

Indicator Sheet

# ADOLESCENT BIRTH RATE

MoNITOR 

## CONCEPT AND DEFINITION

**Concept** An estimated 295 000 women died from pregnancy or childbirth-related complications in 2017. Adolescent girls are at a higher risk of morbidity and mortality due to complications in pregnancy, when compared to women of older ages (1). Reducing adolescent fertility and addressing the multiple factors underlying it are essential for improving sexual and reproductive health as well as the social and economic well-being of adolescents. Preventing births very early in a woman's life is an important measure to improving maternal health and reducing infant mortality.

**Definition** The adolescent birth rate (ABR) is defined as the annual number of births in women aged 15–19 years old per 1000 women in the same respective age group (2). The adolescent birth rate is also referred to as the age-specific fertility rate (ASFR) for women aged 15–19 years old.

**Unit of measurement:** Rate

**Level of indicator use:** Population-based global, national and subnational (first or second administrative level)

**Monitoring and evaluation framework:** Impact

**Domain:** Fertility

**Continuum of care:** Across all continuums

# MEASUREMENT GUIDANCE

## Data sources

The four main data sources for this indicator are:

- a. Civil registration and vital statistics (CRVS) systems
- b. Routinely collected administrative data
- c. Population-based household surveys
- d. Nationally representative census data.

## Civil registration and vital statistics systems

A well-functioning and integrated national or subnational CRVS system will universally register and certify vital events, including live births, stillbirths and deaths that occur in the country or administrative area. Birth and death certificates should be issued as part of the CRVS system, allowing the compilation, analysis and dissemination of information through vital statistics agencies, including population characteristics (e.g. sex, date of birth/death, place of birth/death, place of usual residence) and cause-of-death information. Some CRVS systems will also register and certify other important vital events within the population, such as adoptions, marriages and divorces (3).

Data from CRVS are the preferred data source for this indicator when the system freely and universally records vital events and data are recorded in a systematic manner that ensures high data quality for both the public and private health sectors, regardless of birth location (e.g. health facility or community-based birth).

**Key source of data:** The main source of data from this indicator involves several steps and will vary based on the policies and procedures of the national or subnational CRVS or other routine system within health facilities and/or communities. Declaration of the live birth and age of mother can be obtained through: (a) forms completed by health personnel at health facilities; or (b) community-based sources, including registration forms submitted directly by the parents of the live birth and/or death. Either paper or electronic forms containing this information are then submitted to the relevant civil authorities and/or vital statistics agencies, which have the responsibility to officially record the birth event and issue information on birth and/or death characteristics such as name, date and place of birth, nationality, and names and ages of the mother and/or father. At the national or subnational level, the civil authority or vital statistics agency formalizes the birth and registration. National or subnational civil authorities or vital statistics agencies are responsible for reporting live birth information specific to this indicator.

**Indicator definition and calculation:** The indicator is calculated as the number of live births to women aged 15–19 years per 1000 women aged 15–19 during a specified time period.

**Numerator:** The number of women aged 15–19 years with a live birth in a specified period.

**Denominator:** Total number of women aged 15–19 years old (per 1000) in a specified time period.

To compute the rate per 1000 births, the numerator is divided by the denominator and multiplied by 1000. In order to calculate the denominator, estimates of exposure to childbearing by women aged 15–19 years old (per 1000 women) in the population is necessary, either through census data or other representative sources.

**Frequency of measurement:** Within CRVS, this indicator is generally monitored at a national or subnational level on an annual basis. The data can be compiled and aggregated subnationally to provide national-level data.

**Disaggregation:** By maternal age, sex, place of birth, place of residence (e.g. urban, rural), subnational administrative units (e.g. districts, provinces, regions) and type of reporting source (e.g. health facility, community).

**Missing values:** Missing values are usually not known. To ascertain missing data, estimates of the total number of live births to women aged 15–19 years old in a country or administrative area can be compared with the absolute number of live births in the same period.

#### Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/records or registers and are entered into national and/or subnational health management information systems (HMIS).

Data from health information systems may collect information on the ABR among live births in a health facility. Routinely collected administrative data and health facility statistics are the preferred data source in settings without an established CRVS system and when there is high utilization of health facility services and data are recorded in a manner that ensures good data quality for both the public and private health sectors. The compiled data in the national HMIS or District Health Information System (DHIS2) should include data from both the public and private health sectors, especially when the private sector is a substantial source of service provision to the population. In settings where utilization of health facilities is not high (e.g. settings with a high prevalence of births occurring at home), data may suffer from incompleteness if information about women delivering outside facilities is not captured. In addition, there are often challenges in accurately measuring the numerator and the denominator when routine health information system data are used to measure this indicator.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from obstetric and neonatal medical records, including health service registers. Relevant

information is recorded about live births, date of birth and maternal age for deliveries occurring at health facilities on paper forms completed by health personnel and/or through an electronic medical record. Data from paper or electronic sources are ideally entered or abstracted into a database or registry and are compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for the reporting of this indicator.

**Indicator and calculation:** The indicator is calculated as the number of live births to women aged 15–19 years in health facilities per 1000 women in the same age group during a specified time period.

*Numerator:* Number of live births to women (aged 15–19 years) in health facilities during a specified time period.

*Denominator:* Total number of women (aged 15–19 years) during a specified time period.

To compute the rate per 1000 births, the numerator is divided by the denominator and multiplied by 1000. In order to calculate the denominator, estimates of number of women aged 15–19 years old in the population is necessary either through census data or other representative sources.

**Frequency of measurement:** The indicator can be calculated on an annual basis or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on facility, subnational and national processes for data entry, compilation and analysis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Monthly, quarterly, or as needed based on the country and/or facility need
- *Subnational level (first and second administrative level):* Monthly or quarterly
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By maternal age, sex, place of birth, place of residence (e.g. urban, rural), subnational administrative units (e.g. districts, provinces, regions) and level of facility.

**Missing values:** Missing values are usually not known or not reported.

#### Population-based household surveys

The main source of data for this indicator has been through population-based household surveys collected through nationally or subnationally representative and structured questionnaires, such as:

- Demographic Health Surveys (DHS) (4)
- Multiple Indicator Cluster Surveys (MICS) (5)
- Reproductive Health Surveys (RHS)
- Other household surveys.

Population-based household survey data are the preferred data source in settings without an established CRVS system and utilization of health facility services is not very high (e.g. settings with a high prevalence of births occurring at home) or where private health sector data are excluded from routinely collected administrative data sources.

**Key source of data:** Eligible women of reproductive age (15–49 years) are identified in the household survey for inclusion and interviewing using an individual women's questionnaire. Women are considered eligible for survey interview if they are either usual residents or visitors of the household who stayed there the night before the interview.

Calculations for this indicator are based on having the interviewer complete a full birth history, whereby eligible women are asked to report the names and relevant information for all live births they have had in their lifetime.<sup>1</sup> The birth history does not include stillbirths, miscarriages, or abortions. For each of the children the woman has given birth to, they are asked to record in chronological order from first to last birth: the sex (male or female), multiple births (singleton or multiple), the date of birth (day, month, and year) and whether the child is currently alive (yes or no) and if no longer alive, the age at death in days, months, or years.

The MoH and NSO typically conduct household surveys and compile, analyse and report the results for this indicator in collaboration with the survey programme (e.g. DHS, or other survey) and funding agency.

**Indicator definition and calculation:** Individual women of reproductive age (15–49 years old) are asked about the total number of live births they have had in their lifetime or during a specified time period prior to survey interview.

<sup>1</sup> In some instances, a shortened birth history may be implemented in the survey in order to calculate the list of all live births during a specified time period, usually five years prior to the date of the survey interview.

The ABR is the number of live births to women aged 15–19 years (per 1000 women) in that age group. The indicator consists of the following numerator and denominator:

*Numerator:* Number of interviewed women aged 15–49 years with a live birth in the two (or five) years prior to survey completion.

*Denominator:* Total number of interviewed women aged 15–19 years old in the two (or five) years prior to survey completion.

To compute the rate per 1000 births, the numerator is divided by the denominator and multiplied by 1000.

**Frequency of measurement:** Household surveys are typically conducted every 3–5 years.

**Disaggregation at population level:** Socioeconomic status (e.g. education level, household wealth quintile), age of woman at the time of interview, place of residence (e.g. urban, rural), subnational administrative units (e.g. districts, provinces, regions), total number of living children at the time of interview, total number of antenatal care (ANC) visits, and timing of first ANC.

**Missing values:** Missing values are not allowed for any of the variables that make up the rate. In particular, the date of interview and the age of the woman would be key for calculation of this indicator.

## Census data

Information from nationally representative censuses will provide information on ABR for the entire population in the 12 months preceding the enumeration. In some cases, the rates based on censuses are adjusted for under-registration based on indirect methods of estimation. The ABR is generally computed on the basis of the date of last birth or the number of births in the 12 months preceding the enumeration period.

**Indicator definition and calculation:** The indicator consists of the following numerator and denominator:

*Numerator:* Number of registered live births born to females aged 15–19 during a given year.

*Denominator:* Estimated or enumerated population of females aged 15–19 years in a given year.

**Frequency of measurement:** The indicator can be calculated on an annual basis. National censuses are completed every 5–10 years.

**Disaggregation at population level:** Age, education level, marital status, number of living children, place of residence, socioeconomic status.

**Missing values:** Missing values are either not known or not reported.

## INTERPRETATION AND USE

### Interpretation

The leading cause of death for women aged 15–19 years old is related to pregnancy or childbirth complications (1). The ABR represents the risk of childbearing among females in the particular age groups. It is commonly reported as the age-specific fertility rate for ages 15–19 years in the context of calculation of total fertility estimates. It has also been called the adolescent fertility rate. This indicator can be used to inform health system planning and policy and the allocation of funds and resources for programmes and interventions aimed at improved maternal, newborn and child health and survival.

### Common challenges

Discrepancies between the sources of data at the country level are common and the level of ABR depends in part on the source of the data selected. Thus, the quality of reporting this indicator varies greatly between and within countries, particularly in countries without effective civil registration systems in place. Many countries lack a single source of high-quality data covering the last several decades. Data from different sources require different calculation methods and may suffer from different errors – for example, random errors in sample surveys or systematic errors due to misreporting. As a result, different sources often yield different estimates of the ABR at a given time period and available data collected by countries are often inconsistent across sources.

### Civil registration and vital statistics systems

Birth registration should be part of a national and/or subnational CRVS system. However, CRVS systems are either non-existent and/or the complete coverage, accuracy and timeliness of civil registration systems is a major issue in many countries worldwide. In order to assess the completeness of the CRVS system, evaluations should be conducted to ascertain the quality of the system, as recommended by the United Nation's revised Principles and Recommendations for a Vital Statistics System (3).

As a result, it is common for live births to be unregistered, particularly for stillbirths and neonatal deaths occurring shortly after birth. This may be due to lack of a legal framework within civil authorities or vital statistics agencies requiring registration for all births, regardless of the outcome. Even in countries with functional CRVS systems and legal frameworks in place, missing or unregistered births still occur due to health professionals and/or parents not knowing the requirement of the need to register stillbirths or in the instance of neonatal death, both the live birth in addition to the death. It is also common for maternal age not to be recorded as part of the birth registration, rendering indicator calculations impossible.

### Data collected from administrative and other routine data systems

Administrative data may suffer from poor quality, such as irregularities in report generation, data duplication and inconsistencies (6). Reporting challenges exist at the facility level given data quality issues, including incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system or inadequate system design.

Many HMIS databases or registries are event-based and only births that occur in health facilities are included. Administrative data should be interpreted with caution in settings where data quality is poor and the percentage of births at public and private sector health facilities is low, or where data from the private health sector is not compiled within the HMIS reporting.

In settings where routine HMIS data lack information on pregnancies and/or births or deliveries that occur outside the public sector – for example, in homes, in the community, or in private sector facilities – the total number of births in the HMIS should not serve to estimate the denominator for this indicator. Where data on the total number of live births for the entire population for the denominator are unavailable, evaluators can calculate total estimated live births using census data for the total population and crude birth rates in a specified area (total expected live births = estimated population x the total crude birth rate).

### Data collected through household surveys

The systematic recording of live births, stillbirths and deaths in many countries remains a serious challenge. In the absence of reliable CRVS systems/administrative data, household surveys have recently become the source of data to monitor levels and trends of stillbirths. In many low- and middle-income countries, such surveys represent the sole source of this information.

For survey and census data, both the numerator and denominator come from the same population. The main limitations are related to age misreporting, birth omissions and misreporting the date of birth of the child, as well as sampling variability (7).

## GLOBAL MONITORING

### Global database

Updated data on the ABR are released annually by the United Nations Department of Economic and Social Affairs, Population Division (<http://www.un.org/en/development/desa/population/theme/fertility/index.shtml>).

### Key initiatives

Countdown to 2030 – Women’s, Children’s and Adolescents’ Health: <http://countdown2030.org/>

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Reference List of 100 Core Health Indicators (plus health-related SDGs), 2018: <https://www.who.int/healthinfo/indicators/2018/en/>

Global Strategy for Women’s, Children’s and Adolescents’ Health (2016–2030): <http://www.who.int/life-course/partners/global-strategy/en/>

United Nations Sustainable Development Goals (SDGs): <https://sustainabledevelopment.un.org>

## ADDITIONAL RESOURCES

Global Health Observatory (GHO) Data – World Health Statistics: [http://www.who.int/gho/publications/world\\_health\\_statistics/en/](http://www.who.int/gho/publications/world_health_statistics/en/)

Making Every Baby Count: Audit and review of stillbirths and neonatal deaths: [http://www.who.int/maternal\\_child\\_adolescent/documents/stillbirth-neonatal-death-review/en](http://www.who.int/maternal_child_adolescent/documents/stillbirth-neonatal-death-review/en)

MEASURE Evaluation: Family Planning and Reproductive Health Indicators Database: Adolescent birth rate: [https://www.measureevaluation.org/prh/rh\\_indicators/womens-health/arh/adolescent-birth-rate](https://www.measureevaluation.org/prh/rh_indicators/womens-health/arh/adolescent-birth-rate)

Sustainable Development Goals (SDGs) Indicators – Metadata repository: <https://unstats.un.org/sdgs/metadata/>

UNICEF Data: Monitoring the situation of children and women: Delivery care: <https://data.unicef.org/topic/maternal-health/delivery-care/>

United Nations, Department of Economic and Social Affairs, Population Division: Fertility: <http://www.un.org/en/development/desa/population/theme/fertility/index.shtml>

UNICEF – Multiple Indicator Cluster Surveys: <http://mics.unicef.org/tools>

The DHS Program – Demographic and Health Surveys: <https://dhsprogram.com>

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Indicator Sheet

**ANTENATAL CARE**  
(eight visits)/**ANTENATAL**  
**CARE** (8<sup>th</sup> visit)

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## CONCEPT AND DEFINITION

**Concept** Antenatal care (ANC) is a critical component for improving maternal and newborn health and provides a platform for important health-care functions, including: health promotion, screening and diagnosis, injury and disease prevention, as well as birth preparedness and preparation for the postnatal period. By implementing timely and appropriate evidence-based practices, ANC can reduce morbidity and mortality and optimize overall health and well-being. ANC also provides the opportunity to communicate with and support women, families and communities at a critical time in the course of a woman's life. ANC comprises effective communication about physiological, biomedical, behavioural and sociocultural issues, as well as emotional and psychological support, to pregnant women in a respectful way (1–3).

**Definition** The number of women of reproductive age with a live birth in a specified reference period who received ANC four or more times from any provider is expressed as a percentage of women in the same age range with a live birth in the same period.

**Unit of measurement:** Percentage (%)

**Level of indicator use:** Global, national, and subnational (first or second administrative level)

**Monitoring and evaluation framework:** Outcome (service coverage)

# MEASUREMENT GUIDANCE

## Data sources

There are two common data sources for this indicator:

- a. Routinely collected administrative data
- b. Population-based household surveys.

## Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/records or registers and are entered into national and/or subnational health information systems:

- Health information management system (HMIS) and/or
- District Health Information Management System (DHIS2).

Routinely collected administrative data and health facility statistics are the preferred data source in settings with a high utilization of health facility services and data are recorded in a manner that ensures good data quality for both the public and private health sectors.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from obstetric and neonatal medical records. Relevant information is recorded about the number and timing of ANC visits among all women who attended ANC during pregnancy within health facilities on paper forms completed by health personnel and/or through an electronic medical record. Data from paper or electronic sources are entered or abstracted into a database or registry and are compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for the reporting of this indicator.

**Indicator definition and calculation:** The indicator is calculated as the percentage of women who received ANC eight times from any provider among all births in a health facility during a specified reference period.

*Numerator:* Number of antenatal clients with eighth ANC visit.

*Denominator:* Total number of antenatal clients with a first ANC visit.

Unless specified, the statistic may include any woman regardless of age and includes both live births and stillbirths, as defined by the health facility and/or national or subnational vital statistics offices. The numerator and denominator definition of ANC is based on individual health facility report or is in accordance with the country-specific definition by the MoH and/or NSO.

**Frequency of measurement:** The indicator can be calculated on an annual basis or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on facility, subnational and national processes for data entry, compilation and analysis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Monthly, quarterly, or as needed based on the country and/or facility need
- *Subnational (first and second administrative) level:* Monthly or quarterly
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By level of facility, location of facility (e.g. urban, rural), type of health personnel, and timing of ANC visit.

**Missing values:** Missing values are usually not known, or not reported.

#### Population-based household surveys

The main source of data for this indicator has been through population-based household surveys collected through nationally or subnationally representative and statistically sound questionnaires, such as:

- Demographic Health Surveys (DHS) (4)
- Multiple Indicator Cluster Surveys (MICS) (5)
- Reproductive Health Surveys (RHS)
- Other household surveys with a similar methodological design.

Population-based household survey data are the preferred data source in settings with a low utilization of health facility services, or where private health sector data are excluded from routinely collected administrative data sources.

**Key source of data:** Eligible women of reproductive age (15–49 years) are identified in the household survey for inclusion and interviewed using an individual women’s questionnaire. Women are considered eligible for survey interview if they are either usual residents or visitors of the household who stayed there the night before the interview.

All eligible and interviewed women between 15 and 49 years of age who had a live birth during a specified reference period, typically 2–5 years prior to the time of interview, are asked “*Did you see anyone for antenatal care for this pregnancy?*”, in reference to the last live birth the individual woman had during the same reference period. If women saw anyone for ANC, they are then asked to identify “*How many times did you receive antenatal care during this pregnancy?*”

MoH and NSO typically conduct household surveys and compile, analyse and report the results for this indicator in collaboration with the survey programme (e.g. DHS, MICS, RHS) and funding agency.

**Indicator definition and calculation:** Individual women of reproductive age (15–49 years old) are asked about ANC visits for their most recent live birth. Questions about ANC visits are asked, irrespective of the child's current living status (dead or alive), and are for live births that they have had during a specified reference period, which is typically 2–5 years before the time of the survey completion. The definition is as follows:

The percentage of interviewed women (aged 15 to 49 years) with a live birth in the 2–5 years prior to survey completion who received ANC at least eight times from any provider. The indicator consists of the following numerator and denominator:

*Numerator:* Number of interviewed women (aged 15–49 years) with a live birth who received ANC at least eight times from any provider

*Denominator:* Total number of women (aged 15–49 years) with a live birth.

**Frequency of measurement:** Household surveys are typically conducted every 3–5 years.

**Disaggregation at population level:** Type of health personnel, place of delivery, mode of delivery, place of residence (e.g. urban, rural), sex of live birth, birth order, socioeconomic status (e.g. education level, wealth quintile), age of woman at the time of delivery, and births attended by skilled health personnel.

**Missing values:** Included in the distribution as “don't know” and /or “missing”.

# INTERPRETATION AND USE

## Interpretation

This indicator helps programme management at global, national and subnational levels by monitoring and evaluating perinatal outcomes and using data to make informed decisions about the planning, development and evaluation of health services delivery and initiatives. The antenatal period presents opportunities for reaching pregnant women with interventions that may be vital to both maternal, fetal and newborn health and well-being. WHO previously recommended that pregnant women complete at least four ANC visits. However, new guidelines from the WHO ANC Model (2018) increase the recommended number of contacts a pregnant woman has with health providers throughout her pregnancy from four to eight visits, and future programmes should consider measuring based on these guidelines (1).

This indicator should be interpreted with caution as it is a measure of contact with the health system and does not take into account the content and quality of care received. Receiving ANC during pregnancy does not guarantee the receipt of evidenced-based interventions that are effective in improving maternal and newborn health and survival. It should not be assumed that women received ANC in accordance with WHO, other international organizations, and/or country-specific recommendations or guidelines. Therefore, this indicator should be complemented with information on the content and quality of interventions received during each ANC contact in order to more effectively monitor and evaluate the effectiveness and impact of maternal and newborn health interventions.

## Common challenges

Data collected from administrative and other routine data systems

Administrative data may suffer from poor quality such as irregularities in report generation, data duplication and inconsistencies (6). Reporting challenges exist at the facility level given data quality issues, including; incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system or inadequate system design.

Many HMIS databases or registries are event-based and only include ANC information for women who delivered a birth at a health facility. In some instances, the denominator may include births delivered by women of an unspecified age range and include both live births and stillbirths. In addition, the definition of a stillbirth varies by country and context, such as differences in inclusion for gestational age (e.g. 20–28 weeks) and birthweight (e.g.  $\geq 500$  grams). As this often only represents those women who present to health facilities for ANC, it does not capture the number of pregnancies and demand for ANC within the total population. These differences in definitions compromise the ability to compare data between countries.

Administrative data should be interpreted with caution in settings where data quality is poor and the percentage of births at public and

private sector health facilities is low, or where data from the private health sector are not compiled within the HMIS reporting.

In settings where routine HMIS data lack information on pregnancies and/or births that occur outside the public sector – for example, in homes or private sector facilities – the total number of births in the HMIS should not serve to estimate the denominator for this indicator. Where data on the total numbers of live births for the entire population for the denominator are unavailable, evaluators can calculate total estimated live births using census data for the total population and crude birth rates in a specified area (total expected live births = estimated population x the total crude birth rate).

#### Data collected through household surveys

Women may not be able to accurately recall details around childbirth when data are collected through household surveys (7). There is also a time lag as the recall period is from two to five years before the survey data are collected.

The most commonly used denominator is the number of live births, which acts as a proxy for the number of pregnant women. However, inclusion of only live births underestimates the total number of pregnancies by excluding those that end in stillbirth or spontaneous or induced abortion, as well as ectopic and molar pregnancies. It also causes survivor bias in that only those women who are alive at the time of interview would be included and underestimates the total number of women requiring care during pregnancy.

The indicator usually measures visits with any provider because national-level household surveys do not collect provider data for each visit. In addition, standardization of the definition of health personnel is sometimes difficult because of differences in naming conventions, competencies and training of health personnel between and within countries (8).

# GLOBAL MONITORING

## Global database

The United Nations Children’s Fund (UNICEF) and WHO each maintain databases for global monitoring and reporting of the percentage of women who received ANC at least four times during pregnancy by any provider. These agencies obtain data from nationally representative household surveys or routinely collected administrative data/services statistics. Before data can be included in the global databases, UNICEF and WHO undertake a process of data verification that includes correspondence with field offices to clarify any questions regarding the reported statistics. More information about the global databases for ANC coverage can be found at the following links for UNICEF and WHO: <https://data.unicef.org/topic/maternal-health/antenatal-care/> and [http://www.who.int/gho/maternal\\_health/en/](http://www.who.int/gho/maternal_health/en/).

## Key initiatives

Countdown to 2030 – Women’s, Children’s and Adolescents’ Health: <http://countdown2030.org/>

Ending Preventable Maternal Mortality (EPMM): [http://who.int/reproductivehealth/topics/maternal\\_perinatal/epmm/en/](http://who.int/reproductivehealth/topics/maternal_perinatal/epmm/en/)

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Reference List of 100 Core Health Indicators (plus health-related SDGs), 2018: <https://www.who.int/healthinfo/indicators/2018/en/>

Global Strategy for Women’s, Children’s and Adolescents’ Health (2016–2030): <http://www.who.int/life-course/partners/global-strategy/en/>

## ADDITIONAL RESOURCES

Global Health Observatory (GHO) Data – World Health Statistics: [http://www.who.int/gho/publications/world\\_health\\_statistics/en/](http://www.who.int/gho/publications/world_health_statistics/en/)

UNICEF Data: Monitoring the situation of children and women: Antenatal care: <https://data.unicef.org/topic/maternal-health/antenatal-care/>

UNICEF – Multiple Indicator Cluster Surveys: <http://mics.unicef.org/tools>

The DHS Program – Demographic and Health Surveys: <https://dhsprogram.com>

MEASURE Evaluation: Family Planning and Reproductive Health Indicators Database: Percent women attended at least four times for antenatal care during pregnancy: [https://www.measureevaluation.org/prh/rh\\_indicators/womens-health/sm/percent-women-attended-at-least-four-times-for](https://www.measureevaluation.org/prh/rh_indicators/womens-health/sm/percent-women-attended-at-least-four-times-for)

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Indicator Sheet

**ANTENATAL CARE**  
(at least four visits)/  
**ANTENATAL** (4<sup>th</sup> visit)

MoNITOR 

## CONCEPT AND DEFINITION

**Concept** Antenatal care (ANC) is a critical component for improving maternal and newborn health and provides a platform for important health-care functions, including: health promotion, screening and diagnosis, injury and disease prevention, as well as birth preparedness and preparation for the postnatal period. By implementing timely and appropriate evidence-based practices, ANC can reduce morbidity and mortality and optimize overall health and well-being. ANC also provides the opportunity to communicate with and support women, families and communities at a critical time in the course of a woman's life. ANC comprises effective communication about physiological, biomedical, behavioural, sociocultural issues, as well as emotional and psychological support, to pregnant women in a respectful way (1–3).

**Definition** The number of women of reproductive age with a live birth in a specified reference period who received ANC four or more times from any provider is expressed as a percentage of women in the same age range with a live birth in the same period.

**Unit of measurement:** Percentage (%)

**Level of indicator use:** Global, national, and subnational (first or second administrative level)

**Monitoring and evaluation framework:** Outcome (service coverage)

# MEASUREMENT GUIDANCE

## Data sources

There are two common data sources for this indicator:

1. Routinely collected administrative data
2. Population-based household surveys.

## Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/records or registers and are entered into national and/or subnational health information systems:

- Health information management system (HMIS) and/or
- District Health Information Management System (DHIS2).

Routinely collected administrative data and health facility statistics are the preferred data source in settings with a high utilization of health facility services and data are recorded in a manner that ensures good data quality for both the public and private health sectors.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from obstetric and neonatal medical records. Relevant information is recorded about the number and timing of ANC visits among all women who attended ANC during pregnancy within health facilities on paper forms completed by health personnel and/or through an electronic medical record. Data from paper or electronic sources are entered or abstracted into a database or registry and are compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for the reporting of this indicator.

**Indicator definition and calculation:** The indicator is calculated as the percentage of women who received ANC four or more times by any provider among women with an ANC visit in a health facility during a specified reference period.

**Numerator:** Number of antenatal clients with a fourth ANC visit in a specified time period.

**Denominator:** Number of antenatal clients with a first ANC visit in a specified time period.

Unless specified, the statistic may include any woman regardless of age and includes both live births and stillbirths, as defined by the health facility and/or national or subnational vital statistics offices.

The numerator and denominator definition of ANC is based on individual health facility report or is in accordance with the country-specific definition by the MoH and/or NSO.

**Frequency of measurement:** The indicator can be calculated on an annual basis or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on facility, subnational and national processes for data entry, compilation and analysis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Monthly, quarterly, or as needed based on the country and/or facility need
- *Subnational (first and second administrative) level:* Monthly or quarterly
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By level of facility, location of facility (e.g. urban, rural), type of health personnel, and timing of ANC visit.

**Missing values:** Missing values are usually not known, or not reported.

#### Population-based household surveys

The main source of data for this indicator has been through population-based household surveys collected through nationally or subnationally representative and statistically sound questionnaires, such as:

- Demographic Health Surveys (DHS) (4)
- Multiple Indicator Cluster Surveys (MICS) (5)
- Reproductive Health Surveys (RHS)
- Other household surveys with a similar methodological design.

Population-based household survey data are the preferred data source in settings with a low utilization of health facility services, or where private health sector data are excluded from routinely collected administrative data sources.

**Key source of data:** Eligible women of reproductive age (15–49 years) are identified in the household survey for inclusion and interviewed using an individual women's questionnaire. Women are considered eligible for survey interview if they are either usual residents or visitors of the household who stayed there the night before the interview.

All eligible and interviewed women between 15 and 49 years of age who had a live birth during a specified reference period, typically 2–5 years prior to the time of interview, are asked “Did you see anyone for

*antenatal care for this pregnancy?”*, in reference to the last live birth the individual woman had during the same reference period. If women saw anyone for ANC, they are then asked to identify *“How many times did you receive antenatal care during this pregnancy?”*

MoH and NSO typically conduct household surveys and compile, analyse and report the results for this indicator in collaboration with the survey programme (e.g. DHS, MICS, RHS) and funding agency.

**Indicator definition and calculation:** Individual women of reproductive age (15–49 years old) are asked about ANC visits for their most recent live birth. Questions about ANC visits are asked, irrespective of the child’s current living status (dead or alive), and are for live births that they have had during a specified reference period, which is typically 2–5 years before the time of the survey completion. The definition is as follows:

The percentage of interviewed women (aged 15 to 49 years) with a live birth in the 2–5 years prior to survey completion who received ANC four or more times from any provider. The indicator consists of the following numerator and denominator:

*Numerator:* Number of women (aged 15–49 years) with a live birth who received ANC four or more times from any provider.

*Denominator:* Total number of women (aged 15–49 years) with a live birth.

**Frequency of measurement:** Household surveys are typically conducted every 3–5 years.

**Disaggregation at population level:** Type of health personnel, place of delivery, mode of delivery, place of residence (e.g. urban, rural), sex of live birth, birth order, socioeconomic status (e.g. education level, wealth quintile), age of woman at the time of delivery, and births attended by skilled health personnel.

**Missing values:** Included in the distribution as “don’t know” and/or “missing”.

# INTERPRETATION AND USE

## Interpretation

This indicator helps programme management at global, national and subnational levels by monitoring and evaluating perinatal outcomes and using data to make informed decisions about the planning, development and evaluation of health services delivery and initiatives. The antenatal period presents opportunities for reaching pregnant women with interventions that may be vital to both maternal, fetal and newborn health and well-being. The World Health Organization (WHO) previously recommended that pregnant women complete at least four ANC visits. However, new guidelines from the WHO ANC Model (2018) increase the recommended number of contacts a pregnant woman has with health providers throughout her pregnancy from four to eight visits, and future programmes should consider measuring based on these guidelines (1).

This indicator should be interpreted with caution as it is a measure of contact with the health system and does not take account the content and quality of care received. Receiving ANC during pregnancy does not guarantee the receipt of evidenced-based interventions that are effective in improving maternal and newborn health and survival. It should not be assumed that women received ANC in accordance with WHO, other international organizations, and/or country-specific recommendations or guidelines. Therefore, this indicator should be complemented with information on the content and quality of interventions received during each ANC contact in order to more effectively monitor and evaluate the effectiveness and impact of maternal and newborn health interventions.

## Common challenges

Data collected from administrative and other routine data systems

Administrative data may suffer from poor quality such as irregularities in report generation, data duplication and inconsistencies (6). Reporting challenges exist at the facility level given data quality issues, including; incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system or inadequate system design.

Many HMIS databases or registries are event-based and only include ANC information for women who delivered a birth at a health facility. In some instances, the denominator may include births delivered by women of an unspecified age range and include both live births and stillbirths. In addition, the definition of a stillbirth varies by country and context, such as differences in inclusion for gestational age (e.g. 20–28 weeks) and birthweight (e.g.  $\geq 500$  grams). As this often only represents those women who present to health facilities for ANC, it does not capture the number of pregnancies and demand for ANC within the total population. These differences in definitions compromise the ability to compare data between countries.

Administrative data should be interpreted with caution in settings where data quality is poor and the percentage of births at public and

private sector health facilities is low, or where data from the private health sector are not compiled within the HMIS reporting.

In settings where routine HMIS data lack information on pregnancies and/or births that occur outside the public sector – for example, in homes or private sector facilities – the total number of births in the HMIS should not serve to estimate the denominator for this indicator. Where data on the total numbers of live births for the entire population for the denominator are unavailable, evaluators can calculate total estimated live births using census data for the total population and crude birth rates in a specified area (total expected live births = estimated population x the total crude birth rate).

#### Data collected through household surveys

Women may not be able to accurately recall details around childbirth when data are collected through household surveys (7). There is also a time lag as the recall period is from two to five years before the survey data are collected.

The most commonly used denominator is the number of live births, which acts as a proxy for the number of pregnant women. However, inclusion of only live births underestimates the total number of pregnancies by excluding those that end in stillbirth or spontaneous or induced abortion, as well as ectopic and molar pregnancies. It also causes survivor bias in that only those women who are alive at the time of interview would be included and underestimates the total number of women requiring care during pregnancy.

The indicator usually measures visits with any provider because national-level household surveys do not collect provider data for each visit. In addition, standardization of the definition of health personnel is sometimes difficult because of differences in naming conventions, competencies and training of health personnel between and within countries (8).

## GLOBAL MONITORING

### Global database

The United Nations Children's Fund (UNICEF) and WHO each maintain databases for global monitoring and reporting of the percentage of women who received ANC at least four times during pregnancy by any provider. These agencies obtain data from nationally representative household surveys or routinely collected administrative data/services statistics. Before data can be included in the global databases, UNICEF and WHO undertake a process of data verification that includes correspondence with field offices to clarify any questions regarding the reported statistics. More information about the global databases for ANC coverage can be found at the following links for UNICEF and WHO: <https://data.unicef.org/topic/maternal-health/antenatal-care/> and [http://www.who.int/gho/maternal\\_health/en/](http://www.who.int/gho/maternal_health/en/).

### Key initiatives

Countdown to 2030 – Women's, Children's, and Adolescent's Health: <http://countdown2030.org/>

Ending Preventable Maternal Mortality (EPMM): [http://who.int/reproductivehealth/topics/maternal\\_perinatal/epmm/en/](http://who.int/reproductivehealth/topics/maternal_perinatal/epmm/en/)

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Reference List of 100 Core Health Indicators, 2018: <https://www.who.int/healthinfo/indicators/2018/en/>

Global Strategy for Women's, Children's, and Adolescent's Health (2016-2030): <http://www.who.int/life-course/partners/global-strategy/en/>

## ADDITIONAL RESOURCES

Global Health Observatory (GHO) Data – World Health Statistics:  
[http://www.who.int/gho/publications/world\\_health\\_statistics/en/](http://www.who.int/gho/publications/world_health_statistics/en/)

UNICEF Data: Monitoring the situation of children and women:  
Antenatal care: <https://data.unicef.org/topic/maternal-health/antenatal-care/>

UNICEF – Multiple Indicator Cluster Surveys: <http://mics.unicef.org/tools>

The DHS Program – Demographic and Health Surveys:  
<https://dhsprogram.com>

MEASURE Evaluation: Family Planning and Reproductive Health Indicators Database: Percent women attended at least four times for antenatal care during pregnancy: [https://www.measureevaluation.org/prh/rh\\_indicators/womens-health/sm/percent-women-attended-at-least-four-times-for](https://www.measureevaluation.org/prh/rh_indicators/womens-health/sm/percent-women-attended-at-least-four-times-for)

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Indicator Sheet

# **ANTENATAL CARE: CLIENT SYPHILIS SCREENING**

**MoNITOR** 

## CONCEPT AND DEFINITION

### Concept

Syphilis is a sexually transmitted infection, mainly acquired through oral, anal, or vaginal sexual contact. Globally, syphilis remains the most common congenital infection and a major cause of preventable death among newborn babies (1–3). Syphilis screening during antenatal care (ANC) is one of the key recommendations put forward by the WHO global initiative to eliminate congenital syphilis (2). When left untreated or inadequately treated, active syphilis infection during pregnancy can result in adverse outcomes in at least half of women infected (4). Adverse outcomes may include: spontaneous late-term abortion ( $\geq 20$  weeks' gestation), stillbirth, prematurity, low birthweight, or neonatal death (1–4). Syphilis screening is thus an important aspect of the laboratory investigations during routine ANC to ensure early prevention of mother-to-child transmission and treatment of syphilis (4). All pregnant women should be screened for syphilis at the first ANC visit in the first trimester and ideally again in the third trimester of pregnancy (4,5). Syphilis screening during ANC may be integrated with HIV testing, viral, or other tests, as relevant to the specific setting, and to strengthen maternal and child health systems (6).

### Definition

The number of antenatal clients screened for syphilis during a specified reference period is expressed as a percentage of the total number of antenatal clients at first ANC visit during the same period (6).

**Unit of measurement:** Percentage (%)

**Level of indicator use:** Facility-based at national and subnational (first and second administrative level)

**Monitoring and evaluation framework:** Outcome

**Domain:** Service coverage

**Continuum of care:** ANC

# MEASUREMENT GUIDANCE

## Data sources

The most common source of data for this indicator is routinely collected administrative data.

## Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/ records or registers and are entered into national and/or subnational health management information systems (HMIS).

Data from health information systems may collect information on health personnel who assisted during delivery among all women who delivered at a health facility. Routinely collected administrative data and health facility statistics are the preferred data source in settings with a high utilization of health facility services and where data are recorded in a manner that ensures good data quality for both the public and private health sectors. The compiled data in the national HMIS or District Health Information System (DHIS2) should include data from both public and private health sectors, especially when the private sector is a substantial source of service provision to the population. In settings where utilization of health facilities is not high (e.g. settings with a high prevalence of ANC visits occurring at home), data may suffer from incompleteness if information about women receiving ANC in the community setting are not captured. In addition, there are often challenges in accurately measuring the numerator and denominator when routine HMIS data are used to measure this indicator.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from antenatal, obstetric and neonatal medical records, including health services registers. Relevant information is recorded about the content and results of screening assessments – including laboratory investigations – completed during ANC visits among all women who attended ANC during pregnancy within health facilities, on paper forms completed by health personnel and/or through an electronic medical record. Data from paper or electronic sources are entered or abstracted into a database or registry and are compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for the reporting of this indicator.

**Indicator definition and calculation:** The indicator is calculated as the percentage of women who received ANC and were screened for syphilis during a specified reference period.

**Numerator:** Number of antenatal clients screened for syphilis in a specified time period.

**Denominator:** Total number of antenatal clients with a first visit in a specified time period.

Unless specified, the statistic may include any woman regardless of age. The numerator and denominator definition of ANC is based on individual health facility report or is in accordance with the country-specific definition by the MoH and/or NSO.

**Frequency of measurement:** The indicator can be calculated on an annual basis or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on facility, subnational and national processes for data entry, compilation and analysis (7). As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Monthly, quarterly, or as needed based on the country and/or facility need
- *Subnational (first and second administrative level):* Monthly or quarterly
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By level of facility, location of facility (e.g. urban, rural), type of health personnel and timing of ANC visit.

**Missing values:** Missing values are usually not known or not reported.

# INTERPRETATION AND USE

## Interpretation

The antenatal period presents opportunities for reaching pregnant women with interventions that may be vital to both maternal, fetal and newborn health and well-being. The WHO ANC Model (2018) recommends that all pregnant women complete at least four (or eight) ANC visits and that universal screening for syphilis occur at the first ANC, ideally during the first trimester, and again in the third trimester (5). Adequate screening and antibiotic treatment of syphilis as early as possible during pregnancy is critical to preventing maternal and perinatal mortality, congenital syphilis, and further exposure of syphilis amongst current and/or future sexual partners.

Thus, the purpose of this indicator is to monitor and track the proportion of ANC clients who received screening for syphilis, and is a proxy measure of the content and quality of care received during ANC. However, measurement of this indicator only includes monitoring the percentage of syphilis screening at the first ANC visit. Programme managers and/or the MoH should consider disaggregating this indicator by gestational age at the time of pregnancy in order to indicate the percentage of pregnant women who received syphilis screening during the first trimester and ideally again in the third trimester. Complementary indicators would also include measurement of the percentage of women attending ANC services who tested positive for syphilis and received treatment, which would be a measure of quality of care and receipt of evidenced-based interventions for syphilis that are effective in improving newborn health and survival.

It should not be assumed that women received high-quality ANC, in accordance with the WHO guidelines, other international organizations and/or country-specific recommendations/guidelines. Therefore, this indicator should be complemented with information on the country context and policies to understand the screening practice recommendations for ANC in order to more effectively monitor and evaluate the effectiveness and impact of maternal and newborn health interventions.

## Common challenges

Data collected from administrative and other routine data systems

Administrative data may suffer from poor quality such as irregularities in report generation, data duplication and inconsistencies (8). Reporting challenges exist at the facility level given data quality issues, including incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system or inadequate system design. Collection of data for this indicator is also reliant on the inclusion of antenatal syphilis screening on the patient medical record and, if so, that the clinical documentation is entered into the registry to database system for national or subnational monitoring and evaluation.

