknown, weighing equal to or more than 400 gms; All live born infants meeting the above criteria who died within 28 days of birth</td>
</tr>
<tr>
<td>10. Supporting breastfeeding</td>
<td>The rate of hospitals / organisations with BFHI accreditation and / or their compliance with the WHO’s 10 Steps to Successful Breastfeeding</td>
<td>Process: Is your hospital / organisation BFHI accredited? If No, the number of WHO’s 10 Steps to Successful Breastfeeding your hospital has achieved at the time of assessment</td>
<td>The WHO’s 10 Steps to Successful Breastfeeding (10)</td>
<td>Incl. All women who gave birth to a live infant of viable age</td>
</tr>
</tbody>
</table>
Appendix B – ACHS example. Primipara births: Intact lower genital tract

Incidence of an intact lower genital tract in primiparous patients delivering vaginally

Rationale
A high incidence of an intact perineum is considered to be a desirable outcome. Lower genital tract is defined as those structures below and not including the cervix. Surgical repair is defined as suture of the lower genital tract following delivery. This indicator relates to those patients who are having their first delivery. Factors leading to a high rate are a lower use of episiotomy (rates lower than 10% have been recommended) and less tears while delivering.

5.1 Primiparous patients - Intact lower genital tract (H)

<table>
<thead>
<tr>
<th>Year</th>
<th>No. HCOs</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Ratea (20)</th>
<th>Rateb (80)</th>
<th>Centile Gains</th>
<th>Stratum Gains</th>
<th>Outlier Gains</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>180</td>
<td>10,269</td>
<td>35,526</td>
<td>28.9</td>
<td>18.6</td>
<td>39.4</td>
<td>3,743</td>
<td>6,345</td>
</tr>
<tr>
<td>1999</td>
<td>165</td>
<td>9,984</td>
<td>33,792</td>
<td>29.5</td>
<td>19.0</td>
<td>41.3</td>
<td>3,984</td>
<td>4,360</td>
</tr>
<tr>
<td>2000</td>
<td>181</td>
<td>11,283</td>
<td>39,157</td>
<td>28.8</td>
<td>18.3</td>
<td>38.7</td>
<td>3,859</td>
<td>5,781</td>
</tr>
<tr>
<td>2001</td>
<td>177</td>
<td>11,303</td>
<td>37,030</td>
<td>30.5</td>
<td>19.3</td>
<td>43.7</td>
<td>4,893</td>
<td>5,537</td>
</tr>
<tr>
<td>2002</td>
<td>173</td>
<td>11,755</td>
<td>40,512</td>
<td>29.0</td>
<td>19.7</td>
<td>39.0</td>
<td>4,062</td>
<td>5,868</td>
</tr>
<tr>
<td>2003</td>
<td>172</td>
<td>11,665</td>
<td>40,439</td>
<td>28.8</td>
<td>18.2</td>
<td>40.0</td>
<td>4,515</td>
<td>6,641</td>
</tr>
<tr>
<td>2004</td>
<td>175</td>
<td>12,321</td>
<td>42,659</td>
<td>28.9</td>
<td>18.6</td>
<td>40.0</td>
<td>4,751</td>
<td>12,236</td>
</tr>
<tr>
<td>2005</td>
<td>174</td>
<td>13,318</td>
<td>44,665</td>
<td>29.8</td>
<td>17.2</td>
<td>41.9</td>
<td>5,410</td>
<td>6,247</td>
</tr>
</tbody>
</table>

(\textit{per 100 primiparous patients delivering vaginally})

In 2005, there were three hundred and nine records from one hundred and seventy-four HCOs. The annual rate was 29.8 per 100 patients.

Trends
There was no significant trend in the fitted rate.

Rates and centiles by year
Appendix C – AHQR safety indicators and results

Safety indicators developed by AHQR from the ICD inpatient data and the results for NSW public hospitals.

<table>
<thead>
<tr>
<th>Indicator</th>
<th># Hosp with Patients at Risk</th>
<th>Events</th>
<th>Patients at Risk</th>
<th>Rate per 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth trauma – injury to neonate</td>
<td>143</td>
<td>891</td>
<td>91,705</td>
<td>972</td>
</tr>
<tr>
<td>Obstetric trauma – caesarean delivery</td>
<td>85</td>
<td>150</td>
<td>3,771</td>
<td>3,978</td>
</tr>
<tr>
<td>Obstetric trauma – vaginal delivery w/ instrument</td>
<td>133</td>
<td>1,172</td>
<td>62,744</td>
<td>1,868</td>
</tr>
<tr>
<td>Obstetric trauma – vaginal delivery w/o instrument</td>
<td>90</td>
<td>58</td>
<td>18,864</td>
<td>307</td>
</tr>
</tbody>
</table>

**Reference: Measures of Patient Safety Based on Hospital Administrative Data. The Patient Safety Indicators.**
Appendix D – Women’s Health Australasia Clinical Indicator Program

The range of clinical indicators collected is dynamic and reviewed annually and this current collection includes indicators relating to:

1. Caesarean Section
2. VBAC
3. Uterine Rupture
4. Neonatal Mortality
5. Stillbirth
6. Perinatal Mortality
7. Instrumental Delivery
8. APGAR Score
9. Maternal Age
10. Epidural Anaesthesia
11. Episiotomy
12. Third and Fourth Degree Tears
13. Intact Lower Genital Tract
14. Pre-Term Birth
15. Post Partum Haemorrhage
16. Blood Transfusion
17. Admission to ICU
18. Peripartum Hysterectomy
19. HIE Grades 2 or 3
20. Breast Feeding

Indicators are chosen on the basis that they:

- are readily collectable
- have a significant degree of clinical relevance
- are capable of identifying a process/outcome that is capable of modification
- are able to be benchmarked with comparable facilities
Appendix E – Obstetrics Indicators from HSRG review

To be considered for the Phase 2 indicator set, a CI should, in principle, satisfy all nine criteria. These were:

1. A CI must have a clearly defined and easily measured numerator. For consistency in reporting the results, the numerator should be defined so that a low rate is considered more desirable than a high rate.

2. A CI must have a clearly defined and easily measured denominator.

3. The sum of all numerators from hospitals contributing data must be large enough so that there is the potential for significant gains to be made.

4. There must be data from a significant number of hospitals so that the distribution of the rates can be determined.

5. There must be the potential for variation in rates between hospitals so that gains may be made.

6. A CI must have the ability to be adjusted for any potential confounding variables, or not be strongly influenced by other variables, such as case-mix.

7. A CI cannot simply be a ‘yes/no’ response for the entire hospital or organisation. The rates in this case will be either 0% or 100%.

8. A CI should be developed from Evidence Based Medicine (EBM).

9. The indicator should measure a process rather than an outcome

Organisations

The following organisations have been developing CIs and publishing information relating to CIs:

Australian Organisations

- NSW Department of Health (NSW DoH)
- Victorian Department of Human Services (Vic DHS)
- Australian Council on Healthcare Standards (ACHS)
- Australian Institute of Health and Welfare (AIHW)
- National Health Priority Areas (NHPA)
Obstetrics Indicators

**International Organisations**

- Joint Commission on Accreditation of Healthcare Organisations (JCAHO) - USA
- Maryland Quality Indicator Project (MQIP) – USA
- Cleveland Health and Quality Choice (CHQC) – USA
- National Health Service Programs (NHS) – UK
- Scottish Health (UK)
**NSW Department of Health**
These indicators were developed as potential CIs by NSW Department of Health.

### Dimension 1 - Safety

<table>
<thead>
<tr>
<th>C#</th>
<th>Indicator</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Pass?</th>
<th>Criteria failed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Infection rates MRSA&gt;48 hours post admission (marker of nosocomial infection)</td>
<td>Number of patients who acquired infection 48 hours post admission.</td>
<td>All patients admitted.</td>
<td>Y</td>
<td></td>
<td>Adjust for Casemix or report by procedure</td>
</tr>
<tr>
<td>1.2</td>
<td>Incident monitoring system (Yes/No)</td>
<td></td>
<td></td>
<td>N</td>
<td>7</td>
<td>Cannot be a Yes/No response. Develop CIs to determine whether monitoring system is being adhered to by departments</td>
</tr>
<tr>
<td>1.3</td>
<td>Unplanned return to operating theatre during same admission</td>
<td>Number of patients with unplanned return to operating theatre</td>
<td>Number of patients receiving surgery</td>
<td>Y</td>
<td></td>
<td>Adjust for Casemix or report by procedure</td>
</tr>
</tbody>
</table>

### Dimension 2 - Effectiveness

<table>
<thead>
<tr>
<th>C#</th>
<th>Indicator</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Pass?</th>
<th>Criteria failed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3</td>
<td>Length of stay (RSI)</td>
<td>Number of beddays</td>
<td>Number of patients</td>
<td>N</td>
<td>1.2</td>
<td>A mean rather than a proportion. Re-define as something like “number of patients above peer group RSI average”</td>
</tr>
<tr>
<td>2.4</td>
<td>Unplanned readmission within 28 days</td>
<td>Number of patients readmitted within 28 days</td>
<td>Number of patients discharged</td>
<td>Y</td>
<td></td>
<td>Report by procedure</td>
</tr>
<tr>
<td>2.5</td>
<td>Unplanned return to operating theatre</td>
<td>Number of patients with unplanned return to OT</td>
<td>Number of patients receiving surgery</td>
<td>Y</td>
<td></td>
<td>Report by procedure</td>
</tr>
</tbody>
</table>
### Dimension 3 - Efficiency

<table>
<thead>
<tr>
<th>C#</th>
<th>Indicator</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Pass?</th>
<th>Criteria failed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2</td>
<td>Proportion of patients waiting to transfer to ward bed &gt; 4 hours after</td>
<td>Number of patients waiting to transfer &gt; 4 hours</td>
<td>Number of patients &quot;ready to transfer&quot;</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>assessment as “ready to transfer”</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.6</td>
<td>Level of over/under crowding</td>
<td>Number of periods/days bed level is above/below set levels</td>
<td>Total number of periods/days</td>
<td>Y</td>
<td></td>
<td>Need to define high/low occupancy levels</td>
</tr>
<tr>
<td>3.11</td>
<td>Level of ambulance diversions</td>
<td>Number of ambulance diversions</td>
<td>Number of ambulance deliveries</td>
<td>Y</td>
<td></td>
<td>Require EDIS data base</td>
</tr>
<tr>
<td>3.12</td>
<td>Trolley block delays</td>
<td>?</td>
<td>?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.13</td>
<td>Average cost per waitee</td>
<td>-</td>
<td>-</td>
<td>N</td>
<td>1,2</td>
<td>Not a rate (numerator / denominator)</td>
</tr>
</tbody>
</table>

