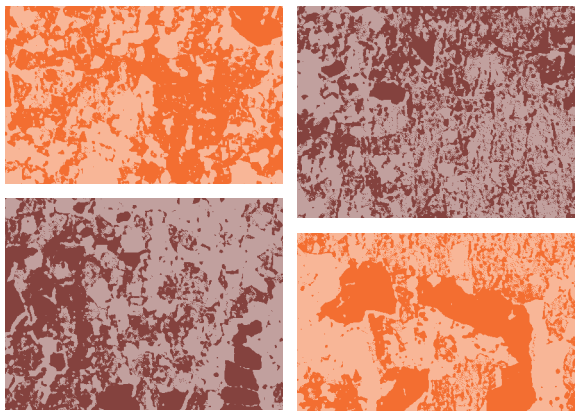
# Consultation on

# Improving measurement of the quality of maternal, newborn and child care in health facilities



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# Contents

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# Abbreviations

| | |
|---|---|
| KMC | Kangaroo Mother Care |
| PMNCH | Partnership for Maternal, Newborn and Child Health |
| SARA | Service Availability and Readiness Assessment |
| UNICEF | United Nations Children's Fund |
| USAID | United States Agency for International Development |
| WRA | White Ribbon Alliance |

# 1. Introduction

Every year, 289 000 women die due to complications in pregnancy and childbirth, and 6.6 million children below 5 years of age die of complications in the newborn period and of common childhood diseases. Many of these deaths could be prevented by providing optimal care at health facilities. Although progress has been made in increasing the coverage of several key reproductive, maternal, newborn and child health interventions over the past two decades, there has been limited progress in improving maternal and paediatric outcomes because of a major gap between coverage and the quality of care provided in health facilities. Therefore, improving the quality of facility-based health care services and making quality an integral component of scaling up interventions to improve health outcomes of mothers, newborns and children is of utmost importance.

On the basis of an earlier literature review, the participants in the meeting approached the issue of the quality of maternal, newborn, and child health care with the model proposed by Donabedian,[1] in which the quality of health care is measured in terms of *structure* or inputs, the material, human and intellectual resources needed to provide care; *processes*, the activities in which these resources are used to provide care; and *outcomes*, the results of the activities. Health care processes eventually result in health impacts. The participants categorized indicators of quality into these three domains.

The purpose of quality indicators is to support continuous improvement in care, often called quality improvement. As global experience increases with health care processes, some authorities prefer the term "process improvement". Issues of structure or resources are important in lower- and middle-income countries, but the limiting factor is usually financial, with few options for other approaches to improvement. Better outcomes are certainly the goal of quality improvement, but these outcomes are achieved by improving the processes that lead to the outcome of interest.

In Donabedian's model of health systems, a series of processes lead to a measurable outcome. Most outcomes become inputs to other sets of processes. For example, the outcome of the processes involved in filing and retrieving antenatal care records is delivery of the record to a clinician for the next visit, and that outcome is an input to the clinician's care during that visit. Health care involves many processes and fewer outcomes; therefore, monitoring a small number of outcome indicators can give an idea of the overall effectiveness of a large number of processes. As more detailed information is usually needed to improve health care processes, however, the first step in improvement is usually to collect baseline information on specific

[1] Donabedian A. The quality of care. How can it be assessed? JAMA 1988;260:1743–8.

health care processes. This level of detail is not suitable for routine information systems as it requires a special effort.

The most commonly studied health care process is the degree to which care follows the evidence-based clinical guidelines that have been widely adopted for basic maternal, neonatal and child health services. Clinical care also depends on a wide range of non-clinical processes, such as records management, which are also suitable for improvement. Most authorities would define quality of care processes in broad terms, to include not only the effectiveness of care (the degree to which it is based on science) but also its efficiency, patient-centredness, accessibility, safety and timeliness. For example, the efficiency of antenatal care and the accessibility of obstetric services by rural populations could be addressed by quality improvement approaches.

Specific methods are used in quality improvement, including audit of clinical records combined with feedback on clinicians' performance. In recent years, however, quality improvement has been increasingly dominated by a more general approach of evidence of improvement rather than a specific intervention. In this approach, teams of providers are organized and supported to identify and test changes in the processes they wish to improve and to measure the impact of the changes against a quantitative indicator of quality. This approach of testing change is also known as "improvement science" because of its focus on evidence. In this approach, the type of changes that can be tested is limited only by the team's imagination and might include interventions such as audit and feedback, training and changes in an established process.

In most countries, there is no national accreditation system or mechanism to monitor the quality of care provided in health facilities, despite the availability of evidence-based guidelines and tools. A few countries have mechanisms to assess the quality of health care, but they are usually for specific population groups, conducted at a limited number of sites and address issues of care of national relevance. Such accreditation systems do not adequately address the dynamic nature of quality of care and the associated problem-solving necessary to improve care. They do, however, represent a launching point for a more standardized approach to quality of care. Several tools are available for assessing and auditing the quality of services provided at health facilities. Nevertheless, existing measures should be rationalized to obtain a unified framework for measuring results with a limited set of output and impact indicators.

Quality of care is an important consideration in the international initiatives that arose from the Global Strategy for Every Woman and Every Child. Leaders of global health agencies have agreed to collaborate on a global agenda for better measurement of the quality of health care provision by aligning the various efforts, which will reduce the burden of data collection and reporting for countries and improve linkage of results with decision-making.

Global consultations have been held to prepare indicators in the area of maternal, newborn and child health. A list of potential indicators for measuring and monitoring quality of care was drawn up at expert meetings in 2010 and 2011. The present meeting was convened by WHO and the Partnership for Maternal, Newborn and Child Health (PMNCH) to achieve consensus on a set of core indicators for measuring and reporting on the quality of maternal, newborn and child care in health facilities. In addition, the meeting provided an opportunity to share tools for assessment and quality improvement and methods and experiences in assessing and improving the quality of care provided to mothers, newborns and children in health facilities. The agenda of the meeting is reproduced in **Annex 1**.

## Aim

The aim of the meeting was to achieve consensus on core indicators for global measurement and reporting on the quality of care provided for mothers, newborns and children in health facilities that could be used during the final years of work on meeting the Millennium Development Goals.

## Objectives

The five objectives of the global consultation were:

- to review assessment tools, methods and processes for measuring the quality of care in health facilities;
- to share global and regional experience in improving the quality of care for mothers, newborns and children in health facilities;
- to review and agree on a core and a supplementary set of indicators for global monitoring and reporting on the quality of care for mothers, newborns and children in health facilities;
- to agree on a framework for reporting on the quality of care for maternal, newborn and child health; and
- to discuss opportunities and future collaboration in improving the quality of maternal, newborn and child care.

The meeting was attended by 70 participants, who included regional and country experts and representatives of professional organizations and nongovernmental organizations working on quality of care and of bilateral and multilateral agencies. (The list of participants is given in **Annex 2**.) The participants agreed on a set of global core indicators for measuring and reporting the quality of maternal, newborn and child care and on the tools, methods and processes required. The existence of a set of global core indicators does not, however, mean that all other "indicators" are ignored or that the proposed global indicators are sufficient in themselves for subnational work to improve quality. These indicators should complement global coverage indicators and be considered markers of important aspects of the quality of health care for comparison within and across countries and to indicate the need for monitoring and improving the quality of health care for mothers, newborns and children. These indicators should be complementary and potential sources of areas for improvement. At subnational level (e.g. district or facility), additional complementary measures of quality of care are likely to be necessary to support continuous improvement, to be linked to a broader set of care processes for improving outcomes for mothers, newborns and children (e.g. precise dosing and timing of high-impact medications, accurate and timely diagnosis, monitoring of complications, coordination of care across system levels).

## Declarations of interest

All meeting participants were required to declare any potential conflict of interests. None of the participants reported a conflict of interest.

# 2. Experience in assessing and monitoring the quality of maternal, newborn and child care in health facilities

To address the first meeting objective, participants shared tools, processes and mechanisms used at country and regional levels to assess and monitor the quality of health care services provided to mothers, newborns and children. Many tools are used to assess different dimensions of quality, and different indicators are used, sometimes making comparison of results difficult. In order to use the experience of developing and implementing these tools and the lessons learnt, experiences were shared.