Many HMIS databases or registries are event-based and only include ANC information for women who delivered a birth (either live or stillbirth) at a health facility. In addition, the definition of a stillbirth varies by country and context, such as differences in inclusion for gestational age (e.g. 20–28 weeks) and birthweight (e.g.  $\geq 500$  grams). The inclusion of only live births or stillbirths within event-based administrative databases underestimates the total number of pregnancies by excluding those pregnancies that end in spontaneous or induced abortion, as well as ectopic and molar pregnancies. This would underestimate the total proportion of women screened for syphilis during ANC, because the denominator would only include total births instead of the total number of antenatal clients. Furthermore, this indicator only represents those women who present to health facilities for ANC; it does not capture the number of pregnancies and demand for screening of syphilis during ANC within the total population. These differences in definitions within administrative databases compromise the ability to compare data between countries.

Administrative data should be interpreted with caution in settings where data quality is poor and the percentage of ANC attendance at public and private sector health facilities is low, or where data from the private health sector or community is not compiled within the HMIS reporting.

## GLOBAL MONITORING

### Global database

The United Nations Children’s Fund (UNICEF), WHO and Joint United Nations Programme on HIV/AIDS (UNAIDS) jointly maintain the Global AIDS Monitoring (GAM) database for global monitoring and reporting of the percentage of women accessing ANC services who were tested for syphilis. These agencies obtain data from nationally representative household surveys or routinely collected administrative data/services statistics. Before data can be included in the global databases, UNICEF, WHO and UNAIDS undertake a process of data verification that includes correspondence with field offices to clarify any questions regarding the reported statistics. More information about the database of women screened for syphilis during pregnancy can be found at: <http://apps.who.int/gho/data/view.main.GSWCAH09v>.

### Key initiatives

Countdown to 2030 – Women’s, Children’s and Adolescents’ Health: <http://countdown2030.org/>

Ending Preventable Maternal Mortality (EPMM): [http://who.int/reproductivehealth/topics/maternal\\_perinatal/epmm/en/](http://who.int/reproductivehealth/topics/maternal_perinatal/epmm/en/)

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Strategy for Women’s, Children’s and Adolescents’ Health (2016–2030): <http://www.who.int/life-course/partners/global-strategy/en/>

## ADDITIONAL RESOURCES

MEASURE Evaluation: Family Planning and Reproductive Health Indicators Database: Percent of women attending antenatal clinics screened for syphilis: [https://www.measureevaluation.org/prh/rh\\_indicators/womens-health/sm/percent-of-pregnant-women-attending-antenatal](https://www.measureevaluation.org/prh/rh_indicators/womens-health/sm/percent-of-pregnant-women-attending-antenatal)

UNICEF Data: Monitoring the Situation of Children and Women: Antenatal care: <https://data.unicef.org/topic/maternal-health/antenatal-care/>

WHO Global Health Observatory indicator data: Women screened for syphilis during pregnancy: <http://apps.who.int/gho/data/view.main.GSWCAH09v>

WHO recommendations on antenatal care for a positive pregnancy experience: <https://apps.who.int/iris/bitstream/handle/10665/250796/9789241549912-eng.pdf>

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Indicator Sheet

**AVAILABILITY OF  
FUNCTIONAL EMERGENCY  
OBSTETRIC AND NEWBORN  
CARE FACILITIES (EMONC)  
(PER POPULATION)**

**MoNITOR** 

## CONCEPT AND DEFINITION

### Concept

Maternal and newborn health (MNH) programmes aimed at improving health outcomes and reducing mortality and morbidity should ensure that women and their newborns have access to health facilities that offer care for complications during pregnancy and childbirth. The Emergency Obstetric and Newborn Care (EmONC) framework was established to measure a minimum requirement of provision of emergency obstetric care interventions available at health facilities to respond to emergency needs.

This is a composite indicator that measures the availability of EmONC services, defined by seven basic and two comprehensive interventions, as recommended by WHO (1,2). The seven basic EmONC signal functions include: (i) administration of intravenous/intramuscular antibiotics; (ii) administration of intravenous/intramuscular uterotonic drugs (i.e. oxytocin); (iii) administration of intravenous/intramuscular anticonvulsants; (iv) manual removal of the placenta; (v) removal of retained products of conception; (vi) perform assisted vaginal delivery; and (vii) perform basic neonatal resuscitation (1,2). The two additional signal functions that comprise comprehensive EmONC services include: (viii) perform surgery (i.e. caesarean section); and (ix) perform blood transfusion (1,2). A health facility is defined as having availability of functional EmONC signal function if service was available and provided within the past three months.

Key signal functions were selected because they are the key medical interventions used to treat direct obstetric complications that cause the vast majority of deaths worldwide (1,2). By capturing signal functions “performed” the indicator is expected to indirectly capture the availability of trained staff, equipment and supplies. This indicator is currently under review as part of an effort to revise the EmONC framework and indicators.

### Definition

The number of obstetric care facilities that provided EmONC signal functions in the last three months per 500 000 total population.

**Unit of measurement:** Percentage (%)

**Level of indicator use:** Population-based at national and subnational (first or second administrative level)

**Monitoring and evaluation framework:** Output

**Domain:** Service access and availability

**Continuum of care:** Intrapartum

# MEASUREMENT GUIDANCE

For measurement of this indicator, there must be at least five EmONC facilities per 500 000 total population, including at least one comprehensive and the rest basic EmONC facilities (1,2).

A basic EmONC facility is one in which all signal functions 1 through 7 are performed; and a comprehensive EmONC is one in which all functions 1 through 9 are performed (see Table 1). If a facility has performed each of the first seven signal functions in the past three months, it qualifies as providing basic EmONC. If it has provided all nine of the signal functions, it qualifies as a “comprehensive” EmONC facility.

**Table 1. Signal functions used to identify basic and comprehensive EmONC**

| Basic EmONC signal functions                                              | Comprehensive EmONC signal functions        |
|---------------------------------------------------------------------------|---------------------------------------------|
| <i>Perform 1–7 signal functions</i>                                       | <i>Perform 1–7 signal functions and 8–9</i> |
| (1) Administer parenteral antibiotics                                     | (8) Perform surgery, e.g. caesarean section |
| (2) Administer uterotonic drugs                                           | (9) Perform blood transfusion               |
| (3) Administer parenteral anticonvulsants for pre-eclampsia and eclampsia |                                             |
| (4) Manually remove the placenta                                          |                                             |
| (5) Remove retained products                                              |                                             |
| (6) Perform assisted vaginal delivery                                     |                                             |
| (7) Perform basic neonatal resuscitation                                  |                                             |

## Data sources

The main data source for this indicator is health facility assessments.

## Health facility assessments

The main source of data for this indicator has been through health facility surveys collected through nationally or subnationally representative structured surveys, including:

- Service Provision Assessment (SPA) survey (3)
- Service Availability and Readiness Assessment (SARA) (4)
- Other health facility assessment surveys with a similar methodological design.

Health facility assessment survey data are the preferred data source in settings without an established routine facility monitoring system and inability to validate self-reported assessment data.

**Key source of data:** The main source of data is facility medical registers or health providers' recall of interventions provided. During the facility assessments, facility registers are reviewed, and staff are asked to report on whether or not any of the signal functions for basic and comprehensive EmONC, as applicable for the level of facility, were carried out in the past three months. Each of the seven basic and two comprehensive EmONC signal functions are asked about separately. If a signal function was reported as being provided in the facility, questions are asked about whether the signal function was provided at least once in the past three months.

**Indicator definition and calculation:** The availability of EmONC services is measured by the number of facilities that performed the complete set of signal functions in the past three months. If the staff has carried out the seven signal functions of basic EmONC in the three-month period before the assessment, the facility is considered to be a fully functioning basic facility. The facility is classified as functioning at the comprehensive level when it offers the seven signal functions plus surgery (i.e. caesarean section) and blood transfusion.

Finally, the availability of functional EmONC facilities is given if, in a geographical area of 500 000 people, there are at least five facilities that qualify, according to the aforementioned definition of performing EmONC, including at least one facility that qualifies as performing comprehensive EmONC. The indicator consists of the following numerator and denominator:

*Numerator:* The number of obstetric care facilities that provided EmONC signal functions in the last three months in a specified time period.

*Denominator:* Total population (per 500 000) in a specified period of time.

To compute the minimum acceptable number of basic and comprehensive EmONC facilities in the defined geographical area, begin by dividing the total population by 500 000. This is the minimum acceptable number of comprehensive facilities. Then, multiply that number by 5 to calculate the overall minimum number of facilities, both basic and comprehensive. These numbers should be compared with the actual number of facilities found; then classify the services as fully functioning basic or comprehensive.

**Frequency of measurement:** The indicator can be calculated on an annual basis, or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on facility, subnational and national processes for data entry, compilation and analysis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Subnational (first and second administrative) level:* Quarterly
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation at population level:** By location of health facility (first or second administrative level)

**Missing values:** Missing values are not allowed for any of the variables that make up the indicator, as it is a composite score and each of the signal functions is required.

# INTERPRETATION AND USE

## Interpretation

If a country or region does not have at least five EmONC facilities (including at least one comprehensive facility) per 500 000 total population, the overall minimum acceptable level of EmONC services is not met. If the overall minimum acceptable level of EmONC service is met, it is reasonable to conclude that, in the aggregate, an acceptable minimum number of facilities currently exists (1,2).

This indicator assesses and monitors the availability of services in health facilities to generate evidence for planning and managing a health system to improve service delivery. The objectives are to obtain reliable, regular information on service delivery for basic and comprehensive EmONC. However, it is unknown how many facilities within a geographical area are needed in order to provide timely and adequate access to EmONC services and ultimately to reduce maternal and newborn morbidity and mortality (5,6). Moreover, only facilities with a case load of at least 250 births in three months have a reasonable chance to encounter the complications to provide EmONC signal functions (4,5). Thus, health facilities that see a smaller birth volume will not be able to qualify to meet this indicator because of the low prevalence of complications and the inability to perform the aforementioned signal functions – regardless of whether the services are available and ready to be performed at that facility.

Moreover, this indicator does not take into account the geographical location of the facilities, the transport and referral system, and the quality of EmONC that is provided. Using geographical information systems to quantify access measured in actual distance and travel time from maternal residence to the nearest obstetric and newborn facility would provide complementary information to understand the need for and access to these services (5,6).

In addition, this indicator assumes that the EmONC signal functions are available at the facility within the last three months to women at any hour of the day, every day of the week. This indicator is only one of the indicators that monitors prompt, adequate treatment of complications of pregnancy and childbirth, and therefore should be tracked together with indicators that monitor the provision of EmONC (1).

## Common challenges

Even if the availability and utilization of health facilities in a country or administrative area is high, it is worthwhile investigating which women are not using them. Certain factors strongly affect use of services in a particular area, such as distance to the facility, prevalence of ethnic or religious minority groups, socioeconomic status (e.g. education, literacy, income levels), and the reputation of the facility. Information on some of these factors, such as maternal place of residence, may already be available in health facility records, and records can be reviewed to determine whether women attended the health facility

from all parts of the catchment area or only from the town in which the facility is located.

The denominator used is “total population” rather than “total births” because most planning is based on population size. However, it may be more appropriate to assess EmONC services in relation to births as this would be a better estimate of the total population in need of services (2). Currently, there is an ongoing discussion among global experts and analyses of available data are being conducted on whether the denominator should be per population or per expected birth (6).

In some cases, facilities are assumed to be functional, but facility visits reveal a different reality (2). At basic EmONC facilities, providers may not have the opportunity to perform all signal functions within the last three months, even if they are capable and have the appropriate equipment and supplies. Even when signal functions are available, they may not be performed – for example, if staff are not trained and are not confident in their skills or authorized to perform certain signal functions. In some countries, a signal function may not be performed because they are not included in the pre-service training of health personnel or national treatment protocols; an example is assisted vaginal deliveries (vacuum or forceps).

The definition of the numerator has also been flagged for revisions around the inclusion and content of the signal functions for this indicator. It is also essential to develop and incorporate signal functions that meet the needs of the newborn. The basic and comprehensive EmONC signal functions and their related indicators are currently being updated by the United Nations Population Fund (UNPFA), Averting Maternal Death and Disability (AMDD) and WHO in response to improving issues related to inexact and inadequate measurement. There has been a preference to report data related to population sizes rather than the number of births and met need for EmONC, as well as defining not only required EmONC facility numbers, but also facility size, capacity and staffing (7). In addition to core competencies related to obstetric and neonatal emergency signal functions, future evaluations should consider a broader spectrum of competencies such as interpersonal skills and ability to counsel and educate women and their families on relevant topics such as family planning (8).

Many countries have a mix of public and private facilities; however, information is commonly collected from the public facilities and not the private facilities. Since the indicator is based on population estimates, it is recommended that both public and private facilities are included in the measurement of the indicator. The validity of this indicator rests on direct inspection of the facilities.

## GLOBAL MONITORING

Global monitoring data for the availability of functional EmONC facilities is from UNFPA and AMDD. More information about AMDD can be found at: <https://www.mailman.columbia.edu/research/averting-maternal-death-and-disability-amdd/emonc>.

### Key initiatives

Averting Maternal Death and Disability (AMDD): <https://www.mailman.columbia.edu/research/averting-maternal-death-and-disability-amdd>

Countdown to 2030 – Women’s, Children’s and Adolescents’ Health: <http://countdown2030.org/>

Ending Preventable Maternal Mortality (EPMM): [http://who.int/reproductivehealth/topics/maternal\\_perinatal/epmm/en/](http://who.int/reproductivehealth/topics/maternal_perinatal/epmm/en/)

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Reference List of 100 Core Health Indicators (plus health-related SDGs), 2018: <https://www.who.int/healthinfo/indicators/2018/en/>

Global Strategy for Women’s, Children’s and Adolescents’ Health (2016–2030): <http://www.who.int/life-course/partners/global-strategy/en/>

## ADDITIONAL RESOURCES

Moran AC, Jolivet RR, Chou D, Dalglish SL, Hill K, Ramsey K, et al. A common monitoring framework for ending preventable maternal mortality, 2015–2030: phase I of a multi-step process. BMC Pregnancy Childbirth. 2016;16(1):250: <https://doi.org/10.1186/s12884-016-1035-4>

MEASURE Evaluation: Family Planning and Reproductive Health Indicators Database: Number of facilities per 500,000 providing basic and comprehensive emergency obstetric care: [https://www.measureevaluation.org/prh/rh\\_indicators/womens-health/sm/number-of-facilities-per-500-00-providing-basic](https://www.measureevaluation.org/prh/rh_indicators/womens-health/sm/number-of-facilities-per-500-00-providing-basic)

Monitoring emergency obstetric care: a handbook: <http://www.who.int/reproductivehealth/publications/monitoring/9789241547734/en/>

The DHS Program – Service Provision Assessment (SPA) Survey: <https://dhsprogram.com/What-We-Do/Survey-Types/SPA.cfm>

WHO Service Availability and Readiness Assessment (SARA): [http://www.who.int/healthinfo/systems/sara\\_introduction/en/](http://www.who.int/healthinfo/systems/sara_introduction/en/)

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7. Collender G, Gabrysch S, Campbell OM. Reducing maternal mortality: better monitoring, indicators and benchmarks needed to improve emergency obstetric care. Research summary for policymakers. *Trop Med Int Health*. 2012;17(6):694–6. doi:10.1111/j.1365-3156.2012.02983.x.
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Indicator Sheet

# BIRTH REGISTRATION

MoNITOR 

## CONCEPT AND DEFINITION

### Concept

Birth registration is a fundamental human right according to the United Nations Convention of the Rights of the Child (1) and is a key component of improving health of mothers, newborns and children (2). Registering children at birth is the first step in securing their recognition and identity before the law, by providing a certificate of birth that acts as a permanent and formal legal record of birth. In part, this ensures child protection and safeguarding of human rights, which is especially important for children at risk of being exploited – for example, through child labour, child trafficking, or forced early marriage. Knowing the number of births and children there are within a given population is important to be able to plan, implement and evaluate health services and educational programmes (e.g. vaccination campaigns, number of schools and teachers or health facilities and health personnel needed to meet the needs of the population). Children who are not registered at birth or who do not have a birth certificate may lose out on important opportunities and benefits across all ages and stages in life, such as: inability to receive health care, immunizations, nutritional supplements, social assistance or insurance; inability to open a bank account or obtain a driver's license or passports. It also prevents children from receiving an education due to inability to enroll in school.

### Definition

The number of children under 5 years of age with a birth certificate or whose birth was registered with a civil authority during a specified reference period is expressed as a percentage of children under the age of 5 years old in the same reference period (3).

**Unit of measurement:** Percentage (%)

**Level of indicator use:** Population-based at global, national and subnational (first administrative level)

**Monitoring and evaluation framework:** Input

**Domain:** Health information

**Continuum of care:** Across all continuums of care

# MEASUREMENT GUIDANCE

## Data sources

There are three data sources for this indicator:

- a. Civil registration and vital statistics (CRVS) and other routine national surveillance systems
- b. Routinely collected administrative data other than CRVS
- c. Population-based household surveys.

## Civil registration and vital statistics systems

A well-functioning and integrated national or subnational CRVS system will universally register and certify vital events, including live births, stillbirths and deaths that occur in the country or administrative area. Birth and death certificates are issued as part of the CRVS system, allowing the compilation, analysis and dissemination of information through vital statistics agencies, including population characteristics (e.g. sex, date of birth or death, birthweight, place of birth or death, place of usual residence) and cause-of-death information. Some CRVS systems will also register and certify other important vital events within the population, such as adoptions, marriages and divorces (4).

Data from CRVS are the preferred data source for this indicator when the system freely and universally records vital events and data are recorded in a systematic manner that ensures high data quality for both the public and private health sectors and regardless of location of birth (e.g. health facility or community-based births).

**Key source of data:** The main source of data for this indicator involves several steps and vary based on the policies and procedures of the national or subnational CRVS within health facilities and/or within communities. Declaration of live or stillbirth events are obtained: (a) through forms completed by health personnel at health facilities, or (b) through community-based sources, including registration forms submitted directly by the parents of the live birth or stillbirth to civil registrars. Either paper or electronic forms containing this information are then submitted to the relevant civil authorities and vital statistics agencies, which have the responsibility to officially record the birth event and birth characteristics, such as name, sex, date and place of birth, birthweight, nationality, and the names, ages, education level and occupations of the mother and/or father. At the national or subnational level, the civil authority and vital statistics agency issues birth certificates to formalize the birth registration. A birth certificate is a vital record that documents the birth of a child. The term “birth certificate” can refer to either the original document certifying the birth, or to a certified copy or representation of the registration of that birth, depending on the practices of the country issuing the certificate (3). National or subnational civil authorities and vital statistics agencies are responsible for reporting of this indicator.

**Indicator definition and calculation:** The indicator is calculated as the percentage of children under 5 years of age whose birth was registered with the relevant national or subnational civil authorities during a specified time period.

*Numerator:* Number of children under 5 years of age whose births are registered with the relevant national or subnational civil authorities in a specified geographical region and time period.

*Denominator:* Total number of children under the age of 5 in a specified geographical region and time period.

Unless specified, the statistic should include the registration of both live births and stillbirths, as defined by the health facility and/or national or subnational vital statistics offices. To align with the global Sustainable Development Goal (SDG) indicator 16.9 (Proportion of children under 5 years of age whose births have been registered with a civil authority, by age), data from CRVS need to be retrospectively disaggregated by age to obtain the percentage of children under the age of 5 years old with a birth certificate or whose birth was registered by the civil authorities.

**Frequency of measurement:** Within CRVS, this indicator is monitored at a national or subnational level on an annual basis. These data normally refer to live births that were registered within a year or the legal time frame for registration applicable in the country (3). The data can be compiled and aggregated subnationally to provide national-level data.

**Disaggregation:** By sex, age, vital status (live birth, still birth), location of birth, place of residence (e.g. urban, rural), subnational administrative units (e.g. districts, provinces, regions), socioeconomic status (e.g. education or occupation of mother/father) and type of reporting source (health facility, community).

**Missing values:** Missing values are usually not known. To ascertain missing data and perform data quality assurance, estimates of the total number of births in a country or administrative area can be compared with the absolute number of registered births in the same period.

#### Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/records or registers and are entered into national and/or subnational health management information systems (HMIS).

Data from health information systems may collect information on the number of births officially registered in health facilities. Routinely collected administrative data and health facility statistics are the preferred data source in settings where the CRVS is non-functioning and there is a high utilization of health facility services and data are recorded in a manner that ensures good data quality for both the public and private health sectors. The compiled data in the national

HMIS or District Health Information System (DHIS2) should include data from both public and private health sectors, especially when the private sector is a substantial source of service provision to the population. In settings where utilization of health facilities is not high (e.g. settings with a high prevalence of births occurring at home), data may suffer from incompleteness if information about births occurring outside facilities are not captured. In addition, there are often challenges in accurately measuring the numerator and the denominator when routine HMIS data are used to measure this indicator.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from medical records, including health services registers. Relevant information about births is recorded by health personnel on paper forms completed by health personnel and/or through an electronic medical record. Data from paper or electronic sources are entered or abstracted into a database or registry and are compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for the reporting of this indicator.

**Indicator definition and calculation:** The indicator is calculated as the percentage of children under 5 years of age whose births were registered with the relevant national or subnational civil authorities during a specified time period.

*Numerator:* Number of children under the age of 5 whose births are reported as being registered by the health facility with the relevant national civil authorities in a specified time period.

*Denominator:* Total number of births in a health facility<sup>1</sup> in a specified time period.

Unless specified, the statistic should include both registered live and stillbirths, as defined by the health facility and/or national or subnational vital statistics offices. To align with the global indicator for children under 5, data from HMIS would need to be retrospectively disaggregated by age and only include live births to obtain the percentage of children under the age of 5 years old with a birth certificate or whose birth was registered by the civil authorities.

**Frequency of measurement:** The indicator can be calculated on an annual basis or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on facility, subnational

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<sup>1</sup> In most countries, the HMIS captures information on births within health facilities. However, in contexts where the HMIS includes both health facility and community birth registration, the denominator should include births registered within the geographic jurisdiction or catchment area of the health facility.

and national processes for data entry, compilation and analysis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Monthly, quarterly, or as needed based on the country and/or facility need
- *Subnational (first and second administrative) level:* Monthly or quarterly
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By sex, age, vital status (live birth, still birth), level of facility, location of facility and place of maternal residence (e.g. urban, rural), subnational administrative units (e.g. districts, provinces, regions).

**Missing values:** Missing values are usually not known or not reported.

#### Population-based household surveys and censuses

The main source of data for this indicator has been through population-based household surveys and censuses collected through nationally or subnationally representative and structured questionnaires, such as:

- Demographic Health Surveys (DHS) (5)
- Multiple Indicator Cluster Surveys (MICS) (6)
- Reproductive Health Surveys (RHS)
- Other household surveys with a similar methodological design
- Censuses.

Population-based household survey data or national/subnational census data are the preferred data source in settings where utilization of health facility services is not very high (e.g. settings with a high prevalence of births occurring at home), or where private health sector data are excluded from routinely collected administrative data sources.

**Key source of data:** Depending on survey methodology,<sup>2</sup> eligible children under the age of 5 years old (0–59 months) are identified in

<sup>2</sup> The MICS questionnaire asks mothers or primary caregivers of all eligible children under the age of 5 years old about birth registration. In the DHS, the household head or other senior member of the household is asked questions about birth registration for children under the age of 5 in the household questionnaire.

the household survey for inclusion and interviewing using a household or an individual child's questionnaire. Children under 5 are considered eligible for the survey if they are either usual residents or visitors of the household who stayed there the night before the interview.

Mothers or caregivers of the eligible children under 5 years old at the time of survey interview are asked “*Does (NAME) have a birth certificate?*” where “name” refers to the name of the child. If the mother/caregiver indicates that the child does not have a birth certificate, or does not know if the child has one, they are asked “*Has (NAME)'s birth been registered with the civil authorities?*”

The MoH and NSO typically conduct household surveys and compile, analyse and report the results for this indicator in collaboration with the survey programme (e.g. DHS, MICS, RHS) and funding agency.

**Indicator definition and calculation:** Households with children under 5 or mothers (primary caregivers) of children under 5 are asked if the child has a birth certificate or if the birth was registered at any time between birth and the date of the survey. The definition is as follows: The percentage of children under age 5 with a birth certificate or whose births are reported registered with a civil authority. The indicator consists of the following numerator and denominator:

*Numerator:* Number of children under age of 5 (0–59 months) with a birth certificate or whose birth was reported as registered with civil authorities at the time of the survey.

*Denominator:* Total number of children under the age of 5 (0–59 months) at the time of the survey.

**Frequency of measurement:** Household surveys are typically conducted every 3–5 years.

**Disaggregation at population level:** Place of residence (e.g. urban, rural), subnational administrative units (e.g. districts, provinces, regions), sex of live birth, age, birth order, socioeconomic status (e.g. education level, household wealth quintile).

**Missing values:** Included in the distribution as “don’t know” or “missing”.

# INTERPRETATION AND USE

## Interpretation

Birth registration for children under the age of 5 years old measures the formal recognition of the child's date of birth, identity and nationality. Birth certificates serve as the first legal identity document that individuals are given and provide the most accurate information on birth dates and proof of age. The lack of formal recognition of birth usually means that a child is unable to obtain a birth certificate and may have implications on their right to health care and education, as well as the safeguarding of their human rights throughout the life-course.

The birth registration indicator is a measure of a country's capacity to plan and implement an effective civil registration system and vital statistics agency that are able to accurately and systematically report vital events, such as births and deaths. Statistics based on birth events form the demographic profile of communities, regions and countries. In countries where CRVS is the main source of data and birth registration is universal and complete, the number of births registered can be used to derive population-level indicators of health status, fertility, infant mortality and population growth (4). In turn, these indicators inform health system planning and policy and the allocation of funds and resources for programmes and interventions aimed at improving maternal, newborn and child health and survival. The SDG agenda highlights the importance of continued momentum towards improving maternal and newborn health by setting, under SDG goal 17, targets for achieving 100% birth registration and 80% death registration by 2030 (7). However, in many contexts the ability to uniquely identify births within the health system is a challenge. Globally, approximately 75% of children under the age of 5 have been registered and the quality of reporting of this indicator varies greatly between and within countries, particularly in countries without effective civil registration systems in place (8). Comparisons of the prevalence of birth registration at the national or subnational level over time can be used to identify areas where improvements in the capture and reporting of vital events are needed.

## Common challenges

### Civil registration and vital statistics systems

Birth registration is part of a national and/or subnational CRVS system. However, CRVS systems are either non-existent and/or the complete coverage, accuracy and timeliness of civil registration systems is a major issue in many countries worldwide. In order to assess the completeness of the CRVS system, evaluations should be conducted to ascertain the quality of the system, as recommended by the United Nation's revised Principles and Recommendations for a Vital Statistics System (4).

As a result, it is common for births to be unregistered, particularly for stillbirths and live birth registrations for neonatal deaths occurring shortly after birth. This may be due to lack of a legal framework within civil authorities and vital statistics agencies requiring registration for

all births, regardless of the outcome. Even in countries with functional CRVS systems and legal frameworks in place, missing or unregistered births still occur due to health professionals and/or parents not knowing the requirement to register stillbirths and in the instance of neonatal death, the need to register both the live birth in addition to the death.

#### Data collected from administrative and other routine data systems

Administrative data may suffer from poor quality such as irregularities in report generation, data duplication and inconsistencies (9). Reporting challenges exist at the facility level given data quality issues, including incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system or inadequate system design, such as no integration with the private sector.

Many HMIS databases or registries are event-based and only include information on deaths within a health facility. In settings where routine HMIS data lack information on deaths that occur outside the public sector – for example, in homes or in private sector facilities – the total number of deaths in the HMIS should not serve to estimate the denominator for this indicator.

#### Data collected through household surveys

The systematic recording of births in many countries remains a serious challenge. In the absence of reliable CRVS systems/ administrative data, household surveys have become the key source of data to monitor levels and trends of birth registration. In most low- and middle-income countries, such surveys represent the sole source of this information.

Respondents to the survey may not always be clear on who the civil authorities in charge of the birth registrations are and may misinterpret notifying a church or village chief of a birth as formal registration. Household surveys generally customize questionnaires by naming the specific national authority responsible for registration. However, even then, confusion about the birth registration process may result. Similarly, questions regarding the possession of a birth certificate may also be the source of erroneous data, since respondents may confuse a birth certificate with a health card or other document.

The most commonly reported denominator for the birth registration indicator is the total number of children under 5 at the time of survey, which acts as a proxy for the total number of eligible children. As only respondents with living children at the time of the survey are included, this indicator is prone to survivor bias in that only those children who are alive at the time of the interview would be included and underestimates the total number of births that were registered at birth.

# GLOBAL MONITORING

## Global database

The United Nations Children’s Fund (UNICEF) maintains databases for global monitoring and reporting on the percentage of children under the age of 5 whose birth are registered. UNICEF obtains data from official registration figures from civil authorities and vital statistics agencies and nationally representative household surveys. Before data can be included in the global databases, UNICEF undertakes a process of data verification that includes correspondence with field offices to clarify any questions regarding the reported statistics. More information about the global databases for birth registration can be found at the following link: <http://data.unicef.org/topic/child-protection/birth-registration/>.

## Key initiatives

Countdown to 2030 – Women’s, Children’s and Adolescents’ Health: <http://countdown2030.org/>

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Reference List of 100 Core Health Indicators (plus health-related SDGs), 2018: <https://www.who.int/healthinfo/indicators/2018/en/>

Global Strategy for Women’s, Children’s and Adolescents’ Health (2016–2030): <http://www.who.int/life-course/partners/global-strategy/en/>

United Nations Sustainable Development Goals (SDGs): <https://sustainabledevelopment.un.org>

## ADDITIONAL RESOURCES

Sustainable Development Goals (SDGs) Indicators – Metadata repository: <https://unstats.un.org/sdgs/metadata/>

UNICEF Data: Monitoring the situation of children and women: Birth registration: <https://data.unicef.org/topic/child-protection/birth-registration/>

UNICEF – Multiple Indicator Cluster Surveys: <http://mics.unicef.org>

The DHS Program – Demographic and Health Surveys: <http://www.dhsprogram.com/>

MEASURE Evaluation. Family Planning and Reproductive Health Indicators Database: Percent of births registered in the country: [https://www.measureevaluation.org/prh/rh\\_indicators/health-systems/hss/percent-of-births-registered-in-the-country](https://www.measureevaluation.org/prh/rh_indicators/health-systems/hss/percent-of-births-registered-in-the-country)

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Indicator Sheet

# **BIRTHS ATTENDED BY SKILLED HEALTH PERSONNEL**

**MoNITOR** 

## CONCEPT AND DEFINITION

### Concept

Most obstetric complications could be prevented or managed if women have access to a skilled birth attendant (SBA) or skilled health personnel who are able to adequately manage and provide quality care and lifesaving interventions during childbirth. The presence of a SBA is a measure of a health system's ability to provide adequate care for pregnant women during labour and childbirth.

Skilled health personnel provide effective, uninterrupted and quality care, and are defined as competent maternal and newborn health (MNH) professionals who are educated, trained, and regulated to national and international standards. All competent MNH professionals are able to: (a) provide and promote evidence-based, human rights-based, quality, socioculturally sensitive and dignified care to women and newborns; (b) facilitate physiological processes during labour and delivery to ensure a clean and positive childbirth experience; and (c) identify and manage or refer women and/or newborns with complications. In addition, as part of an integrated team of MNH professionals (including midwives, nurses, obstetricians, paediatricians and anaesthetists), they perform all signal functions of emergency maternal and newborn care to optimize the health and well-being of women and newborns. Within an enabling environment, health personnel trained to International Confederation of Midwives (ICM) standards can provide nearly all of the essential care needed for women and newborns. In different countries, these competencies are held by cadre with varying occupational titles (1). Not having access to a skilled attendant at the time of delivery is detrimental to a woman's health and empowerment because it could lead to the death of the mother or to her suffering a lifelong disability, especially in marginalized settings (2).

### Definition

The number of women of reproductive age with a live birth attended by skilled health personnel (generally doctors, nurses, or midwives) during delivery in a specified reference period is expressed as a percentage of women in the same age range with a live birth in the same period. Women should be attended by health personnel trained in providing lifesaving obstetric care, including giving the necessary supervision, care and advice to women during pregnancy, labour and the postpartum period, conducting deliveries on their own, and caring for newborns (3). Traditional birth attendants, whether trained or untrained, are not included in the definition of skilled health personnel (1–3).

**Unit of measurement:** Percentage (%)

**Level of indicator use:** Population-based at global, national and subnational (first or second administrative level)

**Monitoring and evaluation framework:** Outcome

**Domain:** Service coverage

**Continuum of care:** Intrapartum

# MEASUREMENT GUIDANCE

## Data sources

There are two common data sources for this indicator:

- a. Routinely collected administrative data
- b. Population-based household surveys.

## Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/records or registers and are entered into national and/or subnational health management information systems (HMIS).

Data from health information systems may collect information on health personnel who assisted during delivery among all women who delivered at a health facility. Routinely collected administrative data and health facility statistics are the preferred data source in settings with a high utilization of health facility services and where data are recorded in a manner that ensures good data quality for both the public and private health sectors. The compiled data in the national HMIS or District Health Information System (DHIS2) should include data from both public and private health sectors, especially when the private sector is a substantial source of service provision to the population. In settings where utilization of health facilities is not high (e.g. settings with a high prevalence of births occurring at home), data may suffer from incompleteness if information about women delivering outside facilities is not captured. In addition, there are often challenges in accurately measuring the numerator and the denominator when routine HMIS data are used to measure this indicator.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from obstetric and neonatal medical records, including health services registers. Relevant information is recorded by health personnel within health facilities on paper forms completed by health personnel and/or through an electronic medical record. Data from paper or electronic sources are entered or abstracted into a database or registry and are compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for the reporting of this indicator.

**Indicator definition and calculation:** The indicator is calculated as the percentage of births attended by skilled health personnel among all births in a health facility during a specified reference period. The indicator consists of the following numerator and denominator:

**Numerator:** Number of births attended by skilled health personnel<sup>1</sup> in a specified time period.

**Denominator:** Number of total births in the health facility in a specified time period.

Unless specified, the statistic may include any woman regardless of age and should include both live births and stillbirths, as defined by the health facility and/or national or subnational vital statistics offices. In many contexts, the definition of “skilled” and inclusion of health personnel in the numerator is based on individual health facility report, or is in accordance with the country-specific definition by the MoH and/or NSO.

**Frequency of measurement:** The indicator can be calculated on an annual basis or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on facility, subnational and national processes for data entry, compilation and analysis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Monthly, quarterly, or as needed based on the country and/or facility need
- *Subnational (first and second administrative) level:* Monthly or quarterly;
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By level of facility, location of facility (e.g. urban, rural), subnational administrative units (e.g. districts, provinces, regions) and type of health personnel.

**Missing values:** Missing values are usually “not known” or “not reported”.

### Population-based household surveys

The main source of data for this indicator has been through population-based household surveys collected through nationally or subnationally representative and structured questionnaires, such as:

- Demographic Health Surveys (DHS) (4)
- Multiple Indicator Cluster Surveys (MICS) (5)

<sup>1</sup> For universal and consistent measurement of this indicator, the definition of “skilled health personnel” providing care during childbirth should align with the 2018 joint statement by WHO, UNFPA, UNICEF, ICM, ICN, FIGO and IPA: <https://www.who.int/reproductivehealth/publications/statement-competent-mnh-professionals/en/>.

- Reproductive Health Surveys (RHS)
- Other household surveys with a similar methodological design.

Population-based household survey data are the preferred data source in settings where utilization of health facility services is not very high (e.g. settings with a high prevalence of births occurring at home) or where private health sector data are excluded from routinely collected administrative data sources.

**Key source of data:** Eligible women of reproductive age (15–49 years) are identified in the household survey for inclusion and interviewing using an individual women’s questionnaire. Women are considered eligible for survey interview if they are either usual residents or visitors of the household who stayed there the night before the interview.

All eligible and interviewed women (between 15 and 49 years old) who had a live birth during a specified reference period, typically 2–5 years prior to the time of the interview, are asked “*Who assisted with the delivery of (NAME)?*”, where “name” refers to the name of the live birth the individual woman had during the same reference period. Women are asked to identify all health personnel or other personnel that assisted during the delivery.

The MoH and the NSO typically conduct household surveys and compile, analyse and report the results for this indicator in collaboration with the survey programme (e.g. DHS, MICS, RHS) and funding agency.

**Indicator definition and calculation:** Depending on survey design, individual women of reproductive age (15–49 years old) are asked about assistance during delivery, either about (a) the most recent live birth, as done in the MICS; or (b) all live births, as done in the DHS.<sup>2</sup> These are asked irrespective of the child’s current living status (dead or alive) and are for live births that the woman had during a specified reference period, which is typically 2–5 years before the time of survey completion. The definition is as follows:

The percentage of women (aged 15–49 years) with a live birth whose most recent live birth was attended by skilled health personnel. The indicator consists of the following numerator and denominator:

**Numerator:** Number of interviewed women (aged 15–49 years) with a live birth in the 2–5 years prior to survey completion whose most recent live birth was attended by skilled health personnel.

<sup>2</sup> The DHS Program (<https://dhsprogram.com/>) Model Women’s Questionnaire asks women about skilled attendance during delivery for all live births in the last five years. Reporting of the indicator may be tabulated and analysed either based on all live births or the most recent live birth.

**Denominator:** Total number of live births in the 2–5 years prior to survey completion.

The categories of health personnel included in the survey are customized with inputs from MoH and NSO, and all nationally applicable health personnel – both skilled and unskilled – that provide assistance during delivery are included. These surveys have consistently asked women to identify all mentioned health personnel, and encourage the interviewer to probe to ensure no health personnel or other adult present at the time of delivery is missed and that there is accuracy in the identification of the correct personnel. This may include special instruction to correctly identify the cadre and status of the provider to distinguish between skilled and unskilled providers, such as a midwife versus a traditional birth attendant. During the analysis stage the most highly skilled health personnel who assisted in the delivery is identified and included in the indicator calculation.

**Frequency of measurement:** Household surveys are typically conducted every 3–5 years.

**Disaggregation at population level:** Type of health personnel, place of delivery (e.g. private or public health facility, community), mode of delivery, place of residence (e.g. urban, rural), subnational administrative units (e.g. districts, provinces, regions), sex of live birth, birth order, socioeconomic status (e.g. education level, household wealth quintile), age of woman at the time of delivery, total number of ANC visits, and timing of first ANC visit.

**Missing values:** Included in the distribution of all health personnel as “don’t know” or “missing”.

# INTERPRETATION AND USE

## Interpretation

This indicator helps programme management at global, national and subnational levels by monitoring and evaluating whether safe motherhood and MNH programmes are on target with the utilization of skilled personnel at the time of labour and childbirth. In addition, the proportion of births attended by skilled personnel is a measure of the health system's functioning and potential to provide adequate coverage for deliveries.

Conversely, this indicator is a measure of contact with the health system and does not take into account the content and quality of care received. This indicator has been proposed as a proxy indicator for monitoring progress towards the reduction of maternal mortality. It is highly correlated with maternal mortality levels, although such a correlation does not provide levels of causality.

Note that this indicator does not usually change rapidly as utilization of delivery services is dependent on broader factors, such as the training and deployment of additional health personnel, which may take considerable time to scale up.

Ambiguities and differences in the categorization of “skilled health personnel” between and within countries, and the inclusion of additional or different health personnel as skilled over time, and differences in measurement of SBA through administrative data and household surveys have compromised the accuracy, comparability and consistency of measurement of this indicator. The differences and inconsistencies in SBA definition and measurement methodology may often explain wide discrepancies between statistics from different data sources for the same population or between countries. Consideration for these differences should be considered when interpreting SBA at national, subnational, or health facility levels, as well as when determining trends.

## Common challenges

Data collected from administrative and other routine data systems

Administrative data may suffer from poor quality such as irregularities in report generation, data duplication and inconsistencies (6). Reporting challenges exist at the facility level given data quality issues, including incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system – including untrained health personnel and lack of access to technology or infrastructure – and/or inadequate health system design.

Many HMIS databases or registries are event-based and only include women who delivered a birth at a health facility. In some instances, the denominator may include births delivered by women of an unspecified age range and include both live births and stillbirths. This underestimates the number of spontaneous or induced abortions, as well as ectopic and molar pregnancies. In addition, the definition of a stillbirth varies by country and context, such as differences in

inclusion for gestational age (e.g. 20–28 weeks) and birthweight (e.g.  $\geq 500$  grams). These differences in definitions compromise the ability to compare data between countries.

Administrative data should be interpreted with caution in settings where data quality is poor and the percentage of births at public and private sector health facilities is low, or where data from the private health sector are not compiled within the HMIS reporting.

In settings where routine HMIS data lack information on pregnancies and/or births that occur outside the public sector – for example, in homes or private sector facilities – the total number of births in the HMIS should not serve to estimate the denominator for this indicator. Where data on the total numbers of live births for the entire population for the denominator are unavailable, evaluators can calculate total estimated live births using census data for the total population and crude birth rates in a specified area (total expected live births = estimated population x the total crude birth rate).

#### Data collected through household surveys

Women may not be able to accurately recall details around childbirth when data are collected through household surveys (7). There is also a time lag as the recall period is up to 2–5 years before the survey data were collected.

