

health

# Outcomes

indicators

## NORMAL PREGNANCY AND CHILDBIRTH

Report of a working group  
to the Department of Health



## FOREWORD

The Government consultation document "A First Class Service - Quality in the new NHS", published in 1998, emphasised three essential aspects of ensuring delivery of high quality of care by the National Health Service: setting, delivering and monitoring standards. It also discussed the importance of partnership between the Government and the clinical professions and patients in achieving such quality.

This series of 10 reports concerns the third aspect - monitoring standards. It represents the culmination of work that was started several years ago under the auspices of the Clinical Outcomes Group, chaired jointly by the then Chief Medical Officer, Sir Kenneth Calman, and the Chief Nursing Officer, Dame Yvonne Moores. The work was commissioned by the former Central Health Outcomes Unit of the Department of Health. The Unit has since moved and is now called the National Centre for Health Outcomes Development (NCHOD), based jointly at the Institute of Health Sciences, University of Oxford and the London School of Hygiene and Tropical Medicine, University of London.

The background to the work was the need to ensure that the NHS is driven by considerations of quality and outcome. The Department wanted to build on an earlier set of Population Health Outcome indicators, which had been limited by the constraints of existing routine data. It therefore commissioned systematic work on ten clinical topics, to be undertaken by a Working Group on each, tasked to make recommendations on 'ideal indicators' for each condition. 'Ideal indicators' were defined as statistical measures of what should be known, and realistically could be known, about the outcomes of the condition in routine clinical practice. The Groups were asked to consider a wide spectrum of possible uses of outcome indicators, from national monitoring of NHS performance by government to the periodic assessment of local services by clinicians and users.

The work of the Working Groups was coordinated by Michael Goldacre, University of Oxford. A particular feature of the work is that the Groups have recommended definitions and technical specifications for each indicator. It is hoped that people interested in monitoring the topic covered by each indicator will use the same definitions so that comparisons can be facilitated. Moreover, the methodology adopted by the Working Groups is applicable to developing health outcome indicators for many other conditions.

The publication of these reports, however, is only one further step on a long road of quality assessment in health care. The reports present 'menus' of suggestions for ways in which outcomes might be monitored in a variety of settings, by a variety of organisations and people. It goes without saying that NCHOD will welcome feedback on the reports and on the development and use of outcome indicators.

I believe that the work described here shows the value and potential of partnerships between various parties. Each working group had members who brought together perspectives of all the relevant clinical professions plus patients, NHS managers, policy makers, researchers and others as appropriate. The recommendations of the Working groups show quite clearly how these various perspectives may contribute to a broader and more balanced monitoring of standards. I would personally like to congratulate and thank everyone who has worked so hard and well to bring this initiative to fruition.

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# OUTCOME INDICATORS FOR NORMAL PREGNANCY AND CHILDBIRTH

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# SUMMARY OF RECOMMENDATIONS

Using a variety of check lists including a health outcome model, the Group identified outcome indicators and specified them in a standard format. Outcome indicators, whose numbers correspond to the specifications in Section 4, were grouped under four headings relating to the aims of the care.

Recommendations for implementation were made for each indicator using the following categories:

- A** - To be implemented generally on a routine basis.
- B** - To be implemented generally by periodic survey.
- C** - To be implemented where local circumstances allow on a routine basis.
- D** - To be implemented where local circumstances allow by periodic survey.
- E** - To be further developed either because link with effectiveness is not clear or the indicator specification is incomplete.

Category	Page	<i>Indicators about the well-being of mother and baby during and after pregnancy</i>
E	13	1. General health status of the mother after delivery.
E	15	2. Incidence of post-natal depression.
*D	19	3. Smoking among pregnant women.
*D	22	4. Weekly alcohol consumption among pregnant women.
E	24	5. Illegal drug misuse among pregnant women.
E	26	6. Incidence of domestic violence associated with pregnancy and childbirth.
*D	28	7. Incidence and duration of breast-feeding.
 <i>Indicators about effective and safe care during pregnancy, labour, delivery and post-delivery</i>		
A	30	8. Maternal mortality rate.
A	32	9. Stillbirth, neonatal and post-neonatal mortality rate.
E	34	10. Incidence of eclampsia.
E	36	11. Incidence of severe post-partum haemorrhage.
A	38	12. Perineal trauma and episiotomy rates.
E	40	13. Pain in labour and delivery.
D	43	14. Incidence of post-natal urinary incontinence.
E	46	15. Incidence of post-natal faecal incontinence.
A	48	16. Gestational age.
A	50	17. Birthweight.
E	52	18. Maternal admissions to ICU.
B	54	19. Use of ante-natal corticosteroids to enhance pulmonary maturity.
A	55	20. Mode of delivery rates.
A	58	21. Neonatal admissions to (a) intensive care.
C	58	(b) special care.

- |          |           |  |
|----------|-----------|--|
| <b>E</b> | <b>60</b> | <b>22.</b> Emergency post-natal admission of mother.<br><br><i>Indicator about detecting and responding to specific disorders affecting the baby</i>   |
| <b>B</b> | <b>62</b> | <b>23.</b> Detection and treatment of rhesus iso-immunisation in pregnancy.<br><br><i>Indicator about ensuring mother is satisfied with the support she has received and that she and her baby have been at the centre of care</i> |
| <b>B</b> | <b>64</b> | <b>24.</b> Women's experience of maternity services.   |

\* These indicators can also be obtained from the National Infant Feeding Survey, which should continue to be the source for national data over time.

# 1. INTRODUCTION TO THE REPORT

## **Health outcome indicators**

- 1.1** This Report is one of a series containing the recommendations of working groups set up to report on 'ideal' indicators of the health outcomes of specific conditions. The background to the work, commissioned by the Department of Health, is summarised in Appendix A.
- 1.2** Health outcomes have been defined as changes in health, health related status or risk factors affecting health, or lack of change when change is expected. They may be the result of the natural history of the condition or may be the effect of interventions to prevent or treat it. The particular concern of the working groups has been to make recommendations about outcomes which may be attributable to care or the lack of it.
- 1.3** The term indicator has been defined as an aggregated statistical measure, describing a group of patients or a whole population, compiled from measures or assessments made on individuals in the group or the population. An indicator may not necessarily provide answers to whether care has been 'good' or 'bad'; but well chosen indicators, as the term implies, should at least provide pointers to circumstances which may be worth further investigation.
- 1.4** An 'ideal' indicator has been taken to mean what should be known, and realistically could be known, about the outcomes of the prevention and care of specific conditions. The development of the recommendations has, of course, been tempered by considerations of the likely cost and availability of information. However, the working groups have tried to be reasonably far-sighted in their views about future advances in information systems.
- 1.5** For each condition the working group has developed a menu of indicators which can be used by different groups of people for a variety of purposes. In particular, an attempt has been made to recommend, within each set, indicators which reflect a population, clinical, patient or service user, and in relevant cases, family perspective.

## **Pregnancy and Childbirth Working Group**

- 1.6** The terms of reference and membership of the Group are shown in Appendix B. The Group included representatives of professional, managerial and user groups involved with the support of pregnancy and childbirth.
- 1.7** The work of the Group had three main components:
  - development of check lists including a health outcome model for pregnancy and childbirth to assist members choose candidate indicators
  - specification of candidate indicators

- recommendations about implementation and further development of indicators.

**1.8** In this Report we include:

- the health outcome model in Section 2
- check lists for choosing candidate indicators in Appendix C
- guidelines for specifying candidate indicators in Appendix D
- candidate indicator specifications in Section 3
- recommendations about implementation and development in Section 4
- references to publications in Appendix E.

**Recommendations**

**1.9** The recommendations made by the Group were categorised as those which:

- can be implemented generally throughout the NHS as there are systems available which can provide the requisite data, although where these are currently of poor quality improvements must be achieved
- could be implemented now where local circumstances allow, and more generally in the near future once expected developments are in place
- will not be possible to implement in the near future but, because of their desirability, they should be considered in the future development of clinical and management information systems
- require further work before a recommendation can be made.

**1.10** The recommendations have been further categorised as to whether the requisite indicators should be available:

- on a routine basis
- from periodic surveys and/or sampling, either at different points in time nationally or in geographical areas when there is a particular need or interest.

## 2. HEALTH OUTCOME MODEL FOR PREGNANCY AND CHILDBIRTH

### **Definition and scope of the work**

- 2.1** The Group's remit from the Department of Health was to develop outcome indicators for 'normal' pregnancy and childbirth. Although the sense of what was required was clear there were difficulties in defining 'normal' pregnancy and childbirth. Many pregnancies start normally but complications develop later. Some complications are important and common outcomes of otherwise normal pregnancy.
- 2.2** The Group required a definition of normal pregnancy in order to:
- have a clear idea of the range of issues to be covered
  - identify risk factors and interventions associated with them
  - define denominators for the outcome indicators required.
- 2.3** It was agreed that for the purposes of scoping the subject, the definition of normal pregnancy should be 'a pregnancy lasting at least 24 weeks' and thus leading to a registrable birth. For the purposes of this work the term baby has been used to include both fetus and baby. The indicators recommended relate in the main to singleton births.
- 2.4** The work on outcome indicators which could be generated from a review of all aspects of pregnancy and childbirth was considered too great for the Group in the time available. It was decided that the scope of the work should not include:
- family planning
  - outcomes of pregnancies lasting less than 24 weeks and therefore it would not include comprehensive coverage of the outcomes of ante-natal screening
  - outcomes of pregnancy, relating either to mother or baby, occurring more than one year after childbirth.
- The issues excluded are important and need addressing by others. The Group noted in particular a requirement for work on the long term effects of pregnancy on mothers.
- 2.5** The health outcome model was developed as an aid to help Group members identify potential indicators. Other aids which were used, in particular a classification of types of outcome indicator, are reproduced in Appendix C.
- 2.6** The basis of the model was a classification of the objectives of the support of pregnancy and childbirth and the various interventions which might be required to achieve them.

**2.7** The broad objectives were to ensure where possible:

- That the well-being of mother and baby are maintained during and after pregnancy, through interventions, when necessary, to:
  - promote the general well-being of mother and baby during and after pregnancy (see paragraphs 2.10 to 2.12)
  - ensure effective and safe care during pregnancy, labour, delivery and post-delivery (see paragraphs 2.13 to 2.18).
  
- That any problems of mother and baby arising in pregnancy are identified and responded to effectively and sensitively, which includes interventions when necessary to:
  - detect specific disorders affecting the baby (see paragraphs 2.19 to 2.22).
  
- That the mother is satisfied that she and her baby have been at the centre of care and with the support she has received, assessed through:
  - obtaining maternal views of the experience of pregnancy/childbirth (see paragraph 2.23).

**2.8** In reviewing potential indicators related to each objective and its associated interventions, consideration was given first to direct outcome indicators (see paragraph C7). Criteria were then agreed to assist in deciding which indirect indicators might also be included.

**2.9** It was agreed that the Group would recommend candidate indicators for risk factors and for care processes if:

- In the case of a **risk factor**:
  - it should be common in the population
  - it should directly affect pregnancy outcomes
  - there should be evidence that there are effective interventions to modify it.
  
- In the case of a **care process or intervention**:
  - there is strong evidence that it directly affects pregnancy outcomes
  - there is evidence that it is an effective intervention
  - it adds extra information not already available from direct indicators.

### **General well-being of mother and baby**

**2.10** The Group considered both direct and indirect outcome indicators which might be related to the promotion of general well-being. Direct indicators which were considered suitable for specification were:

- **general health after pregnancy**
- **incidence of post-natal depression.**

**2.11** Having followed the criteria noted in paragraph 2.9, it was agreed to develop candidate indicators in relation to:

- **cessation of smoking**
- **misuse of illegal substances**
- **misuse of alcohol**
- **domestic violence**
- **breast-feeding.**

**2.12** It was decided not to develop candidate indicators related to poor diet, specific contacts with health professionals, the mobilisation of social support and mothers' time off work as they did not fit all the criteria noted in paragraph 2.9. Some of these issues have also been considered in the recording of the mothers' experience of pregnancy.

### **Pregnancy, labour, delivery and post-delivery care**

**2.13** The Group considered direct and indirect outcome indicators which might be related to pregnancy, labour, delivery and post-delivery care. Direct indicators specified were:

- **With respect to mother:**

- **mortality**
- **eclampsia**
- **post-partum haemorrhage**
- **state of perineum**
- **pain in labour and delivery**
- **urinary incontinence**
- **faecal incontinence**

- **With respect to baby:**

- **mortality**
- **gestation**
- **birthweight.**

**2.14** It was decided not to develop an indicator related to major haemorrhage during pregnancy because, when it occurs, it is not generally preventable, although good management will prevent a fatality. Thrombo-embolic disorders such as deep vein thrombosis and pulmonary embolus were also rejected because of the difficulties in diagnosis and the lack of an effective intervention to prevent them. It was decided not to develop an indicator related to dyspareunia because of the difficulties of defining the symptom.

**2.15** The outcome indicators for mothers with diabetes have been reviewed by the Working Group on Health Outcome Indicators for Diabetes.

**2.16** Having followed the criteria noted in paragraph 2.9, it was agreed to develop candidate indicators in relation to:

- **intensive care for mother during and after pregnancy**
- **use of ante-natal corticosteroids to enhance pulmonary maturity**
- **use of Caesarean section and instruments during labour**
- **admission to special or intensive care baby unit**
- **emergency admission for mother post-natally.**

**2.17** It was decided not to develop candidate indicators related to the use of induction, labour inhibiting drugs, pain control and support given in labour. Indicators related to fetal monitoring, immediate resuscitation and prophylactic measures given to the newborn were also rejected as outcome measures as they did not fit all the criteria noted in paragraph 2.9. However, the Group recognised that many of these factors may need to be measured when monitoring the process of care or the quality of services.

**2.18** It was decided not to develop indicators related to screening for diabetes or hypertension as these may be reviewed by the Ante-Natal Screening Sub-Committee of the National Screening Committee. Indicators of the process of general ante-natal care and the use of specific investigations were also rejected as was admission to hospital during pregnancy.

#### **Specific disorders affecting the baby**

**2.19** It is now possible to detect a large range of physical disorders affecting the baby. These include:

- genetic disorders and fetal abnormalities
- maternal infections affecting the baby
- rhesus iso-immunisation.

**2.20** Because the Group limited its work to pregnancies lasting 24 weeks and more it was not appropriate to review the whole range of outcomes of ante-natal screening, many of which relate to pregnancies terminating before 24 weeks. Ante-natal screening outcomes are being reviewed by the Ante-Natal Screening Sub-committee of the National Screening Committee.

**2.21** It was agreed only to consider indicators for a condition which:

- occurs commonly
- can be detected reliably
- can be treated effectively.

**2.22** The following conditions were considered:

- **rhesus iso-immunisation for which the Group agreed to specify a candidate indicator**
- hepatitis B which has recently been the subject of Department of Health guidance
- haemaglobinopathies, which are relevant to specific ethnic sub-groups of the general population
- phenylketonuria and hypothyroidism, which should be addressed by the National Screening Committee.

### **Maternal views of the experience of pregnancy and childbirth**

**2.23** To identify whether the mother is satisfied that she and her baby have been at the centre of care and with the support she has received, it was agreed to develop candidate indicators in relation to:

- **maternal involvement in choice at all stages of pregnancy, labour and post-natal care including ante-natal screening and its consequences**
- **satisfaction with the pregnancy including the support given during it.**



### 3. CANDIDATE INDICATOR SPECIFICATIONS

- 3.1** This section contains the detailed specifications of the indicators chosen by the Group. Guidance notes which explain the attributes used in these specifications are included in Appendix D. The detailed work was carried out by Robert Cleary of CASPE Research.
- 3.2** To ensure that all potentially useful aspects of outcomes were considered the matrix shown in Exhibit 1 was drawn up using the following dimensions:
- aim of intervention (see paragraph 2.7)
  - perspective of measurement (see paragraph C.6).

**EXHIBIT 1: MATRIX FOR PREGNANCY OUTCOME INDICATORS**

Aim of health intervention	Primary measurement perspective		
	Population	Clinical	User
Promote general well-being	3,4,5,7		1,2,6
Ensure effective and safe care	8,9	10,11,12 16,17,18 19,20,21,22	13,14,15
Detect specific disorders		23	
Ensure maternal satisfaction			24

**3.3** The indicators chosen for specification, shown in Exhibit 1, were:

- 1:** general health status of mother after delivery
- 2:** incidence of post-natal depression
- 3:** smoking among pregnant women
- 4:** weekly alcohol consumption among pregnant women
- 5:** illegal drug misuse among pregnant women
- 6:** incidence of domestic violence associated with pregnancy and childbirth
- 7:** incidence and duration of breast-feeding
- 8:** maternal mortality
- 9:** stillbirth, neonatal and post-neonatal mortality
- 10:** incidence of eclampsia
- 11:** incidence of severe post-partum haemorrhage
- 12:** perineal trauma and episiotomy rates
- 13:** pain during labour and delivery
- 14:** incidence of post-natal urinary incontinence
- 15:** incidence of post-natal faecal incontinence
- 16:** gestational age
- 17:** birthweight

- 18:** maternal admissions to ICU
- 19:** use of ante-natal corticosteroids to enhance pulmonary maturity
- 20:** mode of delivery rates
- 21:** neonatal admissions to (a) intensive and (b) special care
- 22:** emergency post-natal admission of mother
- 23:** detection and treatment of rhesus iso-immunisation in pregnancy
- 24:** women's experience of maternity services.