**Bangladesh:** In collaboration with the Obstetric and Gynaecological Society of Bangladesh and the Bangladesh Paediatric Society, the International Centre for Diarrhoeal Disease Research, Bangladesh, is improving the quality of maternal and newborn health care through a facility-based project known as the Quality Improvement Initiative for Newborn Health Care within a partnership between Japan and UNICEF that started in 2011. As part of this initiative, the International Centre for Diarrhoeal Disease Research has prepared a baseline tool to assess the quality of maternal and newborn care, as reported at the meeting.

**WHO Regional Office for Europe:** The European Regional Office has prepared maternal and newborn and paediatric assessment and quality improvement tools to assess the quality of care provided in hospitals. The two tools are derived from WHO standards and evidence-based guidelines of care. Assessment requires a multi-professional team, is participatory, involves peer-to-peer review with no blame and allows identification of actions to improve the quality of care. The tools are intended to support staff and managers of health facilities, local authorities, ministries of health and development partners to assess the quality of perinatal and paediatric health care at facility level in a homogeneous, valid way, to contribute to the identification of key areas that require improvement and to plan actions for improving the quality of health care at local and national levels. These tools have been field-tested and used in a number of countries in Europe and have been revised and updated on the basis of experience with implementation.

**Johns Hopkins Program for International Education in Gynecology and Obstetrics (JHPIEGO):** The programme has experience with a standards-based approach to promote best practice in maternal, newborn and child care. The aim of this participatory approach is to reduce the gap between information and action in four steps: set standards, implement the standards, measure progress, and reward achievements. The initiative has been used and evaluated in Afghanistan, Guatemala, Malawi, Mozambique and Zambia. The outcomes of the approach have been general awareness of and participation in the process, better availability of supplies, changes in internal policies, creation of hospital committees, motivation and a sense of empowerment of the providers and improved perception of change by clients.

**WHO Service Availability and Readiness Assessment (SARA):** WHO presented the SARA tool and some results from the countries in which it has been used. SARA is a tool for assessing and monitoring the availability of services in health facilities and the readiness of the health sector to generate evidence for planning and managing a health system. SARA consists of a systematic survey for generating tracer indicators of service availability and readiness. The objective is to obtain reliable, regular information on service delivery (such as the availability of key human and infrastructure resources), the availability of basic equipment, basic amenities, essential medicines and diagnostics, and the readiness of health facilities to provide basic interventions in family planning, child health services, basic and comprehensive emergency obstetric care and treatment and care for HIV, tuberculosis, malaria and noncommunicable diseases. The survey is rapid, as it is based on observation and interviews, and is cheap and sustainable. The results of surveys are comparable among districts and even countries.

**United States Agency for International Development:** The experience of USAID in addressing gaps in the quality of care in maternal, newborn, and child health services was presented and discussed, with case studies of quality improvement interventions in Africa. The programme is based on tests of change, as modified by the Institute for Healthcare Improvement. In this model, several improvement teams from different facilities work together towards the same aim. By sharing their experience periodically, the teams identify processes for improvement more rapidly than teams working in isolation (the traditional continuous quality improvement model.) The collaborative approach also establishes a peer group, which appears to provide a strong incentive for the teams. Health impacts were associated with quality improvement, such as a drop in the frequency of postpartum haemorrhage in Niger after improvements in active management of the third stage of labour. This was the result of changes made by teams of rural midwives with no external resources provided. A cost-effectiveness analysis of the intervention showed a sustained 20% reduction in the average cost of an institutional delivery to the Ministry of Health. The changes made in Niger were taken to scale and, in a separate initiative, shared with counterparts in Mali, where similar results were documented.

**Quality of Prenatal and Maternal Care (QUALMAT)**, a work programme sponsored by the European Union, addresses the critical issues in establishing a comprehensive continuum of care for mothers, newborns and children by better-motivated health workers. A computer-assisted clinical decision support system to improve maternal and neonatal health is being tested in Burkina Faso, Ghana and the United Republic of Tanzania to bridge the gap between information and action. Some of the problems encountered so far have been poor records with missing data, poor quality of data, weak ownership of the project by local stakeholders and lack of capacity to analyse and interpret data for action.

**Harmonized reproductive health registries:** An initiative of the Norwegian Institute of Public Health, the University of Oxford and WHO has been to prepare indicators and minimum datasets to monitor uptake of WHO essential interventions in reproductive, maternal and child health. The work packages for the registries were prepared after extensive consultation and feedback, in which experts in maternal and child health in 15 countries assessed and reviewed the indicators for inclusion in registries on the basis of five criteria: action-focused, important, operational, feasible, and simple and valuable. The indicators generally scored well for action-focused and important but less well for simple and valuable and often poorly for operational and feasible, largely because of difficulties in data collection. The group is refining and testing the indicators in the field.

These seven experiences illustrate tools used for assessing the quality of maternal, newborn and child care, which vary in method, area of focus and purpose. While each tool was effective to a greater or lesser extent in improving the quality of the health care practices that it addressed, a number of lessons were learnt (**Box 1**).

**BOX 1**

### Lessons learnt from experience in assessing and monitoring the quality of maternal, newborn and child care in health facilities

- → As a champion, the ministry of health plays a key role. Therefore, it is important to engage a focal person for quality improvement activities within the ministry (national and regional), with the involvement of other relevant departments.
- → Local stakeholders (managers, providers, expert clinicians) should be involved in planning and preparing the tools for quality assessment and devising or reviewing standards of care and clinical guidelines.
- → Local teams (front-line providers and managers) should be engaged and trained in continuous improvement of care, including monitoring local measures, to assess progress.
- → When possible, high-priority quality of care measures should be integrated and monitored in facility information systems (e.g. records and registers), and sentinel quality measures should be defined and monitored in national information systems.
- → All existing quality improvement efforts and tools in the country should be identified and linkage assured with existing programmes.
- → The capacity of health staff should be built to use tools for assessing quality of care assessment and to design and use means for quality improvement, including pre-service and continuing medical education.
- → Collaboration with professional associations (often weak in most countries), academia and international agencies can be a driving force in developing and implementing quality assurance.
- → Results must be documented and the effectiveness of tools evaluated in operational research, such that any barriers can be identified and removed.
- → Locally feasible interventions should be used initially, with periodic assessment to monitor progress and some mechanism for rewarding good practice.

### Challenges

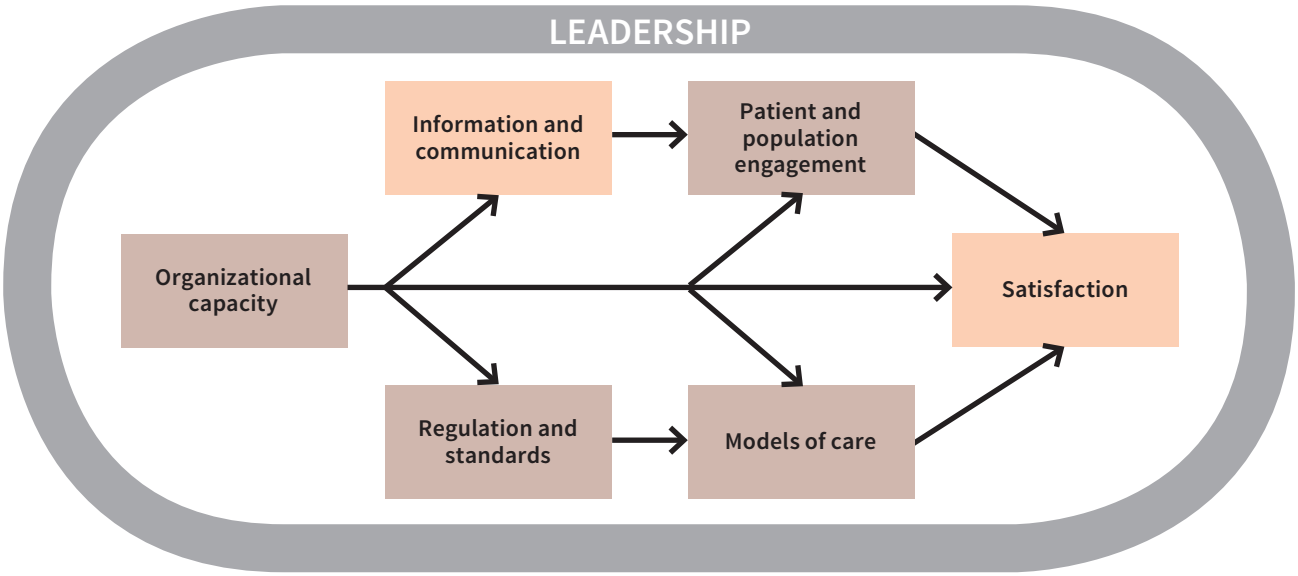
Prepare for challenges that are likely to be encountered, such as poor facility records, including missing and poor-quality data, weak ownership of the project by stakeholders and poor capacity to analyse and interpret data and take action at the local level. However imperfect, early feasible actions from which data can be used locally may ensure better measurement and monitoring.