The most commonly used denominator is the number of live births, which acts as a proxy for the number of pregnant women. However, inclusion of only live births underestimates the total number of pregnancies by excluding those that end in stillbirth or spontaneous or induced abortion, as well as ectopic and molar pregnancies. It also causes survivor bias in that only those women who are alive at the time of the interview would be included, and underestimates the total number of women requiring skilled care during pregnancy, labour and childbirth.

Depending on survey design, interviewed women are asked about either all live births or the most recent live birth during the survey reference period. Including all live births may overrepresent those women with shorter birth intervals and multiple births, which may be related to systematic differences in socioeconomic and demographic factors (e.g. education, wealth, rural or urban residence). However, only including the most recent live birth may impact sample size and may be challenging in surveys that have time or budgetary constraints.

With regard to data obtained from surveys, the validity of such data depends on correct identification by the woman of the credentials of the health personnel or other person(s) who assisted during the delivery, which may not be obvious in certain countries. The ability of the woman to correctly identify the type of health personnel may compromise the accuracy of this indicator.

## Validation studies

### Publications

Technical work to improve the specificity of this indicator has been conducted via the following:

Blanc AK, Diaz C, McCarthy KJ, Berdichevsky K. Measuring progress in maternal and newborn health care in Mexico: validating indicators of health system contact and quality of care. *BMC Pregnancy Childbirth*. 2016;16(1):255 (<https://doi.org/10.1186/s12884-016-1047-0>, accessed 21 October 2020).

Blanc AK, Warren C, McCarthy KJ, Kimani J, Ndwiga C, RamaRao S. Assessing the validity of indicators of the quality of maternal and newborn health care in Kenya. *J Glob Health*. 2016;6(1):010405 (<http://www.jogh.org/documents/issue201601/jogh-06-010405.pdf>, accessed 21 October 2020).

Hobbs AJ, Moller AB, Kachikis A, Carvajal-Aguirre L, Say L, Chou D. Scoping review to identify and map the health personnel considered skilled birth attendants in low-and-middle income countries from 2000–2015. *PLoS One*. 2019;14(2):e0211576 (<https://doi.org/10.1371/journal.pone.0211576>, accessed 21 October 2020).

McCarthy KJ, Blanc AK, Warren CE, Kimani J, Mdawida B, Ndwidga C. Can surveys of women accurately track indicators of maternal and newborn care? A validity and reliability study in Kenya. *J Glob Health*. 2016;6(2):020502 (<https://dx.doi.org/10.7189/jogh.06.020502>, accessed 21 October 2020).

Munos MK, Stanton CK, Bryce J, the Core Group for Improving Coverage Measurement for MNCH. Improving coverage measurement for reproductive, maternal, neonatal and child health: gaps and opportunities. *J Glob Health*. 2017;7(1):010801 (<http://jogh.org/documents/issue201701/jogh-07-010801.pdf>, accessed 21 October 2020).

Radovich E, Benova L, Penn-Kekana L, Wong K, Campbell OMR. ‘Who assisted with the delivery of (NAME)?’ Issues in estimating skilled birth attendant coverage through population-based surveys and implications for improving global tracking. *BMJ Glob Health*. 2019;4:e001367 (<http://dx.doi.org/10.1136/bmjgh-2018-001367>, accessed 21 October 2020).

Wiley B, Waiswa P, Kajjo D, Munos M, Akuze J, Allen E, et al. Linking data sources for measurement of effective coverage in maternal and newborn health: what do we learn from individual- vs ecological-linking methods? *J Glob Health*. 2018;8(1):010601 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5823029/>, accessed 21 October 2020).

### Reports

Berdichevsky K, Diaz-Olavarrieta C, McCarthy K, Blanc A. Validating the indicators of the quality of maternal health care: Final report, Mexico. Mexico City: Population Council; 2014 ([https://www.popcouncil.org/uploads/pdfs/2014RH\\_MHTF-Mexico.pdf](https://www.popcouncil.org/uploads/pdfs/2014RH_MHTF-Mexico.pdf), accessed 21 October 2020).

Warren C, Kimani J, Kivunaga J, Mdawida B, Ndwiga C, McCarthy K, et al. Validating the indicators of the quality of maternal health care: Final report, Kenya. Nairobi: Population Council; 2014 ([https://www.popcouncil.org/uploads/pdfs/2014RH\\_MHTF-Kenya.pdf](https://www.popcouncil.org/uploads/pdfs/2014RH_MHTF-Kenya.pdf), accessed 21 October 2020).

## GLOBAL MONITORING

### Global database

The United Nations Children’s Fund (UNICEF) and WHO jointly maintain a database for global monitoring and reporting of the percentage of births attended by a skilled health personnel. These agencies obtain data from nationally representative household surveys or routinely collected administrative data/services statistics. Before data can be included in the global databases, UNICEF and WHO undertake a process of data verification that includes correspondence with field offices to clarify any questions regarding the reported statistics. For example, some household survey reports may present the total percentage of live births attended by a type of health personnel that does not conform to the internationally agreed-upon definition (e.g. total includes personnel who are not considered skilled, such as community health workers or traditional birth attendants). In these instances, the national categories of skilled health personnel are verified and data for some countries may include additional categories of trained personnel beyond doctors, nurses and midwives. More information about the joint UNICEF/WHO database of skilled health personnel can be found at the following link: <https://data.unicef.org/topic/maternal-health/delivery-care/>.

### Key initiatives

Countdown to 2030 – Women’s, Children’s and Adolescents’ Health: <http://countdown2030.org/>

Ending Preventable Maternal Mortality (EPMM): [http://who.int/reproductivehealth/topics/maternal\\_perinatal/epmm/en/](http://who.int/reproductivehealth/topics/maternal_perinatal/epmm/en/)

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Reference List of 100 Core Health Indicators (plus health-related SDGs), 2018: <https://www.who.int/healthinfo/indicators/2018/en/>

Global Strategy for Women’s, Children’s and Adolescents’ Health (2016–2030): <http://www.who.int/life-course/partners/global-strategy/en/>

United Nations Sustainable Development Goals (SDGs): <https://sustainabledevelopment.un.org>

## ADDITIONAL RESOURCES

Global Health Observatory (GHO) Data – World Health Statistics: [http://www.who.int/gho/publications/world\\_health\\_statistics/en/](http://www.who.int/gho/publications/world_health_statistics/en/)

Sustainable Development Goals (SDGs) Indicators – Metadata repository: <https://unstats.un.org/sdgs/metadata/>

UNICEF Data: Monitoring the situation of children and women: Delivery care: <https://data.unicef.org/topic/maternal-health/delivery-care/>

Multiple Indicator Cluster Surveys (MICS): <http://mics.unicef.org>

The DHS Program: <http://www.dhsprogram.com/>

MEASURE Evaluation: Family Planning and Reproductive Health Indicators Database: Percent of deliveries attended by skilled health personnel: [https://www.measureevaluation.org/prh/rh\\_indicators/womens-health/sm/percent-of-deliveries-attended-by-skilled-health](https://www.measureevaluation.org/prh/rh_indicators/womens-health/sm/percent-of-deliveries-attended-by-skilled-health)

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2. Making pregnancy safer: the critical role of the skilled attendant: A joint statement by WHO, ICM and FIGO. Geneva: World Health Organization; 2004 ([https://www.who.int/maternal\\_child\\_adolescent/documents/9241591692/en/](https://www.who.int/maternal_child_adolescent/documents/9241591692/en/), accessed 21 October 2020).
3. Metadata for Goal 3: Ensure healthy lives and promote well-being for all at all ages. In: Metadata for the proposed global indicators for the review of the 2030 Agenda for Sustainable Development [website]. New York: United Nations Statistics Division; 11 May 2016 (<http://unstats.un.org/sdgs/files/metadata-compilation/Metadata-Goal-3.pdf>, accessed 21 October 2020).
4. The DHS Program [website]. Rockville: ICF International; 2020 (<http://www.dhsprogram.com/>, accessed 21 October 2020).
5. Multiple Indicator Cluster Surveys (MICS) [website]. New York: UNICEF; 2020 (<http://mics.unicef.org>, accessed 21 October 2020).
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7. Blanc AK, Diaz C, McCarthy KJ, Berdichevsky K. Measuring progress in maternal and newborn health care in Mexico: validating indicators of health system contact and quality of care. BMC Pregnancy Childbirth. 2016;16(1):255 (<https://doi.org/10.1186/s12884-016-1047-0>, accessed 21 October 2020).

Indicator Sheet

# CAESAREAN SECTION RATE

MoNITOR 

## CONCEPT AND DEFINITION

### Concept

Mode of delivery is a key indicator for childbirth. Spontaneous vaginal birth is the most common mode of delivery, followed by birth by caesarean section (CS). A CS is a delivery of a baby through an incision in the woman's abdomen and womb, rather than the baby passing through the birth canal. Such a delivery is necessary for some women due to pregnancy or childbirth complications. When medically justified, a CS can effectively prevent maternal and perinatal mortality and morbidity (1,2).

The proportion of CS conducted at the population level is proposed to reflect the accessibility and utilization of services and the functionality of the health system (1). It can serve as a proxy for policy-makers and governments in assessing progress in maternal and infant health and in monitoring emergency obstetric care and resource utilization (2). The appropriate use of a CS leads to a decrease in maternal mortality and morbidity, as well as a decrease in perinatal morbidity and mortality (1–3). However, in large parts of the world CS rates have risen to very high levels and in these settings a large number of CS may not be medically indicated (3).

The number of women of reproductive age who delivered by CS in a specified reference period is expressed as a percentage of women in the same age range with a delivery in the same period.

### Definition

**Unit of measurement:** Percentage (%)

**Level of indicator use:** Population-based at global, national and subnational (first and second administrative level)

**Monitoring and evaluation framework:** Outcome

**Domain:** Service coverage

**Continuum of care:** Intrapartum

# MEASUREMENT GUIDANCE

## Data sources

There are two common data sources for this indicator:

- a. Routinely collected administrative data
- b. Population-based household surveys.

## Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/records or registers and are entered into national and/or subnational health management information systems (HMIS).

Data from health information systems may collect information on CS rates among all women who delivered at a health facility. Routinely collected administrative data and health facility statistics are the preferred data source in settings with a high utilization of health facility services and where data are recorded in a manner that ensures good data quality for both the public and private health sectors. The compiled data in the national HMIS or District Health Information System (DHIS2) should include data from both public and private health sectors, especially when the private sector is a substantial source of service provision to the population. In settings where utilization of health facilities is not high (e.g. settings with a high prevalence of births occurring at home), data may suffer from incompleteness if information about women delivering outside facilities is not captured. In addition, there are often challenges in accurately measuring the numerator and the denominator when routine HMIS data are used to measure this indicator.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from obstetric medical records, including health services registers. Relevant information is recorded by health personnel within health facilities on paper forms completed by health personnel and/or through an electronic medical record. Data from paper or electronic sources are entered or abstracted into a database or registry and are compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for reporting this indicator.

**Indicator definition and calculation:** The indicator is calculated as the percentage of deliveries by CS among all deliveries, irrespective of vital status at birth (live birth and stillbirth), in a health facility during a specified reference period. The indicator consists of the following numerator and denominator:

*Numerator:* Number of CS in a specified time period.

**Denominator:** Number of total deliveries in the health facility in a specified time period.

Unless specified, the statistic may include any woman regardless of age and includes both live births and stillbirths, as defined by the health facility and/or national or subnational vital statistics offices.

**Frequency of measurement:** The indicator can be calculated on an annual basis or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on facility, subnational and national processes for data entry, compilation and analysis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Monthly, quarterly, or as needed based on the country and/or facility need
- *Subnational (first and second administrative) level:* Monthly or quarterly
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By level of facility, location of facility (e.g. urban, rural), subnational administrative units (e.g. districts, provinces, regions), and type of health personnel.

**Missing values:** Missing values are usually not known or not reported.

#### Population-based household surveys

The main source of data for this indicator has been through population-based household surveys collected through nationally or subnationally representative and structured questionnaires, such as:

- Demographic Health Surveys (DHS) (5)
- Multiple Indicator Cluster Surveys (MICS) (6)
- Reproductive Health Surveys (RHS)
- Other household surveys with a similar methodological design.

Population-based household survey data are the preferred data source in settings where utilization of health facility services is not very high (e.g. settings with a high prevalence of deliveries occurring at home) or where private health sector data are excluded from routinely collected administrative data sources.

**Key source of data:** Eligible women of reproductive age (15–49 years) are identified in the household survey for inclusion and interviewing using an individual women's questionnaire. Women are considered eligible for survey interview if they are either usual residents or visitors of the household who stayed there the night before the interview.

All eligible and interviewed women (between 15 and 49 years old) who

had a live birth at a health facility during a specified reference period, typically 2–5 years prior to the time of interview, are asked about “*Was (NAME) delivered by caesarean, that is, did they cut your belly open to take the baby out?*”, where “name” refers to the name of the live birth the individual woman had during the same reference period.

The MoH and NSO typically conduct household surveys and compile, analyse and report the results for this indicator in collaboration with the survey programme (e.g. DHS, MICS, RHS) and funding agency.

**Indicator definition and calculation:** Individual women of reproductive age (15–49 years old) are asked if they delivered their baby by CS at a health facility, irrespective of the child’s current living status (dead or alive), and are for the most recent live birth they had during a specified reference period, which is typically 2–5 years before the time of the survey completion. The definition is as follows:

The percentage of interviewed women (aged 15–49 years) with a live birth in the 2–5 years prior to survey completion whose most recent live birth was delivered by CS. The indicator consists of the following numerator and denominator:

*Numerator:* Number of interviewed women (15–49 years old) with a live birth in the 2–5 years prior to survey completion whose most recent live birth was delivered by CS.

*Denominator:* Total number of interviewed women (aged 15–49 years old) with a live birth in the 2–5 years prior to survey completion.

**Frequency of measurement:** Household surveys are typically conducted every 3–5 years.

**Disaggregation at population level:** Type of health personnel, place of delivery (private or public health facility, community), place of residence (e.g. urban, rural), subnational administrative units (e.g. districts, provinces, regions), sex of live birth, birth order, socioeconomic status (e.g. education level, household wealth quintile), age of woman at the time of delivery, births attended by skilled health personnel, total number of antenatal care (ANC) visits and timing of first ANC visit, early breastfeeding initiation, and timing and location of postnatal care health check.

**Missing values:** Included in the distribution as “don’t know” or “missing”.

## INTERPRETATION AND USE

### Interpretation

The CS rate in a geographical area is a measure of access to and use of a common obstetric intervention for averting maternal and neonatal deaths and for preventing complications, such as obstetric fistula (1). Of all the procedures used to treat major obstetric complications, CS is one of the most common, and reporting is relatively reliable. When medically justified, a CS can effectively prevent maternal and perinatal mortality and morbidity (1,2).

While WHO has in the past proposed an “ideal rate” for CS of between 10% and 15% (1,7), more recent recommendations propose that the preferred level set needs to be locally informed by the epidemiological/demographic pattern in respective countries.

As the proportion of CS increases, the uncertainty between these classifications also increases (1). Rates above 15% suggest overuse of the procedure for non-emergency reasons. However, in many contexts the overuse and underuse of CS coexist, making it difficult – if not impossible – to recommend benchmark levels for optimal CS rates. This is why WHO suggests to review CS rates regularly using the Robson (10-group) classification, where CS can be compared and analysed within more comparable groups of women (8). The system classifies all women into one of 10 categories based on five basic obstetric characteristics that are routinely collected in all deliveries (parity, number of fetuses, previous CS, onset of labor, gestational age, and fetal presentation) (8).

A CS procedure usually occurs at the end of a complex series of events, possibly including pre-existing and pregnancy-specific medical factors, identification of complications, transportation to health-care facilities, and availability of necessary technology. Excessive use unnecessarily exposes women to anaesthesia and surgery with their concomitant risks; moreover, it drains scarce health-care resources (3). When using this indicator, health programme managers and evaluators may also want to employ more in-depth techniques, such as case audits, to investigate what clinical indicators are being used for CS and if the appropriate women are receiving this service. By itself, the indicator reveals nothing about the appropriateness of the procedure (4).

To reduce the possibility that this indicator will mask inequities in access to and use of CS, evaluators must look closely at their data (1). Rates are often inconsistent and inequities exist between urban and rural environments, public and private sectors, different payment schemes, and/or across administrative areas within a country. Thus, disaggregation of the data is encouraged and national averages need to be interpreted with caution (4).

## Common challenges

### Data collected from administrative and other routine data systems

Administrative data may suffer from poor quality such as irregularities in report generation, data duplication and inconsistencies (4). Reporting challenges exist at the facility level given data quality issues, including incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system or inadequate system design.

Many HMIS databases or registries are event-based and only include women who delivered a birth at a health facility. In some instances, the denominator may include births delivered by women of an unspecified age range and include both live births and stillbirths. In addition, the definition of a stillbirth varies by country and context, such as differences in inclusion for gestational age (e.g. 20–28 weeks) and birthweight (e.g.  $\geq 500$  grams). These differences in definitions compromise the ability to compare data between countries.

Administrative data should be interpreted with caution in settings where data quality is poor and the percentage of births at public and private sector health facilities is low, or where data from the private health sector is not compiled within the HMIS reporting.

In settings where routine HMIS data lack information on pregnancies and/or births or deliveries that occur outside the public sector – for example, in private sector facilities, the total number of births in the HMIS should not serve to estimate the denominator for this indicator. Where data on the total numbers of live births for the entire population for the denominator are unavailable, evaluators can calculate total estimated live births using census data for the total population and crude birth rates in a specified area (total expected live births = estimated population x the total crude birth rate).

### Data collected through household surveys

Women may not be able to accurately recall details around childbirth when data are collected through household surveys (5). There is also a time lag as the recall period is up to 2–5 years before the survey data were collected.

The most commonly reported denominator is the number of women with a live birth in the years preceding the survey, which acts as a proxy for the number of pregnant women. This indicator is prone to survivor bias in that only those women who are alive at the time of the interview would be included, and underestimates the total number of deliveries by CS.

# GLOBAL MONITORING

## Global database

The United Nations Children’s Fund (UNICEF) maintains databases for global monitoring and reporting of the percentage births delivered by CS. UNICEF obtains data from nationally representative household surveys or routinely collected administrative data/services statistics. Before data can be included in the global databases, UNICEF undertakes a process of data verification that includes correspondence with field offices to clarify any questions regarding the reported statistics. More information about the global databases for CS coverage for women can be found at the following link: <https://data.unicef.org/topic/maternal-health/delivery-care/>.

## Key initiatives

Countdown to 2030 – Women’s, Children’s and Adolescents’ Health: <http://countdown2030.org/>

Ending Preventable Maternal Mortality (EPMM): [http://who.int/reproductivehealth/topics/maternal\\_perinatal/epmm/en/](http://who.int/reproductivehealth/topics/maternal_perinatal/epmm/en/)

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Reference List of 100 Core Health Indicators (plus health-related SDGs), 2018: <https://www.who.int/healthinfo/indicators/2018/en/>

Global Strategy for Women’s, Children’s and Adolescents’ Health (2016–2030): <http://www.who.int/life-course/partners/global-strategy/en/>

United Nations Sustainable Development Goals (SDGs): <https://sustainabledevelopment.un.org>

## ADDITIONAL RESOURCES

Global Health Observatory (GHO) Data – World Health Statistics: [http://www.who.int/gho/publications/world\\_health\\_statistics/en/](http://www.who.int/gho/publications/world_health_statistics/en/)

Sustainable Development Goals (SDGs) Indicators – Metadata repository: <https://unstats.un.org/sdgs/metadata/>

UNICEF Data: Monitoring the situation of children and women: Delivery care: <https://data.unicef.org/topic/maternal-health/delivery-care/>

Multiple Indicator Cluster Surveys (MICS) [website]. New York: UNICEF, 2020: <http://mics.unicef.org>

The DHS Program [website]. Rockville: ICF International; 2020: <http://www.dhsprogram.com/>

MEASURE Evaluation: Family Planning and Reproductive Health Indicators Database: Cesarean sections as a percent of all births: [https://www.measureevaluation.org/prh/rh\\_indicators/womens-health/sm/cesarean-sections-as-a-percent-of-all-births](https://www.measureevaluation.org/prh/rh_indicators/womens-health/sm/cesarean-sections-as-a-percent-of-all-births)

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Indicator Sheet

**COSTED NATIONAL  
IMPLEMENTATION  
PLAN(S) FOR MATERNAL,  
NEWBORN AND CHILD  
HEALTH**

**MoNITOR** 

## CONCEPT AND DEFINITION

### Concept

Global health experts agree that to reach every woman, newborn baby and child – particularly, to address the equity and quality gaps in care around the time of birth – requires country-led, data-driven processes to assess and sharpen national health plans (1). Scale-up of maternal, newborn and child health (MNCH) interventions that are evidence-based and have been proven to improve health outcomes and survival are an important part of the achievement of the goals and targets set by the Sustainable Development Goal (SDG) agenda to 2030, including achievement of universal health coverage (UHC) (2). UHC is central to achievement of all SDG targets, especially for the health and well-being of women and girls and children, as it recognizes the right to receive high-quality health services without incurring financial hardship and requires meeting the needs of women, girls and adolescents, including universal access to sexual, reproductive, maternal and newborn health (SRMNH) interventions and services (3). Making progress towards UHC is also the principal health policy goal in many countries. This indicator reflects the governance context that is one of the drivers of change in intervention coverage along the implementation spectrum. It represents governance and leadership – one of the six “building blocks” in WHO’s health system framework “Everybody’s Business” (4)

### Definition

National plan for scaling up MNCH interventions is available and costed.

**Categories for measurement:** This indicator should include the following three categories:

- a. Yes = costed plan or plans to scale up MNCH interventions available at the national level
- b. Partial = costed plan available for either maternal and newborn health or child health
- c. No = no costed plan for MNCH available.

**Unit of measurement:** Percentage (%) by category

**Level of indicator use:** Global

**Monitoring and evaluation framework:** Input

**Domain:** Financing

**Continuum of care:** Across all continuums

# MEASUREMENT GUIDANCE

## Data sources

**Key source of data:** Commonly used data sources for global monitoring are collected via global policy surveys from WHO and the United Nations (UN) partners. Global databases include the Global Maternal, Newborn, Child and Adolescent Health (MNCAH) Policy Indicator Survey maintained by WHO, routine monitoring data from UN organizations, and surveys administered to national or subnational government authorities by WHO (5,6). The surveys normally involve a questionnaire to regional offices to complete with respective ministries of health (MoH) and other relevant stakeholders every two to three years. The focus on these surveys is whether or not a policy exists with costing information and the plan and current context and extent of implementation of MNCH interventions. Survey responses are validated by UN agencies at the country level and compiled by WHO.

**Indicator definition and calculation:** The WHO regional offices provide support for implementation of the Global MNCAH Policy Indicator Survey through country offices. Responses from each country are provided by the MoH and/or other National Statistical Offices (NSO) through the WHO office in the country. More information on the indicators presented and policy survey tools are presented under: <https://www.who.int/data/maternal-newborn-child-adolescent-ageing/national-policies>.

**Frequency of measurement:** Every 2–3 years

**Disaggregation:** Not applicable

**Missing values:** Not applicable

## INTERPRETATION AND USE

### Interpretation

This indicator reflects whether countries prioritize improved MNCH and reduction of mortality and morbidity. This indicator was introduced when few countries had any costed plans for MNCH as a tracer of government commitment. Currently, the majority of countries have these plans in place and the focus is moving towards effective, targeted and sustainable implementation plans to achieve and maintain the SDGs and UHC (1,3).

### Common challenges

There is no end point described in the scale-up – for example, to reach UHC. This indicator does not measure implementation or the quality or feasibility of the costing and should therefore be interpreted and completed with other indicators. In addition, implementation may vary in subnational settings, which could be masked by only national-level data, especially in decentralized settings.

# GLOBAL MONITORING

## Global database

WHO and UN agencies monitor this indicator through the Global MNCAH Policy Indicator Survey. More information can be found at the following link: <https://www.who.int/data/maternal-newborn-child-adolescent-ageing/national-policies>.

## Key initiatives

In this context, the Every Newborn Action Plan (ENAP) was endorsed in 2014 through a World Health Assembly resolution (7) to guide countries on the path to improving newborn health, and eliminating preventable deaths among mothers and newborns. The plan sets out a clear vision to achieve this objective by 2035, with intermediate milestones for countries to follow as they progress towards this goal. A key national milestone by 2020 is to develop national plans and strategies with strengthened newborn care component. It is recommended that plans should be costed, focused on equity, and present clear targets for neonatal mortality rate and stillbirth rate. Some countries may choose to develop stand-alone newborn plans while others may decide to integrate and strengthen the component of newborn health in plans for maternal and/or child health.

## ADDITIONAL RESOURCES

Countdown to 2030 – Women’s, Children’s and Adolescents’ Health: <http://countdown2030.org/>

Ending Preventable Maternal Mortality (EPMM): [http://who.int/reproductivehealth/topics/maternal\\_perinatal/epmm/en/](http://who.int/reproductivehealth/topics/maternal_perinatal/epmm/en/)

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Reference List of 100 Core Health Indicators (plus health-related SDGs), 2018: <https://www.who.int/healthinfo/indicators/2018/en/>

Global Strategy for Women’s, Children’s and Adolescents’ Health (2016–2030): <http://www.who.int/life-course/partners/global-strategy/en/>

United Nations Sustainable Development Goals (SDGs): <https://sustainabledevelopment.un.org>

### Monitoring and evaluation resources

Reaching the Every Newborn National 2020 Milestones: Country progress, plans and moving forward: <https://data.unicef.org/wp-content/uploads/2016/11/ENAP-country-reports-for-progress-tracking-2015-1.pdf>

Indicator and monitoring framework for the Global Strategy for Women’s, Children’s and Adolescents’ Health (2016–2030): <https://www.who.int/life-course/publications/gc-Indicator-and-monitoring-framework.pdf>

Monitoring the building blocks of health systems: a handbook of indicators and their measurement strategies: [http://www.who.int/healthinfo/systems/WHO\\_MBHSS\\_2010\\_full\\_web.pdf](http://www.who.int/healthinfo/systems/WHO_MBHSS_2010_full_web.pdf)

### Monitoring and evaluation frameworks in national plans

National Strategy for Newborn and Child Survival in Ethiopia 2015/16–2019/20. Federal Ministry of Health, Ethiopia: <https://www.healthynewbornnetwork.org/hnn-content/uploads/nationalstrategy-for-newborn-and-child-survival-in-ethiopia-201516-201920.pdf>

Nepal’s Every Newborn Action Plan 2016. Ministry of Health, Nepal: <https://www.healthynewbornnetwork.org/hnn-content/uploads/NENAP-final-low-resolution.pdf>

Myanmar National Strategic Plan: Newborn Child Health Development (2015–2018). Ministry of Health, Myanmar: <https://www.healthynewbornnetwork.org/resource/myanmar-national-strategic-plan-newborn-child-health-development-2015-2018/>

Every Newborn Action Plan: An Action Plan to end Preventable Neonatal Deaths in Malawi, 2013. Ministry of Health, Malawi: [http://www.who.int/pmnch/media/events/2015/malawi\\_enap.pdf](http://www.who.int/pmnch/media/events/2015/malawi_enap.pdf)

Reaching the Every Newborn National 2020 Milestones: Country progress, plans and moving forward. WHO and UNICEF (2017): <https://data.unicef.org/wp-content/uploads/2016/11/ENAP-country-reports-for-progress-tracking-2015-1.pdf>

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6. Countdown to 2030 [website] (<http://countdown2030.org/>, accessed 22 October 2020).
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Indicator Sheet

# EARLY INITIATION OF BREASTFEEDING

MoNITOR 

## CONCEPT AND DEFINITION

### Concept

Breastfeeding is one of the most important preventive health measures for both mother and child. Early initiation of breastfeeding within the first hour of life is associated with reduced newborn mortality and morbidity, and protects the newborn from acquired infections (1). Early initiation of breastfeeding shortly after birth also improves the likelihood that mothers will be able to successfully initiate lactation, sustain exclusive breastfeeding over the long term, encounter fewer problems breastfeeding, and maintain optimal breastfeeding behaviours (2–4). To achieve optimal maternal and newborn health, breastfeeding should begin no later than one hour after birth concomitantly with skin-to-skin contact between mother and baby for bonding and maternal–infant stimulation, which facilitates suckling and an effective latch (5).

### Definition

The number of newborns who breastfed<sup>1</sup> within one hour of birth during a specified reference period is expressed as a percentage of the total number of live births in the same period (6).

**Unit of measurement:** Percentage (%)

**Level of indicator use:** Population-based at global, national and subnational (first or second administrative level)

**Monitoring and evaluation framework:** Outcome

**Domain:** Risk factors and behaviours

**Continuum of care:** Postnatal care

<sup>1</sup> Including expressed breast milk.

# MEASUREMENT GUIDANCE

## Data sources

There are two common data sources for this indicator:

- a. Routinely collected administrative data
- b. Population-based household surveys.

## Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/records or registers and are entered into national and/or subnational health management information systems (HMIS).

Data from health information systems may collect information on early initiation of breastfeeding among all newborns born in a health facility. Routinely collected administrative data and health facility statistics are the preferred data source in settings with a high utilization of health facility services and data are recorded in a manner that ensures good data quality for both the public and private health sectors. The compiled data in the national HMIS or District Health Information System (DHIS2) should include data from both public and private health sectors, especially when the private sector is a substantial source of service provision to the population. In settings where utilization of health facilities is not high (e.g. settings with a high prevalence of births occurring at home), data may suffer from incompleteness if information about births occurring outside facilities is not captured. In addition, there are often challenges in accurately measuring the numerator and the denominator when routine HMIS data are used to measure this indicator.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from obstetric and neonatal medical records, including health services registers. Relevant information is recorded about early initiation of breastfeeding among all newborns delivered at health facilities and are completed by health personnel on paper forms and/or through an electronic medical record. Data from paper or electronic sources are entered or abstracted into a database or registry and are compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for the reporting of this indicator.

**Indicator and calculation:** The indicator is calculated as the percentage of newborns breastfed within one hour of birth among live births in a health facility during a specified reference period.

**Numerator:** Number of newborns breastfed within one hour of birth in a health facility within a specified time period.

**Denominator:** Number of total live births in a health facility in a specified time period.

**Frequency of measurement:** The indicator can be calculated on an annual basis or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on facility, subnational and national processes for data entry, compilation and analysis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Monthly, quarterly, or as needed based on the country and/or facility need
- *Subnational (first and second administrative) level:* Monthly or quarterly
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By level of facility, location of facility and place of maternal residence (e.g. urban, rural), subnational administrative units (e.g. districts, provinces, regions), type of health personnel, intention to breastfeed, birthweight, gestational age and timing of breastfeeding.

**Missing values:** Missing values are usually not known or not reported.

#### Population-based household surveys

The main source of data for this indicator has been through population-based household surveys collected through nationally or subnationally representative and structured questionnaires, such as:

- Demographic Health Surveys (DHS) (7)
- Multiple Indicator Cluster Surveys (MICS) (8)
- Reproductive Health Surveys (RHS)
- Other household surveys with a similar methodological design.

Population-based household survey data are the preferred data source in settings where utilization of health facility services is not very high (e.g. settings with a high prevalence of births occurring at home) or where private health sector data are excluded from routinely collected administrative data sources.

**Key source of data:** Eligible women of reproductive age (15–49 years) are identified in the household survey for inclusion and interviewing using an individual women's questionnaire. Women are considered eligible for a survey interview if they are either usual residents or visitors of the household who stayed there the night before the interview.

All eligible and interviewed women (between 15 and 49 years old) who had a live birth during a specified reference period, typically 2–5 years prior to the time of interview, are asked “*Did you ever breastfeed (NAME)?*”, where “name” refers to the name of the live birth the individual woman had during the same reference period. The woman is to indicate whether she ever breastfed her last live birth, even if the child died very young. If the child was ever breastfed, she is then asked “*How long after birth did you first put (NAME) to the breast?*” For the early breastfeeding indicator calculation, the woman must report that the baby was put to the breast either immediately after birth or within the first hour after delivery.

The MoH and NSO typically conduct household surveys and compile, analyse and report the results for this indicator in collaboration with the survey programme (e.g., DHS, MICS, RHS) and funding agency.

**Indicator definition and calculation:** Individual women of reproductive age (15–49 years old) are asked about early breastfeeding initiation irrespective of the delivery location and child’s current living status (dead or alive) and are for the most recent live birth that they had during a specified reference period, which is typically 2–5 years before the time of the survey completion. The definition is as follows: The percentage of newborns who were breastfed within one hour of birth in the two (or five) years prior to survey completion. The indicator consists of the following numerator and denominator:

*Numerator:* Number of newborns breastfed within the first hour of birth.

*Denominator:* Total number of live births.

**Frequency of measurement:** Household surveys are typically conducted every 3–5 years.

**Disaggregation at population level:** Place of delivery (private or public health facility, community), mode of delivery, place of residence (e.g. urban, rural), sex of live birth, birth order, socioeconomic status (e.g. education level, wealth quintile), age of woman at the time of delivery, births attended by skilled health personnel, timing of first antenatal care, and timing (within two days) and location of postnatal health check.

**Missing values:** Included in the distribution as “don’t know” or missing.

# INTERPRETATION AND USE

## Interpretation

Early initiation of breastfeeding measures the length of time after birth when the mother initiated breastfeeding, regardless of absence or presence of breast milk. Provision of mother's breast milk, or expressed breast milk, to newborns within one hour of birth is referred to as "early initiation of breastfeeding" and ensures that the infant receives the colostrum, or "first milk", which is rich in protective factors (3). It is an indication of the coverage of one of the essential interventions immediately after birth that can both improve maternal health and reduce newborn mortality and morbidity and protect newborns from acquiring infections (1, 4).

At national and subnational levels, it is recommended to use household survey data, which will provide representative population-based coverage estimates. At the facility level, it is recommended to use HMIS data to improve quality of care among live births in health facilities. Additionally, HMIS data can be aggregated to higher levels to provide more frequent reporting.

Monitoring this indicator will demonstrate the programme efforts for protecting, promoting and supporting breastfeeding in facilities providing maternity and newborn services, which is also a reflection of provisions recommended for essential interventions immediately after birth. With that, it should be noted that the early initiation of breastfeeding indicator is part of essential newborn care, but cannot be used as a proxy on its own for essential newborn care (5).

## Common challenges

Data collected from administrative and other routine data systems

Administrative data may suffer from poor quality such as irregularities in report generation, data duplication and inconsistencies (9).

Reporting challenges exist at the facility level given data quality issues, including incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system or inadequate system design.

Many HMIS databases or registries are event-based and only include breastfeeding information for women who delivered a live birth at a health facility. In some instances, the denominator may include births or deliveries by women of an unspecified age range and may also include both live births and stillbirths. As this often only represents those women who present to health facilities for deliveries, it does not capture the number of pregnancies and total percentage of early initiation of breastfeeding within the total population. These differences in definitions compromise the ability to compare data between countries.

Administrative data should be interpreted with caution in settings where data quality is poor and the percentage of births at public and private sector health facilities is low, or where data from the private health sector are not compiled within the HMIS reporting.

In settings where routine HMIS data lack information on pregnancies and/or births or deliveries that occur outside the public sector – for example, in homes or in private sector facilities – the total number of births in the HMIS should not serve to estimate the denominator for this indicator. Where data on the total numbers of live births for the entire population for the denominator are unavailable, evaluators can calculate total estimated live births using census data for the total population and crude birth rates in a specified area (total expected live births = estimated population x the total crude birth rate).

### Data collected through household surveys

Women may not be able to accurately recall details around childbirth when data are collected through household surveys (10). There is also a time lag as the recall period is up to 2–5 years before the survey data were collected.

The most commonly reported denominator is the number of women with a live birth in the years preceding the survey, which acts as a proxy for the number of pregnant women. This indicator is prone to survivor bias in that only those women who are alive at the time of the interview would be included and underestimates the total number of newborns who initiated breastfeeding within the first hour.

In these surveys, women are asked about their most recent live birth, and when, if at all, their newborn's health was checked following delivery. This should include both live births that were delivered at home and those delivered in a health facility. However, older iterations of household surveys may only obtain this information for births at home and should be taken into consideration when reviewing older data.

### Validation studies

Technical work to improve the specificity of breastfeeding indicators (both early initiation and exclusive breastfeeding) will be beneficial, along with further evaluation of the usefulness of breastfeeding tracer indicators in measuring essential newborn care. Additional validation works are underway.

Published technical work to improve the specificity of this indicator has been conducted via the following:

### Publications

Blanc AK, Diaz C, McCarthy KJ, Berdichevsky K. Measuring progress in maternal and newborn health care in Mexico: validating indicators of health system contact and quality of care. BMC Pregnancy Childbirth. 2016;16(1):255 (<https://doi.org/10.1186/s12884-016-1047-0>, accessed 22 October 2020).

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Stanton CK, Rawlins B, Drake M, dos Anjos M, Cantor D, Chongo L, et al. Measuring coverage in MNCH: testing the validity of women's self-report of key maternal and newborn health interventions during the peripartum period in Mozambique. *PLoS One*. 2013;8(5):e60694 (<https://doi.org/10.1371/journal.pone.0060694>, accessed 22 October 2020).

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# GLOBAL MONITORING

The United Nations Children’s Fund (UNICEF) maintains databases for global monitoring and reporting on infant and young children feeding indicators, including the percentage of newborns who were breastfed within the first hour of life. UNICEF obtains data from nationally representative household surveys or routinely collected administrative data/services statistics. Before data can be included in the global databases, UNICEF undertakes a process of data verification that includes correspondence with field offices to clarify any questions regarding the reported statistics. More information about the global databases for early initiation of breastfeeding can be found at: <https://data.unicef.org/topic/nutrition/infant-and-young-child-feeding/>.

## Key initiatives

Countdown to 2030 – Women’s, Children’s and Adolescents’ Health: <http://countdown2030.org/>

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Reference List of 100 Core Health Indicators (plus health-related SDGs), 2018: <https://www.who.int/healthinfo/indicators/2018/en/>

Global Strategy for Women’s, Children’s and Adolescents’ Health (2016–2030): <http://www.who.int/life-course/partners/global-strategy/en/>

WHO–UNICEF Global Breastfeeding Collective: <https://www.who.int/nutrition/topics/global-breastfeeding-collective/en/>

## ADDITIONAL RESOURCES

UNICEF Data: Monitoring the Situation of Children and Women: Newborn care: <https://data.unicef.org/topic/maternal-health/newborn-care/>

Multiple Indicator Cluster Surveys (MICS): <http://mics.unicef.org>

The DHS Program: <http://www.dhsprogram.com/>

MEASURE Evaluation: Family Planning and Reproductive Health Indicators Database: Percent of children born in the last 24 months who were put to the breast within one hour of birth: [https://www.measureevaluation.org/prh/rh\\_indicators/womens-health/bf/proportion-of-children-born-in-the-last-24-months](https://www.measureevaluation.org/prh/rh_indicators/womens-health/bf/proportion-of-children-born-in-the-last-24-months)

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Indicator Sheet

# **EXCLUSIVE BREASTFEEDING RATE**

**MoNITOR** 

## CONCEPT AND DEFINITION

**Concept** Breastfeeding is one of the most important preventive health measures for both mother and child. WHO recommends exclusive breastfeeding for the first six months of life (and sustained for up to two years) to ensure optimal health for newborns (1). Breastfeeding provides essential nutrients to newborns, immunologic protection, and ensures optimal growth and development; it is economical, safe, and is associated with reduced newborn mortality and morbidity (2). Breastfeeding protects infants from infection and disease, such as diarrhoea and pneumonia. Breastfeeding is also good for mothers; it helps mothers form attachment and bonding with their newborns and allows women to space their children and reduces the risk of ovarian and breast cancers (2,3). WHO recommends that all mothers are supported to breastfeed as soon as possible after delivery, and within the first hour, in order to support continued breastfeeding to six months or longer (3).

The number of infants 0–5 months (< 6 months) of age who are fed exclusively with breast milk during a specified reference period is expressed as a percentage of the total number of infants 0–5 months (< 6 months) of age in the same period (4).

**Definition** **Unit of measurement:** Percentage (%)

**Level of indicator use:** Population-based at global, national and subnational (first or second administrative level)

**Monitoring and evaluation framework:** Outcome

**Domain:** Risk factors and behaviours

**Continuum of care:** Postnatal care

# MEASUREMENT GUIDANCE

## Data sources

There is one common data source for this indicator: population-based household surveys.

## Population-based household surveys

The main source of data for this indicator has been through population-based household surveys collected through nationally or subnationally representative and structured questionnaires, such as:

- Demographic Health Surveys (DHS) (5)
- Multiple Indicator Cluster Surveys (MICS) (6)
- Reproductive Health Surveys (RHS)
- Other household surveys.

Population-based household survey data are the preferred data source for this indicator given the complexity of measurement to follow infants from birth to 6 months of life, especially in settings where utilization of health facility services is not very high (e.g. settings with a high prevalence of births occurring at home) or where private health sector data are excluded from routinely collected administrative data sources.

**Key source of data:** Depending on survey methodology,<sup>1</sup> the key source of data is either: (a) eligible women of reproductive age (15–49 years) are identified in the household survey for inclusion and interviewing using an individual women’s questionnaire; or (b) eligible children under the age of 5 years old (0–59 months) are identified in the household survey for inclusion and interviewing using an individual child’s questionnaire. Eligible woman or children under 5 are considered eligible for the survey if they are either usual residents or visitors of the household who stayed there the night before the interview.