## Candidate indicator 1

Characteristics	
Perspective:	User
Outcome relationship:	Direct

<b>Title</b>	<b>General health status of mother after delivery</b>
<b>Intervention aim</b>	Promote the well-being of mother and baby during and after pregnancy.
<b>Definition</b>	For a population of women (defined with respect to district of residence or use of a given maternity service) delivering within a given time period: <i>summary scores from a multi-dimensional general health status instrument, modified for the population, administered at a specified time after delivery.</i>
<b>Rationale</b>	<p>In addition to the indicators related to <i>specific</i> post-partum complications (see Indicators 2, 11, 12, 14, 15, 18 and 22), the Working Group recommends that methods be developed for comparing the <i>general</i> health status of women with newborn children, with appropriate population norms. Two kinds of comparison may be valuable:</p> <ul style="list-style-type: none"> <li>- Between women who have recently given birth and similar women who have not.</li> <li>- Between subsets of women who have recently given birth. These might be defined in terms of, for example, the site of their care, their social circumstances, aspects of the maternity care they have received, or (to examine trends over time) the year in which their child was born.</li> </ul> <p>The use of general measures, encompassing a relatively broad conception of health status would, it is hoped, allow a greater opportunity for the impact of childbirth to be assessed on a basis that incorporates the values of the women concerned. This contrasts with an approach based on the assessment of a necessarily limited number of specific problems, the selection of which may reflect primarily clinical concerns.</p> <p>The use of an established general health status measure, such as the SF-36 (Ware et al. 1993) would have the advantage of facilitating comparisons with non-childbirth groups. However, the validity of such measures has not as yet been established in a post-partum population. Modified versions of such standard instruments may provide an effective way forward.</p>
<b>Potential uses</b>	Population based comparisons; assessment of local/regional trends.
<b>Potential users</b>	Commissioners; clinicians; national/regional policy makers.
<b>Possible confounders</b>	General health status measures may be influenced by a range of demographic and socio-economic variables.
<b>Data sources</b>	The instrument envisaged for this indicator is likely to be suitable for self-completion, with administration by post a possibility. However, administration by interview may have advantages in terms of improved response rates.

At a national level data collection could be incorporated with a sub-sample of the Health Survey for England, which has previously incorporated the SF-36 instrument (Prescott-Clarke and Primatesta 1998), or within the Infant Feeding Survey which already targets a suitable sample (Foster et al. 1997).

**Data quality**

No specific points.

**Comments**

No specific points.

**Further work required**

A review of the suitability of existing instruments; consideration of the pros and cons of modifying existing instruments to enhance their validity in a post-partum population; pilot testing of potential instruments; testing the utility of the resulting indicators.

**Conclusion & priority**

**E - To be further developed because indicator specification is incomplete.**

**References**

Foster, K., Lader, D., and Cheesbrough, S. (1997). *Infant feeding 1995*. Office for National Statistics, London.

Prescott-Clarke, P., and Primatesta, P. (1998). *Health survey for England 1996*. The Stationery Office, London.

Ware, J.E., Snow, K.K., Kosinski, M., and Gandek, B. (1993). *SF-36 Health Survey, manual and interpretation guide*. The Health Institute, New England Medical Center, Boston, MA.

## Candidate indicator 2

Characteristics	
Perspective:	User
Outcome relationship:	Direct

<b>Title</b>	<b>Incidence of post-natal depression</b>
<b>Intervention aim</b>	Promote the well-being of mother and baby during and after pregnancy.
<b>Definition</b>	<p>For a population of women (defined with respect to district of residence or use of a given maternity service) delivering within a given time period: <i>the number of women who are identified as suffering from post-natal depression, divided by the total number of women</i>. The resulting fraction should be expressed as a percentage and reported with its numerator and denominator, with scope to subdivide by women's age.</p> <p>It is proposed that post-natal depression be operationally defined with reference to the Edinburgh Post-natal Depression Scale (EPDS) - a screening instrument designed to identify women for whom further clinical investigation of depressive symptoms would be appropriate. The limitations of this approach are discussed below. Two follow-up periods are proposed: six weeks and either four or six months post-partum.</p>
<b>Rationale</b>	<p>It is estimated that around 10-15% of mothers experience a marked non-psychotic depressive illness in the early months following childbirth (Kumar and Robson 1984; Cox et al. 1993). Both anti-depressant drug therapy and cognitive-behavioural counselling have been shown to be effective in reducing such post-natal depression (Meager and Milgrom 1996; Holden et al. 1989; Wickberg and Hwang 1996a; Appleby et al. 1997).</p> <p>The EPDS is a validated screening instrument to aid the detection of post-natal depression (Cox et al. 1987; Murray and Carothers 1990; Warner et al. 1996; Wickberg and Hwang 1996b). A threshold score of 12 has been used as an indication of more serious morbidity, correctly identifying - with respect to formalised clinical assessments - at least 80% of mothers with major depression (Cox et al. 1987; Harris et al. 1989; Murray and Carothers 1990). It should be recognised however that this sensitivity is balanced by an imperfect specificity. For example, in Cox et al's 1987 community sample (of mothers previously identified as 'potentially depressed') 27% of the women scoring above the 12 point threshold failed to meet the full Research Diagnostic Criteria for depression. As a result this indicator can only provide an estimate of the true incidence of post-natal depression.</p> <p>The indicator specifies the administration of the EPDS at six weeks and either four or six months post-partum. While the six week measure may be considered as an outcome indicator in itself, it also has a role as a case-mix descriptor, indicating the levels of depression in the relevant population. The later assessment is timed to reflect the effects of any interventions to reduce the level of serious morbidity. The timing of this makes sense in terms of the schedule of any relevant intervention and/or data collection opportunities, and the exact timing should be influenced by local considerations. However, as assessments are further delayed they are likely to</p>

be increasingly influenced at the population level by the difficulty of obtaining data from women returning to work (Callender et al. 1996).

**Potential uses**

Population based comparisons; assessment of local/regional trends.

**Potential users**

Commissioners; clinicians; national/regional policy makers.

**Possible confounders**

Analysis of a substantial UK database of EPDS scores suggests that neither age nor social class are in themselves significant risk factors for a six week EPDS of more than 12 (Warner et al. 1996). However, the same study identified a number of variables, where influence through health service interventions may be difficult or impossible, that were significantly associated with the proposed operational definition of post-natal depression: unplanned pregnancy; a lack of breastfeeding at six weeks; unemployment of the mother prior to pregnancy and/or of the head of household. The influence of these and similar variables on later EPDS scores is unknown.

Any comparisons based on this indicator will require cautious interpretation and a knowledge of social factors applying in the populations under consideration.

**Data sources**

The EPDS is a ten-item instrument suitable for self-completion. Its authors suggest that a child health clinic, post-natal check-up or home visit provide suitable opportunities for its completion. Very high response rates (97%) have also been obtained in a postal administration to a UK sample of primiparous women with partners (Murray and Carothers 1990). There may be a response bias in that depressed women may be less likely to respond.

**Data quality**

No significant data quality issues have been identified by the existing research literature. The use of repeated measures, as specified by the indicator, is likely to reduce the overall response rate. The exclusion from self-completion surveys of women with visual or cognitive disabilities, or who are not English speaking, may have a systematic effect on aggregate data.

**Comments**

The indicator specified here proposes an aggregation of data derived from a process of screening individual women. It is assumed that any such screening will be undertaken primarily to identify and help those individual women suffering from post-natal depression - and that the aggregated data are a subsidiary benefit. Screening for mental distress without the provision of a clinical service to respond is ethically unacceptable.

The fact that the EPDS has been designed primarily as a screening instrument is recognised in the specification of the indicator presented here: each administration of the instrument yields a simple cross-sectional screen of the population using a single cut-off point. The EPDS scale, however, offers a number of other options for presenting outcome data. For example, mean, median or other descriptions of the distribution of scores could be presented for each follow-up period (see, for

example, Appleby et al. 1997). Alternatively, a truly longitudinal indicator could be defined which aggregated individuals' changes in EPDS score. It will be important to evaluate the indicator specified here against such alternatives, before recommending its implementation.

#### Further work required

Evaluation of alternative statistics to describe the distribution of EPDS scores and/or their changes over time. This work should include an examination of the implications of reporting aggregate EPDS scores with respect to various screening thresholds.

The effect on response rates of delaying follow-up assessments to six months should also be examined, as should EPDS use in varied populations.

#### Conclusion & priority

**E - To be further developed because indicator specification is incomplete, in that further work is needed on the compilation of the indicator from screening instruments.**

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Wickberg, B., and Hwang C.P. (1996b). The Edinburgh Post-natal Depression Scale: validation on a Swedish community sample. *Acta Psychiatrica Scandinavica*, **94**, 181-184.

## Candidate indicator 3

Characteristics	
Perspective:	Population
Outcome relationship:	Indirect

### Title

#### Smoking among pregnant women:

- a) Percentage of women smoking at the time of pregnancy
- b) Percentage of women smokers giving up during pregnancy
- c) Percentage of women smokers giving up during pregnancy and not smoking two months after the birth

### Intervention aim

Promote the well-being of mother and baby during and after pregnancy.

### Definition

For a population of women (defined with respect to district of residence or use of a given maternity service) delivering within a given survey period:

- a) *the number of women who report smoking in the year before they became pregnant, divided by the total number of women*
- b) *the number of women smokers (as defined above) who report giving up smoking during their pregnancy, divided by the number of women who reported smoking at the start of their pregnancy*
- c) *the number of women smokers (as defined above) who report both giving up smoking during their pregnancy and not smoking at two months post-partum, divided by the number of women who reported smoking at the start of their pregnancy.*

The resulting fractions should be expressed as percentages and reported with the associated numerators and denominators.

The relevant data are derived from three questions taken from the Infant Feeding Survey (Foster et al 1997; Stage One Questionnaire, completed at around two months after the birth):

- *About how many cigarettes a day were you smoking before you became pregnant? (an earlier question restricts the relevant time period to approximately one year before the birth)*
- *About how many cigarettes a day were you smoking while you were pregnant?*
- *About how many cigarettes a day are you smoking now?*

The respondent is requested to give 'average' figures.

### Rationale

The association between smoking and adverse outcomes of pregnancy has been well established. In particular, it is a factor in intra-uterine growth retardation and is associated with the risk of miscarriage, prematurity and haemorrhage from the placenta. A recent review of pre-natal smoking cessation interventions suggests that they can be effective both in increasing smoking cessation and reducing the incidence of low birthweight (Dolan-Mullen et al. 1994). While the majority of the interventions tested have proved ineffective, further systematic review has identified those most likely to have an impact (Lumley 1994a, 1994b).

Indicator 3a gives an estimate of the prevalence of smoking among women who became pregnant, while Indicator 3b measures progress towards the target by the year 2000 of at least one third of women smokers to stop smoking on becoming

pregnant. The 1995 Infant Feeding Survey shows that this target has already been achieved nationally although there is evidence of regional variation as well as scope for additional overall improvement in the indicator. Indicator 3c goes beyond this basic target to reflect the percentage of women who, having given up during pregnancy, continue to abstain - thereby bringing about additional health benefits for themselves and their children.

The use of question formats compatible with those of the Infant Feeding Survey will allow comparisons between local surveys and national figures.

<b>Potential uses</b>	Population based comparisons; assessment of local/regional trends.
<b>Potential users</b>	Commissioners; clinicians; national/regional policy makers.
<b>Possible confounders</b>	There is strong evidence that those in lower socio-economic groups are much more likely to smoke during pregnancy and find it harder to give up (Foster et al. 1997; Lumley 1991). The strength of these effects makes it highly desirable that the proposed indicator be made available by age and social class - most readily defined by the occupation of the woman's husband or partner. The Infant Feeding Survey includes standard ONS questions through which social class may be classified.
<b>Data sources</b>	<p>The Infant Feeding Survey collects baseline data on smoking using a postal survey at around two months after the birth. While local circumstances might make it more practical to survey women earlier (e.g. before discharge from hospital) it is possible that data collection within the clinical setting might influence the truth of the responses obtained. It should also be noted that surveying two months after the birth allows reporting on women when quitting has been maintained.</p> <p>Data collection timed to be compatible with the national survey might be undertaken in a primary care setting as part of routine post-natal follow-up. Again, the effect of the clinical setting on self reporting will need to be established to ensure that data used in comparisons are not systematically influenced.</p> <p>The Read codes provide a reasonably rich vocabulary to code smoking behaviour, including: 'current smoker' (I37R); 'ex-smoker' (Xa1bv); the time since cessation (UbOp1); and the level of daily consumption (Ub1tl). Given a suitable data structure such terms could be combined to encode the information required by the proposed indicator.</p>
<b>Data quality</b>	<p>The Infant Feeding Survey obtains response rates approaching 75%, although these are achieved following-up to three postal reminders.</p> <p>A reliance on self-report has the obvious disadvantage that respondents who are smokers may be motivated to deny their habit. However, other methods, such as biomedical testing, for assessing smoking behaviour are neither practical or ethical. In this circumstance, the resulting bias may be less important in comparative reports across similar populations.</p>

<b>Comments</b>	This indicator uses a different definition of smoking cessation during pregnancy to that employed by the NHS Common Information Core Headline Indicator B5. The Working Group felt that the B5 definition was cumbersome and that its incompatibility with the Infant Feeding Survey was a significant disadvantage.
<b>Further work required</b>	The effects of survey timing and setting on self-reports of smoking behaviour during pregnancy need to be established.
<b>Conclusion &amp; priority</b>	<p><b>D - To be implemented where local circumstances allow by periodic survey</b> (to provide comparisons of local with national figures).</p> <p><b>B - To be implemented generally by periodic survey</b> (for national data over time, as in the current Infant Feeding Survey).</p>
<b>References</b>	<p>Dolan-Mullen, P., Ramirez, G., and Groff, J.Y. (1994). A meta-analysis of randomized trials of pre-natal smoking cessation interventions. <i>American Journal of Obstetrics and Gynaecology</i>, <b>171</b>, 1328-1334.</p> <p>Foster, K., Lader, D., and Cheesbrough S. (1997). <i>Infant feeding 1995</i>. Office for National Statistics, London.</p> <p>Lumley, J. (1991). Stopping smoking again. <i>British Journal of Obstetrics and Gynaecology</i>, <b>98</b>, 847.</p> <p>Lumley, J. (1994a) Strategies for reducing smoking in pregnancy. In <i>Pregnancy and childbirth module of the Cochrane database of systematic reviews</i> (ed. M. Enkin, M. Keirse, M. Renfrew, and J. Neilson). The Cochrane Library, Oxford.</p> <p>Lumley, J. (1994b). Advice as a strategy for reducing smoking in pregnancy. In <i>Pregnancy and childbirth module of the Cochrane database of systematic reviews</i> (ed. M. Enkin, M. Keirse, M. Renfrew, and J. Neilson). The Cochrane Library, Oxford.</p>

## Candidate indicator 4

Characteristics	
Perspective:	Population
Outcome relationship:	Indirect

<b>Title</b>	<b>Weekly alcohol consumption among pregnant women</b>
<b>Intervention aim</b>	Promote the well-being of mother and baby during and after pregnancy.
<b>Definition</b>	<p>For a population of women (defined with respect to district of residence or use of a given maternity service) delivering within a given survey period: <i>the number of women who fall within a given alcohol consumption category (defined below), divided by the total number of women.</i></p> <p>The following alcohol consumption categories are proposed:</p> <ul style="list-style-type: none"> <li>– <i>did not drink during pregnancy</i></li> <li>– <i>drank during pregnancy, but &lt; 1 unit per week</i></li> <li>– <i>1-7 units per week</i></li> <li>– <i>8-14 units per week</i></li> <li>– <i>&gt; 14 units per week.</i></li> </ul> <p>The resulting fractions should be expressed as percentages and reported with their numerators and denominator.</p> <p>The relevant data are derived from questions taken from the Infant Feeding Survey (Foster et al. 1997; Stage One Questionnaire, completed at around two months after the birth). These request self-report of the weekly frequency ‘when you were pregnant’ of drinking various types of alcoholic drink together with details of the associated ‘usual amounts’.</p>
<b>Rationale</b>	<p>There is general agreement that women should not drink excessively during pregnancy. However, while there is no evidence of fetal harm at levels equivalent to less than eight units per week, there is little consensus as to whether a ‘safe’ limit should be set and if so, at what level (MIDIRS and NHS Centre for Reviews and Dissemination 1997a). With this uncertainty in mind, the indicator specified here simply attempts to use established methods to gain a picture of the distribution of alcohol consumption within a surveyed population of pregnant women. The use of question formats compatible with those of the Infant Feeding Survey will allow comparisons between local surveys and national figures.</p> <p>Relatively simple advisory interventions have been shown to have some influence over the minority of women who drink heavily (MIDIRS and NHS Centre for Reviews and Dissemination 1997a). Current estimates of drinking in pregnancy would indicate that less than 3% of pregnant women drink more than seven units per week (Foster et al. 1997).</p>
<b>Potential uses</b>	Population based comparisons; assessment of local/regional trends.
<b>Potential users</b>	Commissioners; clinicians; national/regional policy makers.