# 3. Experience in improving the quality of maternal, newborn and child care in health facilities

## Literature review

In 2013, WHO conducted a comprehensive review of studies on quality improvement globally to identify facilitators and barriers to good quality of care for maternal, newborn and child health. There are several definitions and models of quality of care. For the purpose of the review, evidence was collected on the three levels of health systems suggested by Donabedian:[1] structure (setting, material and human resources and organizational structures, standards and regulations), process (giving and receiving care) and outcomes (improvements in health outcomes, health behaviour, patients' knowledge and patients' satisfaction). The data from the review of published and unpublished systematic reviews were analysed within the WHO organizational management framework for health systems. Priorities, facilitators and barriers to improving the quality of care were identified and grouped into eight interrelated domains: the six domains of the WHO framework (information, patient and population engagement, leadership, organizational capacity, regulations and standards and models of care) and two other domains (communication and satisfaction) (**Figure 1**).

**Figure 1. Health system domains for organizational management strategies to improve the quality of health care for mothers, newborns and children**




[1] Donabedian A. The quality of care. How can it be assessed? JAMA 1988;260:1743–8.

The main findings of the review are summarized in **Table 1**.

**Table 1. Common facilitators and barriers to improving the quality of care for mothers, newborns and children**

| Domain | Barriers | Facilitators |
|---|---|---|
| Information | Language (migrants, minorities); information provided without active user engagement | Active, regular communication between provider and user; provider decision support systems |
| Communication | Passive flow from providers to users | Active interpersonal communication; continuous communication; decision aids, interactive workshops for providers |
| Patient and population engagement | Users' and community perception; lack of adequate information; lack of effective inter-personal communication; insensitive attitude; power difference between health worker and patient or caregiver or between men and women | Respect in user–provider relationship; confidentiality; active community involvement; providers' time and attention |
| Satisfaction | No assessment of user perspectives in audits; uncaring and disrespectful behaviour of providers; cultural insensitivity; high costs; long waiting times | Engaging users in shared decision-making; continuity of care; comfort and support from health care providers |
| Regulations and standards | Variable fidelity to standard guidelines; incomplete or out-of-date standards; lack of adaptation of standards to local systems of care (community, clinic, hospital) | Regular supervision; audit and feedback; effective training |
| Organizational capacity | Shortages of health care professionals, drugs and equipment; gaps in skills and knowledge; irregular, long working hours; providers' attitude towards change; inefficient care processes | Task shifting; training in need-based programmes; reinforcement of good practice through supervision and refresher training; settings other than clinics that improve comfort and satisfaction; changes to improve efficiency of care processes |
| Models of care | Few antenatal care visits; lack of coordination across system levels (community, clinic, hospital) and phases of care (e.g. antenatal care, labour, delivery, postpartum, child services) | Models providing continuity of care; integrated, comprehensive care and care and support from alternative carers |

## Sharing experience

Within the WHO domains of quality of care, several approaches and methods used to improve the quality of maternal, newborn and child care were described. These included strategies to improve the skills and knowledge of health professionals, use of certain tools, use of actual data and maternal and paediatric case audits. Some of the experiences from countries, regions and partners are described below.

### *Kenya*

Strategies and tools to improve children's health in Kenya included a training course on emergency triage developed by the Ministry of Health, which was based on the WHO course for continued care of critically ill children during the initial 48 h after admission. The 5-day training

course targeted junior doctors, clinical officers and nurses, who were trained in emergency case management and care with measures of quality: preparedness to handle emergencies, mortality-based audits, hospital surveys, feedback and problem-solving. The course was found to be effective in improving the knowledge and practices of health care providers.

### *United States Centers for Disease Prevention and Control*

A systematic review of strategies to improve the performance of health care providers in low- and middle-income countries showed the effectiveness of group problem-solving in addition to training; supervision of training; the effectiveness of longer training; training through lectures, interactive sessions, role play and clinical practice in combination or training covering several topics; and use of checklists.

### *WHO safe childbirth checklist*

The checklist and the accompanying implementation manual help health care workers to deliver essential maternal and perinatal care. They were prepared jointly by the WHO Patient Safety Programme, the departments of Maternal, Newborn, Child and Adolescent Health and Reproductive Health Research and the Harvard School of Public Health. The checklist is based on published guidelines, evidence-based literature, expert consensus, collaborator feedback and reviews of mortality and near-miss audits. It comprises 29 items covering the major causes of maternal death (haemorrhage, infection, obstructed labour and hypertensive disorders), intrapartum-related stillbirths (inadequate intrapartum care) and neonatal deaths (birth asphyxia, infection and complications related to prematurity).

### *Maternal death surveillance and response*

The feasibility and usefulness of establishing a system for surveillance of maternal deaths and responses to draw attention to maternal deaths at local and national level in order to initiate appropriate action was discussed. The system promoted by WHO and partners and currently implemented in many countries includes maternal death identification, reporting, review and response, which is the essential information for stimulating and guiding action to prevent future maternal deaths and improve measurement of maternal mortality. It can improve the quality of care and prevent maternal deaths.

### *South African initiative to improve the quality of paediatric care*

The aim of the project is to strengthen national health systems in managing common childhood illnesses at first-level referral (district) hospitals by improving the quality of care through death reviews. Participatory, collaborative approaches are used to engage stakeholders in assessing the quality of care. Currently, 47% (158/339) of the hospitals in South Africa are volunteers in the initiative. The programme ensures that all inpatient deaths are identified, the social, nutritional and HIV status of each child who dies is determined, a cause is assigned to each death, and modifiable factors in the care of each child who dies are identified. This information is collected on a paper form and entered into software for analysis. More than a decade's experience with this initiative has demonstrated the effectiveness of death reviews in improving the quality of care for children, with a reduction in hospital mortality rates. It has improved data quality, and the reports have been crucial for advocacy and for planning at hospital, district and national levels. Its success depends on champions, support for supervision, training programmes, simplicity and feedback.

### *International Federation of Gynecology and Obstetrics*

Every woman has the right to a positive birth experience and compassionate care; a positive birth experience is associated with a healthy delivery outcome for mothers and newborns. Thus, the Safe Motherhood and Newborn Health Committee in partnership with the International Confederation of Midwives, WHO and the White Ribbon Alliance have developed the Mother Friendly Birthing Facility initiative, with 10 criteria, underpinned by a charter on the universal rights of childbearing women. The aim is to associate human rights with high-quality maternity care.

### *University Research Corporation*

The experience of using field data and teams to improve the quality of care for mothers, infants and children in clinics and hospitals was presented. Regular measurement of quality of care in the field may result in improvement due to periodic assessment, participatory review and follow-up. This was achieved by field testing of changes in care to ensure use of best practice, routine audits of deaths or near-misses, simulated case studies, peer reviews, supportive supervision, regular monitoring and reporting on quality of care performance indicators linked to corrective action. With these mechanisms, health providers reduced estimated postpartum haemorrhage rates and increased adherence to essential newborn care standards and other best practice for mothers and newborns. Meaningful, feasible quality indicators should focus on highest-burden diseases and dimensions that affect patient outcomes, including the effectiveness of care (adherence to best practice), safety (do no harm), continuity and coordination of care, client-centredness and efficiency of care. Indicators for continuous improvement of quality must be measurable by feasible methods from local data that can be obtained regularly by providers and managers in the field (e.g. chart audits, peer observation and evaluations). The lessons learnt are that it is possible to build local capacity to improve adherence to best practice, that it is best to start with a few feasible areas in order to phase improvement efforts and measurement and to ensure continued, engaged leadership.

