

# **Safe midwife staffing for maternity settings**

## **NICE safe staffing guideline**

**Draft for consultation, 17 October to  
13 November 2014**

**Linking evidence to recommendations**

# 1 Organisational strategy

Recommendations	Focus on care for women and babies
	<p data-bbox="507 342 1348 439">1.1.1 Ensure women and babies receive the midwife care they need, including care from specialist midwives, regardless of whether this is in:</p> <ul data-bbox="555 454 1388 741" style="list-style-type: none"><li>• specific maternity services (for example clinics, home visits, maternity units)</li><li>• other settings where maternity care is provided (for example home, community, free-standing midwifery led units, hospitals including obstetric units, day assessment units, and alongside midwifery-led units)</li><li>• any part of the maternity pathway (for example pre-conception, antenatal, intrapartum, postnatal).</li></ul> <p data-bbox="507 752 1348 813">This should be regardless of the time of the day or the day of the week.</p> <p data-bbox="507 824 1157 855"><b>Maintaining the continuity of midwife services</b></p> <p data-bbox="507 866 1388 1032">1.1.2 Develop procedures to ensure that there are enough registered midwives in the organisation to provide safe care to each woman and baby at all times. The board should be responsible for the midwife staffing establishments and the budgets that are set across the organisation's maternity services.</p> <p data-bbox="507 1043 1316 1075">1.1.3 Ensure that all maternity services have the capacity to:</p> <ul data-bbox="555 1086 1388 1865" style="list-style-type: none"><li>• Deliver all midwifery care by registered midwives during pre-conception, antenatal, intrapartum and postnatal care.</li><li>• Allow for locally agreed skill mixes (for example, specialist midwives, consultant midwives).</li><li>• Provide 1 midwife to a maximum of 1 woman during established labour.</li><li>• Provide other locally agreed staffing ratios.</li><li>• Allow for the following:<ul data-bbox="651 1406 1388 1753" style="list-style-type: none"><li>- uplift (annual leave, maternity leave, paternity leave, study leave, and sickness absence)</li><li>- time for midwives to give and receive supervision; the supervision process must operate alongside organisational management processes (such as incident or complaint reviews)</li><li>- ability to deal with fluctuations in demand (such as planned and unplanned admissions and transfers, and daily variations in midwife requirements for intrapartum care).</li></ul></li><li>• Forward plan to predict and account for variations over time as indicated by records of midwife requirements (for example, demographic changes and patient choice).</li></ul> <p data-bbox="507 1877 1348 1973">1.1.4 Ensure that maternity services have plans in place to monitor and respond to daily fluctuation in demand for midwives. Plans could include:</p> <ul data-bbox="555 1984 1037 2016" style="list-style-type: none"><li>• redistribute the midwife workload</li></ul>

- increasing the number of midwives needed beyond the midwife staffing establishment
- using on-call staff to respond to peaks in demand for midwives
- redeploying midwives to and from other areas of care

Service cancellations or closures should only be considered as a last resort.

1.1.5 Ensure that there are enough midwives with the experience and training to determine midwife staffing requirements for each shift.

1.1.6 Ensure that the midwife staffing establishment is developed by midwives trained in establishment-setting. The midwife staffing establishment should be approved by the head or director of midwifery and chief nurse (or delegated accountable staff).

1.1.7 Ensure a senior midwife or another responsible person is accountable for the midwife rosters that are developed from the midwife staffing establishment.

### **Monitor the midwife staffing establishment**

1.1.8 Review indicator data (see recommendation 1.1.4, box 3 and section 8)

1.1.9 Review the midwife staffing establishment and indicator data at a board level at least every 6 months.

1.1.10 Ensure analyses of reported red flags and safe midwife indicators are included in the board's review of the midwife staffing establishment.

1.1.11 Change the midwife staffing establishment in response to the outcome of the review, if appropriate.

Monitor and respond to changes

1.1.12 Ensure maternity services have procedures in place for:

- allowing any member of staff, woman, family member or carer to report midwife red-flags (see box 1) to the person in charge of the shift or service.
- monitoring and responding to any unplanned differences in the number of midwives needed and the number of midwives available for all midwifery services
- monitoring and responding to red flags (including escalation plans).