In the DHS Phase VII (5), eligible women (between 15 and 49 years old) who had a live birth during a specified reference period, typically 2–5 years prior to the time of interview, are asked “*Did you ever*

<sup>1</sup> The MICS questionnaire asks mothers/primary caregivers of all eligible children under the age of 5 years old about exclusive breastfeeding. In the DHS, eligible women (15–49 years old) are asked questions about exclusive breastfeeding for all living children who reside with them in the household that they have given birth to in the two years preceding the survey interview.

*breastfeed (NAME)?*”, where “name” refers to the name of the live birth the individual woman had during the same reference period. For currently living children who reside with the woman in the household, a 24-hour recall of all solid and/or semi-solid foods and liquids consumed is asked similar to the description below for the MICS survey.

In the MICS (6), mothers or primary caregivers of the eligible children under 2 years old at the time of the survey interview are asked “*Has (NAME) ever been breastfed?*”, where “name” refers to the name of child. If the child was ever breastfed, women are then asked “*Is (NAME) still being breastfed?*” If the child is still being breastfed and is currently under 1 or 2 years of age, mothers/caregivers are asked to provide a 24-hour recall of all solids or liquids consumed by the infant the day prior to the interview, including drinking and/or eating any of the following<sup>2</sup> during the prior day or night:

- a. Anything from a bottle with a nipple?*
- b. Oral rehydration solution (ORS)?*
- c. Vitamin or mineral supplements or any medications?*
- d. Breast milk?*
- e. Plain water?*
- f. Juice or juice drinks?*
- g. Clear broth?*
- h. Infant formula?*
- i. Milk?*
- j. Any other liquids?*
- k. Yoghurt?*
- l. Fortified baby food?*
- m. Foods made from grains?*
- n. Pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside?*

<sup>2</sup> It is recommended that this list be customized for country and local contexts for liquids and solids that are available, including availability of local fruits and vegetables and brand names of infant formula and/or yoghurt.

- o. White potatoes, white yams, manioc, cassava, or any other foods made from roots?*
- p. Any dark green, leafy vegetables?*
- q. Ripe mangoes, papayas, or other vitamin-A rich foods?*
- r. Any other fruits or vegetables?*
- s. Liver, kidney, heart, or other organ meats?*
- t. Any other meat, such as beef, pork, lamb, goat, chicken, or duck?*
- u. Eggs?*
- v. Fresh or dried fish or shellfish?*
- w. Any foods made from beans, peas, lentils, or nuts?*
- x. Cheese or other food made from milk?*
- y. Any other solid, semi-solid, or soft foods?*

If consumption of any liquids or solids is mentioned, mothers/ caregivers are then asked: *“How many times did (NAME) eat any solid, semi-solid or soft foods yesterday during the day or night?”*

The Ministry of Health (MoH) and National Statistical Offices (NSO) typically conduct household surveys and compile, analyse and report the results for this indicator in collaboration with the survey programme (e.g. DHS, MICS, RHS) and funding agency.

**Indicator definition and calculation:** Information is collected in the questionnaire from the eligible women or mothers/caregivers based on a 24-hour recall of all solids and/or liquids consumed by the infant in the day or night prior to the interview. In order for the child to be considered “exclusively breastfed” the mother/caregiver must respond by saying that the child (a) is currently breastfeeding; (b) has had breast milk in the past 23 hours; and (c) has not received any other solids, semi-solids, or solid foods in the last day and night prior to the interview. The infant is allowed to have had vitamins, mineral supplements, medicine and/or ORS in the last day. Only children who are less than 6 months old at the time of the interview are included in the indicator calculation. The indicator is defined, as follows:

The percentage of mothers/caregivers of infants 0–5 months of age (< 6 months) who are fed exclusively with breast milk. The indicator consists of the following numerator and denominator:

*Numerator:* Number of infants 0–5 months of age who are exclusively breastfed.

*Denominator:* Total number of infants 0–5 months of age.

**Frequency of measurement:** Household surveys are typically conducted every 3–5 years.

**Disaggregation at population level:** By age (e.g. 0–1 month, 0–5 months), sex, place of residence (e.g. urban, rural), subnational administrative units (e.g. districts, provinces, regions), socioeconomic status (e.g. education level, household wealth quintile), age of woman at the time of delivery, births attended by skilled health personnel, number of antenatal (ANC) visits, timing of first ANC visit, and timing and location of the first postnatal health check.

**Missing values:** Missing or “don’t know” values for liquids and/or solids are assumed to indicate child is not exclusively breastfed.

# INTERPRETATION AND USE

## Interpretation

This indicator helps programme management at global, national and subnational levels by monitoring and evaluating whether safe motherhood and maternal and newborn health (MNH) programmes are on target with the levels and trends for exclusive breastfeeding. Monitoring this indicator demonstrates programme efforts for promoting and supporting breastfeeding in health facilities and communities for provision of MNH services, which is also a reflection of provision of recommended essential interventions immediately after birth. With that, it should be noted that exclusive breastfeeding should be measured in combination with early initiation of breastfeeding, which is an indication of sustained breastfeeding (7).

## Common challenges

### Data collected through household surveys

Unlike other maternal and newborn indicators, the strength of this indicator is that it does not suffer from the same issues of recall bias as it is asked according to a 24-hour recall of solids and liquids that the infant has consumed (8). However, asking only about liquids and solids consumed in the last 24 hours does not necessarily reflect accurate rates of exclusive breastfeeding. For example, an infant would be considered exclusively breastfed if they are currently breastfeeding and have not consumed any solids, semi-solids, or liquids in the last 24 hours, except for vitamins, minerals, medicines and/or ORS. However, this does not mean that the infant did not consume solids, semi-solids, and/or liquids more than 24 hours ago, and does not ascertain whether exclusive breastfeeding was maintained from birth to < 6 months of age. As a result, the 24-hour recall period to measure exclusive breastfeeding may slightly over estimate the percentage of exclusively breastfed infants.

## Validation Studies

Technical work to improve the specificity of breastfeeding indicators (both early initiation and exclusive breastfeeding) would be beneficial, along with further evaluation of the usefulness of breastfeeding tracer indicators in measuring essential newborn care. Additional validation works are underway.

Published technical work to improve the specificity of this indicator has been conducted via the following:

### Publications

Blanc AK, Diaz C, McCarthy KJ, Berdichevsky K. Measuring progress in maternal and newborn health care in Mexico: validating indicators of health system contact and quality of care. *BMC Pregnancy Childbirth*. 2016;16(1):255 (<https://doi.org/10.1186/s12884-016-1047-0>, accessed 22 October 2020).

Blanc AK, Warren C, McCarthy, KJ, Kimani J, Ndwiga C, RamaRao S. Assessing the validity of indicators of the quality of maternal and newborn health care in Kenya. *J Glob Health*. 2016;6(1):010405 (<http://www.jogh.org/documents/issue201601/jogh-06-010405.pdf>, accessed 22 October).

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Munos MK, Stanton CK, Bryce J, the Core Group for Improvement Coverage Measurement for MNCH. Improving coverage measurement for reproductive, maternal, neonatal and child health: gaps and opportunities. *J Glob Health*. 2017;7(1):010801 (<https://dx.doi.org/10.7189/jogh.07.010801>, accessed 22 October 2020).

Sitrin D, Perin J, Vaz LM, Carvajal-Aguirre L, Khan SM, Fishel J, Amouzou A. Evidence from household surveys for measuring coverage of newborn care practices. *J Glob Health*. 2017;7(2):020503 (<https://dx.doi.org/10.7189/jogh.07.020503>, accessed 22 October 2020).

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# GLOBAL MONITORING

## Global database

The United Nations Children’s Fund (UNICEF) maintains databases for global monitoring and reporting on infant and young children feeding indicators, including the percentage of newborns who were breastfed within the first hour of life. UNICEF obtains data from nationally representative household surveys or routinely collected administrative data/services statistics. Before data can be included in the global databases, UNICEF undertakes a process of data verification that includes correspondence with field offices to clarify any questions regarding the reported statistics. More information about the global databases for early initiation of breastfeeding can be found at: <https://data.unicef.org/topic/nutrition/infant-and-young-child-feeding/>.

## Key initiatives

Countdown to 2030 – Women’s, Children’s and Adolescents’ Health: <http://countdown2030.org/>

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Reference List of 100 Core Health Indicators (plus health-related SDGs), 2018: <https://www.who.int/healthinfo/indicators/2018/en/>

Global Strategy for Women’s, Children’s and Adolescents’ Health (2016–2030): <http://www.who.int/life-course/partners/global-strategy/en/>

WHO–UNICEF Global Breastfeeding Collective: <https://www.who.int/nutrition/topics/global-breastfeeding-collective/en/>

## ADDITIONAL RESOURCES

UNICEF Data: Monitoring the Situation of Children and Women: Newborn care: <https://data.unicef.org/topic/maternal-health/newborn-care/>

Multiple Indicator Cluster Surveys (MICS): <http://mics.unicef.org>

The DHS Program: <http://www.dhsprogram.com/>

MEASURE Evaluation: Family Planning and Reproductive Health Indicators Database: Proportion of infants 0–5 months of age who are fed exclusively with breast milk: [https://www.measureevaluation.org/prh/rh\\_indicators/womens-health/bf/proportion-of-infants-0965-months-of-age-who-are](https://www.measureevaluation.org/prh/rh_indicators/womens-health/bf/proportion-of-infants-0965-months-of-age-who-are)

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3. Effect of breastfeeding on infant and child mortality due to infectious diseases in less developed countries: a pooled analysis. WHO Collaborative Study Team on the Role of Breastfeeding on the Prevention of Infant Mortality. *Lancet*. 2000;355(9202):451–5 (<https://pubmed.ncbi.nlm.nih.gov/10841125/>, accessed 22 October 2020).
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Indicator Sheet

# MATERNAL CAUSE OF DEATH

MoNITOR 

## CONCEPT AND DEFINITION

### Concept

An estimated 295 000 (uncertainty interval [UI] 80%: 279 000 to 340 000) women died from pregnancy or childbirth-related complications in 2017 (1). Maternal deaths include the death of a woman during pregnancy, childbirth, or within 42 days of termination of pregnancy from any cause related to the pregnancy or its management, excluding deaths due to accidental or incidental causes (2). Although progress has been made since 1990 (2), preventable pregnancy and childbirth complications are among the leading causes of maternal mortality, morbidity and disability among women of reproductive age in low- and middle-income countries, and disproportionately affect the most vulnerable women (2). An analysis conducted by WHO found that haemorrhage, hypertensive disorders and sepsis were the three leading direct causes of maternal death, all of which could be preventable with appropriate and timely access to health services (3).

The Sustainable Development Goal (SDG) agenda highlights the importance of continued momentum towards improving maternal health by setting, under SDG goal 3 targets for achieving a global maternal mortality ratio (MMR) of less than 70 maternal deaths per 100 000 live births by 2030 (4,5). National targets are set such that countries should reduce their MMR by at least two thirds from their 2010 baseline and countries with the highest maternal mortality should aim to achieve an even greater reduction (5). In order to achieve these targets, accurate cause-of-death information is needed to identify how, where, when and why women and girls are dying during pregnancy or childbirth, and to plan, implement and evaluate targeted decision-making and adequate allocation of resources. The use of standard definitions for maternal death and causes of death is critical for case ascertainment. WHO applies the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10) to deaths during pregnancy, childbirth and the puerperium – ICD-Maternal Mortality (ICD-MM) – which provides a framework for the consistent collection, analysis and interpretation of maternal deaths (6). Ending preventable maternal mortality will also facilitate the progress towards newborn mortality targets (7).

### Definition

The number of maternal deaths from a specified cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes) during pregnancy, childbirth, or within 42 days of termination of pregnancy for a specified time period is expressed as a percentage of all maternal deaths in the same period (distribution of main causes of death using ICD-MM) (6,8).

**Unit of measurement:** Percentage (%) by cause of death

**Level of indicator use:** Global, national and subnational (first administrative level)

**Monitoring and evaluation framework:** Input

**Domain:** Mortality

**Continuum of care:** Across all continuums

# MEASUREMENT GUIDANCE

## Data sources

There are four main data sources for this indicator:

- a. Civil registration and vital statistics (CRVS) and other routine national surveillance systems
- b. Routinely collected administrative data
- c. Population-based household surveys including census.
- d. Specialized studies such as Confidential Inquiries and Reproductive Age Mortality Surveys (RAMOS).

## Civil registration and vital statistics systems

A well-functioning and integrated national or subnational CRVS system will universally register and certify vital events, including live births, stillbirths and deaths that occur in the country or administrative area. Birth and death certificates should be issued as part of the CRVS system, allowing the compilation, analysis and dissemination of information through vital statistics agencies, including population characteristics (e.g. sex, date of birth or death, place of birth or death, place of usual residence) and cause-of-death information. Some CRVS systems will also register and certify other important vital events within the population, such as adoptions, marriages and divorces (9).

Data from CRVS are the preferred data source for this indicator when the system freely and universally records vital events, issues medical certification of cause of death, and the data are recorded in a systematic manner that ensures high data quality for both the public and private health sectors and regardless of location of death (e.g. health facility or community-based births and deaths).

**Key source of data:** The main source of data from this indicator involves several steps and varies based on the policies and procedures of the national or subnational CRVS or other routine system within health facilities and/or within communities. Declaration of maternal death events are obtained through: (a) forms completed by health personnel at health facilities; or (b) community-based sources, including death registration forms. Either paper or electronic forms containing this information are then submitted to the relevant civil authorities or vital statistics agencies, which have the responsibility to officially record the maternal death and characteristics, such as name, date and place of birth, nationality, place of death and cause of death. At the national or subnational level, the civil authority or vital statistics agency issues death certificates. The use of standardized definitions using the ICD-MM is important for consistent case ascertainment and cause-of-death information (7). Moreover, inclusion of indication that the death occurred during pregnancy or within 42 days after the termination of pregnancy or

childbirth on death certificates is critical. National or subnational civil authorities or vital statistics agencies are responsible for reporting of this indicator.

**Indicator definition and calculation:** The indicator is calculated as the percentage of maternal deaths of a specified cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes) during pregnancy, childbirth, or within 42 days of termination of pregnancy for a specified time period (using ICD-MM), expressed as a percentage amongst all maternal deaths.

*Numerator:* Number of maternal deaths of a specified cause during a specified time period.

*Denominator:* Total number of maternal deaths during a specified time period.

The indicator should be calculated for the main causes of maternal deaths.

**Frequency of measurement:** Within CRVS, this indicator is generally monitored at a national or subnational level on an annual basis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *National and subnational level:* Annually (data can be aggregated subnationally to provide national-level data).

**Disaggregation:** By age, place of residence (e.g. urban, rural), socioeconomic status (e.g. education level, wealth quintile), timing of death, place of death, type of death (e.g. direct or indirect obstetric death), cause of death, and type of reporting source (e.g. health facility, community).

**Missing values:** Maternal deaths are often under-reported and/or misclassified. Where data are limited, misclassified and/or under-reported, correction factors are applied when developing model-based global comparable estimates (1).

### Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/records or registers and are entered into national and/or subnational health information systems:

- Health information management system (HMIS) and/or
- District health information management system (DHIS2).

Data from health information systems may collect information on the number of women who died from a cause related to or aggravated by pregnancy or its management. Routinely collected administrative data and health facility statistics are the preferred data source in settings where the CRVS is non-functioning and there is a high utilization of

health facility services and data are recorded in a manner that ensures good data quality for both the public and private health sectors. However, cause of death may or may not be available in administrative data sources, so linkages with other data sources and medical chart review and data abstraction may need to be done to identify cause-of-death information.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from obstetric and neonatal medical records. Relevant information is recorded by health personnel within health facilities on paper forms completed by health personnel and/or through an electronic medical record. Data from paper or electronic sources are entered or abstracted into a database or registry and are compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for the reporting of this indicator.

**Indicator definition and calculation:** The indicator is calculated as the percentage of maternal deaths of a specified cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes) during pregnancy, childbirth, or within 42 days of termination of pregnancy for a specified time period (using ICD-MM), expressed as a percentage of all maternal deaths in a health facility.

*Numerator:* Number of maternal deaths by cause in a health facility during a specified time period.

*Denominator:* Total number of maternal deaths in a health facility during a specified time period.

**Frequency of measurement:** The indicator can be calculated on an annual basis or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on number of deaths (sample size may be small) and facility, subnational and national processes for data entry, compilation and analysis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Quarterly or annually, or as needed based on the country and/or facility need
- *Subnational (first and second administrative) level:* Annually
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By age, place of residence (e.g. urban, rural), socioeconomic status (e.g. education level, wealth quintile), timing of death, place of death, cause of death, level of facility and location of facility (e.g. urban, rural).

**Missing values:** Missing values are usually not known or not reported.

## Population-based household surveys

Population-based household survey data or censuses are the preferred data source where there is a non-functional CRVS or administrative data system, in settings with a low utilization of health facility services or where private health sector data are excluded from routinely collected administrative data. In the absence of complete death registration, information on maternal mortality can be collected through population-based household surveys collected through nationally or subnationally representative and statistically sound questionnaires, such as:

- Demographic Health Surveys (DHS) (10)
- Multiple Indicator Cluster Surveys (MICS) (11)
- Reproductive Health Surveys (RHS)
- Other household surveys with a similar methodological design.

**Key source of data:** Depending on survey methodology, a household questionnaire is used to collect information on characteristics of the usual residents and visitors who slept in the household the night before the interview, as well as to identify members of the household eligible for an individual interview, such as women and men of reproductive age and children under the age of 5 years old.

Maternal mortality can be estimated using a few different approaches (12). The first approach is by obtaining information on all deaths of any member in the household. The household survey is designed to collect information on household recent deaths within the past 12 months, or other defined reference period, including the name, sex, age at death and reported cause of death. If the household member was a woman of reproductive age, the timing of death relative to pregnancy, childbirth, or the postpartum period is also elicited (e.g. household members are asked if the death occurred (a) while pregnant; (b) during childbirth; or (c) within two months of the end of a pregnancy).

Another approach is the sibling or sisterhood method, whereby information is obtained on a full sibling history through individual interviews with eligible women (aged 15–49) who are residents of the household. The information collected for each sibling (all siblings born to the woman's natural mother) includes: name; sex (male, female); whether still alive (yes, no); if still alive, age in years; and if dead, number of years that have elapsed since the sibling died and age at death. If the sibling who died was the eligible woman's sister (female) above the age of 12 years old at the time of death, separate questions are asked to identify if the sister died either (a) while pregnant; (b) during childbirth; or (c) within two months after the end of pregnancy or childbirth. If the death was reported to have occurred after pregnancy or childbirth, the woman is asked the number of days after the end of pregnancy or childbirth when the sister died. To ascertain whether or not the death was directly related to pregnancy or childbirth, further questions are asked to determine if the death was either due to an act of violence or due to an accident.

The MoH and NSO typically conduct household surveys and compile, analyse and report the results for this indicator in collaboration with the survey programme (e.g. DHS, MICS, RHS) and funding agency.

**Indicator definition and calculation:** Depending on survey design, individual women of reproductive age (15–49 years old) are asked about the living status of all of their siblings. The indicator is calculated during a specified reference period, which is typically seven years before the time of the survey completion. The definition is as follows: The percentage of interviewed women (aged 15 to 49 years) with sisters who died during pregnancy, childbirth, or within 42 days of termination of pregnancy during a specified time period prior to survey completion, typically 0–6 years or 7–13 years, is expressed as a percentage of all maternal deaths during the same time period. The indicator consists of the following numerator and denominator:

*Numerator:* Number of interviewed women (aged 15–49 years) with sisters who died during pregnancy, childbirth, or within 42 days of termination of pregnancy during a specified time period prior to survey completion.

*Denominator:* Total number of interviewed women (aged 15–49 years) with sisters who died during a specified time period prior to survey completion.

This indicator identifies pregnancy-related deaths, not maternal deaths, and cause-of-death information is not captured.

**Frequency of measurement:** Household surveys are typically conducted every 3–5 years.

**Disaggregation at population level:** By age, place of residence (e.g. urban, rural) and socioeconomic status (e.g. household wealth quintile).

**Missing values:** Missing values for unknown sibling maternal status at the time of death are not included as maternal deaths. For missing information about number of days after the end of pregnancy or childbirth when the sibling died, it is assumed that the death occurred within the first two months (or 42 days for global comparison). Missing values for whether or not the death occurred as the result of an act of violence or due to an accident are assumed to have not been due to an accident.

# INTERPRETATION AND USE

## Interpretation

Universal, accurate and timely death registration and cause-of-death information is important to facilitate health systems planning and provision of health services delivery (13). Maternal cause-of-death indicators help programme management at global, national and subnational levels by monitoring and evaluating whether safe motherhood and maternal and newborn health programmes are on target for reducing maternal mortality. In addition, data on maternal cause of death can act as a measure of the health system's functioning and its potential to provide adequate and quality care for pregnant women. Ultimately, accurate ascertainment and review of the causes of death is a means to identify opportunities for prevention in order to eliminate all future preventable maternal deaths (2).

Maternal deaths registered through a CRVS system are also a measure of a country's capacity to plan and implement an effective civil registration system or vital statistics agency that is able to accurately and systematically report vital events. The quality of reporting of this indicator varies greatly between and within countries, particularly in countries without effective civil registration systems in place. Comparisons of the prevalence of maternal death registration at the national or subnational level over time can be used to identify areas where improvements in the capture and reporting of vital events are needed.

## Common challenges

### Civil registration and vital statistics systems

Death registration for all maternal deaths, including cause-of-death information, should be part of a national and/or subnational CRVS system. However, CRVS systems are either non-existent and/or the complete coverage, accuracy and timeliness of civil registration systems is a major issue in many countries worldwide. In order to assess the completeness of the CRVS system, evaluations should be conducted to ascertain the quality of the system, as recommended by the United Nation's revised Principles and Recommendations for a Vital Statistics System (9).

As a result, it is common for deaths not to be registered or for death certificates to not include information on whether or not the death occurred during pregnancy, childbirth, or within 42 days after termination of pregnancy or childbirth. This may be due to lack of a legal framework within civil authorities or vital statistics agencies or a functioning CRVS system, especially when it comes to deaths that occur at home or in the community as opposed to a health facility. Even in countries with functional CRVS systems and legal frameworks in place, missing or unregistered deaths still occur due to health professionals and/or family members not knowing about the requirement to register deaths.

### Data collected from administrative and other routine data systems

Administrative data may suffer from poor quality such as irregularities in report generation, data duplication and inconsistencies (14). Reporting challenges exist at the facility level given data quality issues, including incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system or inadequate system design, such as no integration with the private sector.

Many HMIS databases or registries are event-based and only include women who died in a health facility during delivery. Some administrative systems may capture information on deaths that occur in health facility settings for deaths that occur during transfers of care or admissions/re-admissions within the 42 days postpartum. However, cause-of-death information may be lacking in these instances. In settings where routine HMIS data lack information on pregnancies and/or deliveries that occur outside the public sector – for example, in homes or in private sector facilities – the total number of maternal deaths in the HMIS should not serve to estimate the denominator for this indicator.

### Data collected through household surveys

The systematic recording of deaths in many countries remains a serious challenge. In the absence of reliable CRVS systems or administrative data, household surveys have become the key source of data to monitor levels and trends of maternal mortality. In most low- and middle-income countries, such surveys represent the sole source of this information.

In population-based household surveys, eligible women are asked about the pregnancy status of sisters of reproductive age and whether or not the woman died during pregnancy, childbirth, or two months after pregnancy or childbirth; however, maternal cause-of-death information is not asked in the current iterations of the MICS or DHS questionnaires, which compromises the ability to measure the “cause of maternal death” indicator, and instead allows for measurement of pregnancy-related mortality.

Respondents to the survey may not always understand that the surveyors are interested in collecting information on household members or siblings who are no longer alive. Additionally, many respondents will not report on deaths of household and family members due to cultural sensitivities.

# GLOBAL MONITORING

The WHO Global Health Observatory maintains a database for global monitoring and reporting of maternal mortality. Before data can be included in the global databases, WHO undertakes a process of data verification that includes correspondence with field offices to clarify any questions regarding the reported statistics. There is no global database that systematically compiles, analyses and reports on the causes of maternal death. More information about the WHO database on maternal mortality can be found at: [https://www.who.int/gho/maternal\\_health/mortality/maternal/en/](https://www.who.int/gho/maternal_health/mortality/maternal/en/).

## Key initiatives

Countdown to 2030 – Women’s, Children’s and Adolescents’ Health: <http://countdown2030.org/>

Ending Preventable Maternal Mortality (EPMM): [http://who.int/reproductivehealth/topics/maternal\\_perinatal/epmm/en/](http://who.int/reproductivehealth/topics/maternal_perinatal/epmm/en/)

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Reference List of 100 Core Health Indicators (plus health-related SDGs), 2018: <https://www.who.int/healthinfo/indicators/2018/en/>

Global Strategy for Women’s, Children’s and Adolescents’ Health (2016–2030): <http://www.who.int/life-course/partners/global-strategy/en/>

United Nations Sustainable Development Goals (SDGs): <https://sustainabledevelopment.un.org>

## ADDITIONAL RESOURCES

Global Health Observatory (GHO) Data – World Health Statistics: [http://www.who.int/gho/publications/world\\_health\\_statistics/en/](http://www.who.int/gho/publications/world_health_statistics/en/)

Sustainable Development Goals (SDGs) Indicators – Metadata repository: <https://unstats.un.org/sdgs/metadata/>

UNICEF Data: Monitoring the Situation of Children and Women: Delivery care: <https://data.unicef.org/topic/maternal-health/delivery-care/>

UNICEF – Multiple Indicator Cluster Surveys: <http://mics.unicef.org/tools>

The DHS Program: <https://dhsprogram.com>

MEASURE Evaluation: Family Planning and Reproductive Health Indicators Database: Maternal mortality ratio: [https://www.measureevaluation.org/prh/rh\\_indicators/womens-health/sm/maternal-mortality-ratio-mmr](https://www.measureevaluation.org/prh/rh_indicators/womens-health/sm/maternal-mortality-ratio-mmr)

Trends in maternal mortality 2000 to 2017: estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division: <https://www.who.int/reproductivehealth/publications/maternal-mortality-2000-2017/en/>.

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Indicator Sheet

# MATERNAL DEATH REGISTRATION, INCLUDING CAUSE OF DEATH

MoNITOR 

## CONCEPT AND DEFINITION

### Concept

Vital statistics include the collection of data on events in the lifetime of a person, including pertinent characteristics of those events, the person involved in the event, and those concerned. A complete civil registration and vital statistics (CRVS) system, as defined by the United Nations (UN), includes every vital event concerning life and death that has occurred to members of the population of the defined area within the specified time period (1). Birth and death certificates should be issued for all births and deaths as part of the CRVS system, including recording of population characteristics (e.g. sex, date of birth or death, place of birth or death, place of usual residence) and cause-of-death information.

Death registration, like birth registration, protects the rights of women of reproductive age and newborns worldwide (2). For women and girls who die from preventable complications during pregnancy or childbirth, death registration and death certificates may identify where, when and why these deaths are occurring in order to prevent similar deaths from occurring in the future. For newborns who may have lost their mother during childbirth or otherwise, death registration and death certificates are legal documents that may allow the transfer of inheritance, land ownership, or other assets to the children, helping to close the gap on the cycle of poverty.

Information collected in the CRVS provides legal and protective advantages to the person as well as information to the country for medical and health programme decision-making. Death registration and data on cause of death provide information to help identify how, where, when, and why women, girls and newborns are dying. Compilation and analysis of death registration and cause-of-death information on a timely basis facilitates systems planning and guides decision-making, such as planning and allocation of funding for resources, infrastructure and services aimed at preventing deaths from occurring and improving the health and survival of the population, particularly, for women, girls and newborns (1).

### Definition

The use of standard definitions for maternal and neonatal death and causes of death is critical for case ascertainment. WHO applies the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10) to deaths during pregnancy, childbirth and the puerperium – ICD-Maternal Mortality (ICD-MM) (3). The WHO application of the ICD-10 to deaths during the perinatal period (ICD-PM) provides a framework for the consistent collection, analysis and interpretation of maternal and neonatal deaths (4).

Percentage of maternal deaths registered with cause of death specified based on ICD-MM codes (5).

**Unit of measurement:** Percentage (%) by cause of death

**Level of indicator use:** Global, national and subnational (first or second administrative level)

**Monitoring and evaluation framework:** Impact

**Domain:** Mortality

**Continuum of care:** Postnatal

# MEASUREMENT GUIDANCE

## Data sources

There are three data sources for this indicator:

- a. CRVS and other routine national surveillance systems
- b. Routinely collected administrative data other than CRVS
- c. Population-based household surveys.

## Civil registration and vital statistics systems

A well-functioning and integrated national or subnational CRVS system will universally register and certify vital events, including live births, stillbirths and deaths that occur in the country or administrative area. Birth and death certificates are a part of the CRVS system, allowing the compilation, analysis and dissemination of information through vital statistics agencies, including population characteristics (e.g. sex, date of birth or death, place of birth or death, place of usual residence) and cause-of-death information. Some CRVS systems will also register and certify other important vital events within the population, such as adoptions, marriages and divorces (2).

Data from CRVS are the preferred data source for this indicator when the system freely and universally records vital events and data are recorded in a systematic manner that ensures high data quality for both the public and private health sectors and regardless of location of birth or death (e.g. health facility or community-based births and deaths).

**Key source of data:** The main source of data for this indicator involves several steps and varies based on the policies and procedures of the national or subnational CRVS within health facilities and/or within communities. Declaration of deaths are obtained: (a) through forms completed by health personnel at health facilities; or (b) through community-based sources, including death registration forms. Either paper or electronic forms containing this information are then submitted to the relevant civil authorities and vital statistics agencies, which have the responsibility to officially record the death and death characteristics, such as name, sex, date and place of death, age, nationality, place of residence and cause of death. At the national or subnational level, the civil authority and vital statistics agency issues death certificates. National or subnational civil authorities and vital statistics agencies are responsible for reporting of this indicator.

**Indicator definition and calculation:** The indicator is calculated as the percentage of maternal deaths registered with cause of death specified based on ICD-MM codes, expressed as a percentage amongst total estimated number of maternal deaths.

**Numerator:** Number of maternal deaths registered with cause of death specified based on ICD-MM codes.

*Denominator:* Total number of maternal deaths.

Where information on total deaths is not available because of incomplete civil registration, the denominator for total deaths can be estimated by extrapolating data from a recently conducted census or on the basis of information about mortality rates derived from population-based household surveys.

**Frequency of measurement:** Within CRVS, this indicator is monitored at a national or subnational level on an annual basis. The data can be compiled and aggregated subnationally to provide national-level data.

**Disaggregation:** By sex, age, place of residence (e.g. urban, rural), subnational administrative units (e.g. districts, provinces, regions), socioeconomic status (e.g. education level, occupation), place of death, cause of death, and type of reporting source (health facility, community).

**Missing values:** Missing values are usually not known or not reported. To ascertain missing data and to perform data quality assurance, estimates of the total number of deaths in a country or administrative area can be compared with the absolute number of registered deaths in the same period.

#### Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/records or registers and are entered into national and/or subnational health management information systems (HMIS).

Data from health information systems may collect information on the number of deaths officially registered, as well as the cause of death. Routinely collected administrative data and health facility statistics are the preferred data source in settings where the CRVS is non-functioning and there is a high utilization of health facility services and data are recorded in a manner that ensures good data quality for both the public and private health sectors. The compiled data in the national HMIS or District Health Information System (DHIS2) should include data from both public and private health sectors, especially when the private sector is a substantial source of service provision to the population. In settings where utilization of health facilities is not high (e.g. settings with a high prevalence of births or deaths occurring at home), data may suffer from incompleteness if information about deaths occurring outside facilities is not captured. In addition, there are often challenges in accurately measuring the numerator and the denominator when routine HMIS data are used to measure this indicator.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from medical records, including health services registers. Relevant information about the death is recorded by health personnel within health facilities on paper forms completed by health personnel and/or through an electronic medical record. Data from paper or electronic sources are entered

or abstracted into a database or registry and are compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for the reporting of this indicator.

**Indicator definition and calculation:** The indicator is calculated as the percentage of maternal deaths registered with cause of death specified based on ICD-MM codes, expressed as a percentage amongst total estimated number of maternal deaths.

*Numerator:* Number of maternal deaths registered with cause of death specified based on ICD-MM codes.

*Denominator:* Total number of maternal deaths.

**Frequency of measurement:** This indicator can be calculated on an annual basis, or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on facility, subnational and national processes for data entry, compilation and analysis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Monthly, quarterly, or as needed based on the country and/or facility need
- *Subnational (first and second administrative) level:* Monthly or quarterly
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By age, place of residence (e.g. urban, rural), socioeconomic status (e.g. education level, wealth quintile), timing of death, place of death, cause of death, level of facility and location of facility (e.g. urban, rural).

**Missing values:** Missing values are usually not known or not reported.

#### Population-based household surveys and censuses

Population-based household survey data or censuses are the preferred data source where there is a non-functional CRVS or administrative data system, in settings with a low utilization of health facility services or where private health sector data are excluded from routinely collected administrative data. In the absence of complete death registration, information on maternal, neonatal and child mortality can be collected through population-based household surveys collected through nationally or subnationally representative and statistically sound questionnaires, such as the:

- Demographic Health Surveys (DHS) (6)
- Multiple Indicator Cluster Surveys (MICS) (7)

- Reproductive Health Surveys (RHS)
- Other household surveys with a similar methodological design.

**Key source of data:** Depending on survey methodology, a household questionnaire is used to collect information on characteristics of the usual residents and visitors who slept in the household the night before interview, as well as to identify members of the household eligible for an individual interview, such as women and men of reproductive age and children under the age of 5 years old.

Mortality can be estimated using a few different approaches (8). The first approach is by obtaining information on all deaths of any member in the household. The household survey is designed to collect information on household recent deaths within the past 12 months, or other defined reference period, including the name, sex, age at death and reported cause of death.

Another approach is the sibling method, whereby information is obtained on a full sibling history through individual interviews with eligible women (aged 15–49) who are residents of the household. The information collected for each sibling (all siblings born to the woman's natural mother) includes: name; sex (male, female); whether still alive (yes, no); if still alive, age in years; and if dead, number of years that have elapsed since the sibling died, and age at death. If the sibling who died was the eligible woman's sister (female) above the age of 12 years old at the time of death, separate questions are asked to identify if the sister died either (a) while pregnant; (b) during childbirth; or (c) within two months after the end of pregnancy or childbirth. If the death was reported to have occurred after pregnancy or childbirth, the woman is asked the number of days after the end of pregnancy or childbirth when the sister died. To ascertain whether or not the death was directly related to pregnancy or childbirth, further questions are asked to determine if the death was either due to an act of violence or due to an accident.

For neonatal, infant, or under-5 child mortality, the approach is to obtain information on a full birth history, whereby eligible women (15–49 years old) are asked to report the names and relevant information for all live births they have had in their lifetime.<sup>1</sup> The birth history does not include stillbirths, miscarriages, or abortions. For each of the children the woman has given birth to, they are asked to record in chronological order from first to last birth: the sex (male or female), multiple births (singleton or multiple), the date of birth (day, month, and year) and if the child is currently alive (yes or no) and if no longer alive, the age at death in days, months, or years.

<sup>1</sup> In some instances, a shortened birth history may be implemented in the survey in order to calculate the list of all live births during a specified time period, usually 5 years prior to the date of survey interview.

Information on whether the death was registered or if a certificate of death was issued is not currently asked in the current iterations of the MICS or DHS questionnaires. However, information on death registration may be customized and formally added to future iterations of these surveys.

The MoH and NSO typically conduct household surveys and compile, analyse and report the results for this indicator in collaboration with the survey programme (e.g. DHS, MICS, RHS) and funding agency.

**Indicator definition and calculation:** The indicator is calculated as the percentage of deaths (by age and sex) among the total number of population during a specified time period.

*Numerator:* Number of deaths<sup>2</sup> (by age and sex) during a specified time period.

*Denominator:* Total number of population by age and sex during a specified time period.

**Frequency of measurement:** Household surveys are typically conducted every 3–5 years.

**Disaggregation at population level:** By sex, age, place of birth, place of residence (e.g. urban, rural), subnational administrative units (e.g. districts, provinces, regions), socioeconomic status (e.g. education level, household wealth quintile), place of death and cause of death.

**Missing values:** Missing values are not included.

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<sup>2</sup> Information on whether the death was registered or if a certificate of death was issued is not currently asked in the current iterations of the standard MICS or DHS questionnaires. However, information on whether the death was registered can be customized and may be formally added to future iterations of these surveys.

# INTERPRETATION AND USE

## Interpretation

Universal, accurate and timely death registration and cause-of-death information is important to facilitate health systems planning and provision of health services delivery (1). The death registration indicator is also a measure of a country's capacity to plan and implement an effective civil registration system and vital statistics agency that are able to accurately and systematically report vital events, such as births and deaths. Statistics based on crude death rate via the death registration indicator form the demographic profile of communities, regions and countries. The number of deaths registered can be used to derive population-level indicators of health status, such as infant, child and maternal mortality, and population growth. In turn, these indicators inform health system planning and policy and the allocation of funds and resources for programmes and interventions aimed at improved maternal, newborn and child health and survival.

The Sustainable Development Goals (SDG) agenda highlights the importance of continued momentum towards improving maternal and newborn health by setting, under SDG goal 3, targets for achieving 100% birth registration and 80% death registration by 2030 (9). However, less than half of countries in the world have above 80% coverage of death registration or higher, and the quality of reporting of this indicator varies greatly between and within countries, particularly in countries without effective civil registration systems in place (10). Information about death registration and cause of death is also important for monitoring and reporting of SDG 3 – where death registration is the only source that can provide information on cause of death related to maternal, neonatal and child mortality indicators. Comparisons of the prevalence of death registration at the national or subnational level over time can be used to identify areas where improvements in the capture and reporting of vital events are needed.

## Common challenges

### Civil registration and vital statistics systems

Death registration is part of a national and/or subnational CRVS system. However, CRVS systems are either non-existent and/or the complete coverage, accuracy and timeliness of civil registration systems is a major issue in many countries worldwide. In order to assess the completeness of the CRVS system, evaluations should be conducted to ascertain the quality of the system, as recommended by the United Nation's revised Principles and Recommendations for a Vital Statistics System (2).

As a result, it is common for deaths not to be registered due to lack of a legal framework within civil authorities and vital statistics agencies or a functioning CRVS system, especially when it comes to deaths that occur at home or in the community as opposed to a health facility. Even in countries with functional CRVS systems and legal frameworks in place, missing or unregistered deaths still occur due to health professionals and/or family members not knowing the requirement to register deaths.

### Data collected from administrative and other routine data systems

Administrative data may suffer from poor quality such as irregularities in report generation, data duplication and inconsistencies (11). Reporting challenges exist at the facility level given data quality issues, including incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system or inadequate system design, such as no integration with the private sector.

Many HMIS databases or registries are event-based and only include information on deaths within a health facility. In settings where routine HMIS data lack information on deaths that occur outside the public sector – for example, in homes or in private sector facilities – the total number of deaths recorded in the HMIS should not serve to estimate the denominator for this indicator.

### Data collected through household surveys

The systematic recording of deaths in many countries remains a serious challenge. In the absence of reliable CRVS systems/ administrative data, household surveys have become the key source of data to monitor levels and trends of death registration. In most low- and middle-income countries, such surveys represent the sole source of this information.

Information on whether the death was registered or if a certificate of death was issued is not currently asked in the current iterations of the MICS or DHS questionnaires, which compromises the ability to measure the “death registration” indicator and instead allows for measurement of mortality indicators. For surveys that do collect information on death certificates or that plan to collect this information in the future, it is anticipated that there will be similar challenges, as experienced with collection of information on birth registration in household surveys. For example, respondents to the survey may not always be clear on who the civil authorities in charge of the death registrations are, and may misinterpret notifying a church or village chief of a death as formal registration. Household surveys should customize questionnaires by naming the specific national authority responsible for registration. However, even then, confusion about the death registration process may occur. Similarly, questions regarding the possession of a death certificate may also be the source of erroneous data, since respondents may confuse a death certificate with another document.

Respondents to the survey may not always understand that the surveyors are interested in collecting information on household members who are no longer alive or those who do not live in the dwelling during interviews regarding full sibling or birth history. Additionally, many respondents will not report on deaths and cause of deaths of household and family members due to cultural sensitivities.

# GLOBAL MONITORING

The WHO Global Health Observatory maintains databases for global monitoring and reporting on the percentage of deaths that are registered by age and sex. The results are also published in the annual World Health Statistics reports published by WHO. More information about the World Health Statistics and global databases for death registration can be found at [https://www.who.int/gho/publications/world\\_health\\_statistics/2019/en/](https://www.who.int/gho/publications/world_health_statistics/2019/en/) and [http://www.who.int/gho/publications/world\\_health\\_statistics/en/](http://www.who.int/gho/publications/world_health_statistics/en/).

