Classification of Diseases

How can infant and perinatal mortality rates be compared internationally?

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Much of the confusion surrounding international comparisons of infant and perinatal mortality rates could be removed if single definitions of live birth and fetal death were universally adopted. Suggestions as to how this might be achieved are made below.

Although infant and perinatal mortality rates are important indicators of health status and the care available to mothers and babies, it is difficult to make valid international comparisons on the basis of such data because of the great diversity of definitions employed in this sphere and because the judgements of doctors and others as to what is a live birth or a fetal death are often at variance with the formal definitions.

WHO has proposed that the term “live birth”, when used in international comparisons, should exclude fetuses of very low birth weight, i.e., below 1000 grams, except in cases of congenital malformation, where the recommended minimum weight is 500 grams. In the ninth revision of the International classification of diseases, “live birth” is defined as “the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered a live birth”.

Unfortunately, the proposal does not appear to solve the problems. The above definition of live birth is unsatisfactory because many aborted fetuses weighing 200–300 grams or less may move slightly after birth or have a transient heartbeat, even though gestation was less than 22 weeks. Technically and legally, such fetuses should be regarded as representing live births.

Also in the ninth revision of the International classification of diseases, “fetal death” (stillbirth) is defined as “death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy; death is indicated by the fact that after such separation the fetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles”. The recording of fetal deaths varies greatly between countries, since

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the definition contains no indication of minimum weight. Many European countries require the registration of fetal deaths as from 26 or 28 weeks' gestation, or the 28-week equivalent of 1000 grams birth weight or 35 cm