1.1.13 Ensure that responses to red flags or unplanned differences in the number of midwives needed and the number of midwives available:

- take account of women and babies who need extra support from a midwife (for example, high-risk clinical situations)
- do not cause red flags to occur in other areas.

1.1.14 Consider flexible approaches to respond to red flags or unplanned differences in the number of midwives needed and the number of midwives available. This could include adapting shifts, changing the skill mix, and amending assigned location and employment contract arrangements.

	<p>Promote staff training and education</p> <p>1.1.15 Ensure midwives are given the training, mentoring and preceptorship they need to deliver safe care.</p> <p>1.1.16 Involve midwives in developing and maintaining staffing policies and governance about midwife staff requirements, including escalation policies and contingency plans.</p>
<b>Evidence</b>	<p>Evidence review 2 addressed 6 review questions that aimed to explore relationships between midwife staffing and outcomes. One of the review questions specifically focused on identifying organisational factors that influence safe midwife staffing (see review question 6, page 77 of evidence review 2).</p> <p>Evidence review 3 (economics) also aimed to identify evidence on organisation factors that influence safe midwife staffing.</p> <p>No evidence that met the inclusion criteria was identified.</p>
<b>Committee considerations</b>	<p>The committee agreed that it was of utmost importance to ensure that senior managers, board and commissioners are accountable for staffing decisions in order to support the implementation of the recommendations in other sections of this guideline. The committee also agreed that the organisational context for midwife staffing in maternity settings is the same as the organisational context for nurse staffing in inpatient settings, since the same board and senior managers would be responsible for both midwives and nurses. Therefore the committee extrapolated from the evidence and recommendations that were part of the organisational recommendations that were developed for the <a href="#">safe staffing for nursing in adult inpatient wards in acute hospitals</a>.</p> <p>The committee reviewed each of the recommendations that were developed for the acute adult inpatient guideline. Recommendations that were based on evidence that was not relevant to midwife staffing were removed, and recommendations that could be adapted for midwives were amended and used.</p>

## 2 Assessing the number of midwives needed and setting the midwife establishment

### Recommendations

1.2.1 Determine the midwife staffing establishment for each maternity service (for example, pre-conception, antenatal, intrapartum and postnatal services) at least every 6 months.

1.2.2 Use the following systematic assessment to calculate the midwife staffing establishment. Evidence-based toolkits endorsed by NICE should be used to support this assessment:

- Use data that has been collected by maternity services over the past 6 months (see recommendation 1.3.4) to inform future midwife establishment setting.
- Select a defined period of time from the collected data (for example, a 2-week sample, or all 24 weeks of data) and determine the midwife activities that are needed.
- Calculate the total midwife hours that are needed over the period of time.
- Use the current number of bookings in the maternity service to predict likely midwife hours for the next 6 months.
- Identify the maternity care activities for which midwives are responsible, and the activities that can be delegated to or provided by other trained and competent staff. Base this on the local configuration of services and range of staff available (such as maternity support workers, registered nurses, GPs). Use box 2 part B and C as prompts.
- Estimate the midwife time needed to perform the activities that will not be provided by other trained and competent staff, and apply the following midwife staffing ratios:
  - 1 midwife to a maximum of 1 woman during established labour

Staffing ratios for other stages of care should be developed locally depending on the local service configuration and needs of individual women and babies.

- Divide the total midwife hours by the number of weeks in the defined period of time to give the weekly average number of midwife hours.
- Increase the weekly average number of midwife hours to account for uplift. Uplift should be locally determined and include annual leave, maternity leave, paternity leave, study leave and sickness absence.
- Divide the calculations by 37.5 to determine the number of whole time equivalents needed for the midwife establishment.

1.2.3 Base the number of whole-time equivalents on registered midwives, and do not include the following in the calculations:

- registered midwives undertaking a Local Supervising Authority Programme
- registered midwives with supernumerary status (for

example, newly qualified midwives, midwives returning to practice)

- student midwives.