# 4. Core indicators to measure the quality of health care for mothers, newborns and children

The development of global core indicators to assess the quality of health care for mothers, newborns and children was initiated in 2010, when a maternal health working group discussed indicators of effective interventions for the prevention and management of major causes of death and disability, human resources, geographical access and referral, and equipment, supplies, medicines and record-keeping. It agreed to work further on definitions and testing of the core indicators in order to obtain consensus. In 2011, the indicators for reproductive, maternal, newborn, child and adolescent health were reviewed and revised by experts by scoring and applying feasibility measures, to generate a list of 76 indicators. The list was reduced to 32 by filtering out indicators that were unlikely to become available or be useful in the next 1–2 years, and was subsequently further reduced to 15 by scoring their importance on a scale of 0–3 (none, low, moderate, high). These comprised one indicator for reproductive health, six for maternal health, four for newborn health, three for child health and one for adolescent health.

The group decided to concentrate on maternal, newborn and child health and to discuss indicators of reproductive and adolescent health later. Thus, 13 indicators were retained, which cover policies, human resources, commodities, practices, knowledge and demand (**Annex 3**). A further set of 43 indicators was compiled from a list of indicators that have been used by countries and organizations to assess the quality of maternal care during and after pregnancy and childbirth and for child care during the neonatal period, infancy and childhood (**Annex 4**). These indicators were reviewed at the meeting in 2013, when the global core indicators were generated iteratively in two phases: selection of core and optional indicators and achieving consensus.

## Phase 1. Iterative selection of core and optional indicators

The participants were divided into three groups according to their expertise and experience – maternal, newborn and child health – each group with the task of generating a list of five core indicators. “Core indicators” were defined as essential, which should be reported in all countries. The groups reviewed the 13 core indicators prepared previously (see above and **Annex 3**) and the 43 additional indicators related to pregnancy, childbirth, postnatal, neonatal and child health (**Annex 4**). Each of the 56 indicators was discussed extensively and scored between 0 and 3 (0, don’t agree, to 3, completely agree) on the basis of five criteria (**Box 2**).

The groups noted the numerator and denominator for each indicator and suggested definitions and clarifications when necessary. Each group also generated a list of optional indicators (**Annex 5**), which they considered important but not essential. Countries could opt to report on these indicators, depending on their situation. The core and optional lists also included general indicators of the quality of health care that are relevant from the perspective of health systems,

**BOX 2**

### Criteria for assessing indicators

- **Action-focused:** It is clear what should be done to improve outcomes associated with this indicator (e.g. vaccination to reduce neonatal tetanus).
- **Important:** The indicator and the data generated will make a relevant, significant contribution to determining how to respond to the problem effectively.
- **Operational:** The indicator is quantifiable; the definitions are precise, and reference standards are available and tested or could be developed.
- **Feasible:** It will be feasible to collect the data required for the indicator in the relevant setting.
- **Simple and valued:** The people involved in the service can understand and value the indicator.

Source: Adapted from *Harmonized reproductive health registries*. Oslo: Norwegian Institute of Public Health, 2013.

irrespective of the beneficiaries. The lists of core indicators from the three groups were then discussed and debated by all participants, and their suggestions led to the second phase.

## Phase 2. Achieving consensus on the list of global core indicators

Discussions following phase 1 raised concern about what was to be measured, whether the indicators reflect the quality of health care, whether it would be feasible to collect reliable, good-quality data to measure them, sources of data and methods of measurement. Therefore, during phase 2, the groups re-evaluated their lists of core and optional indicators to resolve these concerns and discuss sources of data and methods of collecting data and existing data (routinely or during surveys). Phase 2 included a discussion on possible indicators for local facilities and a plan to build networks and collaboration for deciding on global indicators.

Although the indicators generated in phase 1 did not change significantly in phase 2, a few were replaced by others that were not on the original list of 56 but were considered to be important; some were revised, and a few others were redefined and clarified, leading to 19 global core indicators for assessing the quality of health care for mothers, newborns and children (**Table 2**).

### *Maternal health indicators*

Care was taken to ensure that the maternal indicators covered some aspect of antenatal, intrapartum and postpartum care, including screening, prevention or management of major causes of maternal mortality. The group focused on information that can be collected in facilities at the time of birth.

Of all interventions in the antenatal period, the group considered that measurement of blood pressure is the most important for the diagnosis and early management of hypertensive disorders in pregnancy. Magnesium sulfate is the preferred anticonvulsant for the management of severe preeclampsia and eclampsia, while oxytocin is the preferred uterotonic for prevention of postpartum haemorrhage in all births. Hence, the group agreed to include indicators of compliance with these evidence-based practices.

Prolonged obstructed labour is an important cause of maternal and perinatal mortality and morbidity, and the group discussed various options for indicators of this condition. The group agreed that use of an indicator linked to partography (e.g. number of partographs correctly completed) or caesarean section (e.g. not performed at all levels, lack of consensus on optimal rate) would not be suitable and agreed on use of the proportion of women in active labour (with a cervical dilatation of at least 4 cm on dilatation) for more than 12 h as the indicator. These women should have been delivered in the facility after augmentation of labour or operative delivery or should have been referred elsewhere for these interventions.

Ideally, intrapartum stillbirth as an indicator of the quality of intrapartum care should include all fetuses weighing 1000 g or more or after 28 weeks of gestation. The group recognized that decision-making for low birthweight and short gestational age categories depends on the availability of resources: personnel are reluctant to intervene for the sake of the fetus when resources are limited; however, setting a birthweight cut-off of 1500 or 2000 g would negatively affect recording of data on stillbirths. Hence, the indicator proposed is based on the WHO-recommended birthweight cut-off for international comparison.

Puerperal sepsis is another important cause of maternal death and is often linked to the quality of care during labour and childbirth. As women who give birth in facilities are often discharged home before clinical signs of severe sepsis appear, the group agreed to include readmissions for sepsis in the indicator.

### *Newborn health indicators*

Birth asphyxia is an important cause of neonatal mortality. The indicators considered for this condition were the proportion of births assisted by health workers trained and equipped for newborn resuscitation and the availability of health professionals with midwifery skills on duty in labour and childbirth wards. The group agreed that information on the availability of functioning resuscitation equipment would be easier to monitor than other proposed indicators and therefore agreed to include the proportion of health facilities with functional neonatal bags and masks (two sizes) in childbirth wards as a core indicator. The group proposed a composite indicator of essential newborn care that included all four elements: immediate and thorough drying of the infant, immediate skin-to-skin contact between the infant and the mother, delayed cord clamping and initiation of breastfeeding in the first hour after birth.

Two other core indicators were proposed by the group: care of small infants, measured as the availability of Kangaroo Mother Care (KMC) at various levels of health facilities, and birthweight-specific neonatal mortality in facilities. Overall, the proposed core indicators measure the quality of care in individual facilities (essential newborn care, birthweight-specific neonatal mortality rates) and at regional and subregional levels (proportion of facilities with resuscitation equipment and ability to provide KMC).

### *Child health indicators*

The group considered the three suggested indicators – availability of tracer medicines for management of common childhood illnesses, case management and referral care – and gave them high scores, as they are already collected in health facility surveys and are readily available for global reporting. The group also recognized that severe acute malnutrition is a major contributor to child mortality and should be included in the list of global indicators at all levels of care in facilities and in the hospitalized case fatality rate. The group also considered

inclusion of deaths among hospitalized children under 5 years, as monitoring of hospital deaths has become a standard in assessing the performance of hospitals and the quality of care.

The group suggested that oral amoxicillin be included in the stock-out indicator, as it is one the 13 United Nations lifesaving commodities and pneumonia is a major cause of child mortality. The group considered that antimalarial agents, rapid diagnostic tests for malaria and antiretroviral agents are context-specific commodities in countries and regions where the prevalence of malaria or HIV infection is high. For the indicator of correctly prescribed antibiotics, the group proposed to include context-specific common diseases such as malaria to encourage correct prescription of antimalarial agents in countries with a high malaria burden.

The group thus added two core child indicators, on severe acute malnutrition and hospital mortality, and proposed three optional indicators: paediatric mortality audit as a process indicator and the availability of an uninterrupted supply of oxygen, soap, running water or alcohol-based hand rub as structural indicators.

The group agreed that severe acute malnutrition is a difficult and complex indicator to measure. An indicator that is relevant at the level of both primary facilities and hospitals level is “the percentage of children with severe acute malnutrition who are correctly prescribed therapeutic feeding (RUTF or F75/F100) at facility level”, which could easily be collected from patient records or registers. The hospital mortality rate is readily available, as it is usually collected by health management information systems. It simply requires recording the number of deaths that occurred within a given period (the numerator) and the number of admissions or discharges during the same period (the denominator). When possible, it could be stratified by age, 0–1 month, 2–11 months and 12–59 months, with the option of including deaths occurring within 24 h of admission as a measure of how well emergency cases are managed.

