



HEALTH CARE NEAR-MISS – Indicators to measure the performance of obstetric teams in resource-poor settings



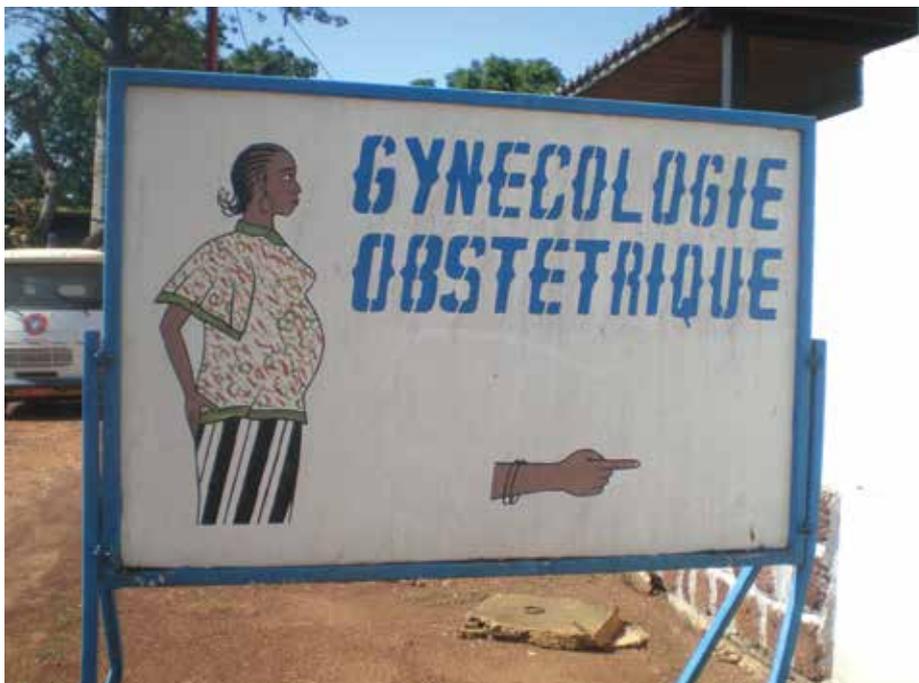
OVERVIEW

Indicators of health care near-miss measure the occurrence of omissions, delays and treatment failure. They are different from maternal near-miss indicators which measure the number of women who nearly died in pregnancy and were saved in extremis. This briefing paper presents why and how the FEMHEALTH project developed and tested health care near-miss indicators for measuring the performance of obstetric teams in low- and middle-income countries. It uses findings from FEMHEALTH's analysis of the potential effect of the removal of users' fees on the quality of care in Benin, Burkina Faso, Mali and Morocco, to recommend a set of indicators of health care near-miss for use in other evaluations. This

recommended set include: omission scores for vaginal deliveries, caesarean delivery, and early neonatal care; transfusion less than requested; delays for caesarean section between decision and intervention; serious adverse events and incidents for caesareans; baby heart present at admission among stillbirths. In addition, the FEMHEALTH project also recommends the use of two complementary quality of care indicators: maternal near-miss after admission among women who were admitted for a normal delivery and case fatality among severe acute maternal morbidity to assess the quality of care in facilities. These indicators can be collected using routine data included in medical records. Their usefulness was

KEY MESSAGES

- The quality of obstetric care provided in facilities is of paramount importance in the fight against maternal and perinatal mortality as there is limited point in getting women into facilities unless they receive adequate care.
- Quality of care is a broad concept, concerned with multiple facets of care, including the hospital environment, preventive and therapeutic interventions and communication with patients.
- For routine monitoring, a good indicator of quality of care is easy to collect from medical records, enables target to be set so that progress can be measured and captures the most essential quality of care aspects.
- Obstetric near-misses are women who experience a very severe complication and survive either because of chance or the good care they receive.
- "Health care near-miss" is an extension of the obstetric near-miss concept. Health care near-miss are errors in the *process of care* which should not have happened but did so without (necessarily) leading to very serious harm.
- Health care near-misses include indicators of omissions, delays and treatment failures. We recommend a short list of 9 indicators for monitoring vaginal delivery, caesarean delivery and neonatal care using routinely collected hospital data.



assessed on the basis of the frequency of events, the ease of interpretation, the completeness of medical records and the potential they had in showing variations. Our analysis implied that quality of care was better where the implementation of the policy was best in at least one country. Use of these indicators for clinical audits or for evaluations could help improve the quality of care in facilities.