<b>Possible confounders</b>	As with Indicator 3, socio-economic variables are likely to have a significant role in explaining variations in alcohol consumption among pregnant women. The use of ONS standard descriptors of social class, duration of education and age in the Infant Feeding Survey provide information about confounders.
<b>Data sources</b>	The Infant Feeding Survey collects data on drinking during pregnancy using a postal survey at around two months after the birth. Data collection locally at a similar time after birth might be undertaken in a primary care setting as part of routine post-natal follow-up. The effect of the clinical setting on self-reports will need to be established to ensure that data used in comparisons are not systematically influenced.
<b>Data quality</b>	<p>The Infant Feeding Survey obtains response rates approaching 75%, although these are achieved following-up to three postal reminders.</p> <p>Respondents may under-report their consumption. The resulting bias may be less important in comparative reports across similar populations.</p>
<b>Comments</b>	Additional indicators of change in alcohol consumption during and after pregnancy (cf. Indicator 3) would be of value. The relevant Infant Feeding Survey questions could be augmented to support this.
<b>Further work required</b>	The reliability of self-reports of drinking during pregnancy needs to be established.
<b>Conclusion &amp; priority</b>	<p><b>D - To be implemented where local circumstances allow by periodic survey</b> (to provide comparisons of local with national figures).</p> <p><b>B - To be implemented generally by periodic survey</b> (for national data over time, as in the current Infant Feeding Survey).</p>
<b>References</b>	<p>Foster, K., Lader, D., and Cheesbrough S. (1997). <i>Infant feeding 1995</i>. Office for National Statistics, London.</p> <p>MIDIRS and NHS Centre for Reviews and Dissemination (1997a). <i>Informed choice for professionals: alcohol and pregnancy</i>. MIDIRS, Bristol.</p>

## Candidate indicator 5

Characteristics	
Perspective:	Population
Outcome relationship:	Indirect

<b>Title</b>	<b>Illegal drug misuse among pregnant women</b>
<b>Intervention aim</b>	Promote the well-being of mother and baby during and after pregnancy.
<b>Definition</b>	<p>For a population of women (defined with respect to district of residence or use of a given maternity service) delivering within a given time period: <i>the number of women who fall within a given category of illegal drug misuse (discussed below), divided by the total number of women.</i></p> <p>Categories of illegal drug misuse might be defined with respect to self-reports of: the type of drug; the time of misuse (e.g. in terms of gestation); amounts consumed (e.g. typical dosage per week); circumstances of misuse (e.g. use of shared needles); and sequelae of misuse (e.g. neonatal withdrawal). Proxy measures of misuse (e.g. participation in a needle exchange scheme) might also be useful in either categorising misuse or identifying a sample for detailed surveying.</p> <p>The resulting fractions should be expressed reported with their numerator and denominator.</p>
<b>Rationale</b>	<p>Pregnant women who misuse drugs experience a wide range health problems, either specifically due to the misuse or stemming from a background of multiple social problems exacerbated by drug use (Hepburn 1993). The impact of drug use on maternal health can encompass infection, overdosage, poor nutrition, and a variety of obstetric complications. The babies of mothers who have misused drugs during pregnancy may suffer withdrawal symptoms ranging from mild irritability to convulsions. Additionally, maternal drug misuse is associated with an increased incidence of pre-term delivery, low birthweight and babies which are small for gestational age (Connaughton et al. 1977; Bolton 1987). The extent to which the associated morbidity and mortality results from specific teratogenic effects rather than more general factors linked with social deprivation, is unclear (Hepburn 1993).</p> <p>While there is evidence that comprehensive multi-professional packages of clinical care that target pregnant drug users can improve maternal and neonatal outcomes (e.g. Jansson et al. 1996), the effectiveness of ante-natal education in changing drug use behaviour is currently less clear (Palinkas et al. 1996; O'Neill et al. 1996; Sarvela 1993).</p>
<b>Potential uses</b>	Population based comparisons; assessment of local/regional trends.
<b>Potential users</b>	Commissioners; clinicians; national/regional policy makers.
<b>Possible confounders</b>	As noted above, the prevalence of drug misuse is confounded with socio-economic factors and the causal interrelationships between deprivation and drug use will complicate the interpretation of population based comparisons.

<b>Data sources</b>	Data collection in the sensitive area of illegal drug misuse is likely to present significant difficulties. Simple questionnaire-based methods are unlikely to yield accurate data in view of the illicit nature of the activities of interest. Valid data are most likely to be obtained through one-to-one interviews in a context that allows the interviewee to develop a degree of trust in the interviewer – with respect to both confidentiality and the risk of being ‘judged’ adversely.
<b>Data quality</b>	Beyond the general comments, above, specific data quality issues cannot be discussed in advance of the development of a data collection methodology.
<b>Comments</b>	No specific points.
<b>Further work required</b>	Definition of the categories of illegal drug misuse of interest. Development and testing of a data collection methodology.
<b>Conclusion &amp; priority</b>	<b>E - To be further developed because indicator specification is incomplete.</b>
<b>References</b>	<p>Bolton, P.J. (1987) Drugs of abuse. In <i>Drugs and pregnancy. Human teratogenesis and related problems</i> (ed. D. Hawkins). Churchill Livingstone, London.</p> <p>Connaughton, J.F., Reeser, D., Schut, J., and Finnegan, L.P. (1977). Perinatal addiction: outcome and management. <i>American Journal of Obstetrics and Gynaecology</i>, <b>129</b>, 679-686.</p> <p>Hepburn, M. (1993). Drug use in pregnancy. <i>British Journal of Hospital Medicine</i>, <b>49</b>, 51-55.</p> <p>Jansson, L.M., Svikis D., Lee, J., Paluzzi, P., Rutigliano, P., and Hackerman, F. (1996). Pregnancy and addiction. A comprehensive care model. <i>Journal of Substance Abuse Treatment</i>, <b>13</b>, 321-329.</p> <p>O’Neill, K., Baker, A., Cooke, M., Collins, E., Heather, N., and Wodak, A. (1996). Evaluation of a cognitive-behavioural intervention for pregnant injecting drug users at risk of HIV infection. <i>Addiction</i>, <b>91</b>, 1115-1125.</p> <p>Palinkas, L.A., Atkins, C.J., Miller, C., and Ferreira, D. (1996). Social skills training for drug prevention in high-risk female adolescents. <i>Preventive Medicine</i>, <b>25</b>, 692-701.</p> <p>Sarvela, P.D., and Ford, T.D. (1993). An evaluation of a substance abuse education program for Mississippi delta pregnant adolescents. <i>Journal of School Health</i>, <b>63</b>, 147-152.</p>

## Candidate indicator 6

Characteristics	
Perspective:	User
Outcome relationship:	Indirect

<b>Title</b>	<b>Domestic violence associated with pregnancy and childbirth</b>
<b>Intervention aim</b>	Promote the well-being of mother and baby during and after pregnancy.
<b>Definition</b>	For a population of women (defined with respect to district of residence or use of a given maternity service) delivering within a given time period: <i>the number of women who are identified as suffering domestic violence associated with pregnancy, divided by the total number of women.</i> The resulting fraction should be expressed as a percentage and reported with its numerator and denominator.
<b>Rationale</b>	<p>Pregnancy as a trigger for violent attacks on women by their husbands or partners has been highlighted recently (Mezey and Bewley 1997). In pregnancy, domestic violence endangers the health and safety of both the mother and the fetus. In reviewing U.S. studies Mezey and Bewley note that estimates of the incidence of such attacks within a given pregnancy vary between 4% and 17%. There is also evidence that the risk continues into the post-partum period (Gielen et al. 1994).</p> <p>Monitoring population based comparisons and trends over time may help identify where practice is effective in reducing the risks of violence faced by pregnant women. Mezey and Bewley conclude that more research is needed to identify interventions that might offer women protection from attacks. The nature of these interventions may help inform decisions regarding the appropriate point(s) in time during pregnancy and the neonatal period to capture relevant data.</p>
<b>Potential uses</b>	Population based comparisons; assessment of local/regional trends.
<b>Potential users</b>	Commissioners; clinicians; national/regional policy makers.
<b>Possible confounders</b>	A range of social and demographic factors may be associated with the risk of domestic violence associated with pregnancy and the neonatal period. The Department of Health has recently commissioned a substantial survey of pregnant women in the UK to measure the prevalence of the phenomenon and identify the associated risk factors.
<b>Data sources</b>	<p>The use of structured questions to screen US obstetric populations has been shown to improve detection rates (e.g. Norton et al. 1995). Mezey and Bewley point out that recent changes in maternity services, such as patient held notes and the encouragement of partners to accompany women to clinics and in labour, may reduce the opportunity to identify and intervene in cases of domestic violence.</p> <p>A Study Group convened by the Royal College of Obstetricians and Gynaecologists has recently recommended that enquiry about violence should be included routinely in the taking of any social history – either during a medical consultation or by a midwife at booking. The Group also noted that routine screening of this kind was found to be generally acceptable to women, although there was a need to develop further screening tools that were both practical and robust. They further</p>

recommend that, to facilitate the disclosure of sensitive information, all pregnant women should have at least one consultation with a professional which is not attended by their partner or other family member (Study Group on Violence Against Women 1997).

**Data quality**

It is to be expected that self-reports of domestic violence will be strongly influenced by the nature of the screening process - who is asking, in what context, at what point in the pregnancy etc.. To provide a suitable basis for making comparisons of aggregated figures a practical methodology capable of reliable implementation will have to be developed.

**Comments**

The indicator specified here proposes an aggregation of data derived from a process of screening individual women. It is assumed that any such screening will be undertaken primarily to identify and help those individual women suffering violence - and that the aggregated data are a subsidiary benefit. Screening for domestic violence without the provision of social support is ethically unacceptable.

**Further work required**

Development of an operational definition of domestic violence in pregnancy and childbirth; development of practical screening methods.

**Conclusion & priority**

**E - To be further developed because indicator specification is incomplete.**

**References**

Gielen, A.C., O'Campo, P.J., Faden, R.R., Kass, N.E., and Xue, X. (1994). Interpersonal conflict and physical violence during the childbearing year. *Social Science and Medicine*, **39**, 781-787.

Norton, L.B., Piepert, J.F., Zierler, S., Lima, B., and Hume, L. (1995). Battering in pregnancy: an assessment of two screening methods. *Obstetrics and Gynaecology*, **85**, 321-325.

Mezey, G.C., and Bewley, S. (1997). Domestic violence and pregnancy. *British Medical Journal*, **314**, 1295.

Study Group on Violence against Women (1997). Recommendations arising from the Study Group on Violence against Women. In *Violence against women* (ed. S. Bewley). Royal College of Obstetrics and Gynaecology Press, London.

## Candidate indicator 7

Characteristics	
Perspective:	Population
Outcome relationship:	Indirect

### Title

**Incidence and duration of breast-feeding**

### Intervention aim

Promote the well-being of mother and baby during and after pregnancy.

### Definition

For a population of babies (defined in terms of district of birth or the maternity service responsible for their care) and survey period: *the cumulative number of babies born within the survey period who were wholly or partially breast-fed:*

- to four months old
- to six weeks old
- to two weeks old
- to one week old
- initially (i.e. all babies who were put to the breast at all, even if this was on one occasion only).

The resulting figures should be expressed as percentages of the total number of babies within the survey and should be reported with the associated numerators and denominator.

The relevant data are derived from a maximum of three questions taken from the Infant Feeding Survey (Foster et al. 1997; stage one and stage two questionnaires, completed at around two and five months after the birth, respectively):

- *Did you ever put your baby to the breast?*
- *At the moment is your baby: breast-fed; bottle-fed; or both?*
- *How old was your baby when you last breast fed him/her?*

### Rationale

The benefits of breast-feeding are widely recognised, and the good evidence of its association with improved health for the baby covers a wide range of potential illness, including gastroenteritis, respiratory infection, and diabetes mellitus (MIDIRS and NHS Centre for Reviews and Dissemination 1997b). In support of breast-feeding as the best way to ensure a healthy start for the newborn, the Department of Health has for some time recommended that mothers should be encouraged to breast-feed, preferably for at least four months (Department of Health 1994). Current estimates suggest that 27% of UK babies are breast-fed for this period. The indicator specified here encompasses the four month target and places it within the context of the incidence of attempted breast-feeding and the duration of breast-feeding within the first four months. Where a very rapid reduction in breast-feeding levels is seen among those women who attempt to breast-feed, this may point to a need for additional support in terms of encouragement from professionals and others and education on technique. It is frequently related to a return to a social environment in which breast-feeding is not the norm. Within this context a breast-feeding duration of one week (for some or all feeds) has been termed ‘successful initiation’ (Kessler et al. 1995). A decline in numbers breastfeeding, beyond the initial weeks, may reflect other pressures relating to, for example, a return to work.

The use of question formats compatible with those of the Infant Feeding Survey will allow comparisons between local surveys and national figures.

<b>Potential uses</b>	Population based comparisons; assessment of local/regional trends.
<b>Potential users</b>	Commissioners; clinicians; national/regional policy makers.
<b>Possible confounders</b>	Socio-economic variables such as social class are associated with the prevalence of breast-feeding. The use of ONS standard descriptors of social class, duration of education and age in the Infant Feeding Survey provide information about confounders.
<b>Data sources</b>	<p>The Infant Feeding Survey collects initial data on breast-feeding using a postal survey at around two months, and again at four to five months after the birth.</p> <p>Data collection timed to be compatible with the national survey might be undertaken in a primary care setting as part of routine post-natal follow-up. The effect of the clinical setting on self-reports will need to be established to ensure that data used in comparisons are not systematically influenced.</p>
<b>Data quality</b>	The Infant Feeding Survey obtains response rates approaching 75%, although these are achieved using up to three postal reminders.
<b>Comments</b>	No specific points.
<b>Further work required</b>	The reliability of self-reports of breast-feeding during pregnancy need to be established.
<b>Conclusion &amp; priority</b>	<p><b>D - To be implemented where local circumstances allow by periodic survey</b> (to provide comparisons of local with national figures).</p> <p><b>B - To be implemented generally by periodic survey</b> (for national data over time, as in the current Infant Feeding Survey).</p>
<b>References</b>	<p>Department of Health (1994). <i>Weaning and the weaning diet. Report of the working group on the weaning diet of the Committee of the Medical Aspects of Food Policy.</i> Her Majesty's Stationery Office, London.</p> <p>Foster, K., Lader, D., and Cheesbrough S. (1997). <i>Infant feeding 1995.</i> Office for National Statistics, London.</p> <p>MIDIRS and NHS Centre for Reviews and Dissemination (1997b). <i>Informed choice for professionals. Breastfeeding or bottle feeding, helping women to choose.</i> MIDIRS, Bristol.</p>

## Candidate indicator 8

Characteristics	
Perspective:	Population
Outcome relationship:	Direct

<b>Title</b>	<b>Maternal mortality rate</b>
<b>Intervention aim</b>	Ensure effective ante-natal, labour, delivery and post-delivery care.
<b>Definition</b>	For a given three year period: <i>the number of direct, indirect and late maternal deaths (as defined in the International Classification of Diseases) per 100,000 total births</i> . In addition to the overall rate, direct and indirect rates should be reported separately.
<b>Rationale</b>	Although the rate of maternal mortality in the UK has fallen to 9.8 per 100,000 total births for the period 1991-96, its importance as an adverse outcome remains. The continuing work of the Confidential Enquiries into Maternal Deaths (Department of Health et al. 1996) reveals that the proportion of deaths in which sub-standard care was considered a factor is substantial, implying that the rate could be reduced still further.
<b>Potential uses</b>	Population based comparisons; assessment of national trends.
<b>Potential users</b>	Commissioners; regional/national policy makers.
<b>Possible confounders</b>	No specific ones identified.
<b>Data sources</b>	The Confidential Enquiries into Maternal Deaths.
<b>Data quality</b>	It is unknown whether case ascertainment is complete, depending as it does on the diagnosis of pregnancy, and the reporting of the death to the relevant Confidential Enquiry (McColl and Gulliford 1993). However, of the deaths known to the Enquiry detailed assessment is possible in a very high proportion of cases (in excess of 99% in the most recent report).
<b>Comments</b>	<p>Maternal deaths are sufficiently rare that analysis at the national level is required.</p> <p>The Working Group also noted that while maternal deaths are an important outcome of pregnancy and childbirth, they form only one component of the mortality associated with women's reproductive role. Others, outside the remit of the Working Group, are deaths associated with contraceptive use and the management of sub-fertility.</p>
<b>Further work required</b>	None recommended.
<b>Conclusion &amp; priority</b>	<b>A - To be implemented generally on a routine basis.</b>

**References**

Department of Health, Welsh Office, Scottish Home & Health Department and Department of Health & Social Services, Northern Ireland. (1996). *Report on confidential enquiries into maternal deaths in the United Kingdom 1991-1993*. Her Majesty's Stationery Office, London.