### Dimension 4 - Access

<table>
<thead>
<tr>
<th>C#</th>
<th>Indicator</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Pass?</th>
<th>Criteria failed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2</td>
<td>Out of area transfers</td>
<td>Number of patients transferred out of area</td>
<td>Number of patients admitted</td>
<td>Y</td>
<td></td>
<td>Report by procedure</td>
</tr>
<tr>
<td>4.6</td>
<td>Level of over/under crowding</td>
<td>Number of periods/days bed level is above/below set levels</td>
<td>Total number of periods/days</td>
<td>Y</td>
<td></td>
<td>Need to define high/low occupancy levels</td>
</tr>
</tbody>
</table>
## Dimension 6 - Consumer Participation

<table>
<thead>
<tr>
<th>CI#</th>
<th>Indicator</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Pass?</th>
<th>Criteria failed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>Patient/relative satisfaction surveys (Yes/No)</td>
<td>-</td>
<td>-</td>
<td>N</td>
<td>7</td>
<td>Cannot be a Yes/No response. Develop CIs to determine whether monitoring system is being adhered to by departments</td>
</tr>
<tr>
<td>6.2</td>
<td>AHS have an ongoing structure for participation</td>
<td>-</td>
<td>-</td>
<td>N</td>
<td>7</td>
<td>Cannot be a Yes/No response. Develop CIs to determine whether monitoring system is being adhered to by departments</td>
</tr>
<tr>
<td>6.3-6.11</td>
<td>AHS recommendations (9 indicators)</td>
<td>-</td>
<td>-</td>
<td>N</td>
<td>7</td>
<td>Cannot be a Yes/No response. Develop CIs to determine whether monitoring system is being adhered to by departments</td>
</tr>
<tr>
<td>6.12</td>
<td>Patient rating of ED care / ED preference / hospital preference</td>
<td>-</td>
<td>-</td>
<td>N</td>
<td>7</td>
<td>Cannot be a Yes/No response. Develop CIs to determine whether monitoring system is being adhered to by departments</td>
</tr>
</tbody>
</table>

### Victorian Department of Human Services


## Dimension 4 - Effectiveness

<table>
<thead>
<tr>
<th>CI#</th>
<th>Indicator</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Pass?</th>
<th>Criteria failed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5</td>
<td>Low/Very low birthweight rates</td>
<td>Number of babies born with low or very low birthweight</td>
<td>Number of births</td>
<td>Y</td>
<td></td>
<td>Define low and very low birthweight</td>
</tr>
</tbody>
</table>

## Dimension 8 - Appropriateness

<table>
<thead>
<tr>
<th>CI#</th>
<th>Indicator</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Pass?</th>
<th>Criteria failed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1</td>
<td>Relative utilisation rates of targeted procedures (CABG, PTCA, Lap Chole, hysterectomy, laminectomy, Caesar, vag birth after Caesar, prostatectomy)</td>
<td>Number of procedures</td>
<td>Population of AHS/SLA</td>
<td>Y</td>
<td></td>
<td>Population based CI rather than hospital based. Age and sex adjustment required</td>
</tr>
</tbody>
</table>
## ACHS Obstetrics Indicators

<table>
<thead>
<tr>
<th>CI#</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Pass?</th>
<th>Criteria failed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>The number of patients undergoing induction of labour for indications other than those listed, (excluding augmentation of labour).</td>
<td>The total number of patients undergoing induction of labour for any reason, (excluding augmentation of labour).</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td>The number of patients undergoing induction of labour for indications other than those listed, (excluding augmentation of labour).</td>
<td>The total number of patients delivering, (including augmentation of labour).</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>The number of patients delivering vaginally following a previous primary caesarean section, as defined above.</td>
<td>The total number of patients delivering who have had a previous primary caesarean section and no intervening pregnancies greater than twenty weeks gestation.</td>
<td>Y</td>
<td></td>
<td>Re-define so that a low rate is preferred, i.e. patients that did NOT</td>
</tr>
<tr>
<td>3.1</td>
<td>The number of patients undergoing primary caesarean section for failure to progress after a period of labour with cervical dilatation of 3cm or less.</td>
<td>The total number of patients undergoing primary non-elective caesarean section.</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2</td>
<td>The number of patients undergoing primary caesarean section for failure to progress after a period of labour with cervical dilatation of more than 3 cm.</td>
<td>The total number of patients undergoing primary non-elective caesarean section.</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>The number of patients undergoing primary caesarean section for fetal distress as defined.</td>
<td>The total number of patients delivering, including those delivering vaginally.</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2</td>
<td>The number of patients undergoing primary caesarean section for fetal distress as defined.</td>
<td>The total number of patients delivering by primary caesarean section only.</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1</td>
<td>The number of primiparous patients not requiring surgical repair of the lower genital tract.</td>
<td>The total number of primiparous patients delivering vaginally.</td>
<td>Y</td>
<td></td>
<td>Re-define so that a low rate is preferred, i.e. patients that did NOT</td>
</tr>
<tr>
<td>6.1</td>
<td>The number of babies born with an Apgar score of four or below at five minutes post delivery.</td>
<td>The total number of babies born.</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.2</td>
<td>The number of babies born with an Apgar score of six or below at ten minutes post delivery.</td>
<td>The total number of babies born.</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.1</td>
<td>The number of term babies transferred/admitted to a neonatal intensive care unit (as defined above) for reasons other than congenital abnormality.</td>
<td>The total number of term live babies born.</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## AIHW Sentinel Events