1.2.4 Use professional judgement when checking the calculations.

1.2.5 Review the midwife staffing establishment more frequently than every 6 months if the numbers of midwives needed may change rapidly (for example, for intrapartum care).

1.2.6 Design the midwife roster on the basis of the midwife staffing establishment calculation, taking into account any predictable peaks in activity (for example, during the day when midwife activities are likely to be planned).

1.3.1 Systematically assess differences between the number of midwives needed and the number of midwives available for each maternity service in all settings.

1.3.2 As a minimum, the systematic assessment should be performed:

- once before the start of the service (for example, in antenatal or postnatal clinics) or day (for example, for community visits), or
- once before the start of each shift (for example, in hospital wards).

1.3.3 Perform the systematic assessment more frequently if the numbers of midwives needed may change rapidly (for example, for intrapartum care).

1.3.4 Use the following systematic assessment.:

- Assess the needs of each woman and baby in the service (use box 2 part A as a prompt)
- Identify the maternity care activities for which midwives are responsible, and the activities that can be delegated to or provided by other trained and competent staff. Base this on the local configuration of services and range of staff available (such as maternity support workers, registered nurses, GPs. Use box 2 part B and C as prompts).
- Estimate the midwife time needed to perform the activities that are not provided by other trained and competent staff, and apply the following midwife staffing ratios:
  - 1 midwife to a maximum of 1 woman during established labour

Staffing ratios for other stages of care should be developed locally depending on the local service configuration and needs of individual women and babies.

- Make additional allowances for other factors that may affect the time taken to provide midwife care (such as travel time, breaks, talking to other health professionals). Use box 2 part D as a prompt.
- Assess the range of maternity care activities that need to be undertaken and ensure that there are adequate numbers of midwives available to provide the care who have the

	<p>relevant experience and skills</p> <ul style="list-style-type: none"> <li>Record the total number of midwife hours calculated from performing the assessment.</li> </ul> <p>Evidence-based toolkits endorsed by NICE could be used to support this assessment.</p> <p>1.3.5 Check if the number of midwife hours calculated is different to the number of midwives hours available.</p> <p>1.3.6 Use professional judgement when checking the calculations.</p> <p>1.3.7 Take action in line with locally developed procedures, including escalation plans, if the number of midwives available is different from the number of midwives needed. Action could include delegating activities to other staff or allocating additional on-call or temporary staff. Service cancellations or closures should be the last option. Take into account the potential of cancellations or closures to limit women’s choice and to affect service provision and the reputation of the organisation</p> <p>1.3.8 Continually monitor the red flags detailed in box 1 and any additional locally agreed red flags.</p> <p>1.3.9 A red flag should prompt an immediate escalation, for example by allocating additional midwives to the service or deploying other members of the multidisciplinary team, or reviewing the midwife staffing establishment before the planned review.</p> <p>1.3.10 Keep records of the following to inform planning of future midwife establishments or other action:</p> <ul style="list-style-type: none"> <li>differences between the number of midwives needed and available for each shift and</li> <li>reported red flags, and the action taken in response.</li> </ul>
<p><b>Evidence</b></p>	<p>The committee considered evidence reviews 1, 2 and 3 when formulating the recommendations in sections 1.2 and 1.3 of the guideline.</p> <p><b>Evidence review 1</b> aimed to assess the effectiveness of toolkits or other approaches for determining midwife staffing requirement. The review identified only two studies that were of low quality. The two studies provided insufficient evidence to determine if toolkits or other approaches are effective or not, but the evidence did suggest that a commonly used toolkit, Birthrate plus, may not calculate sufficient staff to enable one-to-one midwifery care during labour to be achieved.</p> <p>Question 1 of <b>evidence review 2</b> aimed to identify what outcomes are influenced by midwife staffing. Overall, eight studies were identified that met the inclusion criteria, but they differed in quality, meaning that the results of some studies may be less reliable than others. Overall the evidence showed that higher levels of midwife staffing significantly influenced the following outcomes (see page 33 of evidence review 2 for evidence statements):</p> <ul style="list-style-type: none"> <li>Increase in delivery with bodily integrity (Sandall et al, in press)</li> <li>Increase in attendance by known midwife during labour</li> </ul>