McColl, A.J., and Gulliford, M.C. (1993). *Population health outcome indicators for the NHS: a feasibility study*. Faculty of Public Health Medicine of the Royal College of Physicians, London.

## Candidate indicator 9

Characteristics	
Perspective:	Population
Outcome relationship:	Direct

<b>Title</b>	<b>Stillbirth, neonatal and post-neonatal mortality rates</b>
<b>Intervention aim</b>	Ensure effective ante-natal, labour, delivery and post-delivery care.
<b>Definition</b>	<p>For a given population and year, the following statistics should be compiled:</p> <ul style="list-style-type: none"> <li>– <i>number of stillbirths (fetal deaths occurring at or after 24 completed weeks' gestation) per 1,000 total live and stillbirths</i></li> <li>– <i>number of neonatal deaths (deaths of infants aged less than 28 completed days) per 1,000 live births</i></li> <li>– <i>number of post-neonatal deaths (deaths of infants aged 28 days to 365 completed days) per 1,000 live births.</i></li> </ul> <p>Figures must be available in such a way that they can be tabulated by birthweight intervals of 500g; i.e. &lt; 500g; 500-999g; 1000-1499g, etc., and by ONS cause of death groups.</p>
<b>Rationale</b>	<p>Stillbirth and infant mortality rates reflect some of the most serious adverse outcomes of childbirth. As advances are made in neonatal intensive care, the proportion of infants sustained briefly beyond the perinatal period may increase (Field et al. 1988). For this reason it is now considered appropriate to monitor neonatal and post-neonatal deaths in place of the perinatal mortality rate.</p> <p>The indicators presented here are similar to Public Health Common Data Set (PHCDS) indicators CDS-C8 and C9. The main differences are the separate use of stillbirth and neonatal deaths rather than perinatal death, and the use of birthweight specific tabulations. The importance of birthweight in the interpretation of perinatal mortality was reviewed and favoured during the development of the PHCDS indicators (McColl and Gulliford 1993), and its use in the presentation of these mortality data is considered crucial by the Working Group. Tabulation by ONS cause of death groups will allow more detailed analysis, enabling, for example separate consideration of deaths associated with congenital abnormalities.</p>
<b>Potential uses</b>	Population based comparisons; assessment of regional/national trends.
<b>Potential users</b>	Commissioners; regional/national policy makers.
<b>Possible confounders</b>	The risks of stillbirth, neonatal and post-neonatal deaths are influenced by a wide range of maternal factors - including age, parity, socio-economic status, ethnicity – as well as by improvements in obstetric care.
<b>Data sources</b>	ONS registration data.

<b>Data quality</b>	Registration data on which this indicator is based are likely to be of good quality and completeness. Nevertheless, it has been noted that variations in the recording of viability at birth may influence the extent of registration of live births and hence neonatal mortality rates (Fenton et al. 1990). This issue is likely to be particularly relevant within the < 500g birthweight category.
<b>Comments</b>	Additional data on causal factors will be available from the ongoing Confidential Enquiry into Stillbirths and Deaths in Infancy (CESDI 1998).
<b>Further work required</b>	None recommended.
<b>Conclusion &amp; priority</b>	<b>A - To be implemented generally on a routine basis.</b>
<b>References</b>	<p>CESDI (1998). <i>Confidential enquiry into stillbirths and deaths in infancy. Fifth annual report</i>. Maternal and Child Health Consortium.</p> <p>Fenton, A.C., Field, D.J., Mason, E., and Clark, M. (1990). Attitudes to viability of preterm infants and their effect on figures for perinatal mortality. <i>British Medical Journal</i>, <b>300</b>, 434-436.</p> <p>Field, D.J., Smith, H., Mason, E., and Milner, A.D. (1988). Is perinatal mortality still a good indicator of perinatal care? <i>Paediatric and Perinatal Epidemiology</i>, <b>2</b>, 213-219.</p> <p>McColl, A.J., and Gulliford, M.C. (1993). <i>Population health outcome indicators for the NHS: a feasibility study</i>. Faculty of Public Health Medicine of the Royal College of Physicians, London.</p>

## Candidate indicator 10

Characteristics	
Perspective:	Clinical
Outcome relationship:	Direct

<b>Title</b>	<b>Incidence of eclampsia</b>
<b>Intervention aim</b>	Ensure effective ante-natal, labour, delivery and post-delivery care.
<b>Definition</b>	For a population of women (defined with respect to district of residence or use of a given maternity service) and year: <i>the number of women with eclampsia (both pre- and post-delivery) delivering in the given year, divided by the total number of women delivering in the year.</i> This should be expressed as a rate per 1,000 women.
<b>Rationale</b>	Eclampsia, defined as the occurrence of one or more convulsions (fits) in association with the syndrome of pre-eclampsia, is a rare but serious complication of pregnancy. In the UK it has an incidence of approximately of 1 in 2000 deliveries (Douglas & Redman 1994) and is associated with significant morbidity and mortality. One aim of ante-natal care is to detect pre-eclampsia, in the hope that the onset of serious complications (including eclampsia) can be delayed or prevented. There is some evidence that the occurrence of eclampsia can be reduced by the use of anti-convulsant drugs (Duley et al. 1997).
<b>Potential uses</b>	Assessment of regional/national trends.
<b>Potential users</b>	Commissioners; clinicians; national/regional policy makers.
<b>Possible confounders</b>	It may be helpful to examine indicator results in the light of additional information on the distribution of parity and the occurrence of multiple pregnancies within the relevant population.
<b>Data sources</b>	The required data are available from the contract minimum data sets for admitted patient care (mothers' delivery episodes). The denominator is given by the number of women with such records. The numerator is the number of women with records including an ICD-10 diagnosis of 'eclampsia' (O15).
<b>Data quality</b>	The validity of comparisons based on this indicator will be dependent on the reliability of the clinical diagnosis of eclampsia. The importance of eclampsia increases the likelihood that where a clinical diagnosis has been made it will also be recorded within the relevant minimum data set. However the rarity of the event means that missing even small numbers of cases via the routine coding of diagnostic information can have a large impact on the indicator results. It may be that a dedicated 'adverse event' recording system would more easily achieve the required levels of case ascertainment.
<b>Comments</b>	No specific points.
<b>Further work required</b>	Estimates of the incidence of eclampsia derived from routine data sources, as captured within the hospital episode statistics, should be validated against dedicated survey data.

**Conclusion & priority**

**E - To be further developed because link with effectiveness is not clear.**

**References**

Duley, L., Gulmezoglu, A.M., and Henderson-Smart, D.J. (1997). Anticonvulsants for women with severe pre-eclampsia. In *Pregnancy and childbirth module of the Cochrane database of systematic reviews* (ed. J. Neilson, C. Crowther, E. Hodnett, G. Hofmeyr, and M. Keirse). The Cochrane Library, Oxford.

Douglas, K.A., and Redman, C.W.G. (1994). Eclampsia in the United Kingdom. *British Medical Journal*, **309**, 1395-1400.

## Candidate indicator 11

Characteristics	
Perspective:	Clinical
Outcome relationship:	Direct

<b>Title</b>	<b>Incidence of severe post-partum haemorrhage</b>
<b>Intervention aim</b>	Ensure effective ante-natal, labour, delivery and post-delivery care.
<b>Definition</b>	<p>For a population of women (defined with respect to district of residence or use of a given maternity service) and year: <i>the number of women delivering in the given year, who suffered a major post-partum haemorrhage (PPH), divided by the number of women who delivered in the given year.</i> The resulting fraction should be expressed as a rate per 1,000 women and reported with its numerator and denominator.</p> <p>A standardised definition of severity will include the volume of blood lost, but it may also be appropriate to consider other parameters such as the timing of the haemorrhage. The only simple way of identifying PPH is from a post-partum hospital admission record and statistical indicators could be compiled of hospital admission rates for PPH.</p>
<b>Rationale</b>	<p>Post-partum haemorrhage is associated with maternal morbidity and mortality, not only through the direct effects of bleeding and its consequences (e.g. acute anaemia), but also as a result of the interventions a major haemorrhage may necessitate (e.g. general anaesthesia, manual removal of the placenta or hysterectomy).</p> <p>The risks of post-partum haemorrhage may be influenced both by the management of the third stage of labour (Prendiville et al. 1997) and the manner in which the placenta is removed following Caesarean section (Enkin and Wilkinson 1997).</p>
<b>Potential uses</b>	Clinical audit; assessment of local/regional trends.
<b>Potential users</b>	Clinicians; commissioners; national/regional policy makers.
<b>Possible confounders</b>	No specific ones identified.
<b>Data sources</b>	PPH is coded within the delivery episodes of the contract minimum data set (ICD-10 diagnosis O72 'post-partum haemorrhage'). The identification of the subset of these cases meeting the definition of a 'severe' PPH would then rely on a review of cases notes to find those meeting the criterion. Where available, PPH could also be identified from midwives' case records or GP consultations in practices where computerisation would support this.
<b>Data quality</b>	Using the method outlined above, case ascertainment would be critically dependent on the completeness of routine PPH diagnostic coding. Beyond this, the indicator will be influenced by the accuracy of the clinical note regarding the severity of haemorrhage. With respect to the volume of blood loss, there may be (in addition to measurement uncertainty) the phenomenon of 'digit preference' in recording the volume of bleeds close to any pre-determined threshold.

<b>Comments</b>	No specific points.
<b>Further work required</b>	A definition of 'severe' PPH needs to be developed and tested with respect to the practicality and utility of the resulting indicator. The use of routine hospital episode statistics and GP records should also be explored.
<b>Conclusion &amp; priority</b>	<b>E - To be further developed because the indicator definition is incomplete.</b>
<b>References</b>	<p>Enkin, M.W., and Wilkinson, C. (1997). Manual removal of placenta at Caesarean section. In <i>Pregnancy and childbirth module of the Cochrane database of systematic reviews</i> (ed. J. Neilson, C. Crowther, E. Hodnett, G. Hofmeyr, and M. Keirse). The Cochrane Library, Oxford.</p> <p>Prendiville, W.J., Elbourne, D., and McDonald, S. (1997). Active versus expectant management of the third stage of labour. In <i>Pregnancy and childbirth module of the Cochrane database of systematic reviews</i> (ed. J. Neilson, C. Crowther, E. Hodnett., G. Hofmeyr, and M. Keirse). The Cochrane Library, Oxford.</p>

## Candidate indicator 12

Characteristics	
Perspective:	Clinical
Outcome relationship:	Direct

<b>Title</b>	<b>Perineal trauma and episiotomy rates</b>
<b>Intervention aim</b>	Ensure effective ante-natal, labour, delivery and post-delivery care.
<b>Definition</b>	<p>For a population of women (defined with respect to district of residence or use of a given maternity service) and year: <i>the number of women, delivering vaginally in the given year, experiencing a perineal tear and/or episiotomy, divided by the number of women delivering vaginally in the given year.</i> The following classification should be used:</p> <ul style="list-style-type: none"> <li>– <i>intact perineum: no episiotomy or tear</i></li> <li>– <i>first degree tear</i></li> <li>– <i>second degree tear</i></li> <li>– <i>third or fourth degree tear</i></li> <li>– <i>episiotomy (including those to facilitate an instrumental delivery).</i></li> </ul> <p>The resulting fractions should be expressed as percentages, and reported with the denominator, both as an overall figure and broken down by parity (0, 1, 2, 3 or more). ICD-10 definitions of perineal laceration should be used. It is recognised that the categories are not mutually exclusive in that an episiotomy may be preceded by a tear, and vice versa.</p>
<b>Rationale</b>	Perineal wounds, whether traumatic or surgical, are associated with a variety of adverse outcomes including pain, oedema, infection, and sexual dysfunction. The benefits and risks of episiotomy as a means of avoiding more severe damage to the perineum and possible cranial trauma to the neonate are still matters of research and debate. Currently available research evidence supports restrictive rather than routine use of the procedure (Carroll et al. 1997).
<b>Potential uses</b>	Clinical audit; provider based comparisons.
<b>Potential users</b>	Clinicians; consumers/public.
<b>Possible confounders</b>	Parity is included within the definition of the indicator, primarily as a proxy for previous perineal trauma or episiotomy.
<b>Data sources</b>	The required data are available from the contract minimum data sets for admitted patient care (delivery episodes) and home births (all episodes). The denominator is given by the number of episodes within these data sets recording a vaginal <i>delivery method</i> . This denominator may then be subdivided on the basis of parity recorded in the CMDS field <i>pregnancy: total previous pregnancies</i> . These records may then be broken down across the required perineal wound categories with reference to the ICD-10 <i>diagnosis</i> (O70, 'perineal laceration during delivery') and OPCS-4 <i>procedure</i> (R27.1 'episiotomy to facilitate delivery') fields.

<b>Data quality</b>	There is evidence that a proportion of units do not complete the <i>delivery method</i> field of the contract minimum data set for admitted patient care, required to identify the denominator (Department of Health 1997). The same survey has also revealed the completeness of the home birth CMDS to be relatively poor. Where data are available, there should be no major obstacles to recording tolerably well the basic facts of tears and episiotomies. However, it is likely that a reliance on general diagnosis and procedure fields will result in less complete data capture than would be the case if coding was mediated by dedicated multiple choice fields within the CMDS. In the absence of such dedicated fields this indicator will be critically dependent on the quality of the general coding process. Furthermore the distinctions between tears of different degrees may be uncertain due to unreliability in either the clinical record or the coding process. In particular, the differentiation between third and fourth degree tears is believed to be unreliable, and the indicator definition avoids this issue by aggregating the data across this distinction.
<b>Comments</b>	It would be helpful to identify whether and how the perineal trauma was treated.
<b>Further work required</b>	None recommended.
<b>Conclusion &amp; priority</b>	<b>A - To be implemented generally on a routine basis.</b>
<b>References</b>	<p>Carroli, G., Belizan, J., and Stamp, G. (1997). Episiotomy policies in vaginal births. In <i>Pregnancy and childbirth module of the Cochrane database of systematic reviews</i> (ed. J. Neilson, C. Crowther, E. Hodnett, G. Hofmeyr, and M.Keirse). The Cochrane Library, Oxford.</p> <p>Department of Health (1997). <i>Statistical bulletin. NHS maternity statistics, England: 1989-90 to 1994-95</i>. Department of Health, London.</p>

## Candidate indicator 13

Characteristics	
Perspective:	User
Outcome relationship:	Direct

**Title** **Pain during labour and delivery**

**Intervention aim** Ensure effective ante-natal, labour, delivery and post-delivery care.

**Definition** For a population of women (defined with respect to district of residence or use of a given maternity service) and a given survey period: *the distribution of responses from women, delivering within the survey period, across the self-report categories of pain (a) in labour and (b) during delivery, given below.* The resulting fractions should be expressed as percentages and reported with their numerators and denominator, both as overall figures and by parity (0, 1, 2, 3 or more).

Reports of pain should use the following question format, taken from the National Birthday Trust's (NBT) national survey of pain and pain relief in childbirth (Chamberlain et al. 1993):

*How much pain would you say you felt during the labour? (or during the delivery of your baby?, as appropriate):*

- *a great deal, unbearable*
- *a great deal, bearable*
- *some pain*
- *very little pain*
- *no pain at all because of effective pain relief*
- *no pain at all without any pain relief*
- *other / don't know.*

**Rationale** The proposed indicator focuses on overall estimates of the levels of pain experienced in labour and delivery. It identifies those cases where pain was not an issue because of effective intervention and also allows the derivation of a simply defined adverse outcome: a failure to prevent 'unbearable' pain. The latter approach has been used in a number of published trials (e.g. Thornton 1992; Fraser et al. 1992). Within the NBT survey 16% and 14% of women reported unbearable pain for labour and delivery respectively. It is anticipated that the distinction between high levels of pain that are bearable as opposed to unbearable may be sensitive to interventions that seek to inform womens' expectations of pain in childbirth, and help them to develop strategies to cope with such pain.

The uncomplicated approach proposed here is expected to have advantages over the multi-dimensional McGill Pain Questionnaire (MPQ; Melzack 1975, 1983) in terms of the ease with which it may be integrated with a self-completed instrument which might be used to capture data relevant to a range of outcome indicators.

While the MPQ is well established within the research literature, the rich information it provides on the pain experienced is possibly more relevant to detailed evaluations of particular interventions. However, its use in measuring labour pain has already been examined (Wilkie et al. 1990) and it would be appropriate to formally assess any practical advantages the NBT categories might have over the MPQ.

A focus on perceived pain has the disadvantage of ignoring other potential adverse outcomes of pain relief interventions. For example, a policy that promoted the use of epidural anaesthesia might reduce the incidence of high levels of pain, but might also be associated with a variety of negative outcomes such as reduced feelings of control and/or enjoyment during labour or additional adverse side effects following the delivery. The NBT survey provides some evidence consistent with this hypothesis. It will be important for this indicator to be analysed alongside other indicators of the mother's perception of labour, delivery and the immediate post-natal period.