<table>
<thead>
<tr>
<th>CI#</th>
<th>Indicator</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Pass?</th>
<th>Criteria failed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3</td>
<td>Caesarean section rate</td>
<td>Number of caesareans</td>
<td>Number of births</td>
<td>Y</td>
<td></td>
<td>Hospital based</td>
</tr>
</tbody>
</table>

## National Health Priority Areas


### NHPA 3. Diabetes

<table>
<thead>
<tr>
<th>CI#</th>
<th>Indicator</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Pass?</th>
<th>Criteria failed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Gestational diabetes among women aged 20–44 years, by parity</td>
<td>Number of women aged 20-44 years with gestational diabetes</td>
<td>Population women aged 20-44 years</td>
<td>Y</td>
<td></td>
<td>Population rather than hospital based indicator</td>
</tr>
</tbody>
</table>

### NHPA 5. Mental Health

<table>
<thead>
<tr>
<th>CI#</th>
<th>Indicator</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Pass?</th>
<th>Criteria failed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Prevalence rate for women who have given birth and who experience post-partum depression over the following year</td>
<td>Number of women who have given birth and who experience post-partum depression over the following year</td>
<td>Number of women who have given birth</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Joint Commission on Accreditation of Healthcare Organisations (USA)

A national comparative performance management system that provides data to improve patient care.

### Dimension 2 - Obstetric

<table>
<thead>
<tr>
<th>CI#</th>
<th>Indicator</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Pass?</th>
<th>Criteria failed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Caesarean section</td>
<td>Number of caesarean section deliveries</td>
<td>Total number of births</td>
<td>Y</td>
<td></td>
<td>Is high or low rate preferred?</td>
</tr>
<tr>
<td>2.2</td>
<td>Vaginal Birth after previous caesarean section</td>
<td>Number of vaginal deliveries</td>
<td>Number of women giving birth whose previous delivery was a caesarean</td>
<td>Y</td>
<td></td>
<td>Redefine so that a low rate is more desirable. Caesarean deliveries following previous caesarean.</td>
</tr>
<tr>
<td>2.3</td>
<td>Low birth weight</td>
<td>Number of babies born with low birth weight</td>
<td>Total number of deliveries</td>
<td>Y</td>
<td></td>
<td>Define low birthweight (&lt;3000g?)</td>
</tr>
<tr>
<td>2.4</td>
<td>Newborn outcomes</td>
<td>?</td>
<td>?</td>
<td>N</td>
<td></td>
<td>Need better definitions for the indicator, numerator and denominator</td>
</tr>
<tr>
<td>2.5</td>
<td>AGPAR score for infants 1000-2500g</td>
<td>Number of babies with birthweight 1000-2500g and an AGPAR score less than 4</td>
<td>Number of babies with birthweight 1000-2500g</td>
<td>Y</td>
<td></td>
<td>Why only low birthweight? This reduces the size to &lt;5% of all births.</td>
</tr>
</tbody>
</table>

### Dimension 7 - Infection Control

<table>
<thead>
<tr>
<th>CI#</th>
<th>Indicator</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Pass?</th>
<th>Criteria failed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1</td>
<td>Surgical site infection by 17 procedures</td>
<td>Number of patients with surgical site infection by procedure</td>
<td>Number of patients undergoing procedure</td>
<td>Y</td>
<td></td>
<td>Define procedures. Should be wound infection.</td>
</tr>
</tbody>
</table>
# Obstetrics Indicators

## Maryland Quality Indicator Project (USA)

Maryland Hospital Association, established in 1985.