SYNTHESIS OF LEARNING

i. Main questions addressed

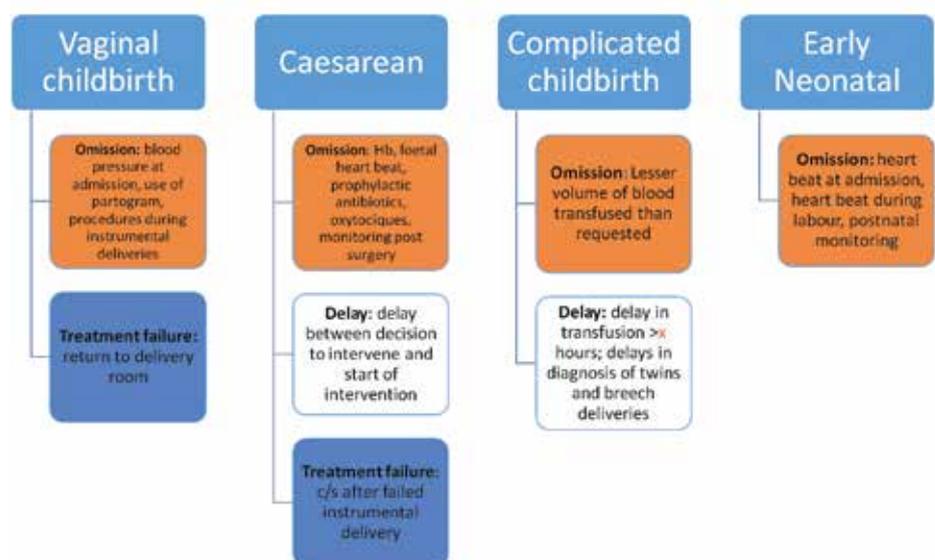
Reducing financial barriers to obstetric care is a priority in many countries who have adopted policies to remove users' fees. There is some evidence that the proportions of women delivering in facilities or by caesarean section have increased after the introduction of these policies (Dzakpasu et al, 2013). However it is not always possible to attribute these changes to fees removal policies. This is often because studies are of poor methodological quality (Dzakpasu et al, 2013; Cresswell et al, a FEMHEALTH forthcoming reference).

The possible knock on effects of the removal of users' fees on the quality of care in facilities, and therefore the performance of obstetric teams, are hotly debated. On the one hand, the removal of user fees may help routine and emergency obstetric care to take place in a more effective fashion as women may arrive in better conditions in facilities and patients and staff may be less busy finding items needed for clinical intervention. On the other hand, a large increase in women reaching understaffed facilities could

compromise safety and lead to medical errors. Because the professionals are overloaded they may not behave suitably with the women and her family. Quality of obstetric care is a function of multiple domains, including the hospital or health centre environment, the preventive and therapeutic interventions which are applied, and the interaction between women's and providers as well as their expectations and how these are being met.

How can we best measure the performance of obstetric teams in the context of an evaluation focusing mostly on deliveries and emergency obstetric care? Maternity units in low-income countries' hospitals are often busy departments where rapid thinking and action is required (Filippi et al, 2005).