<b>Potential uses</b>	Clinical audit; provider based comparisons; consumer/public.
<b>Potential users</b>	Clinicians; commissioners; service users
<b>Possible confounders</b>	Parity is included in the definition of the indicator as a control for the longer labours likely to be experienced by primigravidae. The influence of socio-demographic factors on reported pain is unknown and will need to be disentangled from their effects on the type of analgesia received by women in labour.
<b>Data sources</b>	The NBT survey successfully employed a postal self-completion questionnaire administered at six months post-partum. There would be potential to integrate similar data collection with that required for a number of the other indicators defined by the Working Group. However, the NBT survey provides evidence that the timing of the self-report may have a significant effect on women's assessments. This effect will require further investigation if self-reports were to be elicited at other points in time.
<b>Data quality</b>	A response rate of 82% was obtained by the NBT postal survey (79% was obtained without reminder).
<b>Comments</b>	Variability in this indicator across providers has not been documented. Pilot testing of provider based comparisons is required to establish its utility as a summary of the effects of provider policy and practice on the effectiveness of pain relief. Depending on the aspects of health included within any fully developed specification for Indicator 1 (general health status post-partum) it may be appropriate to augment the pain-specific indicator defined here to encompass some assessment of post-natal pain.
<b>Further work required</b>	Pilot testing of the indicator should examine the extent to which it has practical advantages over the use of McGill Pain Questionnaire. Socio-demographic and provider effects on self-reported labour and delivery pain should also be examined. Additional multivariate analysis of existing survey data may be an appropriate way to undertake this work. Additionally, further study of the effects of survey timing will be required before implementation using follow-up periods other than six weeks could be recommended.

**Conclusion & priority**

**E - To be further developed because further work is needed on the methods of measurement. Following this further development to be implemented generally by periodic survey.**

**References**

- Chamberlain, G., Wraight, A., and Steer, P. (1993). *Pain and its relief in childbirth*. Churchill Livingstone, Edinburgh.
- Fraser, W.D., Marcoux, S., Moutquin, J.M., Christen, A., Armson, B.A., Verreault, J.P., Okun, N., Nimrod, C., Joshi, A.K., Cohen, H., Bayer, L., Doran, T., Bernstein, P., Carroll, J., Bottoms, S., and Galarneau, F. (1992). The Canadian multicentre RCT of early amniotomy. *American Journal of Obstetrics and Gynaecology*, **166**, 275.
- Melzack, R. (1975). The McGill Pain Questionnaire: Major properties and scoring methods. *Pain*, **1**, 277-299.
- Melzack, R. (1987). The Short Form McGill Pain Questionnaire. *Pain*, **30**, 191-197.
- Thornton, J.G. (1992). A multicentre randomised trial of early vs. late amniotomy in spontaneous primiparous labour. *Journal of Perinatal Medicine*, **20**, 37.
- Wilkie, D., Savedra, M.C., Holzemer, W.L., Tesler, M.D., and Paul, S.M. (1990). Use of the McGill Pain Questionnaire to measure pain: a meta-analysis. *Nursing Research* **39**, 36-41.

## Candidate indicator 14

Characteristics	
Perspective:	User
Outcome relationship:	Direct

<b>Title</b>	<b>Incidence of post-natal urinary incontinence</b>
<b>Intervention aim</b>	Ensure effective ante-natal, labour, delivery and post-delivery care.
<b>Definition</b>	<p>For a population of women (defined with respect to district of residence or use of a given maternity service), survey period and follow-up period: <i>the number of women, delivering in the given survey period, suffering urinary incontinence at the given follow-up period post-partum, divided by the number of women delivering in the survey period.</i> Three follow-up periods are relevant to the indicator. At around six weeks post-partum a baseline rate (excluding the most transient symptoms) may be established, the modification of which may be assessed in longer term follow-ups - four and twelve months being suggested as suitable.</p> <p>The resulting fractions should be expressed as percentages and reported with their numerators and denominator. Figures should be reported both for the whole population and broken down by parity (0, 1, 2, 3 or more).</p> <p>Figures should also be reportable by type of delivery.</p>
<b>Rationale</b>	<p>Urinary incontinence is a distressing and disabling condition with implications for the social, psychological, occupational, domestic and sexual lives of those it affects (Thomas et al. 1980). The aetiology of post-partum urinary incontinence is multifactorial, including both pre-pregnancy and ante-partum factors as well intra-partum causes (Beck and Hsu 1965). Approximately 20% of mothers suffer some incontinence of urine at three months post-partum (Sleep et al. 1984).</p> <p>On the basis of existing trials, there is no evidence that episiotomy is useful in preventing post-natal incontinence (Carroli et al. 1997). A lack of research evidence precludes an evaluation of ante-natal pelvic floor exercises (PFEs) as a preventative measure (Eastwood 1997). There is however research support for the use of PFEs as a treatment for stress incontinence.</p>
<b>Potential uses</b>	Clinical audit; provider-based comparisons.
<b>Potential users</b>	Clinicians; commissioners.
<b>Possible confounders</b>	Multiparity is included in the indicator's definition as the main ante-natal risk factor.
<b>Data sources</b>	Numerator data should be obtained from general practice records of women who have had a baby in the relevant year, and who then, within a year of the birth, consulted their GP with urinary incontinence as a new problem. In general practices which have computerised patient records, these data may be identified through use of Read coding of childbirth (birth details (63.)), and urinary incontinence (1A23.), stress incontinence (1A24.), or urge incontinence (1A26.) as a new problem (NHS Centre for Coding and Classification 1996). Access to information from health visitor records may be a valuable source of data to support

this indicator. The health visitor, who is contracted to visit the mother and baby regularly in this period, is in an ideal position to collect this information. Currently there is no standard document to record this information nationally, and so local data collection systems would be required.

The denominator is the total number of women in the practice who have had a baby in the given year.

**Data quality**

The validity of the indicator will depend on the quality of the GP practice data which is unlikely to be uniformly high. The source relies on a correspondence between other related services and the GP, so that women under the care of, for example, a continence specialist or, attending a continence out-patient clinic, would be identified to the GP, and therefore documented within the general practice. A health care team approach would most likely ensure all women with incontinence are communicated to the GP and recorded in their casenotes. Women who are not registered with a GP would be missed with this approach.

The data source must be able to identify reliably women with no previous record of incontinence. The ability to do this may vary among GP systems. Equally GPs will have different definitions of incontinence, which will consequently effect the extent to which a problem is recorded as part of the notes.

**Comments**

A better source of data would be health visitor records. Health visitors must visit mother and baby at three months so such data collection could easily be incorporated. While this indicator is recommended for implementation now, if the rates were found to be non-variable, its use should be re-assessed.

**Further work required**

Study into the feasibility of health visitors collecting information on incontinence following pregnancy.

**Conclusion & priority**

**D - To be implemented where local circumstances allow by periodic survey. Could possibly be recorded routinely if health visitor data collection proved to be feasible.**

**References**

Beck, R.P., and Hsu, N. (1965). Pregnancy, childbirth and the menopause related to the development of stress incontinence. *American Journal of Obstetrics and Gynaecology*, **91**, 820-903.

Carroli, G., Belizan, J., and Stamp, G. (1997). Episiotomy policies in vaginal births. In *Pregnancy and childbirth module of the Cochrane database of systematic reviews* (ed. J. Neilson., C. Crowther, E. Hodnett, G. Hofmeyr, and M. Keirse). The Cochrane Library, Oxford.

Eastwood, A. (1997). Interventions associated with pregnancy and childbirth. In *Working group on outcome indicators for urinary incontinence: report to the Department of Health*. Unit for Health Care Epidemiology, Oxford and CASPE Research, London.

NHS Centre for Coding and Classification (1996). *The Read Codes October 1996 Demonstrators*. Information Management Group, NHS Executive, London.

Sleep, J., Grant, A.M., Garcia, J., Elbourne, D.R., Spencer, J.A.D, and Chalmers, I. (1984). West Berkshire perineal management trial. *British Medical Journal*, **289**, 587-590.

Thomas, T.M., Plymat, K.R., Balninn, J., and Meade, T.W. (1980). Prevalence of urinary incontinence. *British Medical Journal*, **281**,1243-1245.

## Candidate indicator 15

Characteristics	
Perspective:	User
Outcome relationship:	Direct

<b>Title</b>	<b>Incidence of post-natal faecal incontinence</b>
<b>Intervention aim</b>	Ensure effective ante-natal, labour, delivery and post-delivery care.
<b>Definition</b>	<p>For a population of women (defined with respect to district of residence or use of a given maternity service), survey period and follow-up period: <i>the number of women, delivering vaginally in the survey period, suffering faecal incontinence at the given follow-up period post-partum, divided by the number of women delivering vaginally in the survey period.</i></p> <p>The resulting fraction should be expressed as a percentage and reported with the denominator. The operational definition of faecal incontinence remains to be defined, as does the appropriate follow-up interval.</p>
<b>Rationale</b>	<p>The distressing nature of any form of faecal incontinence can lead to significant social disablement (Sultan and Kamm 1997). In a recent survey of 900 women, 4% had developed new faecal incontinence by approximately ten months after delivery (MacArthur et al. 1997). For over half these women the symptoms were unresolved by the time of follow-up, and only a small proportion had consulted their doctor regarding the problem. While the onset of symptoms tended to be soon after delivery, this was not always the case. Among vaginal deliveries, instrumental delivery (forceps or vacuum) was the only significant obstetric risk factor identified. In reviewing a range of evidence, Sultan and Kamm conclude that liberal use of episiotomy cannot be justified with respect to the prevention of anal incontinence, and emphasise the need for education among obstetric staff as to the proper identification and appropriate management of anal sphincter disruption.</p> <p>The likely early onset of faecal incontinence following childbirth (MacArthur et al. 1997) would allow this indicator to be compiled from surveys undertaken on a relatively short follow-up period, perhaps three months. However, the prevention of faecal incontinence and the effectiveness of its treatment are additional concerns. If, as MacArthur et al. report, in the majority of cases symptoms remain unresolved at ten months, then a longer follow-up, relying on retrospective collection of data relating to incidence and time of onset, may be advantageous.</p>
<b>Potential uses</b>	Clinical audit; provider-based comparisons.
<b>Potential users</b>	Clinicians; commissioners.
<b>Possible confounders</b>	The likelihood that subsequent vaginal delivery may exacerbate faecal incontinence due to previous anal sphincter trauma may make it appropriate to break this indicator down by parity.
<b>Data sources</b>	Data capture for this indicator will require a specific survey, presumably of a sample of the relevant obstetric population. The extremely sensitive nature of the subject makes a postal survey, or other method based on a self-completed

questionnaire, inappropriate. MacArthur et al. specifically excluded questions on faecal incontinence from the questionnaire phase of their wider study of post-natal morbidity, and approached the issue in a subsequent home interview by a research midwife. Their methods probably provide the ideal model for data collection. However, their practicality outside the context of a research project are doubtful. Alternative methods of obtaining these data based around existing health service contacts should be explored. The MacArthur survey provides an operational definition of faecal incontinence including frank incontinence, soiling and urgency, although it has been suggested that it would be additionally useful to enquire about the involuntary loss of flatus (Dunn and McIlwaine 1996, Sultan and Kamm 1997).

**Data quality**

MacArthur et al. were able to interview a high proportion (78%) of the women identified by their sampling frame. Attempts to move data collection to routine health service contacts may suppress self-reports of incontinence.

**Comments**

No specific points.

**Further work required**

Development and piloting of practical data collection methods.

**Conclusion & priority**

**E - To be further developed because the indicator definition is incomplete.**

**References**

Dunn, P.M., and McIlwaine, G. (1996). Perinatal audit. *Prenatal and Neonatal Medicine*, **1**, 160-194.

MacArthur, C., Bick, D.E., and Keighley, M.R.B. (1997). Faecal incontinence after childbirth. *British Journal of Obstetrics and Gynaecology*, **104**, 46-50.

Sultan, A.H., and Kamm, M.A. (1997). Faecal incontinence after childbirth. *British Journal of Obstetrics and Gynaecology*, **104**, 979-982.

## Candidate indicator 16

Characteristics	
Perspective:	Clinical
Outcome relationship:	Direct

<b>Title</b>	<b>Gestational age</b>
<b>Intervention aim</b>	Ensure effective ante-natal, labour, delivery and post-delivery care.
<b>Definition</b>	<p>For a population of registrable births (defined in terms of district of birth or the maternity service responsible for their care) and year: <i>the distribution of gestational age within the given year, across the following categories:</i></p> <ul style="list-style-type: none"> <li>– <i>extremely pre-term: gestation &lt; 28 completed weeks (CW, 196 days)</i></li> <li>– <i>very pre-term: 28 CW (196 days) ≤ gestation &lt; 32 CW (224 days)</i></li> <li>– <i>pre-term: 32 CW (224 days) ≤ gestation &lt; 37 CW (259 days)</i></li> <li>– <i>term: 37 CW (259 days) ≤ gestation &lt; 42 CW (294 days)</i></li> <li>– <i>post-term: gestation ≤ 42 CW (294 days).</i></li> </ul> <p>The resulting fractions should be expressed as percentages and reported, with their numerators and denominators, separately for single and multiple births.</p> <p>In line with the WHO definition, gestational age should be measured from the first day of the last normal menstrual period (LMP).</p> <p>If the LMP is not known or is uncertain, or if the discrepancy between the expected date of delivery based on ultrasonography and on LMP exceeds two standard deviations about the mean at the time of examination (five days for examinations up to 14 weeks, increasing to six days thereafter), the duration of pregnancy should be based on ultrasonography dating, providing the relevant examination has taken place prior to 20 weeks.</p>
<b>Rationale</b>	<p>Preterm birth represents a major factor in perinatal and infant mortality (Rush et al. 1976). Delaying birth and prolonging gestational age may improve a newborn's chances of survival and reduce the risk of subsequent morbidity. The indicator reflects the extent to which the goal of term pregnancies has been achieved. There is some evidence that the risk of preterm birth might be influenced by interventions addressing social and 'life-style' factors (Lumley 1993, Papiernik 1995). Beyond this role as an outcome measure, the indicator is likely to be of use primarily as a case-mix descriptor for a number of other indicators specified by the Working Group.</p>
<b>Potential uses</b>	Case-mix descriptor; assessment of regional/national trends.
<b>Potential users</b>	Clinicians; commissioners; national/regional policy makers.
<b>Possible confounders</b>	A wide variety of factors are associated with pre-term birth, including maternal socio-demographic factors, medical complications and obstetric history (Alexander et al. 1991).

<b>Data sources</b>	The data are available from within the contract minimum data sets for admitted patient care (delivery episodes) and home births (all episodes). The denominator is given by the total <i>number of babies</i> recorded on such episode records. These records may then be broken down across the specified gestation categories with reference to the <i>gestation length</i> field.
<b>Data quality</b>	<p>There is evidence that a proportion of units do not complete the <i>gestation</i> and <i>number of babies</i> fields of the contract minimum data set for admitted patient care (Department of Health 1997). The same survey has also revealed poor completeness of the home birth CMDS.</p> <p>The accuracy of the routine recording of gestational age may be compromised by a failure to comply with the <i>completed</i> weeks definition. The Working Group considers that it is imperative that the collection of gestational age data record the two underlying dates rather than relying on calculation prior to data entry.</p>
<b>Comments</b>	No specific points.
<b>Further work required</b>	None recommended.
<b>Conclusion &amp; priority</b>	<b>A - To be implemented generally on a routine basis.</b>
<b>References</b>	<p>Alexander, G.R., Weiss, J., Hulsey, T.C., and Papiernik, M. (1991). Preterm birth prevention: an evaluation of programs in the United States. <i>Birth</i>, <b>18</b>, 160-169.</p> <p>Department of Health (1997). <i>Statistical bulletin. NHS maternity statistics, England: 1989-90 to 1994-95</i>. Department of Health, London.</p> <p>Lumley, J. (1993). The epidemiology of preterm birth. <i>Baillieres Clinics of Obstetrics and Gynaecology</i>, <b>7</b>, 477-498.</p> <p>Papiernik, E. (1995). Prevention of preterm birth in France. In <i>Reproductive health care for women and babies: policy and ethics</i> (ed B. Sachs). Oxford University Press.</p> <p>Rush, R.W., Keirse, M.J.N.C., Howat, P., Baum, J.D., Anderson, A.B., and Turnbull, A.C. (1976). Contribution of preterm delivery to perinatal mortality. <i>British Medical Journal</i>, <b>2</b>, 965-968.</p>

## Candidate indicator 13

Characteristics	
Perspective:	Clinical
Outcome relationship:	Direct

<b>Title</b>	<b>Birthweight</b>
<b>Intervention aim</b>	Ensure effective ante-natal, labour, delivery and post-delivery care.
<b>Definition</b>	<p>For a population of registrable births (defined in terms of district of birth or the maternity service responsible for their care) and year: <i>the distribution of birthweight within the given year, tabulated by intervals of 500g; i.e. &lt; 500g; 500-999g; 1000-1499g, etc.</i></p> <p>The figures should be expressed per 1,000 births and reported, with their denominators, separately for single and multiple births.</p>
<b>Rationale</b>	<p>Many maternal behavioural and biological factors contribute to low birthweight, which in turn can increase infants' likelihood of disease and death. Among babies born in 1994, those with birthweights below 1500g accounted for around 43% of stillbirths and 52% of neonatal deaths among singletons and 69% of stillbirths and 81% of neonatal deaths among multiple births (Office for National Statistics 1996).</p> <p>The association of birthweight with gestation makes the comments on the maintenance of pregnancy noted in Indicator 16 relevant to the indicator specified here. Additionally, programmes encouraging smoking cessation - see Indicator 3 - may have a role in reducing intra-uterine growth retardation and thereby improving birthweights.</p> <p>As an outcome statistic, the indicator reflects the extent to which the avoidance of low birthweight has been achieved. However, it is also likely to be of use as a case-mix descriptor for a number of other indicators specified by the Working Group.</p>
<b>Potential uses</b>	Case-mix descriptor; assessment of regional/national trends.
<b>Potential users</b>	Clinicians; commissioners; national/regional policy makers.
<b>Possible confounders</b>	A wide variety of factors are associated with low birthweight, including maternal socio-demographic factors such as ethnicity, medical complications and obstetric history.
<b>Data sources</b>	Birthweight data are available from birth registrations, but these sources do not provide details of gestational age for live births. Alternatively, the data are available from within the contract minimum data sets for admitted patient care (delivery episodes) and home births (all episodes). The denominator is given by the total number of babies recorded on such episode records. These records may then be broken down across the specified gestation categories with reference to the birthweight field.
<b>Data quality</b>	Birth registration data are likely to be of good quality. Within the contract minimum data set, there is evidence that a proportion of units do not complete the

*birthweight* and *number of babies* fields of the contract minimum data set for admitted patient care (Department of Health 1997). The same survey has also revealed the completeness of the home birth CMDS to be relatively poor.