### *General indicators*

The groups agreed to include four general indicators. Stock-outs of drugs in health facilities affect the quality of care. For mothers and newborns, the group agreed to include oxytocin, magnesium sulfate, dexamethasone, oral amoxicillin and injectable gentamicin as tracer medicines. For children, the essential medicines are vaccines, oral rehydration salts, zinc, oral amoxicillin and injectable gentamicin. These medicines are among the 13 United Nations lifesaving commodities. Rapid diagnostic tests for malaria and antimalarial and antiretroviral medicines were considered context-specific tracer medicines.

Death reviews are an important part of quality assessment and improvement. The group agreed on an indicator of the proportions of maternal, perinatal and child deaths that were reviewed in each facility.

The availability of soap and running water or an alcohol-based hand rub to prevent infection and the availability of a safe, uninterrupted oxygen supply in labour and childbirth, neonatal and paediatric wards are also core general indicators.

**Table 2. Global core indicators for assessing the quality of health care provided to mothers, newborns and children in health facilities**

| Core indicator | Numerator | Denominator | Data source | Methods |
|---|---|---|---|---|
| **Mothers** | | | | |
| Proportion of antenatal care visits at which blood pressure was measured | No. of antenatal care visits at which blood pressure was measured | Total no. of antenatal care visits | Antenatal care registry or hand-held prenatal record (facility-specific) | Collected by delegated staff from available records |
| Proportion of women with severe preeclampsia or eclampsia treated with magnesium sulfate injection | No. of women with severe preeclampsia[a] or eclampsia[b] treated with magnesium sulfate injection | Total no. of women with severe preeclampsia or eclampsia | Birth unit or maternity registry | Collected by delegated staff from available records |
| Proportion of women receiving oxytocin within 1 min of birth of infant | No. of women receiving oxytocin immediately after birth of the infant and before birth of placenta, irrespective of mode of delivery | Total no. of women giving birth in the health facility | Birth unit registry, patient records | Collected by delegated staff from available records or chart review |
| Proportion of women with prolonged labour | No. of women who have not given birth or were not transferred out within 12 h of active labour[c] | Total no. of women in active labour in the health facility | Generally available through birth records, partographs | Collected by delegated staff from available records |
| Intrapartum stillbirth rate | No. of stillborn infants weighing > 1000 g and fetal heart rate documented on admission | Total no. of births of infants weighing > 1000 g in facility | Admission and labour ward registry, partographs | Collected by delegated staff from available records |
| Proportion of women with severe systemic infection or sepsis in postnatal period, including readmissions | No. of women seen in the facility with severe systemic infection or sepsis in postnatal period,[d] including readmissions after birth in facility | Total no. of women giving birth in the health facility | Admission and discharge records | Collected by delegated staff from available records |
| **Newborns** | | | | |
| Proportion of health facilities with functional bags and masks (two neonatal mask sizes) in the delivery areas of maternity services | No. of health facilities with functional bags and masks (two neonatal mask sizes) in the delivery areas of maternity services | Total no. of health facilities with maternity services assessed | Direct observation (e.g. facility and self-assessment)[e] | Facility surveys, self-assessments |

| Core indicator | Numerator | Denominator | Data source | Methods |
|---|---|---|---|---|
| **Newborns** | | | | |
| Proportion of newborns who received all four elements of essential care:<br>• immediate and thorough drying<br>• immediate skin-to-skin contact<br>• delayed cord clamping<br>• initiation of breastfeeding in the first hour | No. of newborns who received all four elements of essential newborn care | Total no. of live births in the health facility | Direct observation, perinatal information system, charts | Case observation, chart reviews, exit interviews of mothers |
| Proportion of health facilities in which KMC is operational,[f] by level of facility | No. of health facilities in which KMC is operational, by level of facility | Total no. of health facilities with maternity services | Direct observation | Facility surveys, self-assessments |
| Facility neonatal mortality rate disaggregated by birthweight: > 4000 g, 2500–3999 g, 2000–2499 g, 1500–1999 g, < 1500 g | No. of neonatal deaths by category of birthweight: > 4000 g, 2500–3999 g, 2000–2499 g, 1500–1999 g, < 1500 g | Total no. of live births in the health facility segregated by birthweight | Hospital statistics | Charts, internal monitoring system |
| Proportion of health facilities offering maternity services certified by the Baby-friendly Hospital Initiative and recertification not older than 2 years | No. of health facilities offering maternity services certified by the Baby-friendly Hospital Initiative and recertification not older than 2 years | Total no. of health facilities with maternity services | Direct observation | Facility surveys, self-assessments |
| **Children** | | | | |
| Proportion of children who are correctly prescribed an antibiotic for pneumonia | No. of children with valid classification who are correctly prescribed an antibiotic for pneumonia (including doses, number of times per day and number of days) | Total no. of children with diagnosed pneumonia | Patient records, registers and direct observation | Presently collected in health facility surveys, hospital quality assessment tool |
| Proportion of children requiring referral who receive correct pre-referral treatment and referral | No. of children requiring referral who receive correct pre-referral treatment and referral | Total no. of children with severe disease requiring referral | Patient records, registers, referral cards and direct observation | Presently collected through health facility surveys, hospital quality assessment tool |
| Proportion of children with severe acute malnutrition who are correctly prescribed therapeutic feeding | No. of children with severe acute malnutrition who are correctly prescribed therapeutic feeding | Total no. of children with severe acute malnutrition | Patient records, registers, referral cards and direct observation | Direct observation[g] |
| Death rate of hospitalized children under 5 years | Total no. of deaths of hospitalized children under 5 years of age in a given period | Total no. of hospitalized children under 5 years for the same period | Hospital records and registers, outcome forms and death case reviews | WHO hospital quality assessment tool, SARA |

| Core indicator | Numerator | Denominator | Data source | Methods |
|---|---|---|---|---|
| **General** | | | | |
| Proportion of health facilities that had stock-outs of essential lifesaving medicines for mothers, newborns and children in a specified period | No. of health facilities that had stock-outs of essential lifesaving medicines for mothers (oxytocin, magnesium sulfate, dexamethasone, oral amoxicillin, injectable gentamicin (context-specific malaria rapid diagnostic tests, antimalarial and antiretroviral agents)), newborns and children (vaccines, oral rehydration salt, zinc, oral amoxicillin, injectable gentamicin (context-specific malaria rapid diagnostic tests, antimalarial and antiretroviral agents in a specified period)) | Total no. of health facilities | Out-of-stock cards and direct observation | Routinely collected and through health facility surveys, SARA and essential drugs survey |
| Proportion of maternal, perinatal and child deaths occurring in a facility that were reviewed | No. of maternal, perinatal and child deaths occurring in a facility that were reviewed[h] | Total no. of maternal, perinatal and child deaths in facilities | Hospital records, audit reports | Surveys |
| Proportion of health facilities with soap and running water or alcohol-based rub available in labour, childbirth, neonatal and paediatric wards | No. of health facilities with soap and running water or alcohol-based rub available in labour, childbirth, neonatal and paediatric wards | Total no. of health facilities | Direct observation | SARA, health facility surveys, self-assessment |
| Proportion of health facilities with safe, uninterrupted oxygen supply in childbirth, neonatal and paediatric wards | No. of health facilities with safe, uninterrupted oxygen supply in childbirth, neonatal and paediatric wards | Total no. of health facilities | Direct observation | SARA, health facility surveys, self-assessment |

Times for collection of numerator and denominator data in this list will be defined in the operational manual.