(NSCCRT, 2000)

- Increase in the duration of labour (NSCCRT, 2000)
- Decrease in straightforward birth (Rowe et al, 2014)
- Decrease in decision to delivery time (Cerbinskaite et al. 2011)
- Decrease in emergency c-section process times (Cerbinskaite et al. 2011)
- Decrease in maternal readmission within 28 days (Gerova et al. 2010)

No evidence of an association with midwifery staffing and the following outcomes was found:

- healthy mother (Sandall et al, in press)
- normal birth (Tucker et al, 2003; Sandall et al, in press; Rowe et al, 2014)
- instrumental vaginal delivery (Joyce et al, 2002; Gerova et al 2010)
- Overall caesarean sections (Sandall et al, in press; Joyce et al, 2002)
- elective caesarean section (NSCCRT, 2000; Sandall et al, in press)
- spontaneous vaginal delivery (Sandall et al, in press)
- induction of labour (NSCCRT, 2000)
- multiple and breech delivery (NSCCRT, 2000)
- preoperative time in theatre for emergency caesarean sections (Cerbinskaite et al. 2011)
- any foetal outcome (NSCCRT, 2000; Tucker, 2003; Joyce 2004)

It was not clear if increases in midwife staffing caused an increase, a decrease, or had no association with the following outcomes:

- perineal outcomes (NSCCRT, 2000; Tucker et al, 2003)
- epidural use (NSCCRT, 2000; Sandall et al, in press; Rowe et al. 2014)
- emergency caesarean section (NSCCRT, 2000; Sandall et al, in press; Rowe et al. 2014)
- augmentation (NSCCRT, 2000; Rowe et al. 2014)
- straightforward birth (Rowe et al. 2014)

Other important outcomes (for example, maternal mortality, dystocia etc.) were not reported in the evidence.

Questions 2 to 6 of **evidence review 2** specifically aimed to identify factors that may influence, or modify, the relationship between midwife staffing and outcomes such as maternal and neonatal risk factors (7 studies), environmental factors (6 studies), staffing factors (5 studies), management factors (2 studies) and organisational factors (no studies). The evidence was difficult to interpret as studies were often not appropriately designed to enable the modifying factors to be explored properly. The evidence also drew mixed conclusions which made interpretation of the evidence

	<p>difficult. However, some quite strong and clear evidence did emerge from the study by Sandall et al (in press) which suggested that maternal clinical risk influences the relationship between midwife staffing and outcomes. That is, for women with low clinical risk, higher levels of midwife staff led to better outcomes than in women with high clinical risk.</p> <p><b>Evidence review 3</b> identified economic evidence from two partially applicable studies. One study with very serious limitations suggested a reduction in midwifery overload (the number of women exceed the scheduled workload) could be achieved with a small increase in budget. A reduction in midwifery overload could also be achieved by reducing staffing on Saturday night and all of Sunday and reapplied at peak weekday times with no increase in costs. One study (Sandall et al, in press) showed that higher midwife staffing levels were associated with higher costs of each delivery. An additional midwife would increase the number of deliveries possible in a trust by between 124 and 144 in a year. The study also showed that midwives should be complemented with additional support staff and doctors, but substituted by consultants (please note, that the results from Sandall et al, in press are subject to change). No economic evidence was found which aimed to assess the cost-effectiveness of toolkits or other approaches for determine midwife staffing requirement.</p>
<p><b>Committee considerations</b></p>	<p>The Department of Health and the Royal Colleges of Anaesthetists, Midwives, and Obstetricians and Gynaecologists advise maternity services use toolkits to support decision making. This advice has led to many maternity units in England to use the Birthrate Plus toolkit to determine midwife staffing requirement.</p> <p>Insufficient evidence was identified to determine if Birthrate plus, or any other method for determining staffing requirement, is effective and appropriate for use in maternity settings (see evidence review 1 and 3). Although Birthrate Plus is in widespread use throughout maternity services in England, the committee agreed that there is insufficient evidence showing the process leads to an improvement in the safety or quality of care that is provided by midwives. Thus, the committee felt it couldn't explicitly recommend Birthrate Plus. However it did agree that systematic processes should be used to help inform decisions about the number and skill mix of midwives needed. This is because the committee felt that systematic processes make staffing decisions more explicit and reduce the opportunity for organisations to inadvertently over or underestimate the number of midwives that are required. It would also reduce inappropriate variation in the number and skill mix of midwives needed and improve consistency of staffing decisions taken by different members of staff. Using a systematic process may also improve efficiency by identifying if too many midwives are available and not required, or could help to avert harm by identifying when there are too few midwives available. In addition, using systematic processes to determine midwife staffing may also be cost neutral or cost saving if they indicate areas of care that are inappropriately over staffed, as organisations could redeploy staff</p>