<b>Comments</b>	No specific points.
<b>Further work required</b>	None recommended.
<b>Conclusion &amp; priority</b>	<b>A - To be implemented generally on a routine basis.</b>
<b>References</b>	Department of Health (1997). <i>Statistical bulletin. NHS maternity statistics, England: 1989-90 to 1994-95</i> . Department of Health, London. Office for National Statistics (1996). <i>Mortality statistics: perinatal and infant, England and Wales, 1995</i> . The Stationery Office, London.

## Candidate indicator 18

Characteristics	
Perspective:	Clinical
Outcome relationship:	Indirect

<b>Title</b>	<b>Maternal admissions to ICU</b>
<b>Intervention aim</b>	Ensure effective ante-natal, labour, delivery and post-delivery care.
<b>Definition</b>	<p>For a population of women (defined with respect to district of residence or use of a given maternity service), year and admission period (defined below): <i>the number of women delivering within the given year who are admitted, for any reason related to pregnancy/childbirth, to an intensive care unit (ICU), divided by the number of women delivering within the given year.</i> Three admission periods are relevant to this indicator:</p> <ul style="list-style-type: none"> <li>– ante-natal (at any gestation)</li> <li>– post-natal (within six weeks of the delivery)</li> <li>– late post-natal (between six weeks and one year after the delivery).</li> </ul>
<b>Rationale</b>	<p>In this indicator maternal admissions to intensive care within the three specified periods are taken as a proxy for any of a wide range of serious complications of pregnancy and childbirth. As not all admissions within these periods will reflect such complications (e.g. admissions following a road traffic accident), individual cases will require review to exclude irrelevant admissions. A relatively brief post-natal interval is included to focus attention on a period in which the proportion of relevant admissions can be expected to be relatively high.</p>
<b>Potential uses</b>	Clinical audit; provider-based comparisons; population based comparisons; assessment of regional/national trends.
<b>Potential users</b>	Clinicians; commissioners; national/regional policy makers.
<b>Possible confounders</b>	<p>While the development of serious complications may in part reflect the effectiveness of prior medical and midwifery care, a wide range of maternal and fetal predisposing factors will influence the risks faced in any given case.</p> <p>Cases in which a particularly high risk of complications is anticipated are likely to be over-represented among women under the care of maternity units with ready access to ICU facilities. The local availability of facilities may also influence the admission thresholds.</p>
<b>Data sources</b>	<p>Admissions to ICU are recorded within the augmented patient care extension to the standard contract minimum data set for admitted patient care (required since October 1997; Information Management Group 1997). Post-natal admissions falling within the specified admission periods may then be identified through linkage to maternity episodes within the same contract minimum data set (by means of the mother's NHS number). The absence of diagnostic information within the augmented patient care extension means that the set of cases identified by the linkage operation would have to be reviewed individually to establish whether the ICU admission was related to pregnancy/childbirth.</p>

Those ante-natal referrals to ICU that were made during an in-patient episode of obstetric care may be identified by a similar process of linkage between the augmented patient care and admitted patient care data sets. However, cases admitted to ICU independently of the maternity unit (for example following sudden collapse) would require a review of all ICU admissions of women of childbearing age. This process would be facilitated by the introduction within the augmented patient care data set of a flag to indicate current or recent pregnancy. The programme of case-mix data collection (and associated national reporting structure), being established by the Intensive Care Society (Rowan 1996) offers the prospect of an alternative way forward and the potential for linking these data with the standard minimum data set should be explored.

**Data quality**

The reliability with which 'pregnancy related' admissions may be identified within individual case reviews will require assessment.

The quality of data within the augmented patient care data set has yet to be established.

**Comments**

No specific points.

**Further work required**

Pilot testing of different data capture methods. The development of a detailed definition of 'pregnancy related' should be considered.

**Conclusion & priority**

**E - To be further developed because further work is needed on the methods of measurement.**

**References**

Information Management Group (1997). *Data Manual Version 5*. NHSE, Birmingham.

Rowan, K. (1996). Need for a national arthroplasty register. Intensive Care Society has set up a centre for national audit. *British Medical Journal*, **313**, 1007-1008.

## Candidate indicator 19

<b>Characteristics</b>	
<i>Perspective:</i>	Clinical
<i>Outcome relationship:</i>	Indirect

<b>Title</b>	<b>Use of ante-natal corticosteroids to enhance pulmonary maturity</b>
<b>Intervention aim</b>	Ensure effective ante-natal, labour, delivery and post-delivery care.
<b>Definition</b>	For a population of women (defined with respect to district of residence or use of a given maternity service) and year: <i>the number of women delivering in the given year at between 24 and 36 completed weeks (168 and 252 days) gestation who receive ante-natal corticosteroids, divided by the number of women delivering in the given year at between 24 and 36 completed weeks gestation.</i> The resulting fraction should be expressed as a percentage and reported with its numerator and denominator. It may be useful to record the number of times corticosteroids are administered in a pregnancy.
<b>Rationale</b>	A policy of administering corticosteroids to women who are expected to deliver preterm can achieve substantial reductions in neonatal morbidity and mortality (Royal College of Obstetricians and Gynaecologists 1996). The proposed indicator measures compliance with current recommended practice in this area.
<b>Potential uses</b>	Clinical audit; inter-provider comparisons; assessment of regional/national trends.
<b>Potential users</b>	Clinicians; commissioners; regional/national policy makers.
<b>Possible confounders</b>	When mothers first present in labour prematurely, there will have been no opportunity for prior administration of corticosteroids. It follows that in units where this is relatively common, the indicator value may be low.
<b>Data sources</b>	Audit of case notes.
<b>Data quality</b>	The accuracy of the indicator will depend on the completeness of clinical notes with respect to relevant indications, contra-indications and details of corticosteroid administration.
<b>Comments</b>	Indications for the use of corticosteroids are given in the relevant guideline from the Royal College of Obstetricians and Gynaecologists (1996).
<b>Further work required</b>	None recommended.
<b>Conclusion &amp; priority</b>	<b>B - To be implemented generally by periodic survey.</b>
<b>References</b>	Royal College of Obstetricians and Gynaecologists (1996). <i>Ante-natal corticosteroids to prevent respiratory distress syndrome: guideline no.7.</i> Royal College of Obstetricians and Gynaecologists, London.

## Candidate indicator 20

Characteristics	
Perspective:	Clinical
Outcome relationship:	Indirect

<b>Title</b>	<b>Mode of delivery rates</b>
<b>Intervention aim</b>	Ensure effective ante-natal, labour, delivery and post-delivery care.
<b>Definition</b>	<p>For a population of women (defined with respect to district of residence or use of a given maternity service) and year: <i>the number of deliveries associated with each of the following modes:</i></p> <ul style="list-style-type: none"> <li>– <i>spontaneous</i></li> <li>– <i>assisted</i></li> <li>– <i>caesarean undertaken before or at onset of labour</i></li> <li>– <i>caesarean undertaken during labour</i></li> </ul> <p><i>each divided by the total number of deliveries.</i> The resulting fractions should be expressed as percentages (with associated numerators and denominators), and the results should be reported both for the whole population as well as by parity (0, 1, 2, 3 or more) and separately for cephalic and breech presentations. Assisted deliveries for cephalic presentations should be further broken down between ventouse and forceps deliveries.</p>
<b>Rationale</b>	<p>The mode of delivery has a potentially wide range of effects on the outcome for both mother and infant (e.g. Johanson et al. 1993; Grant 1997) and thus, although it is a measure of process, it may be useful to those who are examining clinical practice with a view to improving outcomes. In particular, units with an atypical distribution of cases across delivery modes may use this fact as a starting point for the further investigation of their management of labour and delivery. Users of maternity services may also find value in reviewing this indicator as one means of matching their preferences with respect to obstetric intervention to the available maternity services.</p>
<b>Potential uses</b>	Clinical audit; provider based comparisons; assessment of regional national trends.
<b>Potential users</b>	Clinicians; provider management; commissioners; national/regional policy makers; consumers/public.
<b>Possible confounders</b>	<p>A wide range of maternal and fetal risk factors will be associated with mode of delivery. In particular, units receiving substantial numbers of in-utero transfers might wish to examine those cases separately. More generally, the validity of inter-unit comparisons of obstetric practice with respect to delivery methods could be improved by reporting the indicator within risk factor defined case-mix groups such as the 'standard primipara' (Paterson et al. 1991; Cleary et al. 1996), as has been recommended recently by the Audit Commission (Audit Commission 1997).</p> <p>It should be recognised that the personal preferences of the women served by a given maternity unit may also have some influence on its practice with respect to delivery method. Such preferences may vary systematically with socio-demographic variables.</p>

<b>Data sources</b>	The required data are available from within the contract minimum data sets for admitted patient care (delivery episodes) and home births (all episodes). The denominator is given by the total <i>number of babies</i> recorded on such episode records. These records may then be broken down across the required delivery mode categories, within cephalic and breech subsets, with reference to the <i>delivery method</i> , ICD-10 <i>diagnosis</i> and OPCS-4 <i>procedure</i> fields.
<b>Data quality</b>	There is evidence that a proportion of units do not complete the <i>delivery method</i> and <i>number of babies</i> fields of the contract minimum data set for admitted patient care (Department of Health 1997). The same survey has also revealed the completeness of the home birth CMDS to be relatively poor. It may be necessary to use OPCS-4 <i>procedure</i> fields to identify surgical and instrumental deliveries. Linked birth episode records may also be used to count multiple births in the absence of an explicit record. Where data are available, there should be no major obstacles to recording tolerably well the basic classification of mode (and presentation). The distinction between caesareans undertaken before or during labour may be less reliable for the subset of operative deliveries occurring around the commencement of labour.
<b>Comments</b>	Additional subdivisions of forceps deliveries (e.g. lift out vs. rotational) may also be of interest in the context of this indicator. Furthermore, given sufficiently detailed diagnostic coding it would be both possible and valuable to consider, within the indicator definition, the indications for a given mode of delivery and where more than one method was used. However, data quality considerations make it prudent to begin with a relatively crude classification, adding detail as information systems begin to demonstrate competence.
<b>Further work required</b>	None recommended.
<b>Conclusion &amp; priority</b>	<b>A - To be implemented generally on a routine basis.</b>
<b>References</b>	<p>Audit Commission (1997). <i>First class delivery: improving maternity services in England and Wales</i>. Audit Commission, London.</p> <p>Cleary, R., Beard, R.W., Chapple, J., Coles J., Griffin, M., Joffe, M., and Welch, A. (1996). The standard primipara as a basis for inter-unit comparisons of maternity care. <i>British Journal of Obstetrics and Gynaecology</i>, <b>103</b>, 223-229.</p> <p>Department of Health (1997). <i>Statistical bulletin. NHS maternity statistics, England: 1989-90 to 1994-95</i>. Department of Health, London.</p> <p>Grant, A. Elective versus selective Caesarean delivery of the small baby. (1997). In <i>Pregnancy and childbirth module of the Cochrane database of systematic reviews</i> (ed J. Neilson., C. Crowther, E. Hodnett, G. Hofmeyr, and M. Keirse). The Cochrane Library, Oxford.</p>

Johanson, R.B., Rice, C., Doyle, M., Arthur, J., Anyanwu, L., Ibrahim, J. Warwick, A. Redman, C.W., and O'Brien, P.M. (1993). A randomised prospective study comparing the new vacuum extractor policy with forceps delivery. *British Journal of Obstetrics and Gynaecology*, **100**, 524-530.

Paterson, C.M., Chapple, J.C., Beard, R.W., Joffe, M., Steer, P.J., and Wright, C.S.W. (1991). Evaluating the quality of maternity services - a discussion paper. *British Journal of Obstetrics and Gynaecology*, **98**, 1073-1078.

## Candidate indicator 21

Characteristics	
Perspective:	Clinical
Outcome relationship:	Indirect

<b>Title</b>	<b>Neonatal admissions to: (a) intensive care (b) special care</b>
<b>Intervention aim</b>	Ensure effective ante-natal, labour, delivery and post-delivery care.
<b>Definition</b>	For a population of newborns (defined in terms of district of birth or the maternity service responsible for their care) and year: <i>the number of babies of at least 37 completed weeks (259 days) gestation who are born within the given year and admitted within seven days of birth to a special or neonatal intensive care unit for at least 48 hours, divided by the number of babies of at least 37 completed weeks (259 days) gestation born within the given year.</i> The resulting fraction should be expressed as a percentage and reported with its numerator and denominator.
<b>Rationale</b>	<p>A high rate of admission of term babies to special care, relative to other units with a similar case-mix, may reflect suboptimal intra-partum or neonatal care (Dunn and McIlwaine 1996).</p> <p>In order to reduce the effect of inter-unit variability in the definition of special or neonatal intensive care, admission is taken to imply a physical separation of mother and baby. The definition attempts to focus on serious problems, rather than brief precautionary observations, by including admissions within the numerator only if they last for at least 48 hours.</p>
<b>Potential uses</b>	Clinical audit; provider-based comparisons.
<b>Potential users</b>	Clinicians; commissioners.
<b>Possible confounders</b>	<p>While the indicator specifies term babies, variation in birthweight within this group will be associated with the rate of admission to special care. Local provision and availability of special care facilities are likely to influence admission and discharge thresholds, and thereby the number of cases meeting the operational definition of an admission to special care.</p> <p>Tertiary units will have ante-natal transfers of cases of congenital malformations who are likely to require neonatal unit admission. They may also take post-natal transfers of asphyxiated term babies who should not be included within these statistics.</p>
<b>Data sources</b>	Relevant data are held within the contract minimum data set for admitted patient care and home delivery. Term babies born within the given year may be identified with reference <i>gestation</i> and <i>date of birth</i> fields within birth episodes for the district, unit or team under consideration. These birth episodes (and linked general episodes for the same neonate) may then be examined for lengths of stay in excess of two days and a <i>neonatal level of care</i> coded as 1, 2 or 3 ('special care', 'high dependency intensive care' and 'maximal intensive care'). This method however identifies a superset of the numerator specified by the indicator. In the case of admissions to a neonatal intensive care unit, further linkage to the augmented care

data set (ACDS) would identify those infants admitted for at least 48 hours. However, the ACDS does not record admissions to special (as opposed to intensive) care, and additional data would therefore be required identify those cases where at least 48 hours were spent in special care (the *neonatal level of care* indicator refers to the highest level of care within an episode). Furthermore, it should be noted that while any admission to 'level 2' or 'level 3' intensive care is likely to meet the indicator's operational definition of special care, the CMDS designation of 'special care' may include cases where there is no physical separation from the mother.

**Data quality**

The general completeness and accuracy of the *neonatal level of care* field of the CMDS has not been established. The general quality of the ACDS is also currently unknown. The quality of information from specialised clinical information systems covering special care would depend on local circumstances. Admissions to special care associated with congenital malformations have not been excluded from this indicator as it was felt that sufficiently reliable data would not be generally available to do this.

**Comments**

No specific points.

**Further work required**

None recommended.

**Conclusion & priority**

**For neonatal admissions to intensive care (21a):**

**A - To be implemented generally on a routine basis.**

**For admissions to special care (21b):**

**C - To be implemented where local circumstances allow on a routine basis.**

**References**

Dunn, P.M., and McIlwaine, G. (1996). Perinatal audit. *Prenatal and Neonatal Medicine*, **1**, 160-194.