## Key initiatives

Countdown to 2030 – Women’s, Children’s and Adolescents’ Health: <http://countdown2030.org/>

Ending Preventable Maternal Mortality (EPMM): [http://who.int/reproductivehealth/topics/maternal\\_perinatal/epmm/en/](http://who.int/reproductivehealth/topics/maternal_perinatal/epmm/en/)

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Reference List of 100 Core Health Indicators (plus health-related SDGs), 2018: <https://www.who.int/healthinfo/indicators/2018/en/>

United Nations Sustainable Development Goals (SDGs): <https://sustainabledevelopment.un.org>

## ADDITIONAL RESOURCES

Global Health Observatory (GHO) data – World Health Statistics: [http://www.who.int/gho/publications/world\\_health\\_statistics/en/](http://www.who.int/gho/publications/world_health_statistics/en/)

Sustainable Development Goals (SDGs) Indicators – Metadata repository: <https://unstats.un.org/sdgs/metadata/>

UNICEF Data: Monitoring the situation of children and women: Birth registration: <https://data.unicef.org/topic/child-protection/birth-registration/>

UNICEF – Multiple Indicator Cluster Surveys: <http://mics.unicef.org/tools>

The DHS Program – Demographic and Health Surveys: <https://dhsprogram.com>

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Indicator Sheet

# MATERNAL MORTALITY RATIO

MoNITOR 

# CONCEPT AND DEFINITION

## Concept

An estimated 295 000 (uncertainty interval 80%: 279 000 to 340 000) women died from pregnancy or childbirth-related complications in 2017 (1). Maternal deaths include the death of a woman during pregnancy, childbirth, or within 42 days of termination of pregnancy from any cause related to the pregnancy or its management, excluding deaths due to accidental or incidental causes (2). Although progress has been made since 1990 (2), preventable pregnancy and childbirth complications are among the leading causes of maternal mortality, morbidity and disability among women of reproductive age in low- and middle-income countries, and disproportionately affect the most vulnerable women (2). An analysis conducted by WHO found that haemorrhage, hypertensive disorders and sepsis were the three leading direct causes of maternal death, all of which could be preventable with appropriate and timely access to health services (3).

The Sustainable Development Goal (SDG) agenda highlights the importance of continued momentum towards improving maternal health by setting, under SDG goal 3 targets for achieving a global maternal mortality ratio (MMR) of less than 70 maternal deaths per 100 000 live births by 2030 (4,5). National targets are set such that countries should reduce their MMR by at least two thirds from their 2010 baseline and countries with the highest maternal mortality should aim to achieve an even greater reduction (5). In order to achieve these targets, accurate cause-of-death information is needed to identify how, where, when and why women and girls are dying during pregnancy or childbirth, and to plan, implement and evaluate targeted decision-making and adequate allocation of resources. The use of standard definitions for maternal death and causes of death is critical for case ascertainment. The WHO application of the 10th revision of the International Classification of Diseases and Related Health Problems (ICD-10) to deaths during pregnancy, childbirth and the puerperium, ICD-Maternal Mortality (ICD-MM), provides a framework for the consistent collection, analysis and interpretation of maternal deaths (6). Ending preventable maternal mortality will also facilitate the progress towards newborn mortality targets (7).

## Definition

The annual number of female deaths from any cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes) during pregnancy and childbirth or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, expressed per 100 000 live births, for a specified time period (6,8,9).

**Unit of measurement:** Ratio

**Level of indicator use:** Population-based global, national and subnational (first or second administrative level)

**Monitoring and evaluation framework:** Impact

**Domain:** Fertility

**Continuum of care:** Across all continuums

# MEASUREMENT GUIDANCE

## Data sources

There are three common data sources for this indicator:

- a. Civil registration and vital statistics (CRVS) and other routine national surveillance systems
- b. Routinely collected administrative data
- c. Population-based household surveys.

## Civil registration and vital statistics systems

A well-functioning and integrated national or subnational CRVS system will universally register and certify vital events, including live births, stillbirths and deaths that occur in the country or administrative area. Birth and death certificates should be issued as part of the CRVS system, allowing the compilation, analysis and dissemination of information through vital statistics agencies, including population characteristics (e.g. sex, date of birth or death, place of birth or death, place of usual residence) and cause-of-death information. Some CRVS systems will also register and certify other important vital events within the population, such as adoptions, marriages and divorces (10).

Data from CRVS are the preferred data source for this indicator when the system freely and universally records vital events, issues medical certification of cause of death, and the data are recorded in a systematic manner that ensures high data quality for both the public and private health sector and regardless of location of death (e.g. health facility or community-based births and deaths).

**Key source of data:** The main source of data from this indicator involves several steps and varies based on the policies and procedures of the national or subnational CRVS or other routine system within health facilities and/or within communities. Declaration of maternal death events are obtained through: (a) forms completed by health personnel at health facilities; or (b) community-based sources, including death registration forms. Either paper or electronic forms containing this information are then submitted to the relevant civil authorities or vital statistics agencies, which have the responsibility to officially record the maternal death and characteristics, such as name, date and place of birth, nationality, place of death and cause of death. At the national or subnational level, the civil authority or vital statistics agency issues death certificates. The use of standardized definitions using the ICD-MM is important for consistent case ascertainment and cause-of-death information (7). Moreover, inclusion of indication that the death occurred during pregnancy or within 42 days after the termination of pregnancy or childbirth on death certificates is critical. National or subnational civil authorities or vital statistics agencies are responsible for reporting of this indicator.

**Indicator definition and calculation:** The indicator is calculated as the number of deaths from any cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes) during pregnancy and childbirth or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, expressed per 100 000 live births, for a specified time period.

*Numerator:* Number of maternal deaths during a specified time period.

*Denominator:* Total number of live births during a specified time period.

To compute the rate per 100 000 live births, the numerator is divided by the denominator and multiplied by 100 000. The numerator requires information on pregnancy status, timing of death (during pregnancy, childbirth, or within 42 days of termination of pregnancy), and information about the cause of death (9). The denominator should include only live births.

**Frequency of measurement:** Within CRVS, this indicator is generally monitored at a national or subnational level on an annual basis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- National and subnational level: Annually (data can be aggregated subnationally to provide national-level data).

**Disaggregation:** By age, place of residence (e.g. urban, rural), socioeconomic status (e.g. education level, wealth quintile), timing of death, place of death, type of death (e.g. direct or indirect obstetric death), cause of death and type of reporting source (e.g. health facility, community).

**Missing values:** Maternal deaths are often under-reported, and misclassified and missing values are handled through model estimation and/or projection of trends where data are limited (1). Depending on capture of cause-of-death information on the medical death certificates, linkages to other data sources (e.g. administrative data) may need to be done and timing and cause-of-death information can be abstracted from medical chart reviews.

#### Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/records or registers and are entered into national and/or subnational health information systems:

- Health information management system (HMIS) and/or
- District Health Information Management System (DHIS2).

Data from health information systems may collect information on the number of women who died from a cause related to or aggravated by pregnancy or its management. Routinely collected administrative data and health facility statistics are the preferred data source in settings where the CRVS is non-functioning and there is a high utilization of health facility services and data are recorded in a manner that ensures good data quality for both the public and private health sectors. However, cause of death may or may not be available in administrative data sources, so linkages with other data sources and medical chart review and data abstraction may need to be done to identify cause-of-death information.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from obstetric and medical records. Relevant information is recorded by health personnel within health facilities on paper forms completed by health personnel and/or through an electronic medical record. Data from paper or electronic sources are entered or abstracted into a database or registry and are compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for the reporting of this indicator.

**Indicator definition and calculation:** The indicator is calculated as the number of deaths in health facilities from any cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes) during pregnancy and childbirth, or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, expressed per 100 000 live births in health facilities, for a specified time period.

*Numerator:* Number of maternal deaths in a health facility during a specified time period.

*Denominator:* Total number of live births in a health facility during a specified time period.

To compute the rate per 100 000 live births, the numerator is divided by the denominator and multiplied by 100 000. The numerator requires information on number of maternal death (9). The denominator should include only live births.

**Frequency of measurement:** The indicator can be calculated on an annual basis or a more aggregated basis (5- to 10-year time period), depending on number of deaths (sample size may be small) and facility, subnational and national processes for data entry, compilation and analysis. For internal purposes, MMR may be tracked on a more frequent and ongoing basis (e.g. quarterly) at the health facility level, if needed. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Quarterly or annually, or as needed based on the country and/or facility need

- *Subnational (first and second administrative) level:* Annually
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By age, place of residence (e.g. urban, rural), socioeconomic status (e.g. education level, wealth quintile), timing of death, place of death, level of facility and location of facility (e.g. urban, rural).

**Missing values:** Maternal deaths are often under-reported and/or misclassified. Where data are limited, misclassified and/or under-reported, correction factors are applied when developing model-based global comparable estimates (1). Depending on capture of cause-of-death information in the HMIS, more accurate cause-of-death information can be abstracted from medical chart reviews.

### Population-based household surveys

Population-based household survey data or censuses are the preferred data source where there is a non-functional CRVS, HMIS, or other administrative data system, in settings with a low utilization of health facility services or where private health sector data are excluded from routinely collected administrative data. In the absence of complete death registration, information on maternal mortality can be collected through population-based household surveys collected through nationally or subnationally representative and statistically sound questionnaires, such as:

- Demographic Health Surveys (DHS) (11)
- Multiple Indicator Cluster Surveys (MICS) (12)
- Reproductive Age Mortality Studies (RAMOS)
- Other household surveys with a similar methodological design.

**Key source of data:** Depending on survey methodology, a household questionnaire is used to collect information on characteristics of the usual residents and visitors who slept in the household the night before the interview, as well as to identify members of the household eligible for an individual interview, such as women and men of reproductive age and children under the age of 5 years old.

Maternal mortality can be estimated using a few different approaches (13). The first approach is by obtaining information on all deaths of any member in the household. The household survey is designed to collect information on household recent deaths within the past 12 months, or other defined reference period, including the name, sex, age at death and reported cause of death. If the household member was a woman of reproductive age, the timing of death relative to pregnancy, childbirth, or the postpartum period is also elicited (e.g. household members are asked if the death occurred (a) while pregnant; (b) during childbirth; or (c) within two months of the end of a pregnancy).

Another approach is the sibling or sisterhood method, whereby information is obtained on a full sibling history through individual interviews with eligible women (aged 15–49) who are residents of the household. The information collected for each sibling (all siblings born to the woman's natural mother) includes: name; sex (male, female); whether still alive (yes, no); if still alive, age in years; and if dead, number of years that have elapsed since the sibling died, and age at death. If the sibling who died was the eligible woman's sister (female) above the age of 12 years old at the time of death, separate questions are asked to identify if the sister died either (a) while pregnant; (b) during childbirth; or (c) within two months after the end of pregnancy or childbirth. If the death was reported to have occurred after pregnancy or childbirth, the woman is asked the number of days after the end of pregnancy or childbirth when the sister died. To ascertain whether or not the death was directly related to pregnancy or childbirth, further questions are asked to determine if the death was either due to an act of violence or due to an accident.

The RAMOS survey uses various data sources (e.g. interviews with family members, CRVS, health-care facility records, burial records, traditional birth attendants), depending on the context, to identify all deaths of women of reproductive age and to ascertain which of these deaths are maternal or pregnancy related (9).

### Census data

The MoH and NSO typically conduct household surveys and compile, analyse and report the results for this indicator in collaboration with the survey programme (e.g. DHS, MICS, RHS) and funding agency.

**Indicator definition and calculation:** Depending on survey design, individual women of reproductive age (15–49 years old) are asked about the living status of all of their sisters. The indicator is calculated during a specified reference period, which is typically seven years before the time of the survey completion. The definition is as follows:

The percentage of interviewed women (aged 15–49 years) with sisters who died during pregnancy, childbirth, or within 42 days of termination of pregnancy during a specified time period prior to survey completion, typically 0–6 years or 7–13 years, is expressed per 100 000 births during a specified time period. The indicator consists of the following numerator and denominator:

*Numerator:* Number of interviewed women (aged 15–49 years) with sisters who died during pregnancy, childbirth, or within 42 days of termination of pregnancy during a specified time period prior to survey completion.

*Denominator:* Age-adjusted general fertility rate for the same time period prior to survey completion (13).

To compute the rate per 100 000 births, the numerator is divided by the denominator and multiplied by 100 000. This indicator identifies pregnancy-related deaths, not maternal deaths, and cause-of-death information is not captured. Thus, the indicator represents the pregnancy-related MMR.

**Frequency of measurement:** Household surveys are typically conducted every 3–5 years.

**Disaggregation at population level:** By age, place of residence (e.g. urban, rural), and socioeconomic status (e.g. household wealth quintile).

**Missing values:** Missing values for unknown sibling maternal status at the time of death are not included as maternal deaths. For missing number of days after the end of pregnancy or childbirth when the sibling died, it is assumed that the death occurred within the first two months (or 42 days for global comparison). Missing values for whether or not the death occurred as the result of an act of violence or due to an accident are assumed to have not been due to an accident.

# INTERPRETATION AND USE

## Interpretation

The MMR is an indicator of a nation's health status and is a key performance indicator that is monitored and tracked globally as a measure of the health system's functioning. Universal, accurate and timely measurement of the MMR, regardless of the location of death (e.g. community or health facility), with cause-of-death information is important to facilitate health systems planning and provision of health services delivery (14). Maternal cause-of-death indicators help programme management at global, national and subnational levels by monitoring and evaluating whether safe motherhood and maternal and newborn health programmes are on target for reducing maternal mortality, and more broadly, for strengthening health systems. Accurate ascertainment and review of maternal deaths facilitates the identification and recommendations for opportunities for quality improvement and prevention in order to eliminate all future preventable maternal deaths from occurring (2).

Maternal deaths, measured through a CRVS system, are also a measure of a country's capacity to plan and implement an effective civil registration system or vital statistics agency that is able to accurately and systematically report maternal deaths and implement ongoing surveillance and response. The quality of reporting of this indicator varies greatly between and within countries, particularly in countries without effective civil registration systems in place; adjustment factors for more accurate measurement are done by WHO for global comparability (1). Comparisons of the MMR at the national or subnational level over time can be used to identify areas where improvements in health system functioning are needed and areas for improved contact with the health system are needed to provide adequate, timely and quality care for women during pregnancy, childbirth and postpartum.

## Common challenges

### Civil registration and vital statistics systems

Death registration for all maternal deaths that includes cause-of-death information should be part of a national and/or subnational CRVS system. However, CRVS systems are either non-existent and/or the complete coverage, accuracy and timeliness of civil registration systems is a major issue in many countries worldwide. In order to assess the completeness of the CRVS system, evaluations should be conducted to ascertain the quality of the system, as recommended by the United Nations revised Principles and Recommendations for a Vital Statistics System (10).

As a result, it is common for deaths to be unregistered or for death certificates to not include information on whether or not the death occurred during pregnancy, childbirth, or within 42 days after termination of pregnancy or childbirth. This may be due to lack of

a legal framework within civil authorities or vital statistics agencies or a functioning CRVS system, especially when it comes to deaths that occur at home or in the community as opposed to a health facility. Even in countries with functional CRVS systems and legal frameworks in place, missing or unregistered deaths still occur due to health professionals and/or family members not knowing about the requirement to register deaths. As a result, many CRVS systems under-report the majority of maternal deaths due to lack of capturing information on whether or not the woman was currently or recently pregnant. Often, linkages to other data sources, such as administrative data, are required in order to identify more accurate estimates of the MMR.

#### Data collected from administrative and other routine data systems

Administrative data may suffer from poor quality such as irregularities in report generation, data duplication and inconsistencies (14). Reporting challenges exist at the facility level given data quality issues, including incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system or inadequate system design, such as no integration with the private sector.

Many HMIS databases or registries are event-based and only include women who died in a health facility during delivery. Some administrative systems may capture information on deaths that occur in health facility settings for deaths that occur during transfers of care or admissions/re-admissions within the 42 days postpartum. However, cause-of-death information may be lacking in these instances.

#### Data collected through household surveys

The systematic recording of deaths in many countries remains a serious challenge. In the absence of reliable CRVS systems or administrative data, household surveys have become the key source of data to monitor levels and trends of maternal mortality. In most low- and middle-income countries, such surveys represent the sole source of this information.

In population-based household surveys, eligible women are asked about the pregnancy status of sisters of reproductive age and whether or not the woman died during pregnancy, childbirth, or two months after pregnancy or childbirth; however, maternal cause-of-death information is not asked in the current iterations of the MICS or DHS questionnaires, which compromises the ability to measure the “cause of maternal death” indicator and instead allows for measurement of pregnancy-related mortality ratio.

Respondents to the survey may not always understand that the surveyors are interested in collecting information on household members or siblings who are no longer alive. Additionally, many respondents will not report on deaths of household and family members due to cultural sensitivities.

# GLOBAL MONITORING

The WHO Global Health Observatory maintains a database for global monitoring and reporting of maternal mortality. Before data can be included in the global databases, WHO undertakes a process of data verification that includes correspondence with field offices to clarify any questions regarding the reported statistics. More information about the WHO database on maternal mortality can be found at: [https://www.who.int/gho/maternal\\_health/mortality/maternal/en/](https://www.who.int/gho/maternal_health/mortality/maternal/en/).

## Key initiatives

Countdown to 2030 – Women’s, Children’s and Adolescents’ Health: <http://countdown2030.org/>

Ending Preventable Maternal Mortality (EPMM): [http://who.int/reproductivehealth/topics/maternal\\_perinatal/epmm/en/](http://who.int/reproductivehealth/topics/maternal_perinatal/epmm/en/)

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Reference List of 100 Core Health Indicators (plus health-related SDGs), 2018: <https://www.who.int/healthinfo/indicators/2018/en/>

Global Strategy for Women’s, Children’s and Adolescents’ Health (2016–2030): <http://www.who.int/life-course/partners/global-strategy/en/>

United Nations Sustainable Development Goals (SDGs): <https://sustainabledevelopment.un.org>

## ADDITIONAL RESOURCES

Global Health Observatory (GHO) Data – World Health Statistics: [http://www.who.int/gho/publications/world\\_health\\_statistics/en/](http://www.who.int/gho/publications/world_health_statistics/en/)

Sustainable Development Goals (SDGs) Indicators – Metadata repository: <https://unstats.un.org/sdgs/metadata/>

UNICEF Data: Monitoring the Situation of Children and Women: Delivery care: <https://data.unicef.org/topic/maternal-health/delivery-care/>

UNICEF – Multiple Indicator Cluster Surveys: <http://mics.unicef.org/tools>

The DHS Program: <https://dhsprogram.com>

MEASURE Evaluation: Family Planning and Reproductive Health Indicators Database: Maternal mortality ratio: [https://www.measureevaluation.org/prh/rh\\_indicators/womens-health/sm/maternal-mortality-ratio-mmr](https://www.measureevaluation.org/prh/rh_indicators/womens-health/sm/maternal-mortality-ratio-mmr)

Trends in maternal mortality 2000 to 2017: estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division: <https://www.who.int/reproductivehealth/publications/maternal-mortality-2000-2017/en/>

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Indicator Sheet

# NEONATAL CAUSE OF DEATH

MoNITOR 

## CONCEPT AND DEFINITION

### Concept

The first 28 days of life is a vulnerable time for child survival and an estimated 2.4 (uncertainty interval: 2.3, 2.7) million newborns died in 2019 (1). Although progress has been made since 1990, neonatal mortality and morbidity remains a challenge in low- and middle-income countries where there is poor health system infrastructure and critical shortages of health personnel who are able to adequately manage and provide quality care (1,2). Children face the highest risk of dying in their first month of life and the neonatal period accounts for a large proportion of child deaths. An analysis conducted by the WHO Department of Information, Evidence and Research and the Maternal and Child Epidemiology Estimation (MCEE) group found that the main causes of neonatal mortality are due to preterm birth and intrapartum complications, and due to infections, including sepsis, meningitis and pneumonia (3). With appropriate and timely access to evidence-based interventions and health services, these causes of newborn death could be prevented.

The Sustainable Development Goal (SDG) agenda highlights the importance of continued momentum towards improving newborn health by setting, under SDG 3, targets aiming for all countries to reduce neonatal mortality to at least as low as 12 per 1000 live births by 2030 (4,5). The neonatal mortality rate (NMR) can be considered a measure of overall development and directly reflects prenatal, intrapartum and neonatal care. In order to achieve these targets, accurate cause-of-death information is needed to identify how, where, when and why newborns are dying, and to plan, implement and evaluate targeted decision-making and adequate allocation of resources. The use of standard definitions for neonatal death and causes of death is critical for case ascertainment. WHO applies the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10) to deaths during the perinatal period – ICD-PM – which provides a framework for the consistent collection, analysis and interpretation of neonatal deaths (6). Ending preventable maternal mortality will also facilitate the progress towards newborn mortality targets (7).

### Definition

Percentage of neonatal deaths (death on day 0–27 of life) of a specified cause for a specified time period (using ICD-PM) expressed as a percentage of all maternal deaths.

**Unit of measurement:** Percentage (%) by cause of death

**Level of indicator use:** Global, national and subnational (first or second administrative level)

**Monitoring and evaluation framework:** Impact

**Domain:** Mortality

**Continuum of care:** Postnatal

# MEASUREMENT GUIDANCE

## Data sources

There are three main data sources for this indicator:

- a. Civil registration and vital statistics (CRVS) and other routine national surveillance systems
- b. Routinely collected administrative data
- c. Population-based household surveys.

## Civil registration and vital statistics systems

A well-functioning and integrated national or subnational CRVS system will universally register and certify vital events, including live births, stillbirths and deaths that occur in the country or administrative area. Birth and death certificates should be issued as part of the CRVS system, allowing the compilation, analysis and dissemination of information through vital statistics agencies, including population characteristics (e.g. sex, date of birth or death, place of birth or death, place of usual residence) and cause-of-death information. Some CRVS systems will also register and certify other important vital events within the population, such as adoptions, marriages and divorces (8).

Data from CRVS are the preferred data source for this indicator when the system freely and universally records vital events, issues medical certification of cause of death, and the data are recorded in a systematic manner that ensures high data quality for both the public and private health sectors and regardless of location of death (e.g. health facility or community-based births and deaths).

**Key source of data:** The main source of data from this indicator involves several steps and varies based on the policies and procedures of the national or subnational CRVS or other routine system within health facilities and/or within communities. Declaration of neonatal death events are obtained through: (a) forms completed by health personnel at health facilities; or (b) community-based sources, including death registration forms. Either paper or electronic forms containing this information are then submitted to the relevant civil authorities or vital statistics agencies, which have the responsibility to officially record the neonatal death and characteristics, such as name, date and place of birth, nationality, place of death and cause of death. At the national or subnational level, the civil authority or vital statistics agency issues death certificates. The use of standardized definitions using the ICD-PM is important for consistent cause-of-death information (6). National or subnational civil authorities or vital statistics agencies are responsible for reporting of this indicator.

**Indicator definition and calculation:** The indicator is calculated as the number of neonatal deaths (children who died during the first 28 days of life) of a specified cause (using ICD-PM) during a specified time period expressed as a percentage of all neonatal deaths during the same time period.

*Numerator:* The number of children who died during the first 0–27 days of life from a specified cause during a specified period.

*Denominator:* Total number of neonatal deaths during the same time period.

The indicator should be calculated for the main causes of death among children who died in the first 28 days of life.

**Frequency of measurement:** Within CRVS systems, this indicator is generally monitored at a national or subnational level on an annual basis. The data can be compiled and aggregated subnationally to provide national-level data.

**Disaggregation:** By timing of death (early neonatal death = 0 to 6 days; late neonatal death = 7 to 27 days), gestational age in weeks and days, birthweight, sex, place of birth, place of residence (e.g. urban, rural) and type of reporting source (e.g. health facility, community).

**Missing values:** Missing values are usually not known.

#### Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/records or registers and are entered into national and/or subnational health information systems:

- Health information management system (HMIS) and/or
- District Health Information Management System (DHIS2).

Data from health information systems may collect information on the number of children who died by cause in the first 28 days of life. Routinely collected administrative data and health facility statistics are the preferred data source in settings where the CRVS is non-functioning and there is a high utilization of health facility services and data are recorded in a manner that ensures good data quality for both the public and private health sectors. However, cause of death may or may not be available in administrative data sources, so linkages with other data sources and medical chart review and data abstraction may need to be done to identify cause-of-death information.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from obstetric and neonatal medical records. Relevant information is recorded about the fetal/newborn status at the time of delivery – including live births for all newborns delivered at health facilities – on paper forms completed

by health personnel and/or through an electronic medical record. Admissions, re-admissions, or transfers of care within the first 28 days of life are captured in a similar manner, which would be the source of capturing neonatal deaths occurring from 0 to 27 days of birth. Data from paper or electronic sources are ideally entered or abstracted into a database or registry and are compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for the reporting of this indicator.

**Indicator and calculation:** The indicator is calculated as the number of neonatal deaths (children who died during the first 28 days of life) of a specified cause (using ICD-PM) expressed as a percentage of all neonatal deaths in health facilities during the same time period.

*Numerator:* The number of children who died during the first 28 days of life by a specified cause in health facilities during a specified period.

*Denominator:* Total number of neonatal deaths in health facilities during the same time period.

The indicator should be calculated for the main causes of death among children who died in the first 28 days of life.

**Frequency of measurement:** The indicator can be calculated on an annual basis or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on facility, subnational and national processes for data entry, compilation and analysis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Monthly, quarterly, or as needed based on the country and/or facility need
- *Subnational (first and second administrative) level:* Monthly or quarterly
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By timing of death (early neonatal death = 0 to 6 days; late neonatal death = 7 to 27 days), gestational age in weeks and days, birthweight, sex, place of birth, level of facility and place of residence (e.g. urban, rural).

**Missing values:** Missing values or deaths occurring outside of health facilities are usually not known or not reported.

### Population-based household surveys

The main source of data for this indicator has been through population-based household surveys collected through nationally or subnationally representative and statistically sound questionnaires, such as:

- Demographic Health Surveys (DHS) (9)
- Multiple Indicator Cluster Surveys (MICS) (10)
- Other household surveys with a similar methodological design.

Population-based household survey data are the preferred data source in settings without an established CRVS system and where there is a low utilization of health facility services or where private health sector data are excluded from routinely collected administrative data sources.

**Key source of data:** Eligible women of reproductive age (15–49 years) are identified in the household survey for inclusion and interviewing using an individual women’s questionnaire. Women are considered eligible for survey interview if they are either usual residents or visitors of the household who stayed there the night before the interview.

Calculations for this indicator are based on having the interviewer complete a full birth history, whereby eligible women are asked to report the names and relevant information for all live births they have had in their lifetime.<sup>1</sup> The birth history does not include stillbirths, miscarriages, or abortions. For each of the children the woman has given birth to, they are asked to record in chronological order from first to last birth: the sex (male or female), multiple births (singleton or multiple), the date of birth (day, month and year), if the child is currently alive (yes or no), and if no longer alive, the age at death in days, months, or years.

For children that are no longer alive at the time of the interview, women are asked the question “*How old was (NAME) when (he/she) died?*” A probing question is asked to determine the age of death by asking “*Exactly how many [days, months, or years] old was (NAME) when (he/she) died?*”

The MoH and NSO typically conduct household surveys and compile, analyse and report the results for this indicator in collaboration with the survey programme (e.g. DHS, or other survey) and funding agency.

**Indicator definition and calculation:** Individual women of reproductive age (15–49 years old) are asked about the total number of live births they have had in their lifetime and for children that are no longer living, the age at death. Generally, only those births that took place in the five years preceding the survey should be included. The definition is as follows:

<sup>1</sup> In some instances, a shortened birth history may be implemented in the survey in order to calculate the list of all live births during a specified time period, usually five years prior to the date of the survey interview.

The percentage of children who died at age 0–27 days after birth expressed as a percentage of the total number of live births in the same period. The indicator consists of the following numerator and denominator:

*Numerator:* The number of children who died at age 0–27 days after birth in the five years prior to survey completion.

*Denominator:* Total number of live births in the five years prior to survey completion.

This indicator identifies neonatal deaths as a proportion of all live births because cause-of-death information is not captured in household surveys.

**Frequency of measurement:** Household surveys are typically conducted every 3–5 years.

**Disaggregation at population level:** Socioeconomic status (e.g. education, wealth quintile), age of woman at the time of interview, place of residence (e.g. urban, rural).

**Missing values:** Missing values are not allowed for any of the variables that make up the rate. In particular, the date of interview and the age of death would be key for calculation of this indicator.

# INTERPRETATION AND USE

## Interpretation

Universal, accurate and timely death registration and cause-of-death information is important to facilitate health systems planning and provision of health services delivery (11). Neonatal cause-of-death indicators help programme management at global, national and subnational levels by monitoring and evaluating whether safe motherhood and maternal and newborn health programmes are on target for reducing neonatal mortality. In addition, data on neonatal causes of death can act as a measure of the health system's functioning and its potential to provide adequate and quality care to neonates. Ultimately, accurate ascertainment and review of the causes of death is a means to identify opportunities for prevention in order to eliminate all future preventable neonatal deaths (4). Neonatal mortality rates are very sensitive to the quality of data and therefore assessing data quality and sources is essential when interpreting this indicator. Mortality rates among young children are a key indicator for child health and well-being, and more broadly, for social and economic development. This indicator can be used to inform health systems planning and policy and the allocation of funds and resources for programmes and interventions aimed at improving maternal, newborn and child health and survival.

## Common challenges

The quality of reporting of this indicator varies greatly between and within countries, particularly in countries without effective civil registration systems in place. Many countries lack a single source of high-quality data covering the last several decades. Data from different sources require different calculation methods and may suffer from different errors – for example, random errors in sample surveys or systematic errors due to misreporting. As a result, different surveys often yield different estimates of neonatal mortality for a given time period, and available data collected by countries are often inconsistent across sources.

## Civil registration and vital statistics systems

Death registration for all neonatal deaths that includes cause-of-death information should be part of a national and/or subnational CRVS system. However, CRVS systems are either non-existent and/or the complete coverage, accuracy and timeliness of civil registration systems is a major issue in many countries worldwide. In order to assess the completeness of the CRVS system, evaluations should be conducted to ascertain the quality of the system, as recommended by the United Nation's revised Principles and Recommendations for a Vital Statistics System (8).

As a result, it is common for live births to be unregistered, particularly for neonatal deaths occurring shortly after birth. This may be due to lack of a legal framework within civil authorities or vital statistics agencies requiring registration for all births, regardless of the outcome. Even in countries with functional CRVS systems and

legal frameworks in place, missing or unregistered births still occur due to health professionals and/or parents not knowing about the requirement to register both the live birth in addition to the death, in the instance of neonatal death.

#### Data collected from administrative and other routine data systems

Administrative data may suffer from poor quality such as irregularities in report generation, data duplication and inconsistencies (12). Reporting challenges exist at the facility level given data quality issues, including incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system or inadequate system design.

Many HMIS databases or registries are event-based and only births and deaths that occur in health facilities are included. Administrative data should be interpreted with caution in settings where data quality is poor and the percentage of births at public and private sector health facilities is low, or where data from the private health sector is not compiled within the HMIS reporting.

In settings where routine HMIS data lack information on pregnancies and/or births or deliveries that occur outside the public sector – for example, in homes, in the community, or in private sector facilities – the total number of births in the HMIS should not serve to estimate the denominator for this indicator. Where data on the total numbers of live births for the entire population for the denominator are unavailable, evaluators can calculate total estimated live births using census data for the total population and crude birth rates in a specified area (total expected live births = estimated population x the total crude birth rate).

#### Data collected through household surveys

The systematic recording of live births, stillbirths and deaths in many countries remains a serious challenge. In the absence of reliable CRVS systems or administrative data, household surveys have recently become the source of data to monitor levels and trends of stillbirths. In many low- and middle-income countries, such surveys represent the sole source of this information. However, in many cultures and countries in the world the appropriateness of asking about stillborn infants is very sensitive and accuracy of reporting these events in household surveys is compromised due to difficulty in disclosure and also the complexity of probing to be able to properly identify the difference between a live birth, stillbirth (fetal death) and neonatal death.

## GLOBAL MONITORING

### Global database

Neonatal causes of death by country are monitored and tracked by the United Nations Inter-agency Group for Child Mortality Estimation (UN IGME). Nationally representative estimates of neonatal mortality are derived from several different sources, including civil registration and sample surveys. Demographic surveillance sites and hospital data are excluded as they are rarely nationally representative. The preferred source of data is a civil registration system that records births and deaths on a continuous basis. If registration is complete and the system functions efficiently, the resulting estimates will be accurate and timely. However, many low- and middle-income countries do not have well-functioning CRVS systems, and household surveys, such as the MICS supported by the United Nations Children's Fund (UNICEF), the DHS supported by the United States Agency for International Development (USAID), and periodic population censuses have become the primary sources of data on mortality among children under age 5, including newborns. UN IGME estimates are based on nationally representative data from censuses, surveys, or vital registration systems. UN IGME does not use any covariates to derive its estimates; it only applies a curve fitting method to good-quality empirical data to derive trend estimates after data quality assessment (3,4). More information about the data repository for neonatal mortality estimates by country can be found at: <http://www.childmortality.org/> and <https://data.unicef.org/topic/child-survival/neonatal-mortality/>.

### Key initiatives

Countdown to 2030 – Women's, Children's and Adolescents' Health: <http://countdown2030.org/>

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Reference List of 100 Core Health Indicators (plus health-related SDGs), 2018: <https://www.who.int/healthinfo/indicators/2018/en/>

Global Strategy for Women's, Children's and Adolescents' Health (2016–2030): <http://www.who.int/life-course/partners/global-strategy/en/>

United Nations Sustainable Development Goals (SDGs): <https://sustainabledevelopment.un.org>

## ADDITIONAL RESOURCES

Global Health Observatory (GHO) Data – World Health Statistics: [http://www.who.int/gho/publications/world\\_health\\_statistics/en/](http://www.who.int/gho/publications/world_health_statistics/en/)

Making Every Baby Count: Audit and review of stillbirths and neonatal deaths: [http://www.who.int/maternal\\_child\\_adolescent/documents/stillbirth-neonatal-death-review/en](http://www.who.int/maternal_child_adolescent/documents/stillbirth-neonatal-death-review/en)

MEASURE Evaluation: Family Planning and Reproductive Health Indicators Database: Neonatal mortality rate (NMR): [https://www.measureevaluation.org/prh/rh\\_indicators/womens-health/nb/neonatal-mortality-rate-nmr](https://www.measureevaluation.org/prh/rh_indicators/womens-health/nb/neonatal-mortality-rate-nmr)

Sustainable Development Goals (SDGs) Indicators – Metadata repository: <https://unstats.un.org/sdgs/metadata/>

The WHO application of ICD-10 to deaths during the perinatal period: ICD-PM: <https://apps.who.int/iris/bitstream/handle/10665/249515/9789241549752-eng.pdf>

UNICEF Data: Monitoring the Situation of Children and Women: Neonatal mortality: <https://data.unicef.org/topic/child-survival/neonatal-mortality/>

UNICEF – Multiple Indicator Cluster Surveys: <http://mics.unicef.org/tools>

The DHS Program: <https://dhsprogram.com>

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Indicator Sheet

# NEONATAL MORTALITY RATE

MoNITOR 

## CONCEPT AND DEFINITION

### Concept

The first 28 days of life is a vulnerable time for child survival and an estimated 2.4 (uncertainty interval: 2.3, 2.7) million newborns died in 2019 (1). Although progress has been made since 1990, neonatal mortality remains a challenge in low- and middle-income countries (LMIC) where there are poor health system infrastructure and critical shortages of health personnel who are able to adequately manage and provide quality care (1,2). An analysis conducted by the WHO Department of Information, Evidence and Research and the Maternal and Child Epidemiology Estimation (MCEE) group found that the main causes of neonatal mortality are due to preterm birth and intrapartum complications, and due to infections, including sepsis, meningitis and pneumonia (3). The Sustainable Development Goal (SDG) agenda highlights the importance of continued momentum towards improving newborn health by setting, under SDG 3, targets aiming for all countries to reduce neonatal mortality to at least as low as 12 per 1000 live births by 2030 (4,5). The neonatal mortality rate (NMR) can be considered a measure of overall development and directly reflects prenatal, intrapartum and neonatal care. Children face the highest risk of dying in their first month of life and the neonatal period accounts for a large proportion of child deaths.

### Definition

Probability that a child born in a specific year or period will die during the first 28 completed days of life if subject to age-specific mortality rates of that period, expressed per 1000 live births. Neonatal deaths (deaths among live births during the first 28 completed days of life) may be subdivided into early neonatal deaths, occurring during the first seven days of life, and late neonatal deaths, occurring after the seventh day but before the 28th completed day of life (6).

The number of children who died during the first 28 days of life is expressed as a rate per 1000 live births (6).

**Unit of measurement:** Rate

**Level of indicator use:** Population-based global, national and subnational (first or second administrative level)

**Monitoring and evaluation framework:** Impact

**Domain:** Mortality

**Continuum of care:** Postnatal

# MEASUREMENT GUIDANCE

## Data sources

The three main data sources for this indicator are:

- a. Civil registration and vital statistics (CRVS) systems
- b. Routinely collected administrative data
- c. Population-based household surveys.

## Civil registration and vital statistics systems

A well-functioning and integrated national or subnational CRVS system will universally register and certify vital events, including live births, stillbirths and deaths that occur in the country or administrative area. Birth and death certificates should be issued as part of the CRVS system, allowing the compilation, analysis and dissemination of information through vital statistics agencies, including population characteristics (e.g. sex, date of birth or death, place of birth or death, place of usual residence) and cause-of-death information. Some CRVS systems will also register and certify other important vital events within the population, such as adoptions, marriages and divorces (7).

Data from CRVS are the preferred data source for this indicator when the system freely and universally records vital events and data are recorded in a systematic manner that ensures high data quality for both the public and private health sectors and regardless of location of birth (e.g. health facility or community-based births and deaths are captured).

**Key source of data:** The main source of data from this indicator involves several steps and varies based on the policies and procedures of the national or subnational CRVS or other routine system within health facilities and/or within communities. Declaration of the live birth or death events are obtained through: (a) forms completed by health personnel at health facilities; or (b) community-based sources, including registration forms submitted directly by the parents of the live birth and death. Either paper or electronic forms containing this information are then submitted to the relevant civil authorities or vital statistics agencies, which have the responsibility to officially record the birth and death event and issue information about the birth and death characteristics, such as name, date and place of birth, date and place of death, nationality and names of the mother and/or father. At the national or subnational level, the civil authority or vital statistics agency issues birth and death certificates to formalize the birth and registration, respectively. National or subnational civil authorities or vital statistics agencies are responsible for reporting live births and death information specific to this indicator.

**Indicator definition and calculation:** The indicator is the probability that a child born in a specific year or period will die in the first 28 days of life (0–27 days) if subject to age-specific mortality rates of that period, expressed per 1000 live births. It is calculated as the number of neonatal deaths (children who died during the first 28 days of life) per 1000 live births during a specified time period.

*Numerator:* The number of children who died 0–27 days after birth in a specified period.

*Denominator:* Total number of live births (per 1000) in a specified time period.

To compute the rate per 1000 births, the numerator is divided by the denominator and multiplied by 1000.

**Frequency of measurement:** Within CRVS systems, this indicator is generally monitored at a national or subnational level on an annual basis. The data can be compiled and aggregated subnationally to provide national-level data.

**Disaggregation:** By timing of death (early neonatal death = 0 to 6 days; late neonatal death = 7 to 27 days), gestational age in weeks and days, birthweight, sex, place of birth, place of residence (e.g. urban, rural) and type of reporting source (e.g. health facility, community).

**Missing values:** Missing values are usually not known. To ascertain missing data, estimates of the total number of live births in a country or administrative area can be compared with the absolute number of live births in the same period.

#### Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/records or registers and are entered into national and/or subnational health information systems:

- Health information management system (HMIS) and/or
- District Health Information Management System (DHIS2).

Data from health information systems may collect information on neonatal deaths among all live births in a health facility. Routinely collected administrative data and health facility statistics are the preferred data source in settings without an established CRVS system and when there is a high utilization of health facility services and data are recorded in a manner that ensures good data quality for both the public and private health sectors.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from obstetric and neonatal medical records. Relevant information is recorded about the fetal/

newborn status at the time of delivery – including live births for all newborns delivered at health facilities – on paper forms completed by health personnel and/or through an electronic medical record. Admissions, re-admissions, or transfers of care within the first 28 days of life are captured in a similar manner, which would be the source of capturing neonatal deaths occurring from 0 to 27 days of birth. Data from paper or electronic sources are ideally entered or abstracted into a database or registry and are compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for the reporting of this indicator.

**Indicator and calculation:** The indicator is calculated as the number of newborns who died during the first 28 days (0–27 days) of life per 1000 live births in health facilities during a specified time period.

*Numerator:* Number of newborns who died during the first 28 days (0–27 days) of life in health facilities during a specified time period.

*Denominator:* Total number of live births in health facilities during a specified time period.

To compute the rate per 1000 births, the numerator is divided by the denominator and multiplied by 1000.

**Frequency of measurement:** The indicator can be calculated on an annual basis or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on facility, subnational and national processes for data entry, compilation and analysis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Monthly, quarterly, or as needed based on the country and/or facility need
- *Subnational (first and second administrative) level:* Monthly or quarterly
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By timing of death (early neonatal death = 0 to 6 days; late neonatal death = 7 to 27 days), gestational age in weeks and days, birthweight, sex, place of birth, level of facility and place of residence (e.g. urban, rural).