<table>
<thead>
<tr>
<th>CI#</th>
<th>Indicator</th>
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<th>Pass?</th>
<th>Criteria failed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Hospital acquired infection</td>
<td>Number of patients acquiring an infection in hospital</td>
<td>Number of eligible patients</td>
<td>Y</td>
<td></td>
<td>Define eligible patients. Rate by DRG or procedure</td>
</tr>
<tr>
<td>1.2</td>
<td>Surgical wound infection</td>
<td>Number of patients acquiring an infection following or during surgery</td>
<td>Number of eligible patients</td>
<td>Y</td>
<td></td>
<td>Define eligible patients. Rate by procedure</td>
</tr>
<tr>
<td>1.3</td>
<td>Inpatient mortality</td>
<td>Number of deaths in hospital</td>
<td>Number of patients admitted</td>
<td>Y</td>
<td></td>
<td>Adjust for casemix. Rate by DRG or procedure</td>
</tr>
<tr>
<td>1.4</td>
<td>Neonatal mortality</td>
<td>Number of deaths for neonates in hospital</td>
<td>Number of neonates</td>
<td>Y</td>
<td></td>
<td>Adjust for casemix. Rate by DRG or procedure</td>
</tr>
<tr>
<td>1.5</td>
<td>Perioperative mortality</td>
<td>Number of deaths</td>
<td>Number of eligible patients</td>
<td>Y</td>
<td></td>
<td>Adjust for casemix. Rate by DRG or procedure</td>
</tr>
<tr>
<td>1.6</td>
<td>Caesarean Section</td>
<td>Number of caesarean section deliveries</td>
<td>Total number of births</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.7</td>
<td>Unscheduled readmission following inpatient care</td>
<td>Number of unscheduled readmissions following inpatient care</td>
<td>Number of patients admitted for inpatient care</td>
<td>Y</td>
<td></td>
<td>Adjust for casemix or calculate rate for selected diagnoses or procedures</td>
</tr>
<tr>
<td>1.9</td>
<td>Unscheduled returns to a special care unit</td>
<td>Number of unscheduled returns to a special care unit</td>
<td>Number of patients admitted to a special care unit</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.10</td>
<td>Unscheduled returns to operating room</td>
<td>Number of unscheduled returns to operating room</td>
<td>Number of patients in operating room</td>
<td>Y</td>
<td></td>
<td>Calculate CI for specified procedures</td>
</tr>
</tbody>
</table>
Cleveland Health Quality Choice (USA)

None

National Health Service Project (UK)

These indicators have been regularly reported as league tables.

**Dimension 2 - Fair Access**

<table>
<thead>
<tr>
<th>CI#</th>
<th>Indicator</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Pass?</th>
<th>Criteria failed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Surgery Rates</td>
<td>Number of surgical procedures performed</td>
<td>Population by SLA/AHS</td>
<td>Y</td>
<td></td>
<td>Population based rather than hospital based CI</td>
</tr>
</tbody>
</table>

**Dimension 3 - Effective delivery of appropriate health care**

<table>
<thead>
<tr>
<th>CI#</th>
<th>Indicator</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Pass?</th>
<th>Criteria failed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Disease prevention and health promotion</td>
<td></td>
<td></td>
<td>N</td>
<td></td>
<td>Define specific indicators with numerators and denominators</td>
</tr>
<tr>
<td>3.3</td>
<td>Surgery rates</td>
<td>Number of surgical procedures performed</td>
<td>Population by SLA/AHS</td>
<td>Y</td>
<td></td>
<td>Population based rather than hospital based CI</td>
</tr>
<tr>
<td>4.2</td>
<td>LOS in hospital</td>
<td>Number of beddays</td>
<td>Number of patients</td>
<td>N</td>
<td>1.2</td>
<td>Mean rather than a proportion. Redefine as the number of patients above the peer LOS by DRG</td>
</tr>
<tr>
<td>4.3</td>
<td>Unit cost of maternity</td>
<td>Total costweight for maternity</td>
<td>Number of births</td>
<td>N</td>
<td>1.2</td>
<td>Mean rather than a proportion.</td>
</tr>
</tbody>
</table>
## Scottish Health (UK)


### Clinical outcome indicators

<table>
<thead>
<tr>
<th>C#</th>
<th>Indicator</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Pass?</th>
<th>Criteria failed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Pregnancy &lt; 16 years</td>
<td>Number of pregnancies for women aged &lt; 16 years</td>
<td>Population aged &lt; 16 years</td>
<td>Y</td>
<td></td>
<td>Population based rather than hospital based CI</td>
</tr>
<tr>
<td>1.2</td>
<td>Therapeutic abortion rates</td>
<td>Number of therapeutic abortions</td>
<td>Number of pregnancies</td>
<td>Y</td>
<td></td>
<td>Population based rather than hospital based CI</td>
</tr>
<tr>
<td>1.18</td>
<td>Proportion of first births by caesarean section</td>
<td>Number of caesarean first births</td>
<td>Number of first births</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.19</td>
<td>Vaginal Birth after previous caesarean section</td>
<td>Number of vaginal deliveries</td>
<td>Number of women giving birth whose previous delivery was a caesarean</td>
<td>Y</td>
<td></td>
<td>Redefine so that a low rate is more desirable. Caesarean deliveries following previous caesarean.</td>
</tr>
<tr>
<td>1.20</td>
<td>Babies admitted to neonatal unit</td>
<td>Number of babies born in hospital who are admitted to neonatal unit</td>
<td>Number of births</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.22</td>
<td>D&amp;C rates in women under 40</td>
<td>Number of D&amp;C procedures</td>
<td>Population</td>
<td>Y</td>
<td></td>
<td>Population based rather than hospital based CI</td>
</tr>
<tr>
<td>1.36</td>
<td>Breast feeding</td>
<td>Number of women NOT breastfeeding after X weeks</td>
<td>Number of deliveries</td>
<td>Y</td>
<td></td>
<td>Define the number of weeks</td>
</tr>
<tr>
<td>1.37</td>
<td>Smoking during pregnancy</td>
<td>Number of women who smoked during pregnancy</td>
<td>Number of pregnant women</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix F – Can risk adjustment save the low birth weight measure?