Figure 1: Health care near-miss indicators



Many indicators of quality of care require detailed special studies, observations and interviews, or are tricky to capture where computerised medical records are lacking. The FEMHEALTH project decided to extend the work conducted on maternal near-miss (women who nearly died) (Ronsmans and Filippi, 2004), by developing indicators of "health care near-miss" (UK DoH, 2000) and neonatal near-miss (Ronsmans et al, forthcoming). Health care near-misses were defined as negative events or omissions which occurred in the process of care but which did not (necessarily) lead to serious harm. Mistakes without adverse consequences are likely to be more frequent than those that lead to a death or complications.

ii. Methods

A list of potential indicators of health care near-miss was developed on the basis of a literature review of quality of care articles and consultations with maternal and neonatal health experts during and after an international workshop in 2011. FEMHEALTH tested the indicators by conducting a cross sectional survey in 19 purposely selected hospitals in Benin, Burkina Faso, Mali and Morocco. A data collection tool, similar in its presentation to the WHO Multi Country Survey tool, was used to extract data from 14,625 women's and 13,941 babies' medical records (Souza et al, 2013). The usefulness of the indicators was assessed by analysing the frequency of reported events and of missing information, whether variations could be observed between facilities or countries and with the degree of success in implementation of the policy.

iii. Main findings

Figure 1 presents a typology of health care near-miss indicators for vaginal childbirth, caesarean sections, early neonatal care and complicated childbirth. We considered indicators of omissions, delays and treatment failure which could have occurred at any

stage during the “gate to gate” pathway in the facility between admission and discharge or documentation. In total, we tested 18 indicators of health care near-miss based on 47 questions. Complementary health outcomes indicators also included fresh stillbirth in normal size babies, maternal and neonatal near-miss or deaths.

Table 1 includes the definitions of the nine health care near-miss indicators recommended by the FEMHEALTH project. We could not use nine other indicators for the evaluation because they were either infrequent, needed further technical specifications or because they had very high levels of missing data (Table 2). However,

Table 1: Recommended indicators

Indicator	Definition
Omission	
Omission scores for vaginal deliveries for the target group	The proportion of routine procedures for vaginal deliveries not done, including postpartum care. Numerator: Negative or don't know responses to measurement of blood pressure at admission, measurement of heart beat of baby during labour, partogram use, measurement of postpartum pulse, measurement of postpartum blood pressure, measurement of postpartum bleeding, measurement of postpartum temperature Denominator: number of procedures x women Women included: singleton live birth and stillbirths
Omission score for caesarean delivery	The proportion of routine procedures for caesarean deliveries not done, including postpartum care. Numerator: Negative or don't know responses to measurement of haemoglobin pre-surgery, of foetal heart beat pre-surgery, prescription of antibiotics at any point, provision of oxytocin during procedures, measurement of blood pressure postpartum, measurement of respiration postpartum, measurement of pulse postpartum Denominator: number of procedures x women Women included: all women with routine and emergency caesarean
Omission score for neonate	The proportion of routine procedures not done for babies born alive vaginally, including postnatal care. Numerator: Negative or don't know responses to measurement of baby heart during active phase, measurement of Apgar at 5 minutes, assessment of colour during postnatal period, assessment of respiration during postnatal period, assessment of breastfeeding, measurement of temperature during postnatal period Denominator: Number of procedures x number of babies Babies included: singleton babies born alive and vaginally
Transfusion less than requested	Proportion of women requiring a blood transfusion who received less transfusion than requested Women included: women requiring a blood transfusion
Delays	
Delays for caesarean section (c/s) between decision to intervene and start of intervention	Average duration of delays between decisions and intervention Numerator: sum of average length of time for all c/s in facilities, except planned c/s Denominator: number of c/s except planned c/s NB: Accepted decision to delivery time for caesarean section in high income settings is usually set at 30 minutes for audit purpose (National Collaborating Centre for Women's and Children's Health, 2004).
Treatment failure	
Serious events or incidents for caesarean sections	Proportion of women who delivered by caesarean section who have at least one serious morbidity or incidents
Baby's heart present when women arrived among stillbirths	Proportion of stillbirths among women admitted with positive foetal heart beat Numerator: stillbirths with positive heart beat at admissions Denominator: women with positive foetal heart beat at admission (including those who are born alive and stillbirths)
Maternal near-miss after admission	Proportion of women admitted for a normal labour who develop a near-miss after admission Numerator: women with near-miss after admission Denominator: women admitted in normal labour
Case fatality among SAMM	Proportion of women with a severe morbidity who die Numerator: maternal deaths Denominator: maternal near-miss cases and deaths