**Missing values:** Missing values or deaths occurring outside of health facilities are usually not known or not reported.

## Population-based household surveys

The main source of data for this indicator has been through population-based household surveys collected through nationally or subnationally representative and statistically sound questionnaires, such as:

- Demographic Health Surveys (DHS) (8)
- Multiple Indicator Cluster Surveys (MICS) (9)
- Reproductive Health Surveys (RHS)
- Other household surveys with a similar methodological design.

Population-based household survey data are the preferred data source in settings without an established CRVS system and where there is a low utilization of health facility services or where private health sector data are excluded from routinely collected administrative data sources.

**Key source of data:** Eligible women of reproductive age (15–49 years) are identified in the household survey for inclusion and interviewing using an individual women’s questionnaire. Women are considered eligible for survey interview if they are either usual residents or visitors of the household who stayed there the night before the interview.

Calculations for this indicator are based on having the interviewer complete a full birth history, whereby eligible women are asked to report the names and relevant information for all live births they have had in their lifetime.<sup>1</sup> The birth history does not include stillbirths, miscarriages, or abortions. For each of the children the woman has given birth to, they are asked to record in chronological order from first to last birth: the sex (male or female), multiple births (singleton or multiple), the date of birth (day, month and year), if the child is currently alive (yes or no), and if no longer alive, the age at death in days, months, or years.

For children that are no longer alive at the time of the interview, women are asked the question “*How old was (NAME) when (he/she) died?*” A probing question is asked to determine the age of death by asking “*Exactly how many [days, months, or years] old was (NAME) when (he/she) died?*”

The MoH and NSO typically conduct household surveys and compile, analyse and report the results for this indicator in collaboration with the survey programme (e.g. DHS, or other survey) and funding agency.

<sup>1</sup> In some instances, a shortened birth history may be implemented in the survey in order to calculate the list of all live births during a specified time period, usually five years prior to the date of the survey interview.

**Indicator definition and calculation:** Individual women of reproductive age (15–49 years old) are asked about the total number of live births they have had in their lifetime and for children that are no longer living, the age at death. Generally, only those births that took place in the five years preceding the survey should be included. The definition is as follows:

The percentage of children who died at age 0–27 days after birth expressed as a percentage of the total number of live births in the same period. The indicator consists of the following numerator and denominator:

*Numerator:* The number of children who died at age 0–27 days after birth in the five years prior to survey completion.

*Denominator:* Total number of live births in the five years prior to survey completion.

This indicator identifies neonatal deaths as a proportion of all live births because cause-of-death information is not captured in household surveys.

**Frequency of measurement:** Household surveys are typically conducted every 3–5 years.

**Disaggregation at population level:** Socioeconomic status (e.g. education, wealth quintile), age of woman at the time of interview, place of residence (e.g. urban, rural).

**Missing values:** Missing values are not allowed for any of the variables that make up the rate. In particular, the date of interview and the age of death would be key for calculation of this indicator.

## INTERPRETATION AND USE

### Interpretation

Neonatal mortality rates are very sensitive to the quality of data and therefore assessing data quality and sources is essential when interpreting this indicator. Mortality rates among young children are a key indicator for child health and well-being, and more broadly, for social and economic development. This indicator can be used to inform health systems planning and policy and the allocation of funds and resources for programmes and interventions aimed at improved maternal, newborn and child health and survival. However, neonatal deaths are poorly captured and more likely not to be accurately accounted for. The use of standard definitions for neonatal cause of death and accurate and timely classification of these deaths is critical for case ascertainment and global comparability. WHO applies the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10) to deaths during the perinatal period – ICD-PM – which provides a framework for the consistent collection, analysis and interpretation of neonatal deaths (10).

### Common challenges

The quality of reporting of this indicator varies greatly between and within countries, particularly in countries without effective civil registration systems in place. Many countries lack a single source of high-quality data covering the last several decades. Data from different sources require different calculation methods and may suffer from different errors – for example, random errors in sample surveys or systematic errors due to misreporting. As a result, different surveys often yield different estimates of neonatal mortality for a given time period, and available data collected by countries are often inconsistent across sources.

### Civil registration and vital statistics systems

Birth and death registration should be part of a national and/or subnational CRVS system. However, CRVS systems are either non-existent and/or the complete coverage, accuracy and timeliness of civil registration systems is a major issue in many countries worldwide. In order to assess the completeness of the CRVS system, evaluations should be conducted to ascertain the quality of the system, as recommended by the United Nation's revised Principles and Recommendations for a Vital Statistics System (7).

As a result, it is common for live births to be unregistered, particularly for neonatal deaths occurring shortly after birth. This may be due to lack of a legal framework within civil authorities or vital statistics agencies requiring registration for all births, regardless of the outcome. Even in countries with functional CRVS systems and legal frameworks in place, missing or unregistered births still occur due to health professionals and/or parents not knowing about the requirement to register both the live birth in addition to the death, in the instance of neonatal death.

### Data collected from administrative and other routine data systems

Administrative data may suffer from poor quality such as irregularities in report generation, data duplication and inconsistencies (11). Reporting challenges exist at the facility level given data quality issues, including incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system or inadequate system design.

Many HMIS databases or registries are event-based and only births and deaths that occur in health facilities are included. Administrative data should be interpreted with caution in settings where data quality is poor and the percentage of births at public and private sector health facilities is low, or where data from the private health sector is not compiled within the HMIS reporting.

In settings where routine HMIS data lack information on pregnancies and/or births or deliveries that occur outside the public sector – for example, in homes, in the community, or in private sector facilities – the total number of births in the HMIS should not serve to estimate the denominator for this indicator. Where data on the total numbers of live births for the entire population for the denominator are unavailable, evaluators can calculate total estimated live births using census data for the total population and crude birth rates in a specified area (total expected live births = estimated population x the total crude birth rate).

### Data collected through household surveys

The systematic recording of live births, stillbirths and deaths in many countries remains a serious challenge. In the absence of reliable CRVS systems or administrative data, household surveys have recently become the source of data to monitor levels and trends of stillbirths. In many low- and middle-income countries, such surveys represent the sole source of this information. However, in many cultures and countries in the world the appropriateness of asking about stillborn infants is very sensitive and accuracy of reporting these events in household surveys is compromised due to difficulty in disclosure and also the complexity of probing to be able to properly identify the difference between a live birth, stillbirth (fetal death) and neonatal death.

## GLOBAL MONITORING

Neonatal causes of death by country are monitored and tracked by the United Nations Inter-agency Group for Child Mortality Estimation (UN IGME). Nationally representative estimates of neonatal mortality are derived from several different sources, including civil registration and sample surveys. Demographic surveillance sites and hospital data are excluded as they are rarely nationally representative. The preferred source of data is a civil registration system that records births and deaths on a continuous basis. If registration is complete and the system functions efficiently, the resulting estimates will be accurate and timely. However, many low- and middle-income countries do not have well-functioning CRVS systems, and household surveys, such as the MICS supported by the United Nations Children's Fund (UNICEF), the DHS supported by the United States Agency for International Development (USAID), and periodic population censuses have become the primary sources of data on mortality among children under age 5, including newborns. UN IGME estimates are based on nationally representative data from censuses, surveys, or vital registration systems. UN IGME does not use any covariates to derive its estimates; it only applies a curve fitting method to good-quality empirical data to derive trend estimates after data quality assessment (1). More information about the data repository for neonatal mortality estimates by country can be found at: <http://www.childmortality.org/> and <https://data.unicef.org/topic/child-survival/neonatal-mortality/>.

### Key initiatives

Countdown to 2030 – Women's, Children's, and Adolescents' Health: <http://countdown2030.org/>

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Reference List of 100 Core Health Indicators (plus health-related SDGs), 2018: <https://www.who.int/healthinfo/indicators/2018/en/>

Global Strategy for Women's, Children's, and Adolescent's Health (2016-2030): <http://www.who.int/life-course/partners/global-strategy/en/>

United Nations Sustainable Development Goals (SDGs): <https://sustainabledevelopment.un.org>

## ADDITIONAL RESOURCES

Global Health Observatory (GHO) Data – World Health Statistics: [http://www.who.int/gho/publications/world\\_health\\_statistics/en/](http://www.who.int/gho/publications/world_health_statistics/en/)

Making Every Baby Count: Audit and review of stillbirths and neonatal deaths: [http://www.who.int/maternal\\_child\\_adolescent/documents/stillbirth-neonatal-death-review/en](http://www.who.int/maternal_child_adolescent/documents/stillbirth-neonatal-death-review/en)

MEASURE Evaluation: Family Planning and Reproductive Health Indicators Database: Neonatal mortality rate (NMR): [https://www.measureevaluation.org/prh/rh\\_indicators/womens-health/nb/neonatal-mortality-rate-nmr](https://www.measureevaluation.org/prh/rh_indicators/womens-health/nb/neonatal-mortality-rate-nmr)

Sustainable Development Goals (SDGs) Indicators – Metadata repository: <https://unstats.un.org/sdgs/metadata/>

The WHO application of ICD-10 to deaths during the perinatal period: ICD-PM: <https://apps.who.int/iris/bitstream/handle/10665/249515/9789241549752-eng.pdf>

UNICEF Data: Monitoring the Situation of Children and Women: Neonatal mortality: <https://data.unicef.org/topic/child-survival/neonatal-mortality/>

UNICEF – Multiple Indicator Cluster Surveys: <http://mics.unicef.org/tools>

The DHS Program: <https://dhsprogram.com>

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Indicator Sheet

# **NEWBORN RESUSCITATION WITH BAG AND MASK**

**MoNITOR** 

## CONCEPT AND DEFINITION

### Concept

The first 28 days of life is a vulnerable time for child survival and an estimated 2.4 (uncertainty interval: 2.3, 2.7) million newborns died in 2019 (1). Although progress has been made since 1990, neonatal mortality and morbidity remains a challenge in low- and middle-income countries where there are poor health system infrastructure and critical shortages of health personnel who are able to adequately manage and provide quality care (1,2). Approximately 90% of newborns make a smooth transition into the world; however, the remaining may need assistance with breathing and require basic newborn resuscitation (3). In the instance that a newborn does not breathe or cry spontaneously at birth, basic newborn resuscitation consists of stimulation and positive pressure ventilation (PPV) with bag and mask. A very small proportion of newborns (< 1%) may require more comprehensive newborn resuscitation measures, such as chest compressions, medications and/or intubation (3). Highly skilled and trained health personnel are required to perform more comprehensive newborn resuscitation. As a result, programmes such as Helping Babies Breathe® have been implemented in several countries worldwide to train health personnel in low- and middle-income countries on newborn resuscitation, including the appropriate and timely use of stimulation and/or bag and mask ventilation (4). Timely access and appropriate delivery of newborn resuscitation is part of an essential set of evidence-based interventions aimed at global reductions in neonatal mortality and morbidity.

### Definition

The number of newborns not breathing/crying spontaneously within the first minute after birth for whom additional resuscitation actions (stimulation and bag and mask) were taken during a specified reference period is expressed as a percentage of the total number of live births<sup>1</sup> in the same period (4).

**Unit of measurement:** Percentage (%)

**Level of indicator use:** Health facility-based at national and subnational level (first or second administrative level)

**Monitoring and evaluation framework:** Outcome

**Domain:** Service coverage

**Continuum of care:** Postnatal

<sup>1</sup> There is ongoing work to test different denominators for treatment of newborn complications. Additional guidance on appropriate denominators will be made available in future versions of this tool. Different denominators being tested include: (a) total number of live births in the facility; (b) total births in the facility (including stillbirths); (c) target population for coverage (i.e. including fresh stillbirths as a surrogate of intrapartum stillbirths).

# MEASUREMENT GUIDANCE

## Data sources

The main data source for this indicator is routinely collected administrative data.

### Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/records or registers and are entered into national and/or subnational health management information systems (HMIS).

Data from health information systems may collect information on newborn resuscitation immediately after birth among all newborns who were born at a health facility. Routinely collected administrative data and health facility statistics are the preferred data source in settings with a high utilization of health facility services and data are recorded in a manner that ensures good data quality for both the public and private health sectors. The compiled data in the national HMIS or District Health Information System (DHIS2) should include data from both public and private health sectors, especially when the private sector is a substantial source of service provision to the population. In settings where utilization of health facilities is not high (e.g. settings with a high prevalence of births occurring at home), data may suffer from incompleteness if information about women delivering outside facilities is not captured. In addition, there are often challenges in accurately measuring the numerator and the denominator when routine HMIS data are used to measure this indicator.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from obstetric and neonatal medical records, including health services registers. Relevant information is recorded by health personnel on paper forms and/or through an electronic medical record. Information on interventions performed during birth would need to be captured in the medical chart, related to additional stimulation and administration of bag and mask ventilation for calculation of this indicator. Data from paper or electronic sources are entered or abstracted into a database or registry and are compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for the reporting of this indicator.

**Indicator and calculation:** The indicator is calculated as the number of newborns who were not breathing spontaneously or crying at birth for whom resuscitation (stimulation and/or bag and mask) was initiated in the facility expressed as a percentage of all live births in health facilities during the same time period.

**Numerator:** The number of newborns who were not breathing spontaneously or crying at birth and, subsequently, required

resuscitation (stimulation and/or bag and mask) to be performed during a specified period.

*Denominator:* Total number of live births in facility during the same time period.

Of note, there is ongoing work to test different denominators for treatment of newborn complications. Additional guidance on appropriate denominators will be made available in future versions of this tool. Different denominators being tested include: (a) total number of live births in the facility; (b) total births in the facility (including stillbirths); (c) target population for coverage (i.e. including fresh stillbirths as a surrogate of intrapartum stillbirths).

**Frequency of measurement:** The indicator can be calculated on an annual basis or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on facility, subnational and national processes for data entry, compilation and analysis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Monthly, quarterly, or as needed based on the country and/or facility need
- *Subnational (first and second administrative) level:* Monthly or quarterly
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By sex, duration of ventilation (in minutes), level of facility and location of facility (e.g. urban, rural).

**Missing values:** Missing values are usually not known or not reported.

# INTERPRETATION AND USE

## Interpretation

The neonatal period presents opportunities for reaching neonates with interventions that may be vital to newborn health and survival. Adequate resuscitative efforts and action with a bag and mask on newborns that are not born breathing/crying at the time of birth is critical to preventing neonatal mortality.

The purpose of this indicator is to monitor and track the proportion of neonates who received resuscitation actions (stimulation and bag and mask), and is a proxy measure of the health system's functioning and its potential to provide adequate and quality care to neonates. Complementary indicators would also include measurement of health facility readiness to perform newborn resuscitation (e.g. functional equipment, supplies, medicines and trained health personnel) and the neonatal mortality rates by cause of death to ascertain whether or not the burden of neonatal deaths from asphyxia is being simultaneously reduced. This indicator can be used to inform health systems planning and policy and the allocation of funds and resources for programmes and interventions aimed at improving newborn health and survival.

## Common challenges

Data collected from administrative and other routine data systems

Administrative data may suffer from poor quality such as irregularities in report generation, data duplication and inconsistencies (5).

Reporting challenges exist at the facility level given data quality issues, including incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system or inadequate system design. Collection of data for this indicator is also reliant on the inclusion of newborn resuscitation on the patient medical record and, if so, that the clinical documentation is entered into the registry to database system for national or subnational monitoring and evaluation.

Many HMIS databases or registries are event-based and only births that occur in health facilities are included. Administrative data should be interpreted with caution in settings where data quality is poor and the percentage of births at public and private sector health facilities is low, or where data from the private health sector is not compiled within the HMIS reporting.

## GLOBAL MONITORING

There is currently no global database responsible for monitoring and tracking progress of the percentage of newborns not breathing/crying spontaneously at birth for whom additional resuscitation actions (stimulation and/or bag and mask) were taken.

Neonatal causes of death by country are monitored and tracked by the United Nations Inter-agency Group for Child Mortality Estimation (UN IGME). More information about the data repository for neonatal mortality estimates by country can be found at: <http://www.childmortality.org/> and <https://data.unicef.org/topic/child-survival/neonatal-mortality/>.

### Key initiatives

Countdown to 2030 – Women’s, Children’s and Adolescents’ Health: <http://countdown2030.org/>

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Reference List of 100 Core Health Indicators (plus health-related SDGs), 2018: <https://www.who.int/healthinfo/indicators/2018/en/>

Global Strategy for Women’s, Children’s and Adolescents’ Health (2016–2030): <http://www.who.int/life-course/partners/global-strategy/en/>

United Nations Sustainable Development Goals (SDGs): <https://sustainabledevelopment.un.org>

## ADDITIONAL RESOURCES

Global Health Observatory (GHO) Data – World Health Statistics: [http://www.who.int/gho/publications/world\\_health\\_statistics/en/](http://www.who.int/gho/publications/world_health_statistics/en/)

Making Every Baby Count: Audit and review of stillbirths and neonatal deaths: [http://www.who.int/maternal\\_child\\_adolescent/documents/stillbirth-neonatal-death-review/en](http://www.who.int/maternal_child_adolescent/documents/stillbirth-neonatal-death-review/en)

MEASURE Evaluation: Family Planning and Reproductive Health Indicators Database: Neonatal mortality rate (NMR): [https://www.measureevaluation.org/prh/rh\\_indicators/womens-health/nb/neonatal-mortality-rate-nmr](https://www.measureevaluation.org/prh/rh_indicators/womens-health/nb/neonatal-mortality-rate-nmr)

Guidelines on basic newborn resuscitation: [https://apps.who.int/iris/bitstream/handle/10665/75157/9789241503693\\_eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/75157/9789241503693_eng.pdf)

UNICEF Data: Monitoring the Situation of Children and Women: Neonatal mortality: <https://data.unicef.org/topic/child-survival/neonatal-mortality/>

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Indicator Sheet

# **NEWBORNS TREATED FOR NEONATAL SEPSIS/ INFECTION**

**MoNITOR** 

## CONCEPT AND DEFINITION

### Concept

The first 28 days of life is a vulnerable time for child survival; an estimated 2.6 million newborns died in 2016 (1). Although progress has been made since 1990, neonatal mortality and morbidity remains a challenge in low- and middle-income countries where there are poor health system infrastructure and critical shortages of health personnel who are able to adequately manage and provide quality care (1,2). An analysis conducted by the WHO Department of Information, Evidence and Research and the Maternal and Child Epidemiology Estimation (MCEE) group found that the main causes of neonatal mortality are due to preterm birth and intrapartum complications, and due to infections (3). Severe neonatal bacterial infections, including sepsis, meningitis and pneumonia, are the second most common cause of neonatal death, contributing to approximately 35% of all neonatal mortalities (3). With timely access and appropriate care seeking, treatment for neonatal severe bacterial infections could greatly reduce the global burden of neonatal infections and neonatal mortality.

### Definition

The number of newborns 0–28 days of age with suspected<sup>1</sup> severe bacterial infection who receive appropriate antibiotic therapy (at least one injection of antibiotic) during a specified reference period is expressed as a percentage of the total number of live births<sup>2</sup> in the same period (4).

**Unit of measurement:** Percentage (%)

**Level of indicator use:** Population- or health facility-based at national and subnational level (first or second administrative level)

**Monitoring and evaluation framework:** Outcome

**Domain:** Service coverage

**Continuum of care:** Postnatal

<sup>1</sup> Infant reportedly stopped feeding well and/or stopped moving on its own.

<sup>2</sup> There is ongoing work to test different denominators for treatment of newborn complications. Additional guidance on appropriate denominators will be made available in future versions of this tool. Different denominators being tested include: (a) total number of live births in the facility; (b) total births in the facility (including stillbirths); (c) target population for coverage: newborns with possible serious bacterial infection.

# MEASUREMENT GUIDANCE

## Data sources

The main data source for this indicator is routinely collected administrative data.

### Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/records or registers and are entered into national and/or subnational health information systems:

- Health information management system (HMIS) and/or
- District Health Information Management System (DHIS2).

Routinely collected administrative data and health facility statistics are the preferred data source in settings with a high utilization of health facility services and where data are recorded in a manner that ensures good data quality for both the public and private health sectors.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from obstetric and neonatal medical records. Relevant information is recorded about the fetal/newborn status at the time of delivery – including live births for all newborns delivered at health facilities – on paper forms completed by health personnel and/or through an electronic medical record. Admissions, re-admissions, or transfers of care within the first 28 days of life are captured in a similar manner, which would be the source of capturing information about diagnostic and treatment details of severe bacterial infections/sepsis from 0 to 27 days of birth. Data from paper or electronic sources are ideally entered or abstracted into a database or registry and are compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for the reporting of this indicator.

**Indicator and calculation:** The indicator is calculated as the number of newborns 0–28 days of age who receive treatment (at least one injection of antibiotic) for suspected serious bacterial infection in the facility expressed as a percentage of all live births in health facilities during the same time period.

**Numerator:** The number of newborns who receive treatment (at least one injection of antibiotic) for suspected serious bacterial infection in the facility during a specified period.

**Denominator:** Total number of live births in facility during the same time period.

Of note, there is ongoing work to test different denominators for treatment of newborn complications. Additional guidance on appropriate denominators will be made available in future versions

of this tool. Different denominators being tested include: (a) total number of live births in the facility; (b) total births in the facility (including stillbirths); (c) target population for coverage: newborns with possible serious bacterial infection.

**Frequency of measurement:** The indicator can be calculated on an annual basis or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on facility, subnational and national processes for data entry, compilation and analysis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Monthly, quarterly, or as needed based on the country and/or facility need
- *Subnational (first and second administrative) level:* Monthly or quarterly
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By age (e.g. 0–7 days; 0–27 days), sex, antibiotic treatment type, level of facility and location of facility (e.g. urban, rural).

**Missing values:** Missing values are usually not known or not reported.

# INTERPRETATION AND USE

## Interpretation

The neonatal period presents opportunities for reaching neonates with interventions that may be vital to newborn health and survival. Adequate detection of severe bacterial infections as early as possible with timely referral to a health facility and treatment with antibiotics as early as possible is critical to preventing neonatal mortality.

Thus, the purpose of this indicator is to monitor and track the proportion of neonates who receive treatment for severe bacterial infections, and is a proxy measure of the health system's functioning and its potential to provide adequate and quality care to neonates. Complementary indicators would also include measurement of health facility readiness to treat neonatal infections (e.g. functional equipment, supplies, medicines and trained health personnel) and the neonatal mortality rates by cause of death to ascertain whether or not the burden of neonatal deaths from sepsis/infection is being simultaneously reduced. This indicator can be used to inform health systems planning and policy and the allocation of funds and resources for programmes and interventions aimed at improving newborn health and survival.

## Common challenges

Data collected from administrative and other routine data systems

Administrative data may suffer from poor quality such as irregularities in report generation, data duplication and inconsistencies (5).

Reporting challenges exist at the facility level given data quality issues, including incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system or inadequate system design. Collection of data for this indicator is also reliant on the inclusion of treatment for neonatal severe bacterial infections on the patient medical record and, if so, that the clinical documentation is entered into the registry to database system for national or subnational monitoring and evaluation.

Many HMIS databases or registries are event-based and only births that occur in health facilities are included. Administrative data should be interpreted with caution in settings where data quality is poor and the percentage of births at public and private sector health facilities is low, or where data from the private health sector is not compiled within the HMIS reporting.

In settings where routine HMIS data lack information on pregnancies and/or births or deliveries that occur outside the public sector – for example, in homes, in the community, or in private sector facilities – the total number of births in the HMIS should not serve to estimate the denominator for this indicator. Where data on the total numbers of live births for the entire population for the denominator are unavailable, evaluators can calculate total estimated live births using census data for the total population and crude birth rates in a specified area (total expected live births = estimated population x the total crude birth rate).

## GLOBAL MONITORING

There is currently no global database responsible for monitoring and tracking progress of the percentage of newborns with suspected severe bacterial infection who receive appropriate antibiotic therapy.

Neonatal causes of death by country are monitored and tracked by the United Nations Inter-agency Group for Child Mortality Estimation (UN IGME). More information about the data repository for neonatal mortality estimates by country can be found at: <http://www.childmortality.org/> and <https://data.unicef.org/topic/child-survival/neonatal-mortality/>.

### Key initiatives

Countdown to 2030 – Women’s, Children’s and Adolescents’ Health: <http://countdown2030.org/>

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Reference List of 100 Core Health Indicators (plus health-related SDGs), 2018: <https://www.who.int/healthinfo/indicators/2018/en/>

Global Strategy for Women’s, Children’s and Adolescents’ Health (2016–2030): <http://www.who.int/life-course/partners/global-strategy/en/>

United Nations Sustainable Development Goals (SDGs): <https://sustainabledevelopment.un.org>

## ADDITIONAL RESOURCES

Global Health Observatory (GHO) Data – World Health Statistics: [http://www.who.int/gho/publications/world\\_health\\_statistics/en/](http://www.who.int/gho/publications/world_health_statistics/en/)

Making Every Baby Count: Audit and review of stillbirths and neonatal deaths: [http://www.who.int/maternal\\_child\\_adolescent/documents/stillbirth-neonatal-death-review/en](http://www.who.int/maternal_child_adolescent/documents/stillbirth-neonatal-death-review/en)

MEASURE Evaluation: Family Planning and Reproductive Health Indicators Database: Neonatal mortality rate (NMR): [https://www.measureevaluation.org/prh/rh\\_indicators/womens-health/nb/neonatal-mortality-rate-nmr](https://www.measureevaluation.org/prh/rh_indicators/womens-health/nb/neonatal-mortality-rate-nmr)

The WHO application of ICD-10 to deaths during the perinatal period: ICD-PM: <https://apps.who.int/iris/bitstream/handle/10665/249515/9789241549752-eng.pdf>

UNICEF Data: Monitoring the Situation of Children and Women: Neonatal mortality: <https://data.unicef.org/topic/child-survival/neonatal-mortality/>

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2. Alkema L, New JR, Pedersen J, You D, UN Inter-agency Group for Child Mortality Estimation; Technical Advisory Group. Child mortality estimation 2013: an overview of updates in estimation methods by the United Nations Inter-agency Group for Child Mortality Estimation. PloS One. 2014;9(7):e101112 (<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0101112>, accessed 23 October 2020).
3. Disease burden and mortality estimates: Child causes of death, 2000–2017. In: World Health Organization [website] ([https://www.who.int/healthinfo/global\\_burden\\_disease/estimates/en/index2.html](https://www.who.int/healthinfo/global_burden_disease/estimates/en/index2.html), accessed 23 October 2020).
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5. Abouzahr C, Boerma T. Health information systems: the foundations of public health. Bull World Health Organ. 2005;83(8):578–83 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2626318/>, accessed 22 October 2020).

Indicator Sheet

# NEWBORNS WEIGHED AT BIRTH

MoNITOR 

## CONCEPT AND DEFINITION

**Concept** A baby's weight at birth is a strong indicator of maternal and newborn health and nutrition. Measuring and documenting an accurate weight of a newborn at birth is an indicator of newborn care, and the health facility/system functionality. The utilization of infant's birthweight can be used to identify at-risk newborns. Low birthweight (LBW) is defined as the proportion of newborns weighing less than 2500 grams (g) and is associated with higher rates of mortality and neurodevelopmental morbidity. Universal, accurate and regular monitoring of birthweight can be challenging for many countries globally; nearly half of the world's infants are not weighed at birth (1).

**Definition** The number of most recent live births that were weighed at birth in a specified reference period is expressed as a percentage of the total number of most recent live births in the same period.

**Unit of measurement:** Percentage (%)

**Level of indicator use:** Population-based at global, national and subnational (first or second administrative level)

**Monitoring and evaluation framework:** Outcome

**Domain:** Service coverage

**Continuum of care:** Postnatal care

# MEASUREMENT GUIDANCE

## Data sources

There are two common data sources for this indicator:

- a. Routinely collected administrative data
- b. Population-based household surveys.

## Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/records or registers and are entered into national and/or subnational health management information systems (HMIS).

Data from health information systems may collect information on newborns weighed at birth among all newborns born in a health facility. Routinely collected administrative data and health facility statistics are the preferred data source in settings with a high utilization of health facility services and where data are recorded in a manner that ensures good data quality for both the public and private health sectors. The compiled data in the national HMIS or District Health Information System (DHIS2) should include data from both public and private health sectors, especially when the private sector is a substantial source of service provision to the population. In settings where utilization of health facilities is not high (e.g. settings with a high prevalence of births occurring at home), data may suffer from incompleteness if information about births occurring outside facilities is not captured. In addition, there are often challenges in accurately measuring the numerator and the denominator when routine HMIS data are used to measure this indicator.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from obstetric and neonatal medical records, including health services registers. Relevant information is recorded about newborns weighed at birth among all newborns delivered at health facilities on paper forms completed by health personnel and/or through an electronic medical record. Data from paper or electronic sources are entered or abstracted into a database or registry and are compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for the reporting of this indicator.

**Indicator and calculation:** The indicator is calculated as the percentage of newborns born in a health facility with a documented birthweight before discharge among all births in a health facility during a specified reference period (2).

**Numerator:** Number of newborns in a facility with a documented birthweight before discharge within a specified time period.

**Denominator:** Total number of live births<sup>1</sup> in facility in a specified time period.

**Frequency of measurement:** The indicator can be calculated on an annual basis or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on facility, subnational and national processes for data entry, compilation and analysis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Monthly, quarterly, or as needed based on the country and/or facility need
- *Subnational (first and second administrative) level:* Monthly or quarterly
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By level of facility, location of facility (e.g. urban, rural), subnational administrative units (e.g. districts, provinces, regions), gestational age at the time of birth, maternal age at time of birth, and type of delivery health personnel.

**Missing values:** Missing values for documented birthweight are assumed to indicate the newborn was not weighed.

### Population-based household surveys

The main source of data for this indicator has been through population-based household surveys collected through nationally or subnationally representative and structured questionnaires, such as:

- Demographic Health Surveys (DHS) (3)
- Multiple Indicator Cluster Surveys (MICS) (4)
- Reproductive Health Surveys (RHS)
- Other household surveys with a similar methodological design
- Censuses.

Population-based household survey data or national/subnational census data are the preferred data source in settings where utilization of health facility services is not very high (e.g. settings with a high prevalence of births occurring at home) or where private health sector data are excluded from routinely collected administrative data sources.

<sup>1</sup> In contexts where stillbirths are weighed, this indicator should have a denominator that is inclusive of all births (live births plus stillbirths).

**Key source of data:** Eligible women of reproductive age (15–49 years) are identified in the household survey for inclusion and interviewing using an individual women’s questionnaire. Women are considered eligible for survey interview if they are either usual residents or visitors of the household who stayed there the night before the interview.

All eligible and interviewed women (between 15 and 49 years old) who had a live birth during a specified reference period, typically 2–5 years prior to the time of interview, are asked “*Was (NAME) weighed at birth?*”, where “name” refers to the name of the live birth the individual woman had during the same reference period.

The MoH and NSO typically conduct household surveys and compile, analyse and report the results for this indicator in collaboration with the survey programme (e.g. DHS, MICS, RHS) and funding agency.

**Indicator definition and calculation:** Individual women of reproductive age (15–49 years old) are asked if their newborn was weighed at birth, irrespective of the delivery location and child’s current living status (dead or alive), and are for the most recent live birth that they had during a specified reference period, which is typically 2–5 years before the time of the survey completion. For this indicator, the recommended reference period is two years preceding the survey interview. The definition is as follows:

The percentage of interviewed women (aged 15–49 years) with a live birth in the 2–5 years prior to survey completion whose most recent live birth was weighed at birth. The indicator consists of the following numerator and denominator:

*Numerator:* Number of women (15–49 years old) with a live birth whose most recent live birth was weighed at birth.

*Denominator:* Total number of women (aged 15–49) with a live birth

**Frequency of measurement:** Household surveys are typically conducted every 3–5 years.

**Disaggregation at population level:** Place of delivery, mode of delivery, place of residence (e.g. urban, rural), subnational administrative units (e.g. districts, provinces, regions), sex of live birth, birth order, socioeconomic status (e.g. education level, household wealth quintile), age of woman at the time of delivery, births attended by skilled health personnel, number of antenatal care (ANC) visits, timing of first ANC visit, and timing and location of the first postnatal health check.

**Missing values:** Included in the distribution as “don’t know” or missing.

## INTERPRETATION AND USE

### Interpretation

For live births, birthweight should preferably be measured within the first hour of life, before significant postnatal weight loss has occurred. Not being weighed at birth reflects a lack of appropriate newborn care and also presents a challenge to accurately estimating the incidence of LBW (< 2500 g) among newborns, which is associated with newborn health and survival.

### Common challenges

#### Data collected from administrative and other routine data systems

Administrative data may suffer from poor quality such as irregularities in report generation, data duplication and inconsistencies (5). Reporting challenges exist at the facility level given data quality issues, including incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system – including untrained human resources and problems in using technology in some rural areas – or inadequate system design. In low-income countries, many newborns are born outside of health facility settings and thus are not weighed at birth. As a result, information on birthweight and gestational age at birth are incomplete in many parts of the world, and vary in quality.

Administrative data should be interpreted with caution in settings where data quality is poor and the percentage of births at public and private sector health facilities is low, or where data from the private health sector is not compiled within the HMIS reporting.

In settings where routine HMIS data lack information on pregnancies and/or births or deliveries that occur outside the public sector – for example, in homes or in private sector facilities – the total number of births in the HMIS should not serve to estimate the denominator for this indicator. Where data on the total numbers of live births for the entire population for the denominator are unavailable, evaluators can calculate total estimated live births using census data for the total population and crude birth rates in a specified area (total expected live births = estimated population x the total crude birth rate).

#### Data collected through household surveys

Women may not be able to accurately recall details around childbirth when data are collected through household surveys (6). There is also a time lag as the recall period is up to 3–5 years before the survey data were collected.

The most commonly reported denominator is the number of women with a live birth in the years preceding the survey, which acts as a proxy for the number of pregnant women. This indicator is prone to survivor bias in that only those women who are alive at the time of interview would be included, and underestimates the total number of live births that would be weighed at birth.

In these surveys, women are asked about their most recent live birth and when, if at all, their newborn's health was checked following

delivery. This should include both live births that were born at home and those born in a health facility. However, older iterations of household surveys may only obtain this information for births at home; this should be taken into consideration when reviewing older data.

## GLOBAL MONITORING

### Global database

There is currently no global database for this indicator.

### Key initiatives

Countdown to 2030 – Women’s, Children’s and Adolescents’ Health: <http://countdown2030.org/>

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Strategy for Women’s, Children’s and Adolescents’ Health (2016–2030): <http://www.who.int/life-course/partners/global-strategy/en/>

## ADDITIONAL RESOURCES

UNICEF – Multiple Indicator Cluster Surveys: <http://mics.unicef.org/tools>

The DHS Program: <https://dhsprogram.com>

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2. Analysis and use of health facility data: Guidance for RMNCAH programme managers. Working document. October 2019. Geneva: World Health Organization; 2019 ([https://www.who.int/healthinfo/FacilityAnalysisGuidance\\_RMNCAH.pdf](https://www.who.int/healthinfo/FacilityAnalysisGuidance_RMNCAH.pdf), accessed 23 October 2020).
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Indicator Sheet

# POSTNATAL CARE COVERAGE – NEWBORNS/ POSTNATAL CARE NEWBORNS

MoNITOR 

## CONCEPT AND DEFINITION

### Concept

The vast majority of newborn deaths take place in low- and middle-income countries, mostly at home, without skilled care that could greatly increase the infant's chances for survival (1). Children who die within the first 28 days of birth suffer from conditions and diseases associated with lack of quality care at birth or skilled care and treatment immediately after birth, and the majority of these deaths are within the first few days of life. The postnatal period is defined as the time following delivery until six weeks after birth. Contact with a health-care provider during the postnatal period immediately after birth for both mother and newborn is a critical step in improving the health and survival of mothers and newborns.

### Definition

The number of women of reproductive age with a live birth in a specified reference period where the newborn received a postnatal care (PNC) check with a health provider within two days of birth is expressed as a percentage of women in the same age range with a live birth in the same period.

**Unit of measurement:** Percentage (%)

**Level of indicator use:** Global, national and subnational (first or second administrative level)

**Monitoring and evaluation framework:** Outcome (service coverage)

**Domain:** Service coverage

**Continuum of care:** Postnatal

# MEASUREMENT GUIDANCE

## Data sources

There are two common data sources for this indicator:

- a. routinely collected administrative data
- b. population-based household surveys.

## Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/records or registers and are entered into national and/or subnational health information systems:

- Health information management system (HMIS) and/or
- District Health Information Management System (DHIS2).

Data from health information systems may collect information on early PNC for newborns who received a health check between the time of birth and discharge from the health facility. Routinely collected administrative data and health facility statistics are the preferred data source in settings with a high utilization of health facility services and where data are recorded in a manner that ensures good data quality for both the public and private health sector.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from obstetric and neonatal medical records. Relevant information is recorded about the number and timing of PNC visits among all women who delivered a newborn at health facilities on paper forms completed by health personnel and/or through an electronic medical record. Data from paper or electronic sources are entered or abstracted into a database or registry and are compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for the reporting of this indicator.

**Indicator and calculation:** The indicator is calculated as the percentage of newborns who received PNC by any provider among all births in a health facility during a specified reference period. The indicator includes both women who gave birth in the health facility and those who gave birth outside the health facility.

**Numerator:** Number of newborns who received PNC within a specified time period

**Denominator:** Number of live births in the health facility in a specified time period.

The numerator and denominator definition of PNC is based on individual health facility report or is in accordance with the country-specific definition by the MoH and/or NSO.

**Frequency of measurement:** The indicator can be calculated on an annual basis or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on facility, subnational and national processes for data entry, compilation and analysis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Monthly, quarterly, or as needed based on the country and/or facility need
- *Subnational (first and second administrative) level:* Monthly or quarterly
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By level of facility, location of facility (e.g. urban, rural), type of health personnel and timing of health check.

**Missing values:** Missing values are usually not known or not reported.

### Population-based household surveys

The main source of data for this indicator has been through population-based household surveys collected through nationally or subnationally representative and statistically sound questionnaires, such as:

- Demographic Health Surveys (DHS) (2)
- Multiple Indicator Cluster Surveys (MICS) (3)
- Reproductive Health Surveys (RHS)
- Other household surveys with a similar methodological design.

Population-based household survey data are the preferred data source in settings with a low utilization of health facility services or where private health sector data are excluded from routinely collected administrative data sources.

**Key source of data:** Eligible women of reproductive age (15–49 years) are identified in the household survey for inclusion and interviewing using an individual women’s questionnaire. Women are considered eligible for survey interview if they are either usual residents or visitors of the household who stayed there the night before the interview.

All eligible and interviewed women (between 15 and 49 years old) who had a live birth during a specified reference period, typically 2–5 years prior to the time of the interview, are asked about “*checks on (NAME)’s health after delivery?*”, where “name” refers to the name

of the live birth the individual woman had during the same reference period. The sequence of questions about details of the postnatal health checks that are done for the newborn are done differently depending on whether the birth occurred (a) in a health facility, or (b) outside a health facility.

For births that occurred in a health facility, women are asked “*How long after delivery was (NAME)’s health first checked?*” and “*Who checked on (NAME)’s health at that time?*” in order to establish whether anyone checked on the health of the newborn before they left the health facility where the newborn was delivered. The survey also asks about any checks that occurred after discharge from the health facility. If a health check did occur after leaving the facility, women are asked similar questions about the timing of when the check occurred, who performed the check, and the location where the check took place.

For births that occurred outside a health facility, women are asked if there was any health check on her most recent birth right after delivery. If a postnatal check for the newborn occurred after the delivery, women are asked similar questions about the timing of when the check occurred, who performed the check, and the location where it took place.

The MoH and NSO typically conduct household surveys and compile, analyse and report the results for this indicator in collaboration with the survey programme (e.g. DHS, MICS, RHS) and funding agency.

**Indicator definition and calculation:** Individual women of reproductive age (15–49 years old) are asked about PNC checks irrespective of the child’s current living status (dead or alive), and are for the most recent live birth that they had during a specified reference period, which is typically 2–5 years before the time of the survey completion. The definition is as follows:

The percentage of newborns who have postnatal contact with a health-care provider within two days of birth, either before discharge from a health facility or at another location following delivery. The indicator consists of the following numerator and denominator:

*Numerator:* Number of newborns who have postnatal contact with a health-care provider check within two days of birth.

*Denominator:* Total number of last live births.

**Frequency of measurement:** Household surveys are typically conducted every 3–5 years.

**Disaggregation at population level:** Type of health personnel, place of delivery, mode of delivery, place of residence (e.g. urban, rural), sex of live birth, birth order, socioeconomic status (e.g. education level, wealth quintile), age of woman at the time of delivery, births attended by skilled health personnel, timing and location of PNC health check.

**Missing values:** Included in the distribution as “don’t know” or missing.

# INTERPRETATION AND USE

## Interpretation

The main purpose of an indicator for early PNC is to provide information on the utilization of health services and to provide a measure of access to services for newborns in this critical period. Early PNC coverage should respond to programme interventions aimed at increasing coverage in the short term.