Outcome measurement in HEDIS: can risk adjustment save the low birth weight measure?

Inkelas M, Decristofaro AH, McGlynn EA, Keeler EB.

OBJECTIVE. To evaluate whether adjusting the Health Plan Employer Data and Information Set (HEDIS) low birth weight (LBW) measure for maternal risk factors is feasible and improves its validity as a quality indicator.

DATA SOURCE: The Washington State Birth Event Record Data for calendar years 1989 and 1990, including birth certificate data matched with mothers' and infants' hospital discharge records, with 5,837 records of singlet on infants identified as LBW (< 2,500 g) and a 25 percent sample (n = 31,570) of the normal-weight births (/>= 2,500 g).

STUDY DESIGN: We reviewed literature on factors associated with birth weight and identified factors for risk adjustment that are associated with LBW and that are not modifiable by the health plan. We used vital records Data to develop and test possible risk adjustment strategies. Finally, because feasibility is important for a HEDIS measure, we assessed health plan readiness to produce a risk-adjusted measure.

PRINCIPAL FINDINGS: An LBW indicator that is adjusted for maternal risks represents health plan performance better than the unadjusted rate. In the most parsimonious risk adjustment model LBW risk was higher for mothers with a history of prior preterm birth, LBW, or fetal death. Risk was also higher for primiparas or mothers with high parity, mothers less than 19 years of age, and primiparas over age 35. In a model adding race to these obstetric factors, black, Asian/Pacific Islander, or other non-white, non-Hispanic races were also significantly associated with higher LBW risk. While adjusting for maternal risk improved the LBW measure's validity, the rate adjustment magnitude was small (0.17 percentage points) for the most plausible model. This may not be meaningful clinically or for measuring differences in quality. The costs and data collection requirements of risk adjustment could be substantial for health plans lacking access to State birth records data.

CONCLUSIONS Selection of risk adjusters for quality measures depends on judgments of their effect, legitimacy, and feasibility. A comprehensive examination of validity and feasibility is needed to understand to what extent outcome measures represent quality and how their value compares to their cost of collection.
Appendix G – Definition of ‘selected primipara’

The definition of a ‘selected primipara’ uses the following criteria:
- no previous pregnancy \( \geq 20 \) weeks gestation;
- maternal age 20-34 years;
- cephalic presentation at delivery;
- delivery between 37 and 41 weeks gestation inclusive.

The approach of using selected primiparae has been employed by others to allow comparisons across hospitals with variable caseloads (Middle and Macfarlane, 1995; Paterson, Chapple, Beard, Joffe, Steer and Wright, 1991).
Appendix H – ACHS criteria for appropriate induction

Indicator Topic: Induction of labour other than for defined indications

Rationale: These indicators have been included because induction of labour is a common obstetric intervention and one, which is often stated by community critics to be unnecessarily high. Although there are more induction indications utilised by clinicians, it is thought that the defined list covers the majority of widely accepted ones and thus provides a sound basis for appropriate benchmarking and comparison between health care institutions.

Definitions of Terms:
- **Defined indications** are; twins, antepartum haemorrhage, diabetes, premature rupture of membranes, hypertensive disorders (including chronic renal disease), intrauterine growth retardation, isoimmunisation, signs of foetal hypoxia (by cardiocography, ultrasound or amniocentesis documented by clinician), foetal demise, chorioamnionitis, prolonged pregnancy (41 completed weeks, or more).
- **Induction of labour** is defined as surgical and/or medical induction.

ICD-10-AM CODES APPLICABLE TO THIS INDICATOR SET

**Numerator in ICD-10-AM**

<table>
<thead>
<tr>
<th>CI</th>
<th>Codes that may assist data collection:</th>
</tr>
</thead>
</table>
| 1.1| Exclude episodes of care with any of the following disease codes in the code string  
Any code in categories:  
O24 Diabetes mellitus in pregnancy  
O42 Premature rupture of membranes  
O30 Multiple gestation  
O10-O16 Oedema, proteinuria and hypertensive disorders in pregnancy, childbirth and the puerperium  
or  
Any of the following disease codes:  
O36.0 Maternal care for rhesus isoimmunisation  
O36.1 Maternal care for other isoimmunisation  
O36.3 Maternal care for signs of foetal hypoxia  
O36.4 Maternal care for intrauterine death  
O36.5 Maternal care for poor foetal growth  
O41.1 Infection of amniotic sac and membranes  
O45.0 Premature separation of placenta with coagulation defect  
O45.8 Other premature separation of placenta  
O45.9 Premature separation of placenta, unspecified  
O46.0 Antepartum haemorrhage with coagulation defect  
O46.8 Other antepartum haemorrhage  
O46.9 Antepartum haemorrhage, unspecified  
O48 Prolonged pregnancy |
| 1.2| As for 1.1 with  
Any procedure code in block  
[1334] Medical or surgical induction of labour |

**Denominator in ICD-10-AM**

<table>
<thead>
<tr>
<th>CI</th>
<th>Codes that may assist data collection:</th>
</tr>
</thead>
</table>
| 1.1| Any procedure code in block  
[1334] Medical or surgical induction of labour |
| 1.2| Any disease code in category  
Z37 Outcome of delivery |
## Appendix I – Scoring of the National Core Maternity Indicators