to other areas of need, or reduce the amount of staff required in a service. As such, the committee felt the using a systematic process would be a safe and cost-effective use of resources.

Care during the intrapartum period (the period time during labour, and delivery of baby and placenta) is associated with the most serious safety issues. Because of this, services often prioritise midwife activities in relation to providing intrapartum care over and above other midwife activities (such as ante-natal and post-natal activities), and will draw in midwives from lower priority activities to cover intrapartum activities. Whilst this prioritisation aims to reduce the occurrence of the most serious safety issues it leaves other midwife activities depleted and this can have a knock on effect which puts strain on the maternity service and can lead to the development of preventable safety issues later on (for example if antenatal activities are de-prioritised this may result in women not being able to receive regular antenatal screening so changes in her risk status could be undetected leading to increased preventable safety issues during intrapartum care).

Because of this, the committee agreed that it was essential to consider the entire maternity pathway when making safe midwife staffing decisions. This includes preconception care when it is provided by midwives, as although these services are not as common as other midwife services, the committee acknowledged that organisations providing midwife preconception care need to consider this alongside other midwife activities in order for appropriate staffing decisions to be made.

The committee acknowledged that there is a compromise between objectivity of systematic approaches compared to the subjectivity of professional judgement and agreed that it would be inappropriate to rely on professional judgement alone or decision support toolkits alone. Thus the committee agreed that it should recommend use of a systematic process that could be automated by a toolkit, and that the results of these approaches should be checked using professional judgment.

The committee then focused on identifying the key components that a systematic approach should contain. The committee discussed the evidence provided in evidence review 2 and 3 in detail in order to identify other elements that should be part of a systematic process for determining midwife staffing requirement. Overall, the evidence was difficult to interpret and findings were often unclear as some studies showed that particular factors were significantly related to midwife staffing, whereas other studies found the same factors were not significantly related to midwife staffing. The committee felt that these contradictory and confusing findings could be caused by the following problems with the studies included in the evidence reviews:

- Lack of data on rare events: many of the important safety outcomes that occur in maternity settings, such as maternal

death, are relatively rare. A very large sample would need to be examined to detect statistical differences in death rates according to variance in staffing numbers. This means that if a study is too small, it is difficult to establish if the lack of a statistically significant finding is because there is no relationship, or because the sample was too small to observe the relationship.

- Lack of sufficient variation in the data: if data are very similar it prevents differences being observed. Currently most organisations use Birthrate Plus for setting staffing levels and this may stop researchers from identifying outcomes that are sensitive to changes in the number of midwives available.
- Endogeneity: This problem can occur when an outcome is partly determined by an explanatory factor. For example, when adverse outcomes are felt more likely to happen in a particular area of care, more qualified staff might be allocated to that area of care. This means that the techniques used in research to analyse the data can over- or under- estimate the impact of a factor (such as staffing) on an outcome (such as adverse effects). In the context of midwife staffing, the use of systems or rules (such as Birthrate Plus) makes this problem especially likely, and we would expect it to cause research to under-estimate the impact of staffing on outcomes.
- Multicollinearity: This problem is caused when two or more explanatory factors being examined are highly correlated meaning that one can be closely predicted from the other (e.g. staffing and clinical risk, as it is likely that more staff will be required for higher risk cases). If a researcher wanted to understand what factors influence the outcome 'healthy mother' it would be difficult to separate out the individual impacts of staffing and clinical risk on a 'healthy mother' outcome. When multicollinearity is present in data it means the relationship between an outcome and staffing may not be accurately estimated in the evidence.