This indicator should be interpreted with caution as it is a measure of contact with the health system for the newborn within the first two days (48 hours of life) and does not take into account the content and quality of care received. Receiving PNC after delivery does not guarantee the receipt of evidenced-based interventions that are effective in improving newborn health and survival. It should not be assumed that newborns received PNC in accordance to country-specific recommendations/guidelines. Similarly, the indicator does not capture whether there was joint PNC received by both the mother and newborn at the same time, which is the aim of some PNC programmes. Therefore, this indicator should be complemented with information on the content and quality of interventions received during the PNC check in order to more effectively monitor and evaluate the effectiveness and impact of maternal and newborn health interventions.

In addition, the lack of an internationally agreed-upon operational definition of early PNC for women and newborns implicates the global comparability of this indicator. Early PNC is a package of services and not one single intervention. Since the content and quality of care may vary between and within countries, comparison of similar coverage estimates from one context to another may not necessarily reflect similar levels of care received.

It is important to note that while the recommendation is for a PNC check to first occur within 24 hours of delivery, this indicator instead only measures contact within the first two days. The idea behind a longer time period is to allow some flexibility in responses, which women often report in days, particularly for births that occurred late at night or occurred over the course of more than one calendar day.

## Common challenges

Data collected from administrative and other routine data systems

Administrative data may suffer from poor quality such as irregularities in report generation, data duplication and inconsistencies (4). Reporting challenges exist at the facility level given data quality issues, including incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system or inadequate system design.

Many HMIS databases or registries are event-based and only include postnatal information for women who delivered a birth at a health facility. In some instances, the denominator may include births or deliveries by women of an unspecified age range and may also

include both live births and stillbirths. As this often only represents those women who present to health facilities for deliveries, it does not capture the number of pregnancies and demand for PNC within the total population. These differences in definitions compromise the ability to compare data between countries.

Some routine HMIS may also not collect data on PNC coverage within a specified time period, implicating the ability to measure early PNC checks done within two days and the comparability with data from household surveys. Ideally, data from HMIS should stratify the percentage of PNC checks for the newborn by the age of the newborn after birth to better measure access to services in the immediate postnatal period for newborns.

Administrative data should be interpreted with caution in settings where data quality is poor and the percentage of births at public and private sector health facilities is low, or where data from the private health sector are not compiled within the HMIS reporting.

In settings where routine HMIS data lack information on pregnancies and/or births or deliveries that occur outside the public sector – for example, in homes or in private sector facilities – the total number of births in the HMIS should not serve to estimate the denominator for this indicator. Where data on the total numbers of live births for the entire population for the denominator are unavailable, evaluators can calculate total estimated live births using census data for the total population and crude birth rates in a specified area (total expected live births = estimated population x the total crude birth rate).

#### Data collected through household surveys

Women may not be able to accurately recall details around childbirth when data are collected through household surveys (5). There is also a time lag as the recall period is up to 2–5 years before the survey data were collected.

Of note, this indicator is sometimes reported as one visit combining the mother and the newborn in a PNC check into the numerator. The most commonly reported denominator is the number of women with a live birth in the years preceding the survey, which acts as a proxy for the number of pregnant women. This indicator is prone to survivor bias in that only those women who are alive at the time of the interview would be included, and underestimates the total number of newborns requiring care during pregnancy.

The indicator usually measures visits with any provider because national-level household surveys do not always collect provider data for each PNC check for the mother and/or newborn. In addition, standardization of the definition of health personnel is sometimes difficult because of differences in naming conventions, competencies and training of health personnel between and within countries (6).

Both DHS and MICS questionnaires have recently been modified to ensure that the data are reliable and relevant; however, this indicator may still be affected by recall problems. Changes in the measurement

approach over time means that trend data may not be comparable and should be interpreted with caution. In these surveys, women are asked about their most recent live birth and when, if at all, their newborn's health was checked following delivery. This should include both live births that were delivered at home and those delivered in a health facility. However, older iterations of household surveys may only obtain this information for births at home and this should be taken into consideration when reviewing older data.

## Validation studies

Technical work to improve the specificity of this indicator has been conducted via the following:

### Publications

Amouzou A, Mehra V, Carvajal-Aguirre L, Khan SM, Sitrin D, Vaz LM. Measuring postnatal care contacts for mothers and newborns: an analysis of data from the MICS and DHS surveys. *J Glob Health*. 2017;7(2):020502 (<https://doi.org/10.7189/jogh.07.020502>, accessed 23 October 2020).

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Warren C, Kimani J, Kivunaga J, Mdawida B, Ndwiga C, McCarthy K, Blanc A. Validating the indicators of the quality of maternal health care: final report, Kenya. Nairobi: Population Council; 2014 ([https://www.popcouncil.org/uploads/pdfs/2014RH\\_MHTF-Kenya.pdf](https://www.popcouncil.org/uploads/pdfs/2014RH_MHTF-Kenya.pdf), accessed 23 October 2020).

## GLOBAL MONITORING

### Global database

The United Nations Children's Fund (UNICEF) maintains databases for global monitoring and reporting of the percentage of newborns who received postnatal checkup within two days after delivery and includes newborns who received a checkup from a doctor, midwife, nurse, feldsher, or traditional birth attendant. UNICEF obtains data from nationally representative household surveys or routinely collected administrative data or services statistics. Before data can be included in the global databases, UNICEF undertakes a process of data verification that includes correspondence with field offices to clarify any questions regarding the reported statistics. More information about the global databases for PNC coverage can be found at: <https://data.unicef.org/topic/maternal-health/newborn-care/>.

### Key initiatives

Countdown to 2030 – Women's, Children's and Adolescents' Health: <http://countdown2030.org/>

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Reference List of 100 Core Health Indicators (plus health-related SDGs), 2018: <https://www.who.int/healthinfo/indicators/2018/en/>

Global Strategy for Women's, Children's and Adolescents' Health (2016–2030): <http://www.who.int/life-course/partners/global-strategy/en/>

## ADDITIONAL RESOURCES

UNICEF Data: Monitoring the Situation of Children and Women: Newborn care: <https://data.unicef.org/topic/maternal-health/newborn-care/>

UNICEF – Multiple Indicator Cluster Surveys: <http://mics.unicef.org/tools>

The DHS Program: <https://dhsprogram.com>

MEASURE Evaluation: Family Planning and Reproductive Health Indicators Database:  
Percent of newborns receiving a postnatal care check within two days of birth: [https://www.measureevaluation.org/prh/rh\\_indicators/womens-health/nb/percent-of-newborns-receiving-a-postnatal-care](https://www.measureevaluation.org/prh/rh_indicators/womens-health/nb/percent-of-newborns-receiving-a-postnatal-care)

WHO and UNICEF Guidance for RMNCAH programme managers: [https://www.who.int/healthinfo/FacilityAnalysisGuidance\\_RMNCAH.pdf](https://www.who.int/healthinfo/FacilityAnalysisGuidance_RMNCAH.pdf)

## REFERENCES

1. WHO Recommendations on postnatal care of the mother and newborn. Geneva: World Health Organization; 2013 ([https://www.who.int/maternal\\_child\\_adolescent/documents/postnatal-care-recommendations/en/](https://www.who.int/maternal_child_adolescent/documents/postnatal-care-recommendations/en/), accessed 23 October 2020).
2. The DHS Program [website]. Rockville: ICF International; 2020 (<http://www.dhsprogram.com/>, accessed 21 October 2020).
3. Multiple Indicator Cluster Surveys (MICS) [website]. New York: UNICEF; 2020 (<http://mics.unicef.org>, accessed 21 October 2020).
4. Abouzahr C, Boerma T. Health information systems: the foundations of public health. Bull World Health Organ. 2005;83(8):578–83 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2626318/>, accessed 22 October 2020).
5. Blanc AK, Diaz C, McCarthy KJ, Berdichevsky K. Measuring progress in maternal and newborn health care in Mexico: validating indicators of health system contact and quality of care. BMC Pregnancy Childbirth. 2016;16(1):255 (<https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-016-1047-0>, accessed 9 November 2020).
6. DHS Program [website] (<https://dhsprogram.com/>, accessed 11 November 2020).

Indicator Sheet

# POSTNATAL CARE COVERAGE – WOMEN/ POSTNATAL CARE FOR WOMEN

MoNITOR 

## CONCEPT AND DEFINITION

### Concept

The postnatal period is defined as the time following delivery until six weeks after birth and is a critical phase in the lives of mothers and newborns. Most maternal and infant deaths occur in the first month after birth: almost half of postpartum maternal deaths occur within the first 24 hours, and 66% occur during the first week. Contact with a health-care provider during the postnatal period immediately after birth for both mother and newborn is a critical step in improving the health and survival of mothers and newborns.

WHO recommends that women receive facility care for at least 24 hours after birth with two full assessments within that time period, as well as at least three postnatal visits on: (a) day 3 (48–72 hours of birth); (b) between days 7–14 of birth; and (c) six weeks after birth. These contacts can be made at home or in a health facility, depending on the context and the provider. Additional contacts may be needed to address issues or concerns (1).

### Definition

The number of women of reproductive age with a live birth in a specified reference period who received a postnatal/postpartum care (PNC) check with a health provider within two days of delivery is expressed as a percentage of women in the same age range with a live birth in the same period.

**Unit of measurement:** Percentage (%)

**Level of indicator use:** Global, national and subnational (first or second administrative level)

**Monitoring and evaluation framework:** Outcome (service coverage)

**Domain:** Service coverage

**Continuum of care:** Postnatal

# MEASUREMENT GUIDANCE

## Data sources

There are two common data sources for this indicator:

- a. Routinely collected administrative data
- b. Population-based household surveys.

## Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/records or registers and are entered into national and/or subnational health information systems:

- health information management system (HMIS) and/or
- District Health Information Management System (DHIS2).

Data from health information systems may collect information on early PNC for women who received a health check between the time of delivery and discharge from the health facility. Routinely collected administrative data and health facility statistics are the preferred data source in settings with a high utilization of health facility services and where data are recorded in a manner that ensures good data quality for both the public and private health sector.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from obstetric and neonatal medical records. Relevant information is recorded about the number and timing of PNC visits among all women who delivered a newborn at health facilities on paper forms completed by health personnel and/or through an electronic medical record. Data from paper or electronic sources are entered or abstracted into a database or registry and are compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for the reporting of this indicator.

**Indicator and calculation:** The indicator is calculated as the percentage of women who received PNC care by any provider among all deliveries in a health facility during a specified reference period. Note that this indicator includes both women who gave birth in the health facility and those who gave birth outside the health facility. The timing of PNC will vary depending on national context.

**Numerator:** Number of women who received PNC in a health facility within a specified time period.

**Denominator:** Total number of deliveries in facility in a specified time period.

The numerator and denominator definition of PNC for women is based on individual health facility report or is in accordance with the country-specific definition by the MoH and/or NSO.

**Frequency of measurement:** The indicator can be calculated on an annual basis or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on facility, subnational and national processes for data entry, compilation and analysis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Monthly, quarterly, or as needed based on the country and/or facility need
- *Subnational (first and second administrative) level:* Monthly or quarterly
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By level of facility, location of facility (e.g. urban, rural), type of health personnel and timing of health check.

**Missing values:** Missing values are usually not known or not reported.

### Population-based household surveys

The main source of data for this indicator has been through population-based household surveys collected through nationally or subnationally representative and statistically sound questionnaires, such as:

- Demographic Health Surveys (DHS) (2)
- Multiple Indicator Cluster Surveys (MICS) (3)
- Reproductive Health Surveys (RHS)
- Other household surveys with a similar methodological design.

Population-based household survey data are the preferred data source in settings with a low utilization of health facility services or where private health sector data are excluded from routinely collected administrative data sources.

**Key source of data:** Eligible women of reproductive age (15–49 years) are identified in the household survey for inclusion and interviewing using an individual women’s questionnaire. Women are considered eligible for survey interview if they are either usual residents or visitors of the household who stayed there the night before the interview.

All eligible and interviewed women between 15 and 49 years old who had a live birth during a specified reference period, typically 2–5 years prior to the time of the interview, are asked about “checks on your health after delivery?” The sequence of questions about details

of the postnatal health checks that are done for her health are done differently depending on whether the delivery occurred (a) in a health facility or (b) outside a health facility.

For deliveries that occurred in a health facility, women are asked “*How long after delivery was your health first checked?*” and “*Who checked on your health at that time?*” in order to establish whether anyone checked on her health before they left the health facility where the delivery occurred. The survey also asks about any checks that occurred after discharge from the health facility. If a health check did occur after leaving the facility, women are asked similar questions about the timing of when the check occurred, who performed the check, and the location where the check took place.

For births that occurred outside a health facility, women are asked if there was any health check on her most recent birth right after delivery. If a PNC for the newborn occurred after the delivery, women are asked similar questions about the timing of when the check occurred, who performed the check, and the location where it took place.

The MoH and NSO typically conduct household surveys and compile, analyse and report the results for this indicator in collaboration with the survey programme (e.g., DHS, MICS, RHS) and funding agency.

**Indicator definition and calculation:** Individual women of reproductive age (15–49 years old) are asked about PNC checks on their health. Questions about PNC checks for women are asked irrespective of their child’s current living status (dead or alive) and are for the most recent live birth that they had during a specified reference period, which is typically 2–5 years before the time of the survey completion. The definition is as follows:

The percentage of women aged 15 to 49 years with a live birth who received PNC within two days of childbirth by any provider, either before discharge from a health facility or at another location following delivery. The indicator consists of the following numerator and denominator:

*Numerator:* Number of women aged 15–49 years with a live birth who have postnatal contact with a health-care provider within two days of birth.

*Denominator:* Total number of women aged 15–49 with a live birth.

**Frequency of measurement:** Household surveys are typically conducted every 3–5 years.

**Disaggregation at population level:** Type of health personnel, place of delivery, mode of delivery, place of residence (e.g. urban, rural), sex of live birth, birth order, socioeconomic status (e.g. education level, wealth quintile), age of woman at the time of delivery, births attended by skilled health personnel, timing and location of PNC health check.

**Missing values:** Included in the distribution as “don’t know” or missing.

## INTERPRETATION AND USE

### Interpretation

The main purpose of an indicator for early PNC is to provide information on the utilization of health services and to provide a measure of access to services for women and newborns in this critical period. Early PNC coverage should respond to programme interventions aimed at increasing coverage in the short term.

This indicator should be interpreted with caution as it is a measure of contact with the health system for women within the first two days (48 hours) of delivery and does not take into account the content and quality of care received. Receiving PNC after delivery does not guarantee the receipt of evidenced-based interventions that are effective in improving maternal health and survival. It should not be assumed that women received PNC in accordance to country-specific recommendations/guidelines. Similarly, the indicator does not capture whether there was joint PNC received by both the mother and newborn at the same time, which is the aim of some PNC programmes. Therefore, this indicator should be complemented with information on the content and quality of interventions received during the PNC check in order to more effectively monitor and evaluate the effectiveness and impact of maternal and newborn health interventions.

In addition, the lack of an internationally agreed-upon operational definition of early PNC for women and newborns implicates the global comparability of this indicator. Early PNC is a package of services and not one single intervention. Since the content and quality of care may vary between and within countries, comparison of similar coverage estimates from one context to another may not necessarily reflect similar levels of care received.

It is important to note that while the recommendation is for a PNC check to first occur within 24 hours of delivery, this indicator instead only measures contact within the first two days. The idea behind a longer time period is to allow some flexibility in responses, which women often report in days, particularly for deliveries that occurred late at night or occurred over the course of more than one calendar day.

### Common challenges

Data collected from administrative and other routine data systems

Administrative data may suffer from poor quality such as irregularities in report generation, data duplication and inconsistencies (4).

Reporting challenges exist at the facility level given data quality issues, including incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system or inadequate system design.

Many HMIS databases or registries are event-based and only include postnatal information for women who delivered a birth at a health facility. In some instances, the denominator may include births or

deliveries by women of an unspecified age range and may also include both live births and stillbirths. As this often only represents those women who present to health facilities for deliveries, it does not capture the number of pregnancies and demand for PNC within the total population. These differences in definitions compromise the ability to compare data between countries.

Some routine HMIS may also not collect data on PNC coverage within a specified time period, implicating the ability to measure early PNC checks done within two days and the comparability with data from household surveys. Ideally, data from HMIS should stratify the percentage of PNC checks for women after childbirth to better measure access to services in the immediate postnatal period for women.

Administrative data should be interpreted with caution in settings where data quality is poor and the percentage of births at public and private sector health facilities is low, or where data from the private health sector are not compiled within the HMIS reporting.

In settings where routine HMIS data lack information on pregnancies and/or childbirth that occur outside the public sector – for example, in homes or in private sector facilities – the total number of births in the HMIS should not serve to estimate the denominator for this indicator. Where data on the total numbers of live births for the entire population for the denominator are unavailable, evaluators can calculate total estimated live births using census data for the total population and crude birth rates in a specified area (total expected live births = estimated population x the total crude birth rate).

#### Data collected through household surveys

Women may not be able to accurately recall details around childbirth when data are collected through household surveys (5). There is also a time lag as the recall period is up to 2–5 years before the survey data were collected.

Of note, this indicator is sometimes reported as one visit combining the mother and the newborn in a PNC check into the numerator. The most commonly reported denominator is the number of women with a live birth in the years preceding the survey, which acts as a proxy for the number of pregnant women. However, inclusion of only live births underestimates the total number of pregnancies by excluding those that end in stillbirth or spontaneous or induced abortion, as well as ectopic and molar pregnancies. It also causes survivor bias in that only those women who are alive at the time of the interview would be included, and underestimates the total number of women requiring care during pregnancy.

The indicator usually measures visits with any provider because national-level household surveys do not always collect provider data for each PNC check. In addition, standardization of the definition of health personnel is sometimes difficult because of differences in naming conventions, competencies and training of health personnel between and within countries (6).

Both DHS and MICS questionnaires have recently been modified to ensure that the data are reliable and relevant; however, this indicator may still be affected by recall problems. Changes in the measurement approach over time means that trend data may not be comparable and should be interpreted with caution. In these surveys, women are asked about their most recent live birth and when, if at all, their newborn's health was checked following delivery. This should include both live births that were delivered at home and those delivered in a health facility. However, older iterations of household surveys may only obtain this information for births at home and this should be taken into consideration when reviewing older data.

## Validation studies

Technical work to improve the specificity of this indicator has been conducted via the following:

### Publications

Amouzou A, Mehra V, Carvajal-Aguirre L, Khan SM, Sitrin D, Vaz LM. Measuring postnatal care contacts for mothers and newborns: an analysis of data from the MICS and DHS surveys. *J Glob Health*. 2017;7(2):020502 (<https://doi.org/10.7189/jogh.07.020502>, accessed 23 October 2020).

Blanc AK, Diaz C, McCarthy KJ, Berdichevsky K. Measuring progress in maternal and newborn health care in Mexico: validating indicators of health system contact and quality of care. *BMC Pregnancy Childbirth*. 2016;16(1):255 (<https://doi.org/10.1186/s12884-016-1047-0>, accessed 23 October 2020).

Blanc AK, Warren C, McCarthy, KJ, Kimani J, Ndwiga C, RamaRao S. Assessing the validity of indicators of the quality of maternal and newborn health care in Kenya. *J Glob Health*. 2016;6(1):010405 (<https://dx.doi.org/10.7189/jogh.06.010405>, accessed 23 October 2020).

McCarthy KJ, Blanc AK, Warren CE, Mdawida B. Women's recall of maternal and newborn interventions received in the postnatal period: a validity study in Kenya and Swaziland. *J Glob Health*. 2018;8(1):010605 (<https://dx.doi.org/10.7189/jogh.08.010605>, accessed 23 October 2020).

McCarthy KJ, Blanc AK, Warren CE, Kimani J, Mdawida B, Ndwidga C. Can surveys of women accurately track indicators of maternal and newborn care? A validity and reliability study in Kenya. *J Glob Health*. 2016;6(2):020502 (<https://dx.doi.org/10.7189/jogh.06.020502>, accessed 23 October 2020).

Munos MK, Stanton CK, Bryce J, the Core Group for Improvement Coverage Measurement for MNCH. Improving coverage measurement for reproductive, maternal, neonatal and child health: gaps and opportunities. *J Glob Health*. 2017;7(1):010801 (<https://dx.doi.org/10.7189/jogh.07.010801>, accessed 23 October 2020).

Willey B, Waiswa P, Kajjo D, Munos M, Akuze J, Allen E, Marchant T. Linking data sources for measurement of effective coverage in

maternal and newborn health: what do we learn from individual-vs ecological-linking methods? J Glob Health. 2018;8(1):010601 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5823029/>, accessed 23 October 2020).

## Reports

Berdichevsky K, Diaz-Olavarrieta C, McCarthy K, Blanc A. Validating the indicators of the quality of maternal health care: final report, Mexico. Mexico City: Population Council; 2014 ([https://www.popcouncil.org/uploads/pdfs/2014RH\\_MHTF-Mexico.pdf](https://www.popcouncil.org/uploads/pdfs/2014RH_MHTF-Mexico.pdf), accessed 23 October 2020).

Warren C, Kimani J, Kivunaga J, Mdawida B, Ndwiga C, McCarthy K, Blanc A. Validating the indicators of the quality of maternal health care: final report, Kenya. Nairobi: Population Council; 2014 ([https://www.popcouncil.org/uploads/pdfs/2014RH\\_MHTF-Kenya.pdf](https://www.popcouncil.org/uploads/pdfs/2014RH_MHTF-Kenya.pdf), accessed 23 October 2020).

## GLOBAL MONITORING

### Global database

The United Nations Children’s Fund (UNICEF) maintains databases for global monitoring and reporting of the percentage of mothers who received a postnatal checkup within two days after delivery. UNICEF obtains data from nationally representative household surveys or routinely collected administrative data or services statistics. Before data can be included in the global databases, UNICEF undertakes a process of data verification that includes correspondence with field offices to clarify any questions regarding the reported statistics. More information about the global databases for PNC coverage for women can be found at: <https://data.unicef.org/topic/maternal-health/delivery-care/>.

### Key initiatives

Countdown to 2030 – Women’s, Children’s and Adolescents’ Health: <http://countdown2030.org/>

Ending Preventable Maternal Mortality (EPMM): [http://who.int/reproductivehealth/topics/maternal\\_perinatal/epmm/en/](http://who.int/reproductivehealth/topics/maternal_perinatal/epmm/en/)

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Reference List of 100 Core Health Indicators (plus health-related SDGs), 2018: <https://www.who.int/healthinfo/indicators/2018/en/>

Global Strategy for Women’s, Children’s and Adolescents’ Health (2016–2030): <http://www.who.int/life-course/partners/global-strategy/en/>

## ADDITIONAL RESOURCES

Global Health Observatory (GHO) Data – World Health Statistics: [http://www.who.int/gho/publications/world\\_health\\_statistics/en/](http://www.who.int/gho/publications/world_health_statistics/en/)

UNICEF Data: Monitoring the Situation of Children and Women: Antenatal care: <https://data.unicef.org/topic/maternal-health/antenatal-care/>

UNICEF – Multiple Indicator Cluster Surveys: <http://mics.unicef.org/tools>

The DHS Program: <https://dhsprogram.com>

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6. Definition of skilled health personnel providing care during childbirth: the 2018 joint statement by WHO, UNFPA, UNICEF, ICM, ICN, FIGO and IPA. Geneva: World Health Organization; 2018.

Indicator Sheet

# **PREVALENCE OF LOW BIRTHWEIGHT AMONG NEWBORNS**

**MoNITOR** 

## CONCEPT AND DEFINITION

### Concept

A newborn's weight at birth is a strong indicator of maternal and newborn health and nutrition. Being undernourished in the womb increases the risk of death in the early months and years of a child's life. Those who survive tend to have impaired immune function and increased risk of disease; they are likely to remain undernourished, with reduced muscle strength, cognitive abilities and IQ throughout their lives. As adults, they suffer from a higher incidence of diabetes and heart disease. WHO defines low birthweight (LBW) among newborns as a birthweight of less than 2500 grams (g). Ideally, this should be the first weight taken within the first hour of life in order to act as the baseline weight for monitoring growth during the postnatal period. Being born with LBW may be due to preterm birth (before 37 weeks' gestation), restricted fetal (intrauterine) growth, or both underlying causes. LBW is associated with fetal and neonatal mortality, inhibited growth and cognitive/neurodevelopmental morbidity, and chronic diseases later in life (1).

Accurate monitoring of LBW is challenging, since nearly half of the world's infants are not weighed at birth (1). Globally, LBW remains a significant public health concern; in 2019, nearly 15% of babies worldwide were born with LBW (2). Currently, the goal is to achieve a 30% reduction in the number of LBW newborns by the year of 2025 (3).

### Definition

The number of live-born neonates with weight less than 2500 g at birth in a specified reference period is expressed as a percentage of the total number of live births in the same period.

**Unit of measurement:** Percentage (%)

**Level of indicator use:** Population-based at global, national and subnational (first and second administrative level)

**Monitoring and evaluation framework:** Impact

**Domain:** Other health status

**Continuum of care:** Postnatal

# MEASUREMENT GUIDANCE

## Data sources

The three main data sources for this indicator are:

- a. Civil registration and vital statistics (CRVS) systems
- b. Routinely collected administrative data
- c. Population-based household surveys.

## Civil registration and vital statistics systems

A well-functioning and integrated national or subnational CRVS system will universally register and certify vital events, including live births, stillbirths and deaths that occur in the country or administrative area. Birth and death certificates are issued as part of the CRVS system, allowing the compilation, analysis and dissemination of information through vital statistics agencies, including population characteristics (e.g. sex, date of birth or death, place of birth or death, place of usual residence, gestational age at birth and birthweight) and cause-of-death information. Some CRVS systems will also register and certify other important vital events within the population, such as adoptions, marriages and divorces. Data from birth certificates are the preferred data source for this indicator when the system freely and universally records vital events and characteristics (e.g. birthweight); data are recorded in a systematic manner that ensures high data quality for both the public and private health sectors; and across all locations of birth (e.g. health facility or community-based births).

**Key source of data:** The main source of data for this indicator involves several steps and varies based on the policies and procedures of the national or subnational CRVS or other routine system within health facilities and/or within communities. Declaration of live or stillbirth events are obtained through: (a) forms completed by health personnel at health facilities, or (b) community-based sources, including registration forms submitted directly by the parents of the live or stillbirth. Either paper or electronic forms containing this information are then submitted to the relevant civil authorities and vital statistics agencies, which have the responsibility to officially record the birth event and birth characteristics, such as name, date and place of birth, birthweight, nationality and names of the mother and/or father. At the national or subnational level, the civil authority and vital statistics agency issues birth certificates to formalize the birth registration. If the birth certificate is available and birthweight is available on the certificate, then it is the preferred source for data on birthweight compared to recall.

**Indicator definition and calculation:** The indicator is calculated as the percentage of live births that weigh less than 2500 g among the total

number of live births during a specified reference period. The indicator consists of the following numerator and denominator:

*Numerator:* Number of live births with weight less than 2500 g at birth in a specified time period.

*Denominator:* Total number of live births in the same specified time period.

**Frequency of measurement:** Within CRVS, this indicator is generally monitored at a national or subnational level on an annual basis. The data can be compiled and aggregated subnationally to provide national-level data.

**Disaggregation at population level:** By sex, gestational age, age of woman at time of delivery, place of birth, place of residence (e.g. urban, rural), subnational administrative units (e.g. districts, provinces, regions), socioeconomic status (e.g. education level, household wealth quintile), and type of reporting source (e.g. health facility, community).

**Missing values:** Missing values are usually not known.

#### Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/records or registers and are entered into national and/or subnational health management information systems (HMIS).

Data from health information systems may collect information on birthweight, including compilation and analysing the prevalence of LBW (< 2500 g) among all newborns born in a health facility. Routinely collected administrative data and health facility statistics are the preferred data source in settings with a high utilization of health facility services and data are recorded in a manner that ensures good data quality for both the public and private health sectors. The compiled data in the national HMIS or District Health Information System (DHIS2) should include data from both public and private health sectors, especially when the private sector is a substantial source of service provision to the population. In settings where utilization of health facilities is not high (e.g. settings with a high prevalence of births occurring at home), data may suffer from incompleteness if information about births occurring outside facilities is not captured. In addition, there are often challenges in accurately measuring the numerator and the denominator when routine HMIS data are used to measure this indicator.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from obstetric and neonatal medical records, including health services registers. Relevant information is recorded by health personnel within health facilities on paper forms completed by health personnel and/or through an electronic medical record. Data from paper or electronic sources are entered or abstracted into a database or registry and are

compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for the reporting of this indicator.

**Indicator definition and calculation:** The indicator is calculated as the percentage of live births that weigh less than 2500 g among the total number of live births in a health facility during a specified reference period. The indicator consists of the following numerator and denominator:

*Numerator:* Number of live births in health facility with weight less than 2500 g at birth during a specified time period.

*Denominator:* Total number of live births in health facility in a specified time period.

**Frequency of measurement:** The indicator can be calculated on an annual basis or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on facility, subnational and national processes for data entry, compilation and analysis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Monthly, quarterly, or as needed based on the country and/or facility need
- *Subnational (first and second administrative) level:* Monthly or quarterly
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By level of facility, location of facility (e.g. urban, rural), gestational age at the time of birth, and maternal age at delivery.

**Missing values:** Missing values for documented birthweight are assumed to be not weighed.

### Population-based household surveys

The main source of data for this indicator has been through population-based household surveys collected through nationally or subnationally representative and structured questionnaires, such as:

- Demographic Health Surveys (DHS) (4)
- Multiple Indicator Cluster Surveys (MICS) (5)
- Reproductive Health Surveys (RHS)
- Other household surveys with a similar methodological design.

Population-based household survey data are the preferred data source in settings with a low utilization of health facility services or

where private health sector data are excluded from routinely collected administrative data sources.

**Key source of data:** Eligible women of reproductive age (15–49 years) are identified in the household survey for inclusion and interviewed using an individual women’s questionnaire. Women are considered eligible for survey interview if they are either usual residents or visitors of the household who stayed there the night before the interview. All eligible and interviewed women between 15 and 49 years old who had a live birth during a specified reference period, typically 2–5 years prior to the time of the interview, are asked “*Was (NAME) weighed at birth?*”, where “name” refers to the name of the live birth the individual woman had during the same reference period. If the woman responds with an answer of “YES” to this question, she is then asked “*How much did (NAME) weigh?*” If a birth record or certificate is available, the weight is recorded from the card. If no card is available, the birthweight is recorded based on maternal recall.

The MoH and NSO typically conduct household surveys and compile, analyse and report the results for this indicator in collaboration with the survey programme (e.g., DHS, MICS, RHS) and funding agency.

**Indicator definition and calculation:** Individual women of reproductive age (15–49 years old) are asked about their most recent live birth if the newborn was weighed at birth and how much the newborn weighed – irrespective of the delivery location and the child’s current living status (dead or alive) – and are for the most recent live birth that they had during a specified reference period, which is typically 2–5 years before the time of the survey completion. For this indicator, the recommended reference period is two years preceding the survey interview. The definition is as follows:

The percentage of interviewed women aged 15 to 49 years with a live birth in the two (or five) years prior to survey completion whose most recent live birth was to a baby with a reported weight below 2500 g at the time of birth. The indicator consists of the following numerator and denominator:

**Numerator:** Number of interviewed women (15–49 years old) with a live birth in the 2–5 years prior to survey completion whose most recent live birth was to a baby with a reported weight below 2500 g at the time of birth.

**Denominator:** Total number of interviewed women (15–49 years old) with a live birth in the 2–5 years prior to survey completion.

**Frequency of measurement:** Household surveys are typically conducted every 3–5 years.

**Disaggregation at population level:** Place of delivery, mode of delivery, place of residence (e.g. urban, rural), subnational administrative units (e.g. districts, provinces, regions), sex of live birth, birth order, socioeconomic status (e.g. education level, household wealth quintile), age of woman at the time of delivery, births attended by

skilled health personnel, number of antenatal care (ANC) visits and timing of first ANC visit.

**Missing values:** Included in the distribution as “don’t know” or missing.

## INTERPRETATION AND USE

### Interpretation

For live births, birthweight should be measured within the first hour of life, before significant postnatal weight loss has occurred. Not being weighed at birth reflects a lack of appropriate newborn care and also presents a challenge to accurately estimating the incidence of LBW (< 2500 g) among newborns, which is associated with newborn health and survival. For example, infants born with LBW are more likely to die within the first 28 days of life or suffer a higher likelihood of morbidities throughout their life, such as stunted growth (6), lower IQ (7), and chronic conditions like obesity and diabetes (8).

This indicator helps public health programmes, governments and global health leaders track progress towards targets on reducing prevalence of LBW among newborns, as well as monitor and evaluate the implementation and progress towards effective programming targeted to reducing LBW.

### Common challenges

#### Civil registration and vital statistics systems

Collection of vital events such as live births and birthweight that occur either in health facilities or within communities should be part of a well-functioning national and/or subnational CRVS system. However, CRVS systems are either non-existent and/or the complete coverage, accuracy and timeliness of civil registration systems is a major issue in many countries worldwide.

As a result, it is common for births to be undeclared and unregistered, particularly for live birth registrations where neonatal death occurs shortly after birth. This may be due to lack of a legal framework within civil authorities and vital statistics agencies requiring registration for all births, regardless of the outcome. Even in countries with functional CRVS systems and legal frameworks in place, missing or unregistered births still occur due to health professionals and/or parents not knowing about the requirement to register neonatal death and the need to register both the live birth in addition to the death.

#### Data collected from administrative and other routine data systems

Administrative data may suffer from poor quality such as irregularities in report generation, data duplication and inconsistencies (9). Reporting challenges exist at the facility level given data quality issues, including incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system or inadequate system design. In low-income countries, many babies are born outside of health facility settings and thus are not weighed at birth. As a result, information on birthweight and gestational age at birth are incomplete in many parts of the world, and vary in quality.

Many HMIS databases or registries are event-based and only include women who delivered a birth at a health facility. In some instances, the denominator may include births delivered by women of an unspecified age range and include both live births and stillbirths.

These differences in definitions compromise the ability to compare data between countries and across different data sources.

Administrative data should be interpreted with caution in settings where data quality is poor and the percentage of births at public and private sector health facilities is low, or where data from the private health sector are not compiled within the HMIS reporting.

In settings where routine HMIS data lack information on pregnancies and/or births that occur outside the public sector – for example, in homes or in private sector facilities – the total number of births in the HMIS should not serve to estimate the denominator for this indicator. Where data on the total numbers of live births for the entire population for the denominator are unavailable, evaluators can calculate total estimated live births using census data for the total population and crude birth rates in a specified area (total expected live births = estimated population x the total crude birth rate).

#### Data collected through household surveys

The systematic recording of births in many countries remains a serious challenge. In the absence of reliable CRVS systems or administrative data, household surveys have become the key source of data to monitor levels and trends of births. In most low- and middle-income countries, such surveys represent the sole source of this information.

Women may not be able to accurately recall details around childbirth when data are collected through household surveys (10). There is also a time lag as the recall period is up to 2–5 years before the survey data were collected.

The most commonly reported denominator is the number of women with a live birth in the years preceding the survey, which acts as a proxy for the number of live births. This indicator is prone to survivor bias in that only those women who are alive at the time of the interview would be surveyed and underestimates the total number of live births and the total number of newborns born with LBW.

In these surveys, women are asked about their most recent live birth and when, if at all, their newborn's health was checked following delivery. This should include both live births that were delivered at home and those delivered in a health facility. However, older iterations of household surveys may only obtain this information for births at home, which should be taken into consideration when reviewing older data.

#### Validation Studies

Technical work to improve the specificity of this indicator has been conducted via the following:

##### Publications

Blanc AK, Wardla T. Monitoring low birth weight: an evaluation of international estimates and an updated estimation procedure. Bull World Health Organ. 2005;83(3):178–85 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2624216/pdf/15798841.pdf>, accessed 22 October 2020).

Chang KT, Mullany LC, Khatry SK, LeClerq SC, Munos MK, Katz J. Validation of maternal reports for low birthweight and preterm birth indicators in rural Nepal. *J Glob Health*. 2018;8(1):010604 (<http://jogh.org/documents/issue201801/jogh-08-010604.pdf>, accessed 22 October 2020).

Seidman D, Slater PE, Ever-Hadani P, Gale R. Accuracy of mothers' recall of birthweight and gestational age. *Br J Obstet Gynaecol*. 1987;94(8):731–5. doi:10.1111/j.1471-0528.1987.tb03717.x.

## GLOBAL MONITORING

### Global database

The United Nations Children's Fund (UNICEF) and WHO jointly maintain a database for global monitoring and reporting on LBW prevalence (< 2500 g). These agencies calculate nationally representative estimates of LBW prevalence from CRVS, population-based household surveys or routinely collected administrative data/services statistics. Before data can be included in the global databases, UNICEF and WHO undertake a process of data verification that includes correspondence with field offices to clarify any questions regarding data quality and the reported statistics. More information about the joint UNICEF/WHO database on LBW can be found at: <https://data.unicef.org/topic/nutrition/low-birthweight/>.

### Key initiatives

Countdown to 2030 – Women's, Children's and Adolescents' Health: <http://countdown2030.org/>

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Strategy for Women's, Children's and Adolescents' Health (2016–2030): <http://www.who.int/life-course/partners/global-strategy/en/>

## ADDITIONAL RESOURCES

Blencowe H, Krusevec J, de Onis M, Black RE, An X, et al. National, regional, and worldwide estimates of low birthweight in 2015, with trends from 2000: a systematic analysis. *Lancet Glob Health*. 2019;7(7):e849–60: [https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(18\)30565-5/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(18)30565-5/fulltext)

The DHS Program: <https://dhsprogram.com>

MEASURE Evaluation: Family Planning and Reproductive Health Indicators Database: Percent of low birth-weight singleton live births, by parity: [https://www.measureevaluation.org/prh/rh\\_indicators/womens-health/nb/percent-of-low-birth-weight-singleton-live-births](https://www.measureevaluation.org/prh/rh_indicators/womens-health/nb/percent-of-low-birth-weight-singleton-live-births)

UNICEF – Multiple Indicator Cluster Surveys: <http://mics.unicef.org/tools>

WHO recommendations on interventions to improve preterm birth outcomes: [https://www.who.int/reproductivehealth/publications/maternal\\_perinatal\\_health/preterm-birth-guideline/en/](https://www.who.int/reproductivehealth/publications/maternal_perinatal_health/preterm-birth-guideline/en/)

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Indicator Sheet

# **PREVALENCE OF SMALL FOR GESTATIONAL AGE**

**MoNITOR**

## CONCEPT AND DEFINITION

**Concept** Newborns born small for gestational age (SGA) are defined as those weighing below the 10th percentile of birthweight for newborns of the same sex and gestational age in weeks as compared to population-based fetal growth curves (1). SGA newborns may be proportionately small for other measurements, such as length and head circumference, or they may be of normal length but have a lower weight than expected. These newborns can be born premature (before 37 weeks of gestation), full term (37 to 41 weeks), or post-term (after 42 weeks) (1).

Newborns born SGA have a higher risk for mortality and morbidity during the neonatal period and later in development, including delayed neurodevelopment and poor linear growth. These risks are even higher for SGA newborns born premature. Risk factors for SGA are poor maternal nutrition, maternal infection, young maternal age and short birth spacing. Many SGA newborns experience intrauterine growth restriction (IUGR), which occurs when the fetus does not receive the necessary oxygen needed for proper growth and development (1).

**Definition** The number of newborns that are SGA<sup>1</sup> in a specified reference period is expressed as a percentage of the total number of live births in the same period.

**Unit of measurement:** Percentage (%)

**Level of indicator use:** Population-based at global, national and subnational (first and second administrative level)

**Monitoring and evaluation framework:** Impact

**Domain:** Other health status

**Continuum of care:** Postnatal

<sup>1</sup> A newborn who weighs less than the 10th percentile of the expected weight of a newborn of the same gestational age, as defined by a reference population for fetal growth is the threshold for being called small for gestational age (SGA).

# MEASUREMENT GUIDANCE

## Data sources

There are two common data sources for this indicator:

- a. Routinely collected administrative data
- b. Population-based household surveys.

## Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/records or registers and are entered into national and/or subnational health management information systems (HMIS).

Data from health information systems may collect information on the number of newborns born SGA among all newborns born in a health facility. Routinely collected administrative data and health facility statistics are the preferred data source in settings with a high utilization of health facility services and where data are recorded in a manner that ensures good data quality for both the public and private health sectors. The compiled data in the national HMIS or District Health Information System (DHIS2) should include data from both public and private health sectors, especially when the private sector is a substantial source of service provision to the population. In settings where utilization of health facilities is not high (e.g. settings with a high prevalence of births occurring at home), data may suffer from incompleteness if births occurring outside facilities are not captured. In addition, there are often challenges in accurately measuring the numerator and denominator when routine HMIS data are used to measure this indicator.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from obstetric and neonatal medical records, including health services registers. Information about birthweight is recorded by health personnel within health facilities on paper forms completed by health personnel and/or through an electronic medical record. Data from paper or electronic sources are entered or abstracted into a database or registry and are compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for the reporting of this indicator.

**Indicator definition and calculation:** The indicator is calculated as the percentage of newborns SGA among the total number of live births in a health facility during a specified reference period. In order to calculate this indicator, the newborn's gestational age at birth and birthweight are needed and the growth is to be compared to a reference population to determine if the baby weighs below the 10th percentile for the expected birthweight. The indicator consists of the following numerator and denominator:

**Numerator:** The number of newborns SGA (birthweight below the 10th percentile of the expected weight of a newborn of the same gestational age) in a specified time period.