<table>
<thead>
<tr>
<th>Criteria</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose of CI is described clearly and explicitly</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Criteria for the topic of CI are described in detail</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Organizational context of CI is described in detail</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Quality domain of CI is described in detail</td>
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<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Process or outcome covered by CI is described and defined in detail</td>
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<td>4</td>
<td>4</td>
<td>4</td>
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<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Group developing CI includes individuals from all relevant professions</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>All relevant stakeholders have been involved at some stage in development</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
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<td>CI has been formally endorsed</td>
<td>4</td>
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<td>4</td>
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<td>4</td>
<td>3</td>
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<tr>
<td>Systematic methods were used to search for scientific evidence</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>CI is based on evidence based guidelines or peer-reviewed journals</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Supporting evidence has been critically appraised</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2</td>
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</tr>
<tr>
<td>CI is described in detail: numerator and denominator</td>
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<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2</td>
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<tr>
<td>Target patient population is clearly defined</td>
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<tr>
<td>Strategy for risk adjustment has been considered</td>
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<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>CI measures what is intended; validity</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>4</td>
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<tr>
<td>CI measures accurately and consistently: reliability</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>CI has sufficient discriminating power</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>The cost for collecting the CI have been considered</td>
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<td>60</td>
<td>63</td>
<td>59</td>
<td>59</td>
<td>54</td>
<td>57</td>
<td>48</td>
<td>61</td>
<td>41</td>
</tr>
<tr>
<td>Specific instructions for presenting and interpreting the CI results are provided</td>
<td>52</td>
<td>94</td>
<td>98</td>
<td>92</td>
<td>92</td>
<td>84</td>
<td>89</td>
<td>75</td>
<td>95</td>
<td>64</td>
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</tbody>
</table>

### Indicator names

1. Smoking cessation advice during pregnancy
2. Caesarean sections for selected first births
3. Episiotomies performed during first births
4. Induction of labour for selected first births
5. Significant perineal tears during first births
6. Spontaneous unassisted vaginal deliveries for selected first births
7. Infant well-being at birth
8. Significant blood loss following vaginal births
9. Gestation Standardised Perinatal Mortality Ratio
10. Supporting breastfeeding
Appendix J – Variation in adjusted observed/expected ratios

The ratio of Observed/Expected Stillbirths by hospital, 1994 to 1999, adjusted using a logistic model. Each point represents the ratio one year and hospitals are 14 major units in Australia.
Appendix K – Z-scores for obstetric indicators for 138 hospitals

Figure 1. Results for obstetric indicators for 138 hospitals providing 10 or more CIs to the ACHS. The rate is given as a z-score, with positive values being poorer rates and negative better rates. The box-plots (one per hospital) show the values of the z-scores for each of the 138 hospitals. The box contains 50% of the results and the lines denote where 75% of values lie. All hospitals have rates that cover both positive and negative values and most have rates that are at least 5 standard deviations from the mean. This is due to the use of 8 years of data, although not all hospitals have reported for all years.
Appendix

Indicator References

**APGAR score ≤ 6 at 5 minutes for live term infants**


Bharti, B. and Bharti, S (2005), A review of the APGAR score indicated that contextualization was required within the contemporary perinatal and neonatal care framework in different settings, *Journal of Clinical Epidemiology*, Vol. 58, pp: 121-129


Martin, E (2004 last rev.), APGAR, Diseases and Conditions Database
Caesarean section rates for selected first births


Buist, R and Cahill, A, Benchmarking in Obstetrics 2000-2003, Women’s Hospitals Australasia, Canberra 2004


Dietz, H. P. and Peek, M.J (2004), Will there ever be an end to the caesarean section debate? ANZJOG, Vol. 44, page 103, April 2004


Gregory, K.D (2000), Monitoring, risk adjustment and strategies to decrease caesarean rates, Current Opinions in Obstetrics and Gynecology, 2000 Lippincott Williams and Wilkins


Robson, M.S (2001), Can we reduce the caesarean section rate? Best Practice and Research, Clinical Obstetrics and Gynaecology; Vol. 15 No. 1 pp: 179-194


**Episiotomy rates for all first births**

Agency for Healthcare and Research Quality, (2005), What you need to know about episiotomy, *AHRQ*, Publication No. 06-0005, Current as of December 2005


Reynolds, J.L (1995), Reducing the frequency of episiotomies through a continuous quality improvement program, *Can Med Assoc J*, August 1, 1995; Vol. 153(3)


**Induction of labour rates for selected first births**


Sydney: AIHW National Perinatal Statistics Unit (Perinatal Statistics Series No.16).