## Candidate indicator 22

Characteristics	
Perspective:	Clinical
Outcome relationship:	Indirect

<b>Title</b>	<b>Emergency post-natal admission of mother</b>
<b>Intervention aim</b>	Ensure effective ante-natal, labour, delivery and post-delivery care.
<b>Definition</b>	<p>For a population of women (defined with respect to district of residence or use of a given maternity service), year and follow-up period: <i>the number of women delivering within the given year and subsequently admitted to hospital as emergencies, within the specified period post-partum, divided by the number of women delivering within the given year.</i> Two follow-up periods are suggested, although others may also be relevant:</p> <ul style="list-style-type: none"> <li>– <i>seven days post-partum</i></li> <li>– <i>six weeks post-partum.</i></li> </ul> <p>The resulting fractions should be expressed as percentages and reported with their numerators and denominator.</p>
<b>Rationale</b>	<p>Unplanned re-admissions may reflect an adverse outcome of antecedent health care and/or the development of complications. With appropriate consideration of patient risk factors, re-admission rates may draw attention to aspects of the planning, organisation and delivery of care which require review.</p> <p>Due to acknowledged problems with routine diagnostic coding, it is recognised that the information required to distinguish relevant and irrelevant re-admissions may not be readily available. Additionally, diagnostic uncertainty during such emergency admissions will also affect the reliability with which this distinction may be made. To be inclusive, therefore, this indicator counts all admissions irrespective of the recorded reason.</p>
<b>Potential uses</b>	Clinical audit.
<b>Potential users</b>	Clinicians; commissioners.
<b>Possible confounders</b>	A wide range of maternal risk factors are likely to influence the post-natal emergency admission rate. Additionally, those units with relatively long average lengths of stay for delivery episodes may have reduced re-admission rates, as complications have a greater opportunity to become apparent prior to discharge.
<b>Data sources</b>	The required data for capturing the index deliveries are available from the contract minimum data sets for admitted patient care (delivery episodes) and home births (all episodes). Subsequent emergency admissions would be identifiable from the admitted patient care CMDS for general episodes, and could be linked with the index deliveries by means of the NHS number.
<b>Data quality</b>	The basic facts of the occurrence of a delivery and a subsequent emergency admission are likely to be tolerably well recorded by the CMDS.

<b>Comments</b>	Many questions remain about the validity and utility of this indicator (Henderson et al. 1989; Milne and Clarke 1990) and it cannot be recommended for implementation in advance of pilot testing. However, its potentially straightforward derivation from routine information systems (once developments such as the NHS number are in place) makes such exploratory work worthwhile. After such pilot testing is undertaken, consideration could be given to the merits of an indicator covering elective admissions, including day cases, which would cover procedures such as re-suturing, and one for the emergency in-patient re-admission of neonates.
<b>Further work required</b>	Pilot testing as discussed above.
<b>Conclusion &amp; priority</b>	<b>E - To be further developed because link with effectiveness is not clear.</b>
<b>References</b>	<p>Henderson, J., Goldacre, M.J., Graveney, M.J., and Simmons, H.M. (1989). Use of medical record linkage to study re-admission rates. <i>British Medical Journal</i>, <b>299</b>, 708-713.</p> <p>Milne, R., and Clarke, A. (1990). Can re-admission rates be used as an outcome indicator? <i>British Medical Journal</i>, <b>301</b>, 1139-1140.</p>

## Candidate indicator 23

Characteristics	
Perspective:	Clinical
Outcome relationship:	Indirect

<b>Title</b>	<b>Detection and treatment of Rhesus iso-immunisation in pregnancy</b>
<b>Intervention aim</b>	Detect and respond to specific disorders affecting the baby.
<b>Definition</b>	<p>For a population of women (defined with respect to district of residence or use of a given maternity service) and survey period:</p> <p>Detection:</p> <ul style="list-style-type: none"> <li>– <i>number of women booked within the survey period for pregnancy care, who have their Rb group determined ante-natally, divided by the number of women booked within the survey period for pregnancy care</i></li> <li>– <i>number of women who are rhesus negative booked within the survey period for pregnancy care who are screened for antibodies between 28-36 weeks gestation, divided by the number of women booked within the survey period for pregnancy care who are rhesus negative.</i></li> </ul> <p>Treatment:</p> <ul style="list-style-type: none"> <li>– <i>number of women booked within the survey period for pregnancy care and who meet the criteria for anti-D immunoglobulin treatment (see below) and are so treated, divided by the number of women booked within the survey period for pregnancy care and who meet the criteria for anti-D immunoglobulin treatment.</i></li> </ul> <p>The criteria for the administration of anti-D IgG are given in Benbow et al. (1997) and comprise two categories of indication: following the delivery of a RhD-positive baby; and following an event or procedure (e.g. chorionic villus sampling, closed abdominal trauma) that carries a risk of transplacental haemorrhage. Full details of the latter are given in Benbow et al. (1997).</p> <p>The resulting fractions should be expressed as percentages and reported with their denominators.</p>
<b>Rationale</b>	<p>Without prophylaxis a significant proportion of RhD-negative women who give birth to a RhD-positive baby will develop immune anti-D as a result of foeto-maternal haemorrhage. The recommended practice of administering anti-D IgG post-natally in such cases, as well as following miscarriage and a range of ante-natal events associated with foeto-maternal haemorrhage, has contributed to a substantial fall in deaths attributed to haemolytic disease of the newborn (Clarke and Hussey 1994). However, there is evidence that aspects of the guidelines are not being adhered to universally (Howard et al. 1997). Indicator 23 measures compliance with the guidelines, as recently reiterated by Benbow et al. (1997).</p>
<b>Potential uses</b>	Clinical audit; provider based comparisons; assessment of regional/national trends.
<b>Potential users</b>	Clinicians; provider management; commissioners; national/regional policy makers.
<b>Possible confounders</b>	No specific ones identified.

<b>Data sources</b>	Audit of case notes.
<b>Data quality</b>	The accuracy of the indicator will depend on the completeness of clinical notes with respect to screening, its results and the administration of anti-D IgG.
<b>Comments</b>	No specific points.
<b>Further work required</b>	None recommended.
<b>Conclusion &amp; priority</b>	<b>B - To be implemented generally by periodic survey.</b>
<b>References</b>	<p>Benbow, A. Semple, D., and Maresh, M. (1997). <i>Effective procedures in maternity care suitable for audit</i>. The Royal College of Obstetricians and Gynaecologists, London.</p> <p>Clarke, C.A., and Hussey, R.M. (1994). Decline in deaths from Rhesus haemolytic disease of the new born. <i>Journal of the Royal College of Physicians of London</i>, <b>28</b>, 310-311.</p> <p>Howard, H.L., Martlew, V.J., McFadyen, I.R., and Clarke, C.A. (1997). Preventing Rhesus D haemolytic disease of the newborn by giving anti-D immunoglobulin: are the guidelines being adequately followed? <i>British Journal of Obstetrics and Gynaecology</i>, <b>104</b>, 37-41.</p>

## Candidate indicator 24

Characteristics	
Perspective:	User
Outcome relationship:	Direct

<b>Title</b>	<b>Women's experience of maternity services</b>
<b>Intervention aim</b>	Ensure mother is satisfied with the support she has received and that she and her baby have been at the centre of care.
<b>Definition</b>	For a population of women (defined with respect to district of residence or use of a given maternity service) delivering within a given survey period: <i>a summary of women's responses to a standard questionnaire assessing their experiences of / satisfaction with the maternity services they received.</i> Summary scores should be presented for individual parts of the maternity services, together with details of sampling and response rates.
<b>Rationale</b>	<p>The recent report of the Expert Maternity Group (Department of Health 1993b) identified the following objective for the development of maternity services in the UK. <i>The views of women who use the service should be regularly monitored and services adjusted to reflect their needs.</i></p> <p>Surveys of users' satisfaction with the services provided to them represent one practical and potentially valuable method of monitoring these views and providing a basis for modifying the service. While the use of structured questionnaires does not obviate the need to explore users' views using in-depth qualitative methods, the availability of standard indicators of user views will allow providers to analyse their results on a comparative basis. Comparisons between services or for the same service over time can be used to highlight problem areas and guide more detailed local investigations. As noted below, variables reflecting the population served by a given maternity unit are likely to influence the results obtained in a survey of that population's experiences. It is therefore vital that any comparative analysis is undertaken in a collaborative spirit intended to improve services for all. Data on women's experience of, and satisfaction with, services are not a suitable basis for a simplistic 'league table' approach to comparisons. However, units undertaking surveys of this kind may feel it is appropriate to publish the results in such a way that potential future service users can be informed by the views of past users across the range of available services.</p>
<b>Potential uses</b>	Clinical audit; provider based comparisons; regional and national trends.
<b>Potential users</b>	Clinicians; provider management; commissioners; consumers/public.
<b>Possible confounders</b>	A variety of socio-demographic and other factors related to obstetric history are likely to influence women's reports of their experience of maternity services. While inter-unit comparisons, particularly against norms derived from peer group units (e.g. inner city, non-teaching) may be useful, comparisons should be treated with caution.

**Data sources**

A variety of suitable measures are available 'off-the-shelf'. The availability of such measures obviates the need to develop and test questionnaires from scratch, and would allow a group of units to agree on the use of a given questionnaire in order to facilitate inter-unit comparisons of the results. It is of most value to carry out such studies five to six weeks post-partum. Several of the available options, all suitable for postal self-completion, are noted here. The final choice of questionnaire is likely to be guided by local consideration of issues such as the instruments' coverage of different aspects of the maternity services.

- *Women's experience of maternity care - a survey manual* (Mason 1989). This much more detailed and longer survey instrument, produced by the OPCS, was the basis for the 'short form' developed by Lamping and Rowe.
- *Survey of women's experience of maternity services, short form.* (Lamping and Rowe 1996). A relatively brief questionnaire that allows summary scores to be calculated for each of several aspects of care: overall care; ante-natal care; care during labour; and post-natal care.
- *Maternity care survey* (Audit Commission 1997). This is the questionnaire used in the Commission's 1997 audit of maternity services. The report provides some comparative data. It has a strong bias towards coverage of post-natal care.

Additional guidance on the selection and use of off-the-shelf measures is available in the form of a resource pack from the College of Health (Craig 1998). It includes a review of the pros and cons of a range of quantitative instruments and other qualitative approaches to gauging the views of maternity service users.

**Data quality**

On the basis of previous experience with the instruments discussed above, response rates of around 70% can be expected. Although the demographic and clinical details of responders and non-responders may be compared, to establish whether important differences exist between them, the satisfaction of the latter group will remain unknown. The exclusion from postal surveys of women with visual or cognitive disabilities, literacy problems or who are not English speaking, for example, may have a systematic effect on results. These factors underline the need to supplement standard postal surveys with other forms of data collection. It is important to seek out the views of 'hard to reach' groups such as teenagers or travelling people.

**Comments**

No specific points.

**Further work required**

None recommended.

**Conclusion & priority**

**B - To be implemented generally by periodic survey.**

**References**

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## 4. RECOMMENDATIONS

### To be implemented generally on a routine basis

4.1 It is **recommended** that the following indicators be implemented generally on a routine basis (the numbers refer to the indicator specifications in Section 4):

**8: maternal mortality**

**9: stillbirths, neonatal and post-neonatal mortality**

**12: perineal trauma and episiotomy rates**

**16: gestational age**

**17: birthweight**

**20: mode of delivery rates**

**21a: neonatal admissions to intensive care.**

4.2 While the **rate of maternal mortality** in the UK fell in 1996 to 9.8 per 100,000 total births, its importance as an adverse outcome remains as the confidential enquiries still reveal sub-standard care contributing to a substantial number of the deaths.

4.3 **Stillbirths and infant mortality rates** reflect some of the most serious adverse outcomes of pregnancy and childbirth and can be used to provide an estimate of the overall risk faced by an obstetric population. It is essential that birthweight groupings are used in the tabulation and interpretation of these indicators.

4.4 **Perineal wounds** whether traumatic or surgical are associated with a number of adverse consequences and research evidence suggests that episiotomy should be used restrictively rather than routinely. Data from which to derive this indicator are currently poorly collected and the recording of the level of a perineal tear is unreliable. More effort in data capture is required before the indicator can be credible if compiled simply from routine statistics.

4.5 Avoiding premature birth may improve a newborn's chances of survival and reduce the risk of subsequent morbidity. As well as an outcome measure, **gestational age** is also likely to be of use as a case-mix descriptor for other indicators in the recommended set. Currently, data on gestational age are not well collected. The Working Group considers it essential that the two dates – date of last menstrual period and date of birth – are recorded and that gestational age is calculated from the two recorded dates.

4.6 **Birthweight**, like gestational age, is both an indicator of the extent to which an adverse outcome, low birthweight, has been avoided and a case-mix descriptor. The data are generally of good quality.

4.7 The **mode of delivery** has a potentially wide range of effects on outcomes for both mother and baby. Units with an atypical distribution of mode of delivery - e.g. rising section rates - may use this as a starting point for

auditing their management of labour and delivery. Interpretation of the indicator must take into account women's preferences for method of delivery. Data on delivery are currently poorly completed. When this improves it will be possible to develop a more sophisticated classification of modes of delivery.

- 4.8** Information about **admission to neonatal intensive care** is adequately collected and an indicator based on it can be recommended for general implementation. Admission to special care is only recommended for implementation in local circumstances where its recording is known to be good because in many places its recording is known to be very variable. The indicator is defined only to cover babies of 28 weeks gestation or greater.

**To be implemented generally by periodic survey**

- 4.9** It is **recommended** that the following indicators be implemented generally by periodic survey:

**19: use of ante-natal corticosteroids to enhance pulmonary maturity**  
**23: detection and treatment of rhesus iso-immunisation in pregnancy**  
**24: women's experience of maternity services.**

- 4.10** A policy of **administering corticosteroids to women** who are expected to deliver before full-term can achieve substantial reductions in neonatal mortality and morbidity. The indicator can be derived from data obtained by an audit of casenotes.

- 4.11** The **detection and treatment of rhesus iso-immunisation in pregnancy** has contributed to a substantial fall in death attributed to haemolytic disease of the newborn. The indicator measures compliance with current treatment guidelines that evidence suggests are not being used universally. The indicator can be derived from data obtained through audits of case notes.

- 4.12** It is now generally considered good obstetric practice to measure **women's experience of maternity services**. A variety of suitable tools is available and three are commended by the Working Group. Further information about these measurement tools is available from the College of Health. Well planned studies should achieve response rates of over 70%.

**To be implemented where local circumstances allow on a routine basis**

- 4.13** It is **recommended** that the following indicator is implemented where local circumstances allow on a routine basis:

**21b: neonatal admissions to special care.**

**4.14** The accurate collection of data about **neonatal admissions to special care** is considerably more difficult than that for intensive care because of variation in the designation of special care. Furthermore, local provision and availability of special care facilities are likely to influence admission and discharge thresholds.

**To be implemented where local circumstances allow by periodic survey**

**4.15** It is **recommended** that the following indicators be implemented where local circumstances allow by periodic survey:

**3: smoking among pregnant women**

**4: weekly alcohol consumption among pregnant women**

**7: incidence and duration of breast-feeding**

**14: incidence of post-natal urinary incontinence.**

Information about the first three indicators is also available from the current national Infant Feeding Survey.

**4.16** The association between **smoking** and adverse outcomes of pregnancy has been well established. In particular, it is a factor in intra-uterine growth retardation and is associated with the risk of miscarriage, prematurity and haemorrhage from the placenta. Three measures have been recommended relating to women smoking during pregnancy, giving up during pregnancy and still not smoking two months after birth.

**4.17** There is general agreement that women should be moderate in their **alcohol consumption**, or abstain, during pregnancy. However, there is little consensus as to whether a 'safe' limit should be set and what it might be. The indicator recommended only attempts to use established methods to identify the distribution of alcohol consumption in a population of pregnant women.

**4.18** The benefits of **breast-feeding** are widely recognised and the evidence of its association with improved health for the baby includes a reduced incidence of illnesses such as gastroenteritis and respiratory infection. The indicator specified encompasses a four month target and places it within the context of the incidence of attempted breast-feeding and its duration.

**4.19 Post-natal urinary incontinence** may reflect the care provided both pre- and post-natally. Little information is currently available and this indicator would allow the extent of the problem to be quantified in a systematic way.

**To be further developed**

**4.20** It is **recommended** that the following indicators require further development

before implementation is considered:

- 1: general health status of mother after delivery**
- 2: incidence of post-natal depression**
- 5: illegal drug misuse among pregnant women**
- 6: incidence of domestic violence associated with pregnancy and childbirth**
- 10: incidence of eclampsia**
- 11: incidence of severe post-partum haemorrhage**
- 13: pain during labour and delivery**
- 15: incidence of post-natal faecal incontinence**
- 18: maternal admission to ICU**
- 22: emergency post-natal admission of mother.**

**4.21** It is likely that the established **general health status** measure SF-36, could be used as the basis for an indicator but its validity has not yet been tested in a post-partum population. Two kinds of normative comparison have been recommended, i.e. between women who have recently given birth and similar women who have not, and between subsets of women who have recently given birth.

**4.22** About 10-15% of mothers experience non-psychotic **depressive illness** in the early post-partum period. The Edinburgh Post-Depression Scale (EPDS) is a well validated screening tool for the detection of post-natal depression. However, its specificity is imprecise and it has not been used as an outcome measure. Further work is required to describe the distribution of EPDS scores and their changes over time as well as to identify the optimum time in the post-partum period to collect the data.

**4.23** Pregnant women who use **illegal drugs** may experience health problems, either specifically due to the misuse or stemming from social problems exacerbated by drug use. There is no available validated measurement tool and one should be developed as a matter of urgency.