SARA, service availability and readiness assessment

[a] Blood pressure ≥ 160/110 mm Hg; proteinuria ≥ 3+

[b] Convulsions with other signs of preeclampsia (blood pressure > 140/90 mm Hg; proteinuria ≥ 2+)

[c] Cervical dilatation ≥ 4 cm (documented, with clear documentation of delivery time)

[d] First 42 days after birth

[e] Also available from hospital assessments, e.g. SARA, health facilities survey

[f] Provided as per recommended standards

[g] Not collected routinely or in existing surveys

[h] Includes review of causes and circumstances leading to death and assessment of quality of care

# 5. Way forward and conclusion

The purpose of the meeting was to bring researchers and partner agencies together to develop and agree on a minimal set of indicators of the quality of care that pregnant women, newborns and children receive in health facilities that can be collected, reported and monitored routinely at global level. Despite progress made in reducing maternal and child morbidity and mortality, coverage alone – without quality – will not be enough to achieve the global targets for women and children's health. Poor quality at the point of care in health facilities now increasingly contributes directly and indirectly to maternal, newborn and child deaths. Additionally, poor quality of care is inefficient, wasting valuable resources on care that may be ineffective. Several partner agencies are supporting countries in a number of initiatives to ensure the quality of care. The meeting provided an opportunity to share experience in assessing and improving the quality of care.

Some of the challenges of deciding on indicators of quality of care at scale are defining operational measures (adherence with best practices) of care for prevention and management of complications, the feasibility of collecting the data required and the reliability of the data collected. Firstly, in many countries in which these indicators may be used for monitoring, health facility records are incomplete and the information (when available) may be incorrect. Second, because of the nature of quality indicators, they are usually more difficult to collect in regional or national surveys than other health service indicators. Third, while some quality indicators are already well defined and included in existing health service and facility surveys, others are either not routinely collected or are not well defined; therefore, the results often cannot be used beyond the site at which they were collected. Routine information systems rarely include measures of quality of care process, such as the proportion of children with pneumonia who were accurately assessed and treated.

Despite these challenges, the expert consultation drew up a list of global core indicators for sentinel measures of the quality of health care provided to mothers, newborns and children in a rigorous, iterative process. The group agreed that only a few clear indicators were required to measure and report on quality of care at global level in order to ensure accountability and comparison. The list was further refined to include definitions and clarifications where necessary.

Establishment of a set of global indicators that should be collected and reported will serve a number of purposes. It will:

- encourage health facilities to improve the quality of record-keeping and in-facility data collection;

- encourage national health information systems to integrate sentinel measures of quality of care;
- increase the accountability of national health systems, thus adding to broader improvement of quality of health care; and,
- at global level, highlight the need for a shift from just "increasing coverage" of health services and commodities for maternal, newborn and child care to a more balanced focus on "coverage and quality".

WHO and the PMNCH will form a technical working group with researchers and partner agencies to pilot-test these indicators for the feasibility of collection and measurement. This collaborative network will also continue to devise mechanisms for collecting data, reviewing reports, recommending changes and improving the indicators. The next steps will include providing clear guidelines and a users' manual and field-testing the indicators so that they can be institutionalized within countries to improve the effectiveness and efficiency of care delivery at all levels. It is anticipated that the indicators will be measured mainly by strengthening routine information systems, supplemented by health facility surveys.

The global core indicators for assessing the quality of health care provided to mothers, newborns and children should be added to coverage indicators for global, national and subnational reporting. A formal network for quality improvement composed of global, regional and national partners should be established to support, when possible, routine collection of global core indicators as part of national improvement. The global core indicators may be extended to a broader, complementary set of measures to support intensive local (e.g. district) improvement efforts at community, primary care and referral levels. These global core indicators reflect the quality of health care and not coverage. A reliable, sustainable process is required to collect data to measure these indicators routinely and to use them to initiate actions at all levels of the health system to improve the quality of health care for mothers, newborns and children.

# Annex 1. Agenda

**Consultation on improving maternal, newborn and child quality of care in health facilities**

9–11 December 2013
Venue: Hotel Park & Suites, Ferney Voltaire, France

## DAY 1: MONDAY, 9 DECEMBER 2013

| | | |
|---|---|---|
| 08:30–09:00 | Registration | |
| 09:00–09:30 | Welcoming remarks<br>Meeting objectives<br>Introduction of participants and declarations of interest | Elizabeth Mason and Carole Presern |
| 09:30–10:30 | Overview and context of quality of care measurements<br>Global situation analysis of quality of care assessments for maternal, newborn and child health care<br>Overview of the health facility quality of care assessment tools and methodologies | Elizabeth Mason<br>Matthews Mathai<br>Wilson Were |
| **10:30–11:00** | **Coffee break** | |
| 11:00–13:00 | Maternal, newborn and child quality of care facility assessments in countries: experiences<br>• Assessment of quality of maternal and newborn care services in facilities – Bangladesh's experience<br>• Assessing and improving care of the seriously ill child in a teaching hospital – Kenya's experience<br>• Assessment and improvement of quality of maternal, newborn and child care in the WHO European Region<br>• Using a standards-based approach to promote best practices in maternal, newborn and child care<br>• Service availability and readiness assessment (SARA): overview of survey methodology and selected results | <br>Emdadul Hoque<br>Grace Irimu-Thinwa<br>Alberta Bacci<br>Edgar Necochea<br>Kathy O'Neill |
| **13:00–14:00** | **Lunch break** | |

| | | |
|---|---|---|
| 14:00–15:30 | Development and use of quality of care indicators<br>• National core standards to improve quality and safety of care (South Africa)<br>• RMNCH indicator development: harmonized reproductive health registry initiative<br>• QUALMAT methods and experiences in measuring quality of maternal and newborn care<br>• Developing global quality of care indicators – the road so far | <br>Carol Marshall<br><br>Sonja Myhre<br><br>Els Duysburgh<br><br><br>Matthews Mathai |
| **15:30–16:00** | **Coffee break** | |
| 16:00–17:30 | Group work: review maternal, newborn and child health facility quality of care indicators, and propose core indicators<br>• Introduction to group work | Three groups: maternal, newborn and child<br>Wilson Were |

## DAY 2: TUESDAY, 10 DECEMBER 2013

| | | |
|---|---|---|
| 09:00–10:30 | Group work to review and propose core maternal, newborn and child health facility quality of care indicators (continued) | Group work |
| **10:30–11:00** | **Coffee break** | |
| 11:00–13:00 | Group presentations and consensus on core list of indicators for maternal, newborn and child care and global reporting framework | |
| **13:00–14:00** | **Lunch break** | |
| 14:00–15:30 | Consensus on reporting of quality of care maternal, newborn and child indicators (continued) | |
| **15:30–16:00** | **Coffee break** | |
| 16:00–17:30 | Experience of using data to improve maternal, newborn and child health quality of care<br>• Using data in real time to improve maternal, newborn and child health care<br>• Ending preventable maternal deaths through surveillance and response<br>• Improving quality of care through death reviews: a decade of child problem identification programme in South Africa<br>• Strategies to improve health care provider performance | <br>Kathleen Hill<br><br>Matthews Mathai<br><br>Mark Patrick<br><br><br>Florina Serbanescu |

## DAY 3: WEDNESDAY, 11 DECEMBER 2013

| | | |
|---|---|---|
| 09:00–10:30 | Experience in addressing gaps in maternal, newborn and child quality of care<br>• Mother-friendly health facility initiative<br>• Quality of care improvement process in selected African and Central Asian hospitals<br>• Addressing gaps in quality of care<br>• Safe childbirth checklist (SCC) collaborative | <br><br>William Stones<br>Wilson Were<br><br>Jim Heiby<br>Itziar Larizgottia |
| **10:30–11:00** | **Coffee break** | |
| 11:00–13:00 | Group work – data collection and reporting using routine monitoring and periodic facility assessments<br>• Introduction to group work | <br><br><br>Kathy O'Neill |
| **13:00–14:00** | **Lunch break** | |
| 14:00–15:30 | Group work – data collection and reporting using routine monitoring and periodic facility assessments (continued)<br>Feedback from groups | |
| **15:30–16:00** | **Coffee break** | |
| 16:00–17:00 | Conclusions and next steps | |

