World Health
Organization

Indicator Sheet

NEWBORNS TREATED FOR NEONATAL SEPSIS/ INFECTION

MoNIT❤R

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[1] 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[2] 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

---

[1] Infant reportedly stopped feeding well and/or stopped moving on its own.

[2] 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.

MoNITOR

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).

MoNITOR

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

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/

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

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

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/

REFERENCES

1.   United Nations Inter-agency Group for Child Mortality Estimation (UN IGME). Levels and trends in child mortality: report 2020, estimates developed by the United Nations Inter-agency Group for Child Mortality Estimation. New York: United Nations Children's Fund; 2020 (https://www.unicef.org/reports/levels-and-trends-child-mortality-report-2020, accessed 9 November 2020).

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, accessed 23 October 2020).

4.   Global reference list of 100 core health indicators (plus health-related SDGs). Geneva: World Health Organization; 2018 (https://apps.who.int/iris/bitstream/handle/10665/259951/WHO-HIS-IER-GPM-2018.1-eng.pdf, accessed 23 October 2020).

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).

MoNITOR