**4.24 Domestic violence** endangers the health and safety of both the mother and baby. An operational definition of domestic violence should be developed as a matter of urgency as should the method of collecting these data in pregnancy and the post-partum period.

**4.25 Eclampsia** is a rare but serious complication of pregnancy. It occurs in about 1 in 2000 deliveries and is associated with significant mortality and morbidity. However, the evidence that eclampsia can be prevented is not strong. Further work needs to be done to establish the effectiveness of interventions before an indicator on eclampsia, as an avoidable outcome, can be recommended.

- 4.26 Post-partum haemorrhage** is associated with maternal morbidity and mortality, both through direct effects and as a result of its surgical treatment. An operational definition of post-partum haemorrhage should be developed and tested before an indicator can be implemented.
- 4.27 Pain during labour and delivery** could be measured by questions developed in the National Birthday Trust's measurement tool. Before implementation this needs to be tested against other measures such as the McGill Pain Questionnaire and the timing of data collection needs to be assessed.
- 4.28 Faecal incontinence** affects about 4% of women post-partum. Before this indicator can be implemented, work needs to be done on developing appropriate data collection methods for this sensitive information.
- 4.29 Maternal admissions to an intensive care unit** have been taken as a proxy for particularly serious complications of pregnancy and childbirth. Problems exist with identifying pregnancy-related admissions. Data collection methods will need to be developed to ensure all relevant admissions are captured.
- 4.30 The emergency post-natal admission of a mother** to hospital may reflect on the adverse outcome of antecedent health care and/or the development of complications. Although its derivation from routine systems is straightforward, the validity and utility of this indicator needs to be investigated before it could be recommended for implementation.

#### **Routine maternity information systems**

- 4.31** The Working Group felt strongly that serious effort should be put into ensuring better quality of data in routine information systems. There are important data items which should already be recorded completely and reliably when often they are not. Improvements to existing systems will often be a more efficient way of getting good data than the design of new approaches.
- 4.32** In particular, the Working Group recommends that urgent action should be taken to:
- ensure the completeness of the Maternity Hospital Episode System.
  - develop the linkage of clinical and social data about an individual
  - develop systems to collect data about longer term outcomes.



# APPENDIX A: BACKGROUND TO THE WORK

## Summary

**A.1** Over the last few years a major component of the Department of Health's and NHS Executive's strategy has been to promote the development and use of measures of health outcome. In July 1993 the Central Health Outcome Unit (CHOU) was set up within the Department of Health (DoH). Commissioned by the DoH, in 1993 a feasibility study of potential outcome indicators was published by the Faculty of Public Health Medicine and a package of indicators was published by the University of Surrey for consultation. Following these two phases of development, a third phase of work was initiated by the CHOU. Its remit is to report on 'ideal' health outcome indicators.

## Central Health Outcome Unit

**A.2** The CHOU is an internal DoH unit whose goal is 'to help secure continuing improvement in the health of the people of England through cost-effective and efficient use of resources' (Lakhani 1994). The objectives of the Unit are to:

- encourage and co-ordinate the development of health outcome assessment, particularly in respect of the development of appropriate methods, appropriate data collection systems, expertise, analytical skills, and interpretation
- encourage and support the use of health outcome assessment and information in making policy about health interventions and in the planning, delivery and monitoring of services.

**A.3** Several national committees have a special interest in outcomes and were kept informed of progress:

- Clinical Outcomes Group
- Public Health Network
- CMO Working Group on Information Management and Technology.

## Phases 1 and 2

**A.4** The Faculty of Public Health Medicine was commissioned to undertake a feasibility study of potential indicators which reflect health end-points for health services and which cover topics in which health care has an important contribution to make. This work, (McColl and Gulliford 1993) was constrained in that the set of indicators were to:

- be based on reliable routinely collected data
- reflect health service interventions rather than the wider influence on health.

**A.5** The University of Surrey was commissioned to produce a package of comparative statistics based on the outcome measures recommended in the feasibility study. Forty indicators were chosen, 18 for maternal and child health, three for mental health and the rest for other topics in adult health. The publication (Department of Health 1993a) contained indicator definitions, maps and scatter plots showing geographical variations, and tables presenting the rates, with corresponding observed numbers and confidence intervals when appropriate.

### **The Phase 3 work : ideal indicators of health outcome**

**A.6** In the third and current phase of the work on health outcomes a number of research institutions were commissioned to assist in developing a structured approach to identify indicators to cover a number of clinical topics. The prime contractor is the Unit of Health-Care Epidemiology, Department of Public Health and Primary Care, University of Oxford.

**A.7** The respective roles of the supporting organisations are as follows:

- Unit of Health-Care Epidemiology, University of Oxford, to provide epidemiological and managerial support to the Group and co-ordinate the input of the other agencies.
- CASPE Research, in London, to provide technical advice with regard to the indicators and their data sources, and prepare the detailed indicator specifications.

**A.8** In the previous work a key criterion for selection of indicators was the requirement for the work to be based on routinely available data. This practical constraint has meant that the recommended indicators were selected and opportunistic rather than an ideal set. This inevitably led, as the DoH acknowledged, to a bias towards outcomes which may be measurable now but which may not necessarily be those which are most appropriate and most needed. The aim of the third phase is to advise on and develop 'ideal' outcome indicators without confining recommendations to data which have been routinely available in the past.

**A.9** The initial task of the third phase of the work was to select clinical topics for detailed study. In order to ensure that the work would be manageable, and that the NHS would have the capacity to absorb the output, the CHOU decided to limit the activity to five clinical topics a year.

**A.10** A workshop to initiate the work which was attended by over 70 individuals representing a wide range of interests was held in January 1995. A report of the proceedings has been published (Goldacre and Ferguson 1995). The main aims of the workshop were:

- to identify the criteria which should be used to choose clinical topics for the Phase 3 work
- to suggest a list of potential clinical topics which workshop participants would like to be included in the Phase 3 work.

**A.11** Following further consultation within and outside the DoH, the CHOU decided in June 1995 to include the following topics in the first two years of Phase 3 work:

- Asthma
- Breast cancer
- Cataract
- Diabetes mellitus
- Fracture of neck of femur
- Incontinence
- Myocardial infarction
- Pregnancy and childbirth
- Severe mental illness
- Stroke.

### **Health outcome information**

**A.12** In this work the potential uses of outcome information have been identified as follows:

- for clinical decision-making and audit of clinical work, including:
  - management of individual patients
  - audit and management of health professionals' practice
  - research
- for informing decisions about the strategic and operational development of services
- for comparisons of organisations in the delivery of services which may be:
  - provider based
  - population based
- for assessing progress towards agreed standards or targets for health outcomes, agreed nationally or locally, which may be:
  - identified from the research literature
  - set by clinical and managerial decisions.

**A.13** Current managerial interests which are relevant to the use of health outcome information include:

- The NHS goal 'to secure, through the resources available, the greatest improvement in the physical and mental health of people in England'
- clinical audit
- evidence-based commissioning.

**A.14** An important purpose of the work has been to recommend indicators which, if possible, would allow 'health gain' to be assessed alongside information used to measure health service input. The particular focus has been to make recommendations about aggregated statistical information about people with particular conditions which can be used to:

- enable providers of care to review outcomes of the care of their patients
- make comparisons, where appropriate, of health outcomes against locally agreed targets and/or between different places and/or over time.

**A.15** The information may be obtained from continuous data collection systems but, when having continuously collected information is unnecessary, or when the cost or complexity of this is high, use should be made of sample survey techniques or periodic surveys.

**A.16** Health indicators are more likely to be successful if they fit naturally into the everyday work of health care professionals than when they have to be collected as a separate activity. The aim is to have indicators that are:

- *Relevant* because professionals use them everyday in treating their patients and will record them accurately.
- *Reliable* because they can be validated or cross checked from other sources.
- *Responsive* because they readily identify changes in the patient's state of health.
- *Research-based* because there is a plausible link between processes of care and outcome.

**A.17** In common with the approach taken to other types of indicators by the NHS, it is recognised that useful outcome indicators should be capable of identifying circumstances worthy of investigation but that, in themselves, they may not necessarily provide answers to whether care has been 'good' or 'bad'. In particular it is acknowledged that there may be difficulties in drawing causal conclusions - say, that a particular aspect of care caused a particular outcome - from indicators derived from non-experimental clinical settings. Nonetheless, the vast majority of clinical care is delivered in routine rather than experimental practice. The assessment of its outcomes entails, by definition, the use of observational rather than experimental data.

**A.18** To be useful, work on 'ideal' outcome aspects needs to incorporate considerations of practicability. It is a time of rapid change in information technology. What may be feasible now in some places may not be feasible everywhere. What may not be practical today may become so in a year or two.



## APPENDIX B: PREGNANCY AND CHILDBIRTH WORKING GROUP

**B1.** The Pregnancy and Childbirth Working Group was formally constituted in May 1997 and met three times completing the work in January 1998. The Report was completed in August 1998. The terms of reference were:

- To advise on indicators of the health outcomes of 'normal' pregnancy and childbirth.
- To make recommendations about the practicalities of their compilation and interpretation; and to advise if further work is needed to refine the indicators and or make them more useful.

**B2.** The membership of the Working Group and the staff of the supporting organisations are shown below. The composition of the Group included professional and managerial groups involved with pregnancy and childbirth as well as groups representing service users' perspectives.

### MEMBERSHIP OF THE GROUP

#### Chairman & members

Obstetricians	:	Michael Maresh, Manchester Gaye Henson, London James Neilson, Liverpool
Midwives	:	Mavis Kirkham, Sheffield Lynn Thomas, Tower Hamlets Karen Baker, North Hampshire
Health visitor	:	Jennie Billings, Health Visitors Association
GP	:	Pat Hoddinott, Suffolk
Neonatologist	:	Sam Richmond, Sunderland
Researchers/ Public health	:	Pat Troop, Oxford & East Anglia ( <b>Chair</b> ) Paul Bingham, Isle of Wight Jean Chapple, London Alison Macfarlane, Nat Perinatal Epid Unit Margaret Reid, Glasgow
Voluntary groups	:	Meg Goodman, Maternity Alliance Rosemary Green, National Childbirth Trust
CEOs	:	Irene Borgardts, formerly Solihull HA Hilary Scott, Tower Hamlets
DoH	:	Gwyneth Lewis Jenny Carpenter

#### Secretariat and support

Michael Goldacre, Alastair Mason and Ewan Wilkinson, University of Oxford  
Robert Cleary and Moyra Amess, CASPE Research



## APPENDIX C: METHODS FOR CHOOSING INDICATORS

**C1.** Candidate indicators were identified by the Group with the help of the following:

- the health outcome model for normal pregnancy (see Section 2)
- various classifications of the characteristics of outcome indicators.

**C2.** The Group noted that indicators may be related to:

- environmental factors in the general population or relating to the individual
- attitudes and behaviour in the general population
- attitudes, including satisfaction with services, and behaviour of mothers
- mothers' physical and emotional state, health status and well-being
- socio-economic impact of pregnancy on mother and the family
- babies' physical state, health status and well-being
- mothers' pathological/psychological state
- babies' pathological state
- events and/or interventions occurring to mother or baby such as particular procedures, health care contacts and death.

**C3.** The data sources for the indicator entities noted in paragraph C2 will differ. It is likely that:

- indicators for (i) and (ii) would come from population surveys
- indicators for (iii) to (vi) would come from individuals either opportunistically or when specifically called
- indicators for (vii) and (viii) would come from doctors and other health professionals
- indicators for (ix) would come from administrative information systems.

**C4.** The Group recognised the high cost and complexity of obtaining information from continuous data collection systems. Particular consideration was given to obtaining outcome indicator data from sample survey techniques such as a periodic survey when it is not essential to have continuously collected information.

**C5.** Two characteristics of an outcome indicator have been used in the health outcome work for normal pregnancy. They are:

- measurement perspective, relating to whose perspective the indicator is most relevant (see paragraph C6)
- outcome relationship, in that the indicator is either a direct or an indirect, proxy measurement of outcome (see paragraph C7).

**C6.** For the Group's purposes, measurement perspective was classified as that from the service users', the family's, the clinical, or the population's viewpoint.

Following pregnancy the presence of incontinence may be most relevant to the users' perspective while clinical concerns may properly focus on the complications of Caesarean Section. The population perspective has a broader view, best addressed by measures able to assess the impact of pregnancy as a whole. Of course, these perspectives are not necessarily in opposition and will often be associated with shared goals. Where possible, a set of indicators should be developed which satisfies all the measurement perspectives.

- C7.** The Group's main task has been to develop direct indicators of health outcome although in many areas it may be difficult to identify or obtain such information. However, it is recognised that some care processes are so closely related to the production of benefits that the successful completion of the intervention might be used as a proxy measure of the actual outcome. In the absence of direct outcomes, proxy indicators have therefore been developed.
- C8.** There is increasing recognition of the importance of outcome measures derived from data generated by service users. For the purposes of the Group's work, three main areas of interest have been identified:
- involvement of the mother with the support given, degree of choice available, and satisfaction with the support given
  - socio-economic impact of the condition on the mother and family
  - maternal awareness of the management of the condition and services available.
- C9.** With the assistance of the check-lists and a knowledge of the disease supplemented by commissioned work, the Group addressed the following key questions:
- What are health professionals trying to achieve for each mother and baby?
  - What can each mother realistically expect will be achieved for herself?
  - What should be achieved for the population as a whole in respect of the support of pregnancy?

# APPENDIX D: GUIDANCE NOTES FOR CANDIDATE INDICATOR SPECIFICATIONS

<b>Indicator title</b>	<b>A short title to identify the indicator.</b>
<b>Intervention aim</b>	<p>Distinguishes the level of intervention for which the indicator is primarily developed. It is assumed that, for a given condition, an ideal set of indicators would be reasonably balanced across the spectrum of health intervention stages. For normal pregnancy these stages are:</p> <ul style="list-style-type: none"><li>- promote general well-being of mother and baby during and after pregnancy</li><li>- ensure effective and safe care during pregnancy, labour, delivery and post-delivery</li><li>- detect specific disorders affecting the baby</li><li>- obtain maternal views of the experience of pregnancy and childbirth.</li></ul>
<b>Characteristics</b>	<p>Classifies the indicator on two dimensions:</p> <ul style="list-style-type: none"><li>- Perspective: <i>population, clinical or service user.</i></li><li>- Outcome relationship: whether it is a <i>direct</i> measure of outcome or an <i>indirect</i> measure of structure or process, used as a proxy for outcome.</li></ul>
<b>Indicator definition</b>	<p>In addition to a definition of the variable of interest, the description specifies:</p> <ul style="list-style-type: none"><li>- how the variable is to be aggregated across cases, e.g. definitions of both a numerator and a denominator</li><li>- if a variable is to be reported with respect to a set of denominators, e.g. mortality broken down by age and sex</li><li>- if appropriate, how longitudinal change in the variable is to be represented, e.g. over what time interval and whether absolute difference or proportional change.</li></ul>
<b>Rationale</b>	<p>A brief statement of the reasons and objectives behind the indicator, both in terms of the issues it addresses and its selection from a range of potential alternatives.</p>
<b>Definition</b>	<p>The definition in paragraph 2.3 is a pregnancy lasting at least 24 weeks.</p>
<b>Potential uses</b>	<p>The following classification has been used:</p> <ul style="list-style-type: none"><li>- clinical audit</li><li>- provider based comparisons</li><li>- population based comparisons</li><li>- assessment of regional/national trends or progress towards targets.</li></ul> <p>It is recognised that a given indicator may serve several purposes. Indicators that are valuable for the management of individual cases are likely to have practical advantages with respect to data collection in a clinical setting. However, in order for such indicators to be useful for other purposes, a method of aggregation across cases must be specified for the variable of interest.</p>

<b>Potential users</b>	<p>The following classification has been used:</p> <ul style="list-style-type: none"><li>- clinicians</li><li>- provider management</li><li>- commissioners</li><li>- national/regional policy makers</li><li>- service users.</li></ul>
<b>Possible confounders</b>	<p>This section has attempted to identify the population risk factors likely to influence the outcome indicator, and therefore useful in its interpretation. Where such factors are well defined and have a clear or potential association with the outcome of interest, they may be used to specify denominators to be included in the indicator definition itself.</p>
<b>Data sources</b>	<p>Where possible, existing sources of data have been identified for deriving the indicator and the degree to which complete coverage of the population of interest would be obtained has been noted. Where data are not widely available from existing systems, suggestions for new methods of data collection, capable of wide implementation have been made.</p>
<b>Data quality</b>	<p>While the theoretical capabilities of existing and proposed information systems are outlined above, the actual or expected limitations of those systems – in terms of their completeness and accuracy etc. – are noted in this section.</p>
<b>Comments</b>	<p>General comments regarding the indicator's definition, validity, practicality etc.</p>
<b>Further work required</b>	<p>Suggestions about the additional research and development work required to complete the indicator's specification to a level appropriate for large scale piloting.</p>
<b>Conclusions and priority</b>	<p>A statement indicating the Working Group's assessment of the priority for implementation.</p>
<b>References</b>	<p>Appropriate references used in the construction of the indicators.</p>

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