**Denominator:** Total number of live births in health facility in a specified time period.

**Frequency of measurement:** The indicator can be calculated on an annual basis or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on facility, subnational and national processes for data entry, compilation and analysis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Monthly, quarterly, or as needed based on the country and/or facility need
- *Subnational (first and second administrative) level:* Monthly or quarterly
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By level of facility, location of facility (e.g. urban, rural), gestational age at the time of birth and maternal age at delivery.

**Missing values:** Missing values are usually not known or not reported.

#### Population-based household surveys

The main source of data for this indicator has been through population-based household surveys collected through nationally or subnationally representative and structured questionnaires, such as:

- Demographic Health Surveys (DHS) (2)
- Multiple Indicator Cluster Surveys (MICS) (3)
- Reproductive Health Surveys (RHS)
- Other household surveys with a similar methodological design.

Population-based household survey data are the preferred data source in settings with a low utilization of health facility services or where private health sector data are excluded from routinely collected administrative data sources.

**Key source of data:** Eligible women of reproductive age (15–49 years) are identified in the household survey for inclusion and interviewed using an individual women's questionnaire. Women are considered eligible for survey interview if they are either usual residents or visitors of the household who stayed there the night before the interview.

All eligible and interviewed women between 15 and 49 years old who had a live birth during a specified reference period, typically 2–5 years prior to the time of interview, are asked “*When (NAME) was born,*

was (NAME) very large, larger than average, average, smaller than average, or very small?”, where “name” refers to the name of the live birth the individual woman had during the same reference period. If the woman cannot recall, a response option for “don’t know” may be selected by the interviewer.

The MoH and NSO typically conduct household surveys and compile, analyse and report the results for this indicator in collaboration with the survey programme (e.g., DHS, MICS, RHS) and funding agency. Indicator definition and calculation: Individual women of reproductive age (15–49 years old) are asked in regards to their most recent live birth if the newborn was “born ... very large, larger than average, average, smaller than average, or very small” irrespective of the delivery location and the child’s current living status (dead or alive), and are asked for births that occurred during a specified reference period, which is typically 2–5 years before the time of the survey completion. For this indicator, the recommended reference period is two years preceding the survey interview. The definition is as follows:

The percentage of interviewed women (aged 15–49 years) with a live birth in the 2–5 years prior to survey completion whose most recent live birth was estimated by the woman to be born small or very small at birth. The indicator consists of the following numerator and denominator:

*Numerator:* Number of interviewed women (15–49 years old) with a live birth in the 2–5 years prior to survey completion whose most recent live birth was estimated to be born small or very small at the time of birth.

*Denominator:* The total number of interviewed women (aged 15–49) with a live birth in the 2–5 years prior to survey completion.

**Frequency of measurement:** Household surveys are typically conducted every 3–5 years.

**Disaggregation at population level:** Type of health personnel, place of delivery, mode of delivery, place of residence (e.g. urban, rural), sex of live birth, birth order, socioeconomic status (e.g. education level, wealth quintile), age of woman at the time of delivery, and births attended by skilled health personnel.

**Missing values:** Included in the distribution as “don’t know” or missing.

# INTERPRETATION AND USE

## Interpretation

For live births, birthweight should preferably be measured within the first hour of life, in order to ensure a more accurate measurement is taken before significant postnatal weight loss has occurred. Not being weighed at birth reflects a lack of appropriate newborn care and also presents a challenge to accurately estimate the prevalence of SGA newborns, which is associated with newborn health and survival. Newborns who are born SGA (below 10th percentile of the recommended birthweight for sex and gestation age) is a better indicator of assessing fetal growth restriction or malnutrition, when compared to measuring birthweight alone and without consideration of sex and gestational age at birth.

This indicator helps public health programmes, governments and global health leaders track progress towards targets on reducing SGA incidence, as well as monitor and evaluate the implementation and progress towards effective programming targeted to reducing SGA.

## Common challenges

### Data collected from administrative and other routine data systems

Data collected from administrative and other routine data systems Administrative data may suffer from poor quality such as irregularities in report generation, data duplication and inconsistencies (4). Reporting challenges exist at the facility level given data quality issues, including incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system or inadequate system design. In low-income countries, many babies are born outside of health facility settings and thus are not weighed at birth. As a result, information on birthweight and gestational age at birth are incomplete in many parts of the world, and vary in quality.

Many HMIS databases or registries are event-based and only include women who delivered a birth at a health facility. In some instances, the denominator may include births delivered by women of an unspecified age range and include both live births and stillbirths. These differences in definitions compromise the ability to compare data between countries and across different data sources.

Administrative data should be interpreted with caution in settings where data quality is poor and the percentage of births at public and private sector health facilities is low, or where data from the private health sector are not compiled within the HMIS reporting.

In settings where routine HMIS data lack information on pregnancies and/or births that occur outside the public sector – for example, in homes or in private sector facilities – the total number of births in the HMIS should not serve to estimate the denominator for this indicator. Where data on the total numbers of live births for the entire population for the denominator are unavailable, evaluators can calculate total estimated live births using census data for the total population and

crude birth rates in a specified area (total expected live births = estimated population x the total crude birth rate).

### Data collected through household surveys

The systematic recording of births in many countries remains a serious challenge. In the absence of reliable CRVS systems/routine administrative data, household surveys have become the key source of data to monitor levels and trends of births. In most low- and middle-income countries, such surveys represent the sole source of this information.

However, women may not be able to accurately recall details around childbirth when data are collected through household surveys (5). There is also a time lag as the recall period is up to 2–5 years before the survey data were collected. Furthermore, in the DHS and MICS, women are asked to subjectively assess their newborn's size at birth as very large, larger than average, average, smaller than average, or very small. These assessments by the mother are prone to a high degree of error and the categories of measurement are broad, leading to a bias towards larger sizes at birth (6). In addition, data measured in this manner using household surveys are not comparable to more rigorous calculations of SGA using gestational age, birthweight and population growth data to determine if the newborn was born below the 10th percentile for weight and gestational age.

The most commonly reported denominator is the number of women with a live birth in the years preceding the survey, which acts as a proxy for the number of live births. This indicator is prone to survivor bias in that only those women who are alive at the time of the interview would be surveyed, and underestimates the total number of live births and the total number of newborns born SGA.

In these surveys, women are asked about their most recent live birth and when, if at all, their newborn's health was checked following delivery. This should include both live births that were delivered at home and those delivered in a health facility. However, older iterations of household surveys may only obtain this information for births at home; this should be taken into consideration when reviewing older data.

### Validation studies

Technical work to improve the specificity of this indicator has been conducted via the following:

#### Publications

AMANHI (Alliance for Maternal and Newborn Health Improvement), Baqui A, Ahmed P, Dasgupta SK, Begum N, Rahman M, et al. Development and validation of a simplified algorithm for neonatal gestational age assessment – protocol for the Alliance for Maternal Newborn Health Improvement (AMANHI) prospective cohort study. *J Glob Health*. 2017;7(2):021201 (<http://jogh.org/documents/issue201702/jogh-07-021201.pdf>, accessed 23 October 2020).

Blanc AK, Wardla T. Monitoring low birth weight: an evaluation of international estimates and an updated estimation procedure. *Bull*

World Health Organ. 2005;83(3):178–85 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2624216/pdf/15798841.pdf>, accessed 23 October 2020).

Chang KT, Mullany LC, Khatry SK, LeClerq SC, Munos MK, Katz J. Validation of maternal reports for low birthweight and preterm birth indicators in rural Nepal. J Glob Health. 2018;8(1):010604 (<http://jogh.org/documents/issue201801/jogh-08-010604.pdf>, accessed 22 October 2020).

Seidman D, Slater PE, Ever-Hadani P, Gale R. Accuracy of mothers' recall of birthweight and gestational age. Br J Obstet Gynaecol. 1987;94(8):731–5. doi:10.1111/j.1471-0528.1987.tb03717.x.

# GLOBAL MONITORING

## Global database

There is currently no global database responsible for monitoring and tracking progress of the prevalence of SGA. However, the United Nations Children's Fund (UNICEF) and WHO jointly maintain a database for global monitoring and reporting on LBW prevalence (< 2500 g). More information about the joint UNICEF/WHO database for LBW can be found at: <https://data.unicef.org/topic/nutrition/low-birthweight/>.

## Key initiatives

Countdown to 2030 – Women's, Children's and Adolescents' Health: <http://countdown2030.org/>

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Strategy for Women's, Children's and Adolescents' Health (2016–2030): <http://www.who.int/life-course/partners/global-strategy/en/>

## ADDITIONAL RESOURCES

The DHS Program: <https://dhsprogram.com>

MEASURE Evaluation: Family Planning and Reproductive Health Indicators Database: Percent of low birth-weight singleton live births, by parity: [https://www.measureevaluation.org/prh/rh\\_indicators/womens-health/nb/percent-of-low-birth-weight-singleton-live-births](https://www.measureevaluation.org/prh/rh_indicators/womens-health/nb/percent-of-low-birth-weight-singleton-live-births)

UNICEF – Multiple Indicator Cluster Surveys: <http://mics.unicef.org/tools>

WHO recommendations on interventions to improve preterm birth outcomes: [https://www.who.int/reproductivehealth/publications/maternal\\_perinatal\\_health/preterm-birth-guideline/en/](https://www.who.int/reproductivehealth/publications/maternal_perinatal_health/preterm-birth-guideline/en/)

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2. The DHS Program [website]. Rockville: ICF International; 2020 (<http://www.dhsprogram.com/>, accessed 21 October 2020).
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Indicator Sheet

# STILLBIRTH RATE

MoNITOR 

## CONCEPT AND DEFINITION

### Concept

Stillbirth is one of the most common adverse pregnancy outcomes worldwide (1). A stillbirth or fetal death is defined as a baby who was born with no signs of life (e.g. did not cry, move, breathe, or have a heartbeat) either before (antepartum) or during (intrapartum) delivery (2). For international comparison, WHO defines a stillbirth or fetal death, according to the International Classification of Diseases and Related Health Problems, 10th Revision (ICD-10) (2), as a death of a fetus with a birthweight of  $\geq 1000$  grams (g) or a gestational age of  $\geq 28$  weeks or a body length of  $\geq 35$  centimetres (cm).

Stillbirth rates in many settings reflect the quality of antenatal care and the timeliness and quality of intrapartum monitoring and care. The proportion of babies that die in intrapartum is therefore a very important indicator, enabling health personnel to take the most appropriate measures to prevent such deaths. Where women receive good care during childbirth, intrapartum deaths represent less than 10% of stillbirths due to unexpected severe complications (1). While national and international attention, statistics and interventions focus on live births, there is very little research, programmatic or policy attention on stillbirths. Better access to appropriate obstetric care, especially during labour, should reduce stillbirth rates dramatically.

### Definition

The number of fetuses born per year with no sign of life and born with birthweight of 1000 g, or after 28 weeks' gestation, or 35 cm or more body length is expressed as a rate per 1000 births (live and stillbirths) (2).

**Unit of measurement:** Rate

**Level of indicator use:** (a) Population-based global, national and subnational (first or second administrative level); and (b) facility-based at national or subnational level (first or second administrative level)

**Monitoring and evaluation framework:** Impact

**Domain:** Mortality

**Continuum of care:** Antenatal and intrapartum

# MEASUREMENT GUIDANCE

## Data sources

The three main data sources for this indicator are:

- a. Civil registration and vital statistics (CRVS) systems
- b. Routinely collected administrative data
- c. Population-based household surveys.

## Civil registration and vital statistics systems

A well-functioning and integrated national or subnational CRVS system will universally register and certify vital events, including live births, stillbirths and deaths that occur in the country or administrative area. Birth and death certificates are issued as part of the CRVS system, allowing the compilation, analysis and dissemination of information through vital statistics agencies, including population characteristics (e.g. sex, date of birth or death, place of birth or death, place of usual residence) and cause-of-death information. Some CRVS systems will also register and certify other important vital events within the population, such as adoptions, marriages and divorces (3).

Data from CRVS are the preferred data source for this indicator when the system freely and universally records vital events and data are recorded in a systematic manner that ensures high data quality for both the public and private health sectors and regardless of location of birth (e.g. health facility or community-based births).

**Key source of data:** The main source of data for this indicator involves several steps and varies based on the policies and procedures of the national or subnational CRVS or other routine system within health facilities and/or within communities. Declaration of the stillbirth events are obtained through: (a) forms completed by health personnel at health facilities, or (b) community-based sources, including registration forms submitted directly by the parents of the stillbirth to civil registrars. Either paper or electronic forms containing this information are then submitted to the relevant civil authorities and vital statistics agencies, which have the responsibility to officially record the birth event and birth characteristics, such as name, date and place of birth, nationality and names of the mother and/or father. At the national or subnational level, the civil authority and vital statistics agency issues birth certificates to formalize the birth registration, regardless of birth outcome (live or stillbirth). National or subnational civil authorities and vital statistics agencies are responsible for reporting of this indicator.

**Indicator definition and calculation:** The indicator is calculated as the number of stillbirths per 1000 births (live and stillbirths) during a specified time period.

**Numerator:** Number of fetuses born per year with no sign of life and born with birthweight of  $\geq 1000$  g, or  $\geq 28$  weeks' gestation, or  $\geq 35$  cm body length during a specified time period.

**Denominator:** Total number of births (per 1000) in a specified time period.

To compute the rate per 1000 births, the numerator is divided by the denominator and multiplied by 1000. The denominator should include both live and stillbirths, including babies born live and who have later died (i.e. neonatal death). The definition of stillbirth may vary depending on definitions within the health facility and/or national or subnational vital statistics offices. To align with the global indicator, a stillbirth (or fetal death) is defined as a baby born with no signs of life after a given threshold. For international comparison, WHO defines stillbirth as birthweight of  $\geq 1000$  g; if the birthweight is not available, a gestational age of  $\geq 28$  weeks or a length of  $\geq 35$  cm (ICD-10) is used (2).

**Frequency of measurement:** Within CRVS, this indicator is generally monitored at a national or subnational level on an annual basis. The data can be compiled and aggregated subnationally to provide national-level data.

**Disaggregation:** By timing/type of fetal death or stillbirth (antepartum or intrapartum; fresh<sup>1</sup> or macerated<sup>2</sup>) (3), gestational age in weeks and days, birthweight, sex, place of birth, place of residence (e.g. urban, rural), and type of reporting source (e.g. health facility, community).

**Missing values:** Missing values are usually not known. To ascertain missing data, estimates of the total number of births in a country or administrative area can be compared with the absolute number of births in the same period.

#### Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/records or registers and are entered into national and/or subnational health management information systems (HMIS).

Data from health information systems may collect information on stillbirths among all births in a health facility. Routinely collected

<sup>1</sup> An intrapartum fetal death (stillbirth – fresh) refers to a baby that has died after the onset of labour and before birth. Fresh stillbirths do not show any signs of maceration ([https://www.who.int/healthinfo/FacilityAnalysisGuidance\\_RMNAH.pdf](https://www.who.int/healthinfo/FacilityAnalysisGuidance_RMNAH.pdf)).

<sup>2</sup> An antepartum fetal death (stillbirth – macerated) refers to a fetus that has suffered an intrauterine death after the 28th week of gestation and before labour ([https://www.who.int/healthinfo/FacilityAnalysisGuidance\\_RMNAH.pdf](https://www.who.int/healthinfo/FacilityAnalysisGuidance_RMNAH.pdf)).

administrative data and health facility statistics are the preferred data source in settings without an established CRVS system and when there is a high utilization of health facility services and data are recorded in a manner that ensures good data quality for both the public and private health sectors. The compiled data in the national HMIS or District Health Information System (DHIS2) should include data from both public and private health sectors, especially when the private sector is a substantial source of service provision to the population. In settings where utilization of health facilities is not high (e.g. settings with a high prevalence of births occurring at home), data may suffer from incompleteness if information about births occurring outside facilities is not captured. In addition, there are often challenges in accurately measuring the numerator and the denominator when routine HMIS data are used to measure this indicator.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from obstetric and neonatal medical records, including health services registers. Relevant information is recorded about the fetal/newborn status at the time of delivery, including live birth or stillbirth (fetal death antepartum or intrapartum) for all newborns delivered at health facilities on paper forms completed by health personnel and/or through an electronic medical record. Data from paper or electronic sources are ideally entered or abstracted into a database or registry and are compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for the reporting of this indicator.

**Indicator and calculation:** The indicator is calculated as the number of stillbirths per 1000 births (live and stillbirths) in health facilities during a specified time period.

**Numerator:** Number of fetuses and infants born per year with no sign of life and born with birthweight of  $\geq 1000$  g, or  $\geq 28$  weeks' gestation, or  $\geq 35$  cm body length in health facilities during a specified time period (2).

**Denominator:** Total number of births (live and stillbirth) in health facilities<sup>3</sup> during a specified time period.

To compute the rate per 1000 births, the numerator is divided by the denominator and multiplied by 1000. The definition of stillbirth may vary depending on definitions within the health facility and/or national or subnational vital statistics offices. To align with the global indicator,

<sup>3</sup> In most countries, HMIS captures information on births within health facilities. However, in contexts where the HMIS includes both health facility and community birth registration, the denominator should include births registered within the geographic jurisdiction or catchment area of the health facility.

a stillbirth (or fetal death) is defined as a baby born with no signs of life after a given threshold. For international comparison, WHO defines stillbirth as birthweight of  $\geq 1000$  g; if the birthweight is not available, a gestational age of  $\geq 28$  weeks or a length of  $\geq 35$  cm (ICD-10) is used (2).

**Frequency of measurement:** The indicator can be calculated on an annual basis or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on facility, subnational and national processes for data entry, compilation and analysis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Monthly, quarterly, or as needed based on the country and/or facility need
- *Subnational (first and second administrative) level:* Monthly or quarterly
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By timing/type of fetal death or stillbirth (antepartum or intrapartum; fresh or macerated) (4), gestational age in weeks and days, birthweight, sex, level of facility, and location of facility (e.g. urban, rural).

**Missing values:** Missing values or stillbirths that occur outside of health facilities are usually not known or not reported.

### Population-based household surveys

The main source of data for this indicator has been through population-based household surveys collected through nationally or subnationally representative and structured questionnaires, such as:

- Demographic Health Surveys (DHS) (5)
- Multiple Indicator Cluster Surveys (MICS) (6)
- Reproductive Health Surveys (RHS)
- Other household surveys with a similar methodological design.

Population-based household survey data are the preferred data source in settings where utilization of health facility services is not very high (e.g. settings with a high prevalence of deliveries occurring at home) or where private health sector data are excluded from routinely collected administrative data sources.

**Key source of data:** Eligible women of reproductive age (15–49 years) are identified in the household survey for inclusion and interviewing using an individual women's questionnaire. Women are considered eligible for survey interview if they are either usual residents or visitors of the household who stayed there the night before the interview.

In the DHS-7 Women's Questionnaire (5), all eligible and interviewed women between 15 and 49 years old are asked: *"Have you ever had a pregnancy that miscarried, was aborted, or ended in a stillbirth?"* If the woman responded "YES" to this question, she is then asked: *"When did the last such pregnancy end?"* The interviewer then asks for the month and year when the pregnancy ended.

For women who reported having a "pregnancy that miscarried, was aborted, or ended in a stillbirth" within five years prior to the survey interview date, further questions are asked for this pregnancy, as follows:

1. *"In what month and year did the preceding such pregnancy end?"*
2. *"How many months pregnant were you when that pregnancy ended?"*
3. *"Since [5 years before survey interview], have you had any other pregnancies that did not result in a live birth?"*

If the woman responded "YES" to question three above, indicating that she has had other pregnancies that did not result in a live birth, she is then asked questions 1–3 above for each preceding pregnancy that occurred within the five years before the survey interview, until there are no more additional pregnancies identified that did not end in a live birth within that time period.

Women are then asked *"Did you have any miscarriages, abortions, or stillbirths that ended before (YEAR)?"*; where "YEAR" refers to pregnancies that ended more than five years prior to the survey interview. If a woman indicates that she had a miscarriage, abortion, or stillbirth more than five years ago, she is asked *"When did the last such pregnancy that terminated before (YEAR) end?"* where "YEAR" refers to the year more than five years prior to the survey interview.

The MoH and NSO typically conduct household surveys and compile, analyse and report the results for this indicator in collaboration with the survey programme (e.g. DHS or other survey) and funding agency.

**Indicator definition and calculation:** Individual women of reproductive age (15–49 years old) are asked about the number of pregnancy losses during or after the seventh month of pregnancy for the five years preceding the interview. DHS follows WHO's recommendation of reporting of stillbirths of 28 weeks or more gestation age for international comparison. However, in the DHS, duration of pregnancy is only recorded in months, and seven months may mean pregnancy duration is anywhere from 25 to 31 weeks of gestation. The definition is as follows:

The number of stillbirths<sup>4</sup> (pregnancies that lasted seven or more months and terminated in a fetal death) per 1000 births in the five years prior to survey completion. The indicator consists of the following numerator and denominator:

*Numerator:* The number of pregnancies that lasted seven or more months and terminated in a fetal death in the five years prior to survey completion.

*Denominator:* Total number of birth (live births and stillbirth) in the five years prior to survey completion.

To compute the rate per 1000 births, the numerator is divided by the denominator and multiplied by 1000.

**Frequency of measurement:** Household surveys are typically conducted every 3–5 years.

**Disaggregation at population level:** Place of delivery (private or public health facility, community), place of residence (e.g. urban, rural), subnational administrative units (e.g. districts, provinces, regions), socioeconomic status (e.g. education level, household wealth quintile), age of woman at the time of interview, sex of birth, births attended by skilled health personnel, total number of antenatal care (ANC) visits and timing of first ANC visit.

**Missing values:** Missing values are not allowed for any of the variables that make up the rate.

<sup>4</sup> The number of stillbirths is estimated from the contraceptive calendar. See the contraceptive calendar tutorial at: <https://www.dhsprogram.com/data/Calendar-Tutorial/index.cfm>.

# INTERPRETATION AND USE

## Interpretation

A high stillbirth rate may reflect inadequacies in antenatal and intrapartum care, and can be an indication of the quality and coverage of essential, referral and emergency care for women during pregnancy and childbirth. However, stillbirths are poorly captured and more likely not to be accurately accounted for. The use of standard definitions for stillbirth and accurate and timely classification of these deaths is critical for case ascertainment and global comparability. The WHO application of the ICD-10 to deaths during the perinatal period (ICD-PM) provides a framework for the consistent collection, analysis and interpretation of stillbirths (7).

## Common challenges

*Under-reporting:* The number of stillbirths continues to be high and there is a lack of usable data in countries and regions in which most stillbirths occur, with under-reporting being a major challenge (8).

*Inconsistent definitions:* The different criteria used to define stillbirth remain an issue globally (9). Stillbirths are challenging to measure and data are often sparse and suffer from inconsistent definitions. However, for international comparison, WHO uses the ICD-10 definitions of late fetal deaths (1). WHO recommends gestational age threshold as the preferred parameter, because it is a better predictor of viability than birthweight. Most births in low-income countries occur at home, so birthweight is often unknown, and even with facility deliveries, stillborn babies are rarely weighed. This makes gestational age the most reliable criteria by which determination of stillbirths can be based upon (10).

Although the ICD-10 definition of stillbirth encompasses both birthweight and gestational age thresholds, they do not give equivalent results. This problem is compounded by the frequent occurrence of fetal growth restriction, associated with an adverse intrauterine environment before fetal death; hence, a birthweight-based cutoff will give a lower stillbirth rate than one based on gestational age. In many low- and middle-income countries, gestational age is mainly based on the last menstrual period, which women may not remember or may not have any records to rely on (11). There is further variation in definitions, especially in high-income countries. For example, in the United States of America (12), Australia and New Zealand (13, 14) data are collected from 20 weeks of gestation.

*Self-report and recall bias:* In surveys, which are the main source of data for low- and middle-income countries, stillbirths are documented based on self-report from mothers and is subject to recall and misclassification bias. Accuracy of recall, including age at death, may deteriorate with time, as in all surveys, and is also related to the skill and cultural sensitivity of the person carrying out the interview (10).

*Lack of reporting requirements:* Absence of global goals and reporting mechanisms continue to restrict the visibility of stillbirth rates, especially in countries with the greatest disease burden. This is magnified by the fact that the legal requirements for registration of fetal deaths vary between and within countries.

### Civil registration and vital statistics systems

Collection of stillbirths that occur either in health facilities or within communities should be part of a well-functioning national and/or subnational CRVS system. However, in many countries worldwide, CRVS systems are either non-existent and/or the complete coverage, accuracy and timeliness of civil registration systems is a major issue. In order to assess the completeness of the CRVS system, evaluations should be conducted to ascertain the quality of the system, as recommended by the United Nation's revised Principles and Recommendations for a Vital Statistics System (3).

It is common for births to be undeclared and unregistered, particularly for stillbirths and live birth registrations for neonatal deaths occurring shortly after birth. This may be due to lack of a legal framework within civil authorities or vital statistics agencies requiring registration for all births, regardless of the outcome. Even in countries with functional CRVS systems and legal frameworks in place, missing or unregistered births still occur due to health professionals and/or parents not knowing about the requirement to register stillbirths, and in the instance of neonatal death, the need to register both the live birth in addition to the death.

For data from countries with a CRVS system and good coverage, data meeting definition criteria of  $\geq 1000$  g or 28 completed weeks of gestation are taken directly from CRVS without adjustment. For countries with limited data, the stillbirth rate should be estimated using statistical modelling (8).

### Data collected from administrative and other routine data systems

Administrative data may suffer from poor quality such as irregularities in report generation, data duplication and inconsistencies (15). Reporting challenges exist at the facility level given data quality issues, including incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system or inadequate system design.

Many HMIS databases or registries are event-based and the definition of a stillbirth varies by country and context, such as differences in inclusion for gestational age (e.g. 20–28 weeks) and birthweight (e.g.  $\geq 500$  grams). These differences in definitions compromise the ability to compare data between countries.

Administrative data should be interpreted with caution in settings where data quality is poor and the percentage of births at public and private sector health facilities is low, or where data from the private health sector are not compiled within the HMIS reporting.

In settings where routine HMIS data lack information on pregnancies and/or births or deliveries that occur outside the public sector – for

example, in homes, in the community, or in private sector facilities – the total number of births in the HMIS should not serve to estimate the denominator for this indicator. Where data on the total numbers of live births for the entire population for the denominator are unavailable, evaluators can calculate total estimated live births using census data for the total population and crude birth rates in a specified area (total expected live births = estimated population x the total crude birth rate).

### Data collected through household surveys

Women may not be able to accurately recall details around childbirth when data are collected through household surveys (16). There is also a time lag as the recall period is for all pregnancies up to five years before the survey data were collected.

The systematic recording of live births, stillbirths and deaths in many countries remains a serious challenge. In the absence of reliable CRVS systems or administrative data, household surveys have recently become the source of data to monitor levels and trends of stillbirths. In many low- and middle-income countries, such surveys represent the sole source of this information. However, in many cultures and countries in the world, the appropriateness of asking about stillborn infants is very sensitive, and accuracy of reporting these events in household surveys is compromised due to difficulty in disclosure and also the complexity of probing to be able to properly identify the difference between a live birth, stillbirth (fetal death) and neonatal death.

## Validation Studies

Technical work to improve the specificity of this indicator has been conducted via the following:

### Publications

Blencowe H, Cousens S, Bianchi Jassir F, Say L, Chou D, Mathers C, et al. National, regional, and worldwide estimates of stillbirth rates in 2015, with trends from 2000: a systematic analysis. *Lancet Glob Health*. 2016;4(2):e98–108 ([https://doi.org/10.1016/S2214-109X\(15\)00275-2](https://doi.org/10.1016/S2214-109X(15)00275-2), accessed 23 October 2020).

Lawn JE, Blencowe H, Pattinson R, Cousens S, Kumar R, Ibiebele I, et al. Stillbirths: Where? When? Why? How to make the data count? *Lancet*. 2011;377(9775):1448–63 ([http://dx.doi.org/10.1016/S0140-6736\(10\)62187-3](http://dx.doi.org/10.1016/S0140-6736(10)62187-3), accessed 23 October 2020).

Liu L, Kalter HD, Chu Y, Kazmi N, Koffi AK, Amouzou A, et al. Understanding misclassification between neonatal deaths and stillbirths: empirical evidence from Malawi. *PLoS One*. 2016;11(12):e0168743 (<https://doi.org/10.1371/journal.pone.0168743>, accessed 23 October 2020).

## GLOBAL MONITORING

The Every Newborn Action Plan (ENAP), a global multi-partner movement to end preventable newborn deaths and stillbirths, set a target for national stillbirth rates of 12 or fewer stillbirths per 1000 births in all countries by 2030, accompanied by action in countries to address disparities. Progress in reducing the large worldwide stillbirth burden remains slow and insufficient to meet national targets of the ENAP (17). To reach this target, countries will need to act to reduce preventable stillbirths and improve monitoring of stillbirth (14, 16). The indicator and monitoring framework for the Global Strategy for Women's, Children's and Adolescents' Health (2016–2030) focusing on its Survive, Thrive and Transform objectives lists the stillbirth rate as one of 16 key indicators selected as a minimum subset to provide a snapshot of progress on the Global Strategy (18). Stillbirths are increasingly being counted at a local level, but countries and the global community must further improve the quality and comparability of data and ensure that this is more clearly linked to accountability processes, including the Sustainable Development Goals (SDGs).

### Global database

The stillbirth rate per 1000 births by country is monitored and tracked by the WHO Global Health Observatory (GHO). More information about the WHO GHO data repository for stillbirth estimates by country can be found at: <https://apps.who.int/gho/data/view.main.GSWCAH06v>.

### Key initiatives

Countdown to 2030 – Women's, Children's and Adolescents' Health: <http://countdown2030.org/>

Every Newborn Action Plan (ENAP): [http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/127938/1/9789241507448_eng.pdf)

Global Reference List of 100 Core Health Indicators (plus health-related SDGs), 2018: <https://www.who.int/healthinfo/indicators/2018/en/>

Global Strategy for Women's, Children's and Adolescents' Health (2016–2030): <http://www.who.int/life-course/partners/global-strategy/en/>

## ADDITIONAL RESOURCES

Global Health Observatory (GHO) Data – World Health Statistics: [http://www.who.int/gho/publications/world\\_health\\_statistics/en/](http://www.who.int/gho/publications/world_health_statistics/en/)

Making Every Baby Count: Audit and review of stillbirths and neonatal deaths: [http://www.who.int/maternal\\_child\\_adolescent/documents/stillbirth-neonatal-death-review/en](http://www.who.int/maternal_child_adolescent/documents/stillbirth-neonatal-death-review/en)

MEASURE Evaluation. Family Planning and Reproductive Health Indicators Database: Intrapartum or fresh stillbirth rate: <https://www.measureevaluation.org/rbf/indicator-collections/health-outcome-impact-indicators/intrapartum-or-fresh-stillbirth-rate>

The DHS Program: <https://dhsprogram.com>

The WHO application of ICD-10 to deaths during the perinatal period: ICD-PM: <https://apps.who.int/iris/bitstream/handle/10665/249515/9789241549752-eng.pdf>

UNICEF – Multiple Indicator Cluster Surveys: <http://mics.unicef.org/tools>

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Indicator Sheet

# UTEROTONIC FOR PREVENTION OF POSTPARTUM HAEMORRHAGE

MoNITOR 

## CONCEPT AND DEFINITION

### Concept

Most obstetric complications could be prevented or managed with timely and appropriate access, management and quality care during pregnancy and childbirth. Postpartum haemorrhage (PPH) is defined as a blood loss of 500 millilitres or more within 24 hours after birth, and is the leading cause of maternal morbidity and mortality in low-income countries and the primary cause of nearly one quarter of all maternal deaths globally (1). Administering an uterotonic drug (e.g. oxytocin, syntometrine, ergometrine, carbetocine, misoprostol) immediately after delivery of the baby stimulates uterine contractions that facilitate separation of the placenta from the uterine wall, resulting in rapid delivery of the placenta. Uterotonics also stimulate uterine contractions that compress maternal blood vessels at the placental site after delivery of the placenta (2–4). Maternal morbidity and mortality resulting from PPH occur due to uterine atony soon after birth; the majority of these could be avoided through administration of a prophylactic uterotonic drug to all women during the third stage of labour (1). Improving health care for women during childbirth in order to prevent PPH is an essential step towards reducing maternal morbidity and mortality.

### Definition

The number of women who gave birth in a facility who received a prophylactic uterotonic (e.g. oxytocin) immediately<sup>1</sup> after birth for prevention of PPH is expressed as a percentage of the total number of women who gave birth in a facility in the same period (5).

**Unit of measurement:** Percentage (%)

**Level of indicator use:** Facility-based at national and subnational (first and second administrative level)

**Monitoring and evaluation framework:** Outcome

**Domain:** Service coverage

**Continuum of care:** Intrapartum

<sup>1</sup> Ideally, immediately refers to within one minute after birth.

# MEASUREMENT GUIDANCE

## Data sources

The main data source for this indicator is routinely collected administrative data.

### Routinely collected administrative data

Data from routinely collected and compiled administrative data sources will provide information as recorded in medical charts/records or registers and are entered into national and/or subnational health management information systems (HMIS).

Data from health information systems may collect information on administration of uterotonic drugs immediately after delivery among all women who delivered at a health facility. Routinely collected administrative data and health facility statistics are the preferred data source in settings with a high utilization of health facility services and where data are recorded in a manner that ensures good data quality for both the public and private health sector. The compiled data in the national HMIS or District Health Information System (DHIS2) should include data from both public and private health sectors, especially when the private sector is a substantial source of service provision to the population. In settings where utilization of health facilities is not high (e.g. settings with a high prevalence of births occurring at home), data may suffer from incompleteness if information about women delivering outside facilities is not captured. In addition, there are often challenges in accurately measuring the numerator and the denominator when routine HMIS data are used to measure this indicator.

**Key source of data:** Administrative data sources include health facility and health services data abstracted from obstetric and neonatal medical records, including health services registers. Relevant information is recorded by health personnel within health facilities on paper forms completed by health personnel and/or through an electronic medical record. Data from paper or electronic sources are entered or abstracted into a database or registry and are compiled and analysed within the national and/or subnational HMIS. The Ministry of Health (MoH) and/or National Statistical Offices (NSO) are usually responsible for the reporting of this indicator.

**Indicator definition and calculation:** The indicator is calculated as the percentage of women who received a prophylactic uterotonic immediately (within one minute) after birth for prevention of PPH among all births in a health facility during a specified reference period. The indicator consists of the following numerator and denominator:

*Numerator:* Number of women who gave birth in a facility who received a prophylactic uterotonic immediately after birth in a specified time period.

*Denominator:* Number of women who gave birth in the health facility in a specified time period.

*[Note: The standard for operationalizing «immediately» is within one minute.]*

Unless specified, the statistic may include any woman regardless of age and should include both live births and stillbirths, as defined by the health facility and/or national or subnational vital statistics offices. The type of uterotonic given and timing of administration in the numerator is based on individual health facility report or is in accordance with the country-specific definition by the MoH and/or NSO.

**Frequency of measurement:** The indicator can be calculated on an annual basis or may be tracked on a more frequent and ongoing basis (e.g. monthly, quarterly), depending on facility, subnational and national processes for data entry, compilation and analysis. As a guide, the recommended frequency of measurement based on reporting level is outlined below:

- *Facility level:* Monthly, quarterly, or as needed based on the country and/or facility need
- *Subnational (first and second administrative level):* Monthly or quarterly
- *National level:* Annually (data can be aggregated to provide national-level data).

**Disaggregation:** By level of facility, location of facility (e.g. urban, rural), subnational administrative units (e.g. districts, provinces, regions), facility type (public, private, nongovernmental, community-based), age of mother and type of health personnel.

**Missing values:** Missing values are usually not known or not reported.

# INTERPRETATION AND USE

## Interpretation

The use of uterotonics for the prevention of PPH during the third stage of labour is recommended for all births in order to prevent maternal mortality and morbidity (1). This indicator measures a key component of active management of the third stage of labour and, as a routine indicator for country-level HMIS, helps inform the health-care system on how to allocate resources and improve function (4). The immediate postpartum period is before the delivery of the placenta and is ideally within the first minute after delivery of the newborn. This indicator is a measure of the content and quality of care received within health facilities for women during the intrapartum period. However, the quality of care received at health facilities may vary between and within countries. Although WHO recommends oxytocin, the administration of uterotonic drugs may include several different drugs used to contract the uterus (e.g. oxytocin, ergometrine, carbetocin, misoprostol, or a combination of drugs). A recent large-scale randomized controlled trial comparing oxytocin and carbetocin for the prevention of PPH found that carbetocin, a stable drug at room temperature, is appropriate for administration to women for the prevention of PPH, particularly in low-resource settings where there is no access to proper cold chain procedures (6).

## Common challenges

### Data collected from administrative and other routine data systems

Administrative data may suffer from poor quality such as irregularities in report generation, data duplication and inconsistencies (7). Reporting challenges exist at the facility level given data quality issues, including incomplete, inaccurate and lack of timely data due to insufficient capacity in the health system or inadequate system design.

Many HMIS databases or registries are event-based and only include women who delivered a birth at a health facility. An indicator based only on facility deliveries is easier to measure and its quality is high; however, this indicator is not appropriate for a country where a significant proportion of births occur in the community.

The indicator only measures whether an uterotonic was administered immediately postpartum to prevent PPH. It does not capture whether the uterotonic was administered correctly (appropriate drug and correct dosage) and at the correct timing (within one minute of birth/fetal delivery). It is also common to misclassify uterotonics given prophylactically versus for treatment purposes, especially in the instance that the PPH occurs soon after delivery. This may result in an overestimation of the administration of prophylactic uterotonic drugs for the prevention of PPH if doses administered for the purpose of treatment are counted in the calculation of this indicator.

Administrative data should be interpreted with caution in settings where data quality is poor and the percentage of births at public

and private sector health facilities is low, or where data from the private health sector are not compiled within the HMIS reporting. It is recommended that pre-service and in-service training include appropriate and timely administration of prophylactic uterotonics and instruction on how to record this information in order to ensure accurate measurement of this indicator.

## Validation studies

Technical work to improve the specificity of this indicator has been conducted via the following:

### Publications

Gallo ID, Williams HM, Price MJ, Merriel A, Gee H, Lissauer D, et al. Uterotonic agents for preventing postpartum haemorrhage: a network meta-analysis. *Cochrane Database Syst Rev.* 2018;4(4):CD011689 (<https://doi.org/10.1002/14651858.CD011689.pub3>, accessed 23 October 2020).

Moran AC, Jolivet RR, Chou D, Dalglish SL, Hill K, Ramsey K, et al. A common monitoring framework for ending preventable maternal mortality, 2015–2030: phase I of a multi-step process. *BMC Pregnancy Childbirth.* 2016;16(1):250 (<https://doi.org/10.1186/s12884-016-1035-4>, accessed 23 October 2020).

Consultation on improving measurement of the quality of maternal, newborn and child care in health facilities. Geneva: World Health Organization; 2013 ([http://apps.who.int/iris/bitstream/10665/128206/1/9789241507417\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/128206/1/9789241507417_eng.pdf), accessed 23 October 2020).

## GLOBAL MONITORING

### Global database

There is currently no global database responsible for monitoring and tracking progress of the percentage of women who gave birth in a facility who received a prophylactic uterotonic immediately (within one minute) after birth for prevention of PPH.

### Key initiatives

Ending Preventable Maternal Mortality (EPMM): [http://who.int/reproductivehealth/topics/maternal\\_perinatal/epmm/en/](http://who.int/reproductivehealth/topics/maternal_perinatal/epmm/en/)

Global Strategy for Women's, Children's, and Adolescent's Health (2016-2030): <http://www.who.int/life-course/partners/global-strategy/en/>

## ADDITIONAL RESOURCES

MEASURE Evaluation: Family Planning and Reproductive Health Indicators Database: Prevention of postpartum haemorrhage in health facilities: <https://www.measureevaluation.org/rbf/indicator-collections/service-quality-indicators/quality-of-intrapartum-care>

Standards for improving quality of maternal and newborn care in health facilities: <https://apps.who.int/iris/bitstream/handle/10665/249155/9789241511216-eng.pdf>

WHO recommendations: Intrapartum care for a positive childbirth experience: <http://apps.who.int/iris/bitstream/handle/10665/260178/9789241550215-eng.pdf>

WHO recommendations for the prevention and treatment of postpartum haemorrhage: [https://apps.who.int/iris/bitstream/handle/10665/75411/9789241548502\\_eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/75411/9789241548502_eng.pdf)

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2. WHO/UNICEF/UNFPA joint statement: appropriate storage and management of oxytocin – a key commodity for maternal health. Geneva: World Health Organization; 2019 (<https://apps.who.int/iris/bitstream/handle/10665/311524/WHO-RHR-19.5-eng.pdf>, accessed 11 November 2020).
3. Gallos ID, Papadopoulou A, Man R, Athanasopoulos N, Tobias A, Price MJ, et al. Uterotonic agents for preventing postpartum haemorrhage: a network meta-analysis. *Cochrane Database Syst Rev*. 2018;12(12):CD011689 (<https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD011689.pub3/full>, accessed 11 November 2020).
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