Royal College of Obstetricians and Gynaecologists (2001), Induction of Labour Evidence-based
Clinical Guideline Number 9, June, RCOG Press


The Australian Council on Healthcare Standards (2005) *ACHS Clinical Indicator Results for
Australia and New Zealand 1998-2004 – Determining the Potential to Improve Quality of Care 6th
Edition*  www.achs.org.au

**Significant blood loss within 24 hours following a vaginal birth**

DOI: 10.1002/14651858.CD002867

Anderson J., Etches, D., and Smith, D (2000), Postpartum haemorrhage: Third stage emergency,
Family Physicians, Kansas

Ayers, S. and Pickering, A.D (2001), Do Women Get Posttraumatic Stress Disorder as a Result of

Buist, R and Cahill, A, *Benchmarking in Obstetrics 2000-2003*, Women’s Hospitals Australasia,
Canberra 2004

Ferrazzani, S., Guarigla, L., Draisici, G., Sorrentino, L., De Stefano, V., D’Onofrio, G. and Caruso, A

Ford, J., Sullivan, E., Walters, W., Beischer, N. and King J (2001), Maternal deaths in Australia
1994-1996. AIHW Cat. No. PER 13 NHMRC; Sydney: National Perinatal Statistics Unit

Geller, S E., Adams, M. G., Kelly, P. J., Kodkany, B. S. and Derman, R. J (2006), Postpartum
2006 Jan 19

16(2), pp: 21-24

Update*, No. 16 pp: 4-9

Henry, A., Birch, M. R, Sullivan, E. S., Katz, S and Wang, Y (2005), Primary postpartum
haemorrhage in an Australian tertiary hospital: a case-control study, *Australian and New Zealand

Sydney: AIHW National Perinatal Statistics Unit (Perinatal Statistics Series No.15)

NSW Department of Health Policy Directive: Postpartum haemorrhage (PPH) – the framework for prevention, early recognition and management; PD2005_264


**Smoking cessation advice during pregnancy**


Moner, S.E (1993), Smoking in pregnancy, Canadian Taskforce on Preventive Health Care

National Clearing House Guidelines: Guidelines for smoking cessation; revised 2002

University of York, Smoking cessation: What the health service can do, Effectiveness Matters, Vol. 3, Issue 1, March 1998

Supporting breastfeeding

Australian Breastfeeding Association 2003, www.breastfeeding.asn.au


Baby Friendly Hospital Initiative (BFHI) www bfhi org au Accessed 16 February 2006


Nutbeam D., Wise, M., Bauman, A., Harris, E. and Leeder S (1993), *Goals and targets for Australia’s health in the year 2000 and beyond*, AGPS, Canberra


Riordan, J. and Auerbach, K (1999), *Breastfeeding Human Lactation*, 2nd Edition Jones and Bartlett, Boston


Webb, K. Marks, G.C., Lund-Adams, M., Ruthauser, I.H.E., and Abraham, B (2001), *Towards a national system for monitoring breastfeeding in Australia: recommendations for population indicators, definitions and next steps* Commonwealth Department of Health and Aged Care, Australian Food and Nutrition Monitoring Unit, Canberra


Yamauchi Y and Yamanouchi I (1990), Breastfeeding frequency during the first 24 hours after birth in full-term neonates, *Paediatrics*, Vol. 86:2, pp: 171-175

**Third and fourth degree tears for all first births**


Royal College of Obstetricians and Gynaecologists (RCOG), Management of third and fourth degree perineal tears following vaginal delivery, *Royal College of Obstetricians and Gynaecologists (RCOG)*, Guideline No. 29 July 2001

Royal College of Obstetricians and Gynaecologists (RCOG). Methods and materials used in perineal repair. London (UK), *Royal College of Obstetricians and Gynaecologists (RCOG)*, Guideline; No. 23 June 2004


**Unassisted spontaneous vaginal births for selected primipara**


**General References**

Adler, M., and Ziglio, E (1996), Gazing into the oracle, Jessica Kingsley Publishers: Bristol, PA


Buist, R and Cahill, A, Benchmarking in Obstetrics 2000-2003, Women’s Hospitals Australasia, Canberra 2004


Definitions of Consensus: An introduction and worksheet. INNATE, No. 120, June 2004 http://www.innatennonviolence.org/old/workshops/consensus2.htm


Hutchinson, M., Humphrey, M. and Collins, R (2003), National Maternity Data Collaboration Project Report, Department of Health, WA and Obstetrics and Gynaecology Clinical Care Unit, Women’s and Children’s Health Service, WA


International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10-AM) July 2004

Joint Commission on Accreditation in Health Care Organisations (JCAHO)
http://www.jcaho.org/pms/core+measures/pr_overview.htm


Richardson, J (2004), Consensus, Tools for Schools National Staff Development Council; April / May 2004


The Delphi Method: Definition and historical background, [http://www.iit.edu/~it/delphi.html](http://www.iit.edu/~it/delphi.html)


Thomson, R. and Kazandjian, V.A (2002), Effective Use of Indicators in Secondary Care: Experience from the Internal Quality Indicator Project Discussion paper prepared for a project team on NHS Performance, March


Attachment 2: List of recommended Core Maternity Indicators

**Antepartum** (of or occurring in the period before birth)
1) Smoking cessation advice during pregnancy*

**Intrapartum** (of or occurring during labour and birth)
2) Induction of labour rates for selected first births
3) Caesarean section rates for selected first births
4) Episiotomy rates for all first births
5) Third and fourth degree tears for all first births
6) Unassisted vaginal births following a spontaneous onset of labour for selected first births

**Postpartum** (of or occurring in the period after birth)
7) APGAR score ≤ 6 at 5 minutes for live term infants
8) Death of baby around time of birth
9) Significant blood loss during first 24 hours following a vaginal birth*
10) Supporting breastfeeding
*data is not currently collected nationally