Table 2: Indicators which need further development or large sample

Indicators	Reasons for rejection
Omission score for complicated childbirth	Women have admitted for a range of complications, and it was difficult to construct a meaningful indicators which reflect the full range of needs. For this reason, we only included on indicator on omission for haemorrhage which is the most frequent complication
Twins diagnosed during delivery	Too few twin pregnancies. However might be useful for larger study with an interest in the performance of antenatal care
Breech diagnosed during delivery	As above
Instrumental deliveries with position of occiput undetermined	Too rare and event or difficult to collect retrospectively
Delays for blood transfusion	Important indicator, particularly for projects focussing on reducing maternal deaths and near- miss cases from haemorrhage. But difficult to interpret because we do not have a threshold as for caesarean section. Further technical specification required
Return to delivery room for placenta retention	Too rare and event or difficult to collect retrospectively
Emergency c/s following attempted instrumental deliveries	Difficult to interpret with respect to performance
Readmission following complications	Too rare and event or difficult to collect retrospectively
Hospital discharge against advice	Too rare an event or difficult to collect retrospectively

these unused indicators might be useful in different contexts or for different studies. The delay indicator for blood transfusion for example is an indicator which might be useful for projects aiming to reduce haemorrhage deaths at facility level. But it needs further technical specification and larger samples of women with bleeding.

If care was perfect, the omission scores would be set at zero. This is of course never the case even in the most advanced clinical settings (Health Foundation, 2011). To facilitate understanding and avoid blame, these simple scores can be transformed into

percentage of care given without omissions (omission percents).

The use of omission percents for vaginal deliveries, caesarean deliveries and neonatal care revealed that these indicators are able to capture interesting variations between facilities and across countries (Figure 2). Moroccan hospitals performed usually better on all omission percents. Overall neonatal care was of poorer quality than care given to women in the labour room or in the surgical theatre. In Burkina Faso, for example, between 30%-80% of care given to neonates was

done without omissions, while 50%-95% of evidence-based procedures for women with vaginal delivery were provided. Facilities where omissions were frequent for surgery frequently also experienced substantial delays in caesarean sections (Figure 3). We also found an association between omission score and cost of caesarean and deliveries in Burkina Faso, although not in Benin.

iv. Discussion

Our set of health care near-miss indicators is noteworthy because it focuses on errors and omissions, using simple scores where appropriate, rather than the coverage of

