Indicator 3.2.2

Indicator Name, Target and Goal

Indicator 3.2.2 Neonatal mortality rate

Target 3.2 By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births

Goal 3 Ensure healthy lives and promote well-being for all at all ages

Definition and Rationale

○ Definition

The neonatal mortality rate (NMR) is the likelihood that a child born in a given year will die before they reach four weeks of age, based on the current rate of death by age.

○ Concepts

N/A

○ Rationale and Interpretation:

Life tables predict the course of probabilities of dying for a fixed group of births as the cohort ages based on the current probability of dying, assuming that the probability of dying for each age over a given period stays constant in future. The neonatal mortality rate is the ratio of people expected to die before reaching the age of four weeks per 100,000 live births as indicated in life tables.

Data Sources and Collection Method

Abridged life tables

Method of Computation and Other Methodological Considerations

○ Computation Method

The probabilities of dying before four weeks of age was calculated in four age categories: below one week, one week or greater but below two weeks, two weeks or greater but below three weeks and three weeks or greater but below four weeks.

As such, with the mortality rates for each of these categories expressed as $D\binom{0\mathrm{w}}{1\mathrm{w}}$, $D\binom{1\mathrm{w}}{2\mathrm{w}}$, $D\binom{2\mathrm{w}}{3\mathrm{w}}$ and $D\binom{3\mathrm{w}}{4\mathrm{w}}$, the number of live births in each calendar year (January 1 to December 31) expressed as $B\binom{\text{Jan. of a given year}}{\text{Dec. of a given year}}$, the number of live births in a twelve-month period from December 4 of the year before a given year to December of that year expressed as $B\binom{\text{Dec. 4 of previous year}}{\text{Dec. 3 of a given year}}$ and the number of live births during December of the previous year expressed as $B(\text{Dec. of the previous year})$, the probabilities of surviving were first calculated as follows:

$$ {}_{1\mathrm{w}}p_0 = 1 - \frac{D\binom{0\mathrm{w}}{1\mathrm{w}}}{\frac{1}{2}\left[B\binom{\text{Dec. 25 of previous year}}{\text{Dec. 24 of a given year}} + B\binom{\text{Jan. of a given year}}{\text{Dec. of a given year}}\right]} $$

$$ {}_{2\mathrm{w}}p_0 = {}_{1\mathrm{w}}p_0 - \frac{D\binom{1\mathrm{w}}{2\mathrm{w}}}{\frac{1}{2}\left[B\binom{\text{Dec. 18 of previous year}}{\text{Dec. 17 of a given year}} + B\binom{\text{Dec. 25 of previous year}}{\text{Dec. 24 of a given year}}\right]} $$

$$ {}_{3\mathrm{w}}p_0 = {}_{2\mathrm{w}}p_0 - \frac{D\binom{2\mathrm{w}}{3\mathrm{w}}}{\frac{1}{2}\left[B\binom{\text{Dec. 11 of previous year}}{\text{Dec. 10 of a given year}} + B\binom{\text{Dec. 18 of previous year}}{\text{Dec. 17 of a given year}}\right]} $$

$$ {}_{4\mathrm{w}}p_0 = {}_{3\mathrm{w}}p_0 - \frac{D\binom{3\mathrm{w}}{4\mathrm{w}}}{\frac{1}{2}\left[B\binom{\text{Dec. 4 of previous year}}{\text{Dec. 3 of a given year}} + B\binom{\text{Dec. 11 of previous year}}{\text{Dec. 10 of a given year}}\right]} $$

With that said, the following was predicted:

$$B\begin{pmatrix}\text{Dec. 25 of previous year}\\ \text{Dec. 24 of a given year}\end{pmatrix}$$

$$= B\begin{pmatrix}\text{Jan. of a given year}\\ \text{Dec. of a given year}\end{pmatrix}$$

$$+ \frac{7}{31}\{B(\text{Dec. of previous year}) - B(\text{Dec. of a given year})\}$$

$$B\begin{pmatrix}\text{Dec. 18 of previous year}\\ \text{Dec. 17 of a given year}\end{pmatrix}$$

$$= B\begin{pmatrix}\text{Jan. of a given year}\\ \text{Dec. of a given year}\end{pmatrix}$$

$$+ \frac{14}{31}\{B(\text{Dec. of previous year}) - B(\text{Dec. of a given year})\}$$

$$B\begin{pmatrix}\text{Dec. 11 of previous year}\\ \text{Dec. 10 of a given year}\end{pmatrix}$$

$$= B\begin{pmatrix}\text{Jan. of a given year}\\ \text{Dec. of a given year}\end{pmatrix}$$

$$+ \frac{21}{31}\{B(\text{Dec. of previous year}) - B(\text{Dec. of a given year})\}$$

$$B\begin{pmatrix}\text{Dec. 4 of previous year}\\ \text{Dec. 3 of a given year}\end{pmatrix}$$

$$= B\begin{pmatrix}\text{Jan. of a given year}\\ \text{Dec. of a given year}\end{pmatrix}$$

$$+ \frac{28}{31}\{B(\text{Dec. of previous year}) - B(\text{Dec. of a given year})\}$$

Based on those probabilities of surviving, the probabilities of dying in life tables are as follows:

$${}_{1\text{w}}q_0 = 1 - {}_{1\text{w}}p_0$$

$${}_{1\text{w}}q_{1\text{w}} = 1 - \frac{{}_{2\text{w}}p_0}{{}_{1\text{w}}p_0}$$

$${}_{1\text{w}}q_{2\text{w}} = 1 - \frac{{}_{3\text{w}}p_0}{{}_{2\text{w}}p_0}$$

$${}_{1\text{w}}q_{3\text{w}} = 1 - \frac{{}_{4\text{w}}p_0}{{}_{3\text{w}}p_0}$$

○ Comments and limitations

While the neonatal mortality rate is per 1,000 live births, here it is expressed as a percentage.

Data Disaggregation

By gender (male or female)

References

N/A

Custodian Ministries of Data

Ministry of Health, Labour and Welfare

Custodian Ministries of Related Policies

Ministry of Health, Labour and Welfare

International Organizations

United Nations Children's Fund (UNICEF)