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# Annex 3. Initial list of 13 core indicators

| Indicator | Feasibility of measurement | Definition | |
|---|---|---|---|
| | | Numerator | Denominator |
| **MATERNAL HEALTH** | | | |
| 1 Percentage of health facilities equipped with the medications and supplies necessary to provide evidence-based essential maternal health care Markers: Iron supplementation and syphilis screening | Quick survey, SARA, SPA, routine logistic information system | No. of facilities that have iron and folic acid tablets, syphilis test kits in the antenatal clinic or hospital | All health facilities providing antenatal care |
| 2 Percentage of health facilities equipped with the medications and supplies necessary to provide evidence-based emergency obstetric care Markers: Oxytocin, magnesium sulfate | Quick survey, SARA, SPA, routine logistic information system | No. of facilities that have oxytocin and magnesium sulfate in the labour and delivery ward | All health facilities providing maternity care |
| 3 Percentage of women: A. receiving oxytocin to prevent postpartum haemorrhage B. who underwent caesarean section for obstructed labour[a] or prolonged labour in the facility | Quick survey | A. No. of women receiving oxytocin immediately after birth of infant B. No. of women not delivered 12 h or more after admission to the labour and delivery ward | A. All women giving birth in the facility B. All women admitted to the labour and delivery ward |
| 4 Intrapartum or fresh stillbirth rate | Quick survey | All normally formed stillborn infants with no signs of maceration | All births |
| 5 Percentage of facilities that conduct maternal death audits or reviews at district level | Part of Commission on Information and Accountability Maternal, Newborn, Child and Adolescent Health questionnaire, routine information system | No. of facilities providing maternity services in which there have been one or more maternal deaths and which conducted at least one maternal death review in the preceding 3 months | All facilities in the district providing maternity services |

[a] Caesarian section suggested by the group, but, given the complexity of the definition, suggested prolonged labour

| Indicator | Feasibility of measurement | Definition | |
|---|---|---|---|
| | | Numerator | Denominator |
| 6 Density of midwives (no. of midwives actually deployed per 1000 births per district) Alternative: Midwife:birth ratio | Surveys | Number of midwives in the district<br>No. of midwives working in the labour and delivery ward during a specified period, e.g. 24 h | All births in the district<br>No. of births in the specified period |
| **NEONATAL HEALTH** | | | |
| 7 Percentage of health facilities with bags and masks (neonatal mask size) in labour and delivery wards | HFS, quick survey, emergency obstetric care, SARA, SPA | No. of facilities with neonatal bags and masks in the labour and delivery ward | All facilities providing maternity services |
| 8 Percentage of health facilities in which gentamicin is available at suitable peripheral level for neonatal sepsis | HFS, quick survey, emergency obstetric care, SARA, SPA | No. of facilities with injectable gentamicin | All facilities providing maternity services |
| 9 Percentage of health facilities among all emergency obstetric care facilities in which KMC is practised to standard | Basic and comprehensive emergency obstetric care | No. of facilities practising KMC to standard (further definition of standard required) | All facilities providing comprehensive emergency obstetric care |
| 10 Percentage of health facilities offering maternity services certified by the Baby-friendly Hospital Initiative | Quick survey | Number of facilities with current Baby-friendly Hospital Initiative certification | All facilities providing maternity services |
| **CHILD HEALTH** | | | |
| 11 Percentage of health facilities with uninterrupted stocks of vaccines, oral rehydration salts, zinc, antimalarial and antiretroviral agents and injectable gentamicin in the past 3 months | HFS, quick survey, SARA, SPA | No. of facilities with stocks of vaccines, oral rehydration salts, zinc, antimalarial and antiretroviral agents and injectable gentamicin in the past 3 months | All facilities providing child health services |
| 12 Percentage of children correctly prescribed an oral antibiotic or antimalarial agent | HFS | No. of children requiring antibiotics or antimalarial agents who received the correct treatment | No. of children requiring antibiotics or antimalarial agents |
| 13 Percentage of children among all referred cases given pre-referral treatment | HFS, record review, survey | No. of children requiring urgent referral who were referred and received pre-referral treatment | No. of children requiring urgent referral |

HFS, health facility survey; SARA, service availability and readiness assessment; SPA, service provision assessment

# Annex 4. List of 43 indicators

## Maternal health

| Indicator domain | Indicator | Numerator | Denominator | Suggested data source |
|---|---|---|---|---|
| **ANTEPARTUM** | | | | |
| **Process** | **AP1.** Proportion of pregnant women who have a preparedness plan for birth and complications | No. of pregnant women with a preparedness plan for birth and complications | Total no. of pregnant women attending at least one antenatal care visit | Questionnaires, chart reviews |
| | **AP2.** Proportion of pregnant women who were screened for anaemia | No. of pregnant women screened for anaemia | Total no. of pregnant women attending at least one antenatal care visit | Chart review |
| | **AP3.** Proportion of pregnant women who were screened for syphilis | No. of pregnant women screened for syphilis | Total no. of pregnant women attending at least one antenatal care visit | Chart review |
| **INTRAPARTUM** | | | | |
| **Structure** | **IS1.** Existence of separate ward for labour and childbirth | Existence of separate ward for labour and childbirth | NA | Observation |
| | **IS2.** Availability of health professionals with midwifery skills on duty in the labour and childbirth ward | Availability of health professionals with midwifery skills in the labour and childbirth ward 24 h a day, 7 days a week | NA | Observations, review of duty or shift roster |
| | **IS3.** Availability of soap and running water or alcohol-based hand rub on the labour and childbirth ward | Availability of soap and running water or alcohol-based hand rub in the labour and childbirth ward | NA | Observation, inventory |
| | IS4. Uninterrupted availability of oxygen supply in in labour and childbirth ward during past 3 months | Uninterrupted availability of oxygen supply in in labour and childbirth ward during past 3 months | NA | Observation, inventory |
| **Process** | **IP1.** Proportion of women with prolonged labour | No. of women delivered (or transferred out) within 12 h of admission to the labour and delivery ward | Total no. of women admitted during labour and childbirth in the past 3 months | |
| | **IP2.** Proportion of women with companion present during labour and childbirth | No. of women with companion present during labour and childbirth in the past 3 months | Total no. of women admitted during labour and childbirth in the past 3 months | Facility records |

| Indicator domain | Indicator | Numerator | Denominator | Suggested data source |
|---|---|---|---|---|
| **INTRAPARTUM** | | | | |
| **Process** ***(continued)*** | **IP3.** Proportion of women in the past 3 months for whom a partograph was completed | No. of women for whom a partograph was completed in the past 3 months | No. of women admitted to the labour and childbirth ward in the past 3 months | Chart review |
| | **IP4.** Proportion of women in the past 3 months who received oxytocin immediately after the birth of their infant | No. of women in the past 3 months who received oxytocin immediately after the birth of their infant | No. of women giving birth in the health facility in the past 3 months | Chart review |
| **Outcome** | **IO1.** Proportion of women with severe systemic infection or sepsis after delivery in the facility | No. of women with severe systemic infection or sepsis after delivery in the facility | No. of women giving birth in the health facility in the past 3 months | Chart review |
| | **IO2.** Proportion of maternal near-misses of all women giving birth | No. of women with maternal near-misses in the past 3 months | No. of women giving birth in the health facility in the past 3 months | Chart review |
| | **IO3.** Fresh stillbirth rate | No. of normally formed stillbirths with no signs of maceration in the preceding 3 months | No. of births in the facility in the past 3 months | Registers, monthly summaries |
| **POSTPARTUM** | | | | |
| **Process** | **PP1.** Ratio of maternal deaths reviewed | No. of maternal deaths reviewed in the past 3 months | No. of maternal deaths in the past 3 months | Facility records |
| **Outcome** | **PO1.** Proportion of maternal deaths as a result of hypertensive disorders in pregnancy | No. of maternal deaths as a result of hypertensive disorders in pregnancy | No. of births in the facility in the past 3 months | Facility records |