Figure 2: Omission percents

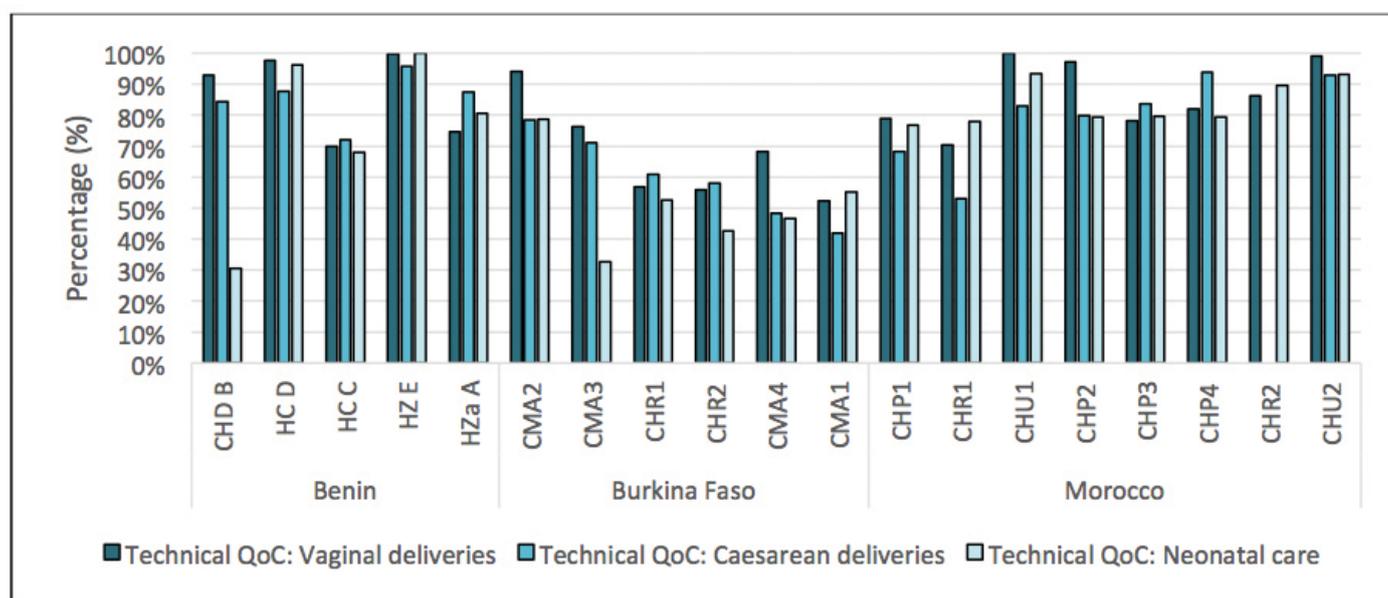


Figure 3: Caesarean section delays between the decision to intervene an the start of the procedure