The committee agreed that the biggest problem affecting the evidence is endogeneity and agreed that it is likely that genuine relationships between midwife staffing and outcomes are present, but the evidence is underestimating the relationship. The committee agreed that the results of studies included in the evidence reviews could be very misleading, and should be treated with caution. Thus, the committee used its knowledge and experience to list the factors that should be considered when determining the number of midwives needed (see box 2 of the guideline).

The committee debated how often the systematic process should be applied recognising the compromise between applying the process regularly and burdening services with data collection that may not be necessary. It also recognised that different maternity services have different requirements for midwife staff. Thus it was agreed that as a minimum the systematic process should be

applied at the start of a maternity service (such as an antenatal clinic) to check whether there are differences in the number of midwives needed to meet the needs of women in the service, and the number of midwives available. The committee also agreed that some services operate on a shift basis, and so the process needs to be repeated before each shift change for the same reasons. They also felt that some services, such as labour wards, may find that their midwife requirement can change rapidly over the course of a few hours and so more frequent assessments may be necessary. If applying the process reveals a difference in the number of midwives needed and the number available, this can prompt the service to immediately respond to ensure the service operates safely.

The committee recognised that midwife time was related to the individual needs of each woman and baby, and that adequate consideration needs to be given to both the mother and the baby when assessing staffing needs, since two (or more) people require care. To safely assess the day to day number and skill mix of midwives needed, a systematic consideration of each woman's and baby's risk factors is needed (Box 2, part A). The committee debated how to consider risk factors. One approach, such as the one used by Birthrate Plus, was to place each risk factor in a broader risk category, and then to allocate each risk category a defined number of midwife hours to attend to the needs of women and babies in that category. The committee acknowledged that risk categorisation enabled quicker and easier midwife staffing assessment, but risked less accuracy in the midwife time needed for each woman and baby and thus increasing the risk of unsafe care. The alternative was to consider each risk factor for each woman and baby separately. The committee acknowledged that this would take longer to assess midwife staffing needs compared to the risk categorisation approach, but would be more accurate and safer.

The committee also debated other factors of maternity care (Box 2, part B) that should also be taken into account when determining midwife staffing, such as the model of care used by the organisation (for example case load midwifery, or team midwifery), the availability of other departments, and availability of other staff in the organisation. Finally, the committee carefully considered the recommendations from the NICE Intrapartum Care guideline (CG55) which suggested that women in established labour should receive supportive one-to-one care. The potential implications on safe care being delivered during this period of labour were discussed by the committee, and it was agreed that a ratio of 1 midwife to a maximum of 1 woman during established labour was needed.

The data obtained from applying the systematic approach should be fed into midwife establishment planning, and this should be done at least twice a year. The committee recognised that once the number of midwives needed for the establishment has been determined, organisations will need to apply an 'uplift' to take into

account factors that affect midwife availability such as training, supervision, annual leave, maternity leave etc. Different organisations calculate uplift differently, and this means that some organisations may be underestimating the amount of uplift that is actually required. Thus, the committee used its knowledge and experience to develop a list of factors that organisations should take into account when determining uplift. The factors that need to be included in the locally determined uplift should include annual leave, maternity and paternity leave, study leave (including time to give and receive supervision) and sickness absence.

The committee also emphasised the need for the midwife establishment to be based on registered midwives only, and that some registered midwives (such as consultant midwives who may occupy non-clinical roles, or student midwives) whilst being available to undertake some midwifery activities should not be counted in midwife staffing calculations. However, the committee acknowledged that some activities undertaken by a midwife could also be undertaken and delegated to other appropriately trained professionals (such as maternity support workers or other registered nurses). Any delegation of midwife activities should be determined locally depending on the clinical circumstances and on the skills and experience of the staff available.