## Neonatal care

| Indicator domain | Indicator | Numerator | Denominator | Suggested data source |
|---|---|---|---|---|
| **Structure** | **NS1.** Proportion of health care facilities with maternity services that have functional bags and masks for newborns | No. of health care facilities with maternity services that have functional bags and masks for newborns | Total no. of facilities with maternity services | Supervision checklist, observation |
| | **NS2.** Designated area for sick newborns requiring extra care (in labour and childbirth or paediatric ward) | Designated area for sick newborns requiring extra care (within labour and childbirth or paediatric ward) | NA | Supervision checklist, observation |

| Indicator domain | Indicator | Numerator | Denominator | Suggested data source |
|---|---|---|---|---|
| **Structure** ***(continued)*** | **NS3.** Availability of health professionals with midwifery skills trained in neonatal resuscitation on duty in the labour and childbirth ward | Availability of health professionals with midwifery skills trained in neonatal resuscitation on duty in the labour and childbirth ward 24 h a day, 7 days a week | NA | Supervision checklist, observation |
| | **NS4.** Proportion of facilities in which KMC is operational, by level of facility and type of KMC service | No. of facilities in which KMC is operational, by level of facility and type of KMC service | No. of health facilities | Supervision checklist, programme records |
| **Process** | **NP1.** Proportion of births assisted by a health worker trained in and equipped for newborn resuscitation | No. of births assisted by a health worker trained in and equipped for newborn resuscitation | No. of women giving birth | Chart review |
| | **NP2.** Proportion of neonatal deaths audited | Proportion of neonatal deaths audited | No. of neonatal deaths | Monthly reports of quality improvement team |
| | **NP3.** Proportion of infants born to HIV-infected women given antiretroviral prophylaxis to reduce the risk for mother-to-child transmission in the first 6 weeks | No. of infants born to HIV-infected women given antiretroviral prophylaxis to reduce the risk for mother-to-child transmission in the first 6 weeks | Estimated no. of live births to HIV-infected women in the past 12 months | Registers, monthly summaries, programme reports |
| | **NP4.** Proportion of newborns with suspected or confirmed neonatal infection receiving antibiotics | No. of newborns with suspected or confirmed neonatal infection receiving antibiotics | No. of newborns with suspected or confirmed neonatal infection | Chart review |
| | **NP5.** Proportion of newborns with visible jaundice within 24 h of birth receiving phototherapy | No. of newborns with visible jaundice within 24 h of birth receiving phototherapy | No. of newborns with visible jaundice within 24 h of birth | Registers, monthly summaries |
| **Outcome** | **NO1.** Proportion of newborns who were breastfed within 1 h of birth | No. of newborns for whom breastfeeding was initiated within 1 h of birth | No. of live births | Registers, monthly summaries |
| | **NO2.** Proportion of deaths among infants who received KMC, by birth weight category | No. of deaths among infants who received KMC, by birth weight category<br>No. of KMC babies | No. of infants who received KMC by birth category | Registers, monthly summaries, programme report |

## Childhood

| Indicator domain | Indicator | Numerator | Denominator | Suggested data source |
|---|---|---|---|---|
| **Structure** | **CS1.** Existence of separate ward for paediatric care in facility (children separated from adults) | Existence of separate ward for paediatric care in facility (children separated from adults) | NA | |
| | **CS2.** Availability of soap and running water or alcohol-based hand rub in the paediatric ward | Availability of soap and running water or alcohol-based hand rub in paediatric ward | NA | |
| | **CS3.** Uninterrupted availability of oxygen supply in paediatric ward in the past 3 months | Uninterrupted availability of oxygen supply in paediatric ward in the past 3 months | NA | Observation, facility records |
| **Process** | **CP1.** At least one paediatric case audit conducted in the past 3 months | At least one paediatric case audit conducted in the past 3 months | NA | Facility records |
| | **CP2.** Proportion of children with diarrhoea who are correctly rehydrated | No. of children with diarrhoea who are correctly rehydrated | No. of children with diarrhoea | Chart review |
| | **CP3.** Children monitored three times/24 h, with recording of vital signs (blood pressure, pulse, respiration rate) | Children monitored three times/24 h, with recording of vital signs (blood pressure, pulse, respiration rate) | NA | |
| **Outcome** | **CO1.** Fatality rate among hospitalized children under 5 years | No. of deaths among children under 5 years in past 3 months | Total no. of children under 5 years hospitalized in past 3 months | Facility records |
| | **CO2.** Case fatality rate for pneumonia | No. of child deaths due to pneumonia in past 3 months | No. of children admitted for pneumonia in past 3 months | Facility records |
| | **CO3.** Case fatality rate for diarrhoea | No. of child deaths due to diarrhoea in past 3 months | No. of children admitted for diarrhoea in past 3 months | Facility records |

## General indicators

| Indicator domain | Indicator | Numerator | Denominator | Suggested data source |
|---|---|---|---|---|
| **Structure** | **GS1.** Facility has functional ambulance or other vehicle for emergency transport of clients that is stationed at or operates from the facility | Facility has functional ambulance or other vehicle for emergency transport of clients that is stationed at or operates from the facility | NA | |
| | **GS2.** Toilet or latrine[a] available for patients | Toilet or latrine[a] available for patients | NA | |
| | **GS3.** Toilet or latrine[a] available for visitors | Toilet or latrine[a] available for visitors | NA | |
| | **GS4.** Facility has a functioning computer with Internet connection | Facility has a functioning computer with Internet connection | NA | |
| | **GS5.** Safe disposal of sharps | Facility has puncture-resistant, rigid, leak-resistant container designed to hold used sharps safely during collection, disposal and destruction in the labour and childbirth ward and paediatric ward | NA | |

[a] Flush or pour flush to piped sewer system or septic tank or pit latrine, ventilated improved pit or other with slab, composting toilet

| Indicator domain | Indicator | Numerator | Denominator | Suggested data source |
|---|---|---|---|---|
| **Structure** ***(continued)*** | **GS6.** The health facility had an uninterrupted stock of the following items in the past 3 months:<br>Ampicillin<br>Blood<br>Ceftriaxone<br>Dexamethasone (for maturation fetal lungs)<br>5% dextrose<br>Diazepam (to treat convulsions in children)<br>Gentamicin<br>10–20% glucose<br>Magnesium sulfate (injection)<br>Misoprostol (25 µg for induction of labour)<br>Normal saline<br>Oxytocin<br>Partograph charts<br>Antiretroviral agents (according to national guidelines)<br>Tocolytics | The health facility had an uninterrupted stock of the following items in the past 3 months:<br>Ampicillin<br>Blood<br>Ceftriaxone<br>Dexamethasone (for maturation fetal lungs)<br>5% dextrose<br>Diazepam (to treat convulsions in children)<br>Gentamicin<br>10–20% glucose<br>Magnesium sulfate (injection)<br>Misoprostol (25 µg for induction of labour)<br>Normal saline<br>Oxytocin<br>Partograph charts<br>Antiretroviral agents (according to national guidelines)<br>Tocolytics | NA | |
| **Process** | **GP1.** Triage is available for children and women seeking care. | Triage is available for children and women seeking care. | NA | |

NA, not applicable

Indicator labels: AS, antenatal care structure; AP, antenatal care process indicators; AO, antenatal care outcome; IS, intrapartum care structure; IP, intrapartum care process; IO, intrapartum care outcome; PS, postnatal care structure; PP, postpartum care process; PO, postnatal care outcome; NS, neonatal care structures; NP, neonatal care process; NO, neonatal care outcome; CS, child care structure; CP, child care process; CO, child care outcome; GS, general structure; GP, general process; GO, general outcome

| | No. of indicators per category | | | Total |
|---|---|---|---|---|
| | Structure | Process | Outcome | |
| Antenatal care | 0 | 3 | 0 | 3 |
| Intrapartum care | 4 | 4 | 3 | 11 |
| Postpartum care | 0 | 1 | 1 | 2 |
| Neonatal care | 4 | 5 | 2 | 11 |
| Child care | 3 | 3 | 3 | 9 |
| General indicators | 6 | 1 | 0 | 7 |
| **Total** | **17** | **17** | **9** | **43** |

# Annex 5. List of optional indicators

| No. | Optional indicators |
|---|---|
| **MOTHERS** | |
| 1 | Proportion of women in who attended antenatal care in whom severe anaemia was diagnosed on admission in labour |
| **NEWBORNS** | |
| 1 | Proportion of facilities with an established mechanism to measure and improve quality of care continuously |
| 2 | Completeness of relevant clinical information on patient charts |
| 3 | Proportion of health facilities providing hospital care for newborns that provide phothotherapy |
| 4 | Proportion of hospitalized newborns who present with low body temperature (< 36.5 °C) at admission to a neonatal ward or neonatal intensive care unit after referral |
| **CHILDREN** | |
| 1 | Proportion of health facilities that have child health record systems |
| 2 | Proportion of children whose nutritional status is correctly assessed |
| 3 | Hospital death rates within 24 h of admission |
| **GENERAL** | |
| 1 | Proportion of health facilities with health record systems |
| 2 | Proportion of days without electricity |
| 3 | Proportion of health facilities with a functional mechanism to measure client satisfaction (national) |
| 4 | Level of client satisfaction from 0–100% (local) |
| 5 | Proportion of health facilities providing inpatient care for newborns that can perform standard blood laboratory tests on micro-samples |
| 6 | Proportion of health facilities that can provide blood transfusion |

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