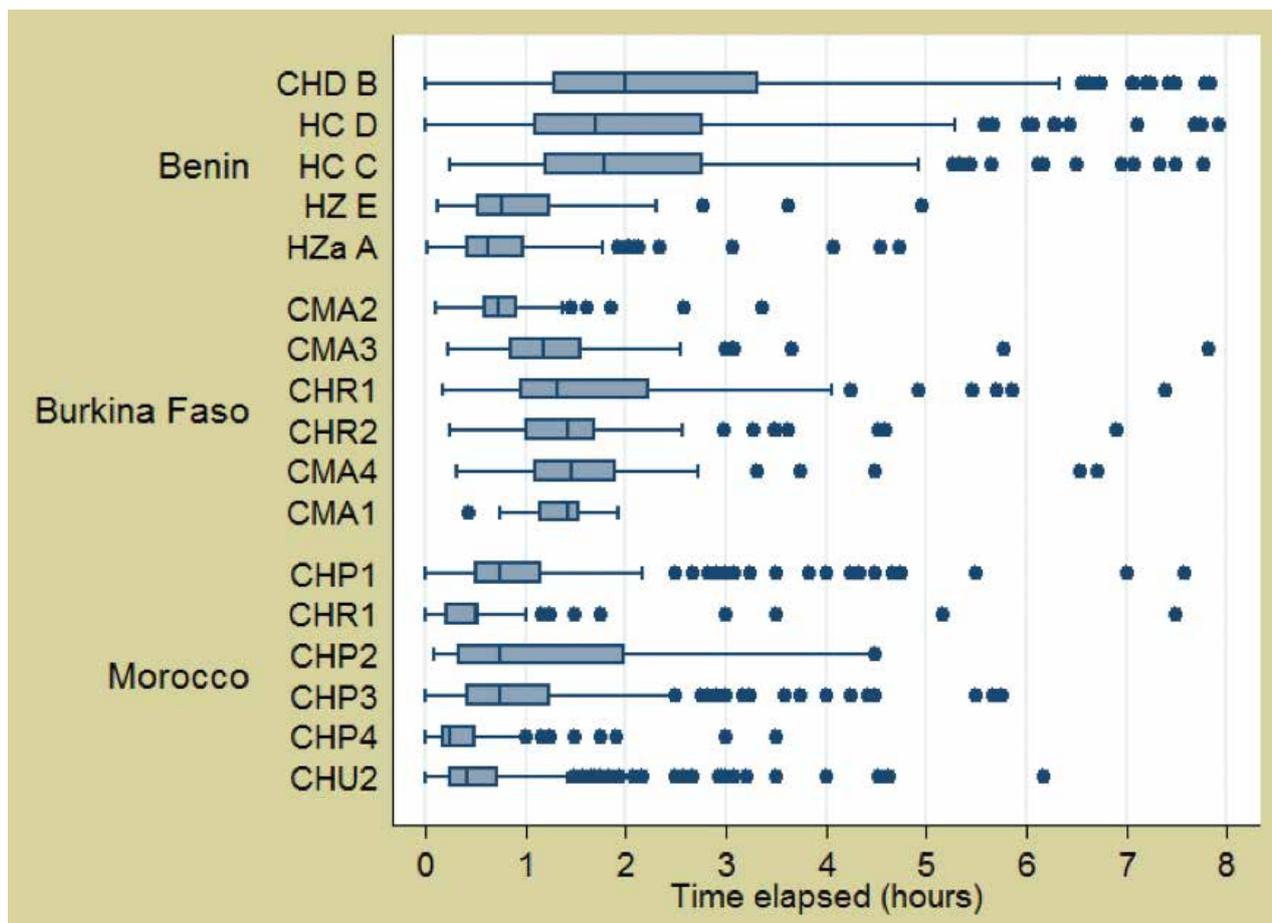
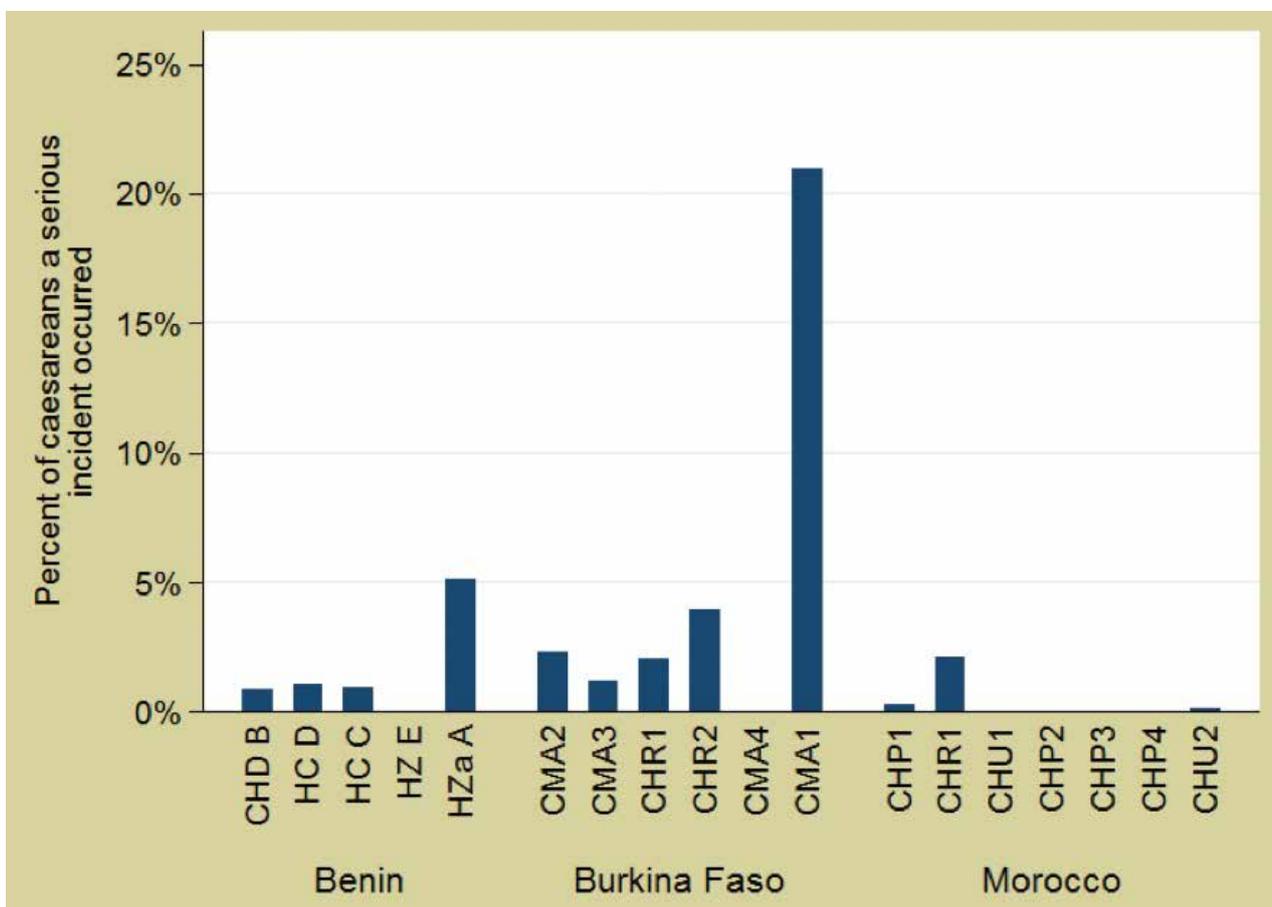