### 3 Monitoring and responding to variation in staffing

<p><b>Recommendations</b></p>	<p>1.4.1 Monitor whether the midwife staffing establishment adequately meets the midwife care needs of women and babies in the service using the safe midwife staffing indicators in box 3. Consider continuous data collection of these safe midwife staffing indicators (using data already routinely collected locally where available) and regularly analyse the results. Section 8 gives further guidance on these indicators.</p> <p>1.4.2 Compare the results of the safe midwife staffing indicators with previous results at least every 6 months. Review reported red flags (box 1) at the same time.</p>
<p><b>Evidence</b></p>	<p>Evidence review 2 identified 8 studies that differed in quality, meaning that the results of some studies may be less reliable than others. Overall the evidence showed that higher levels of midwife staffing significantly influenced the following outcomes:</p> <ul style="list-style-type: none"> <li>• Increase in delivery with bodily integrity</li> <li>• Increase in attendance by known midwife during labour</li> <li>• Increase in the duration of labour</li> <li>• Decrease in straightforward birth</li> <li>• Decrease in emergency c-section process times</li> <li>• Decrease in maternal readmission within 28 days</li> </ul> <p>No evidence of an association with midwifery staffing and the following outcomes was found:</p> <ul style="list-style-type: none"> <li>• elective c-section</li> <li>• healthy mother</li> <li>• normal birth</li> <li>• non-intact perineum</li> <li>• multiple and breech delivery</li> <li>• instrumental vaginal delivery</li> <li>• spontaneous vaginal delivery</li> <li>• induction of labour</li> <li>• any foetal outcome.</li> </ul> <p>It was not clear if increases in midwife staffing caused an increase, a decrease, or had no association with the following outcomes:</p> <ul style="list-style-type: none"> <li>• intact perineum,</li> <li>• augmentation,</li> <li>• epidural use,</li> <li>• emergency c-section</li> </ul> <p>Other important outcomes were not reported in the evidence.</p> <p>No evidence on the cost-effectiveness on monitoring and responding to variation in staffing was found (see evidence review 3).</p>
<p><b>Committee</b></p>	<p>The committee agreed that it was imperative that organisations</p>

**considerations**

should be alerted to potential safety issues so that appropriate responses can be actioned. To do this requires monitoring of events that can alert staff about harm that could be occurring, or is likely to occur because the number of available midwives is too low. This requires the use of both red flags which require immediate action if they occur, and indicators of safe staffing that can be monitored over a period of time to check if the planned midwife establishment is sufficient to provide safe care.

The committee agreed that a list of red flags and indicators should be developed. The evidence that was available on potential red flags and indicators focused on the intrapartum period of care and did not provide evidence about potential red flags and indicators for other periods of care in the maternity pathway such as preconception, antenatal or postnatal care. Furthermore, the committee was not confident in the findings of the evidence review (see table 3 above), and noted that some important outcomes were not reported. Therefore the committee used its knowledge and experience to develop a list of red flags (see box 1 in the guideline) and indicators (see box 3 in the guideline), focussing on what it felt were the most important to women and midwives. When red flags have taken place, the committee agreed that the numbers of midwives available, the red flags and the response should be recorded so that they can be used for future planning, alongside regular reviewing of safe midwife staffing indicators.

The committee discussed the costs and benefits associated with continuous monitoring of red flags and indicators and agreed that there may be a small cost increase because of time taken to collect the data and any necessary electronic data systems that might need to be put in place. To minimise this cost the committee agreed that indicators and red flags should, as far as possible, be based on data which is already collected by the organisation (such as the data collected for mortality and morbidity meetings). The committee highlighted that any costs associated with collecting this data should be small and would lead to long term benefits by reducing adverse events, since effective monitoring and evaluation is fundamental to providing safe and effective care and so is a cost-effective use of resources.