Figure 4: Proportion of caesarean sections where a serious incident occurred



essential obstetric interventions. In preparing this set of indicators, the health care process was conceptualised as dynamic rather than static, where the policy and health care context matters and can influence the performance of individuals. No health system can be free of errors, but the ideal clinical care situation is that women and their babies are not neglected. Measuring quality of care ideally requires investigating many different facets of the process of care (Knight et al, 2013), which is particularly challenging when using routine data. The WHO Survey was unable to find meaningful relationships between the coverage of essential interventions and serious health outcomes, partly because they focus on a very narrow aspect of the quality of care (the coverage of essential interventions). For this reason, we recommend focussing on the levels of errors or performance and triangulating information from several sources whenever possible, for example using quantitative data as well qualitative data. Observation of the clinical environment and interviews with patients in Benin and Morocco enabled us to confirm and complement the quantitative finding in FEMHEALTH facilities, including why some facilities appear to perform less well than others (such as lack of a particular drug). On the other hand, women's satisfaction reported in exit interviews did not correlate well with the omission and delays indicators at facility level but women's satisfaction often concentrated on different aspect of quality of care such as perceived cleanliness of facilities.

The main strengths of these indicators are that they are a small set, evidence-based, suitable for setting targets and relatively easy to capture from medical records. The proposed indicators have some limitations too. They only focuss on some aspects of quality of care and may need expanding; they may reflect local accepted practice as much as unplanned errors, as some of the country variation could imply; they focuses on negative events and communication with health worker and facilities will need to make sure that they are not used to blaming health workers but rather that they are useful to show where there are systemic issues which need to be addressed.

v. Recommendations

Quality of care must be measured using a range of indicators. Health care near-miss indicators are useful if there is any concern that more errors might occur following a particular changes. Indicators of health care near-miss have also been proposed because it is believed that they help identify problems early enough because something very serious might happen (DoH, 2000).

Our recommendations include:

- To the research and evaluation community:
 - i. Further testing is required.
 - ii. Analysis can be improved by taking into account the case mix and the different contexts in which the facilities work, for example the number of providers involved, as well as random fluctuation and differences in data quality.
 - iii. Triangulation is important.
- To health care managers with an interest in monitoring their activities:
 - i. It is important that health providers record better information in their medical records and in systematic fashion.
 - ii. Computerised data system such as those piloted in Burkina Faso and Morocco may help in this regard.
 - iii. Health care near-miss can be used for clinical audit, as targets can be set.
- To policy makers:
 - i. Quality of care for the newborn babies in African hospitals must be urgently addressed.

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KEY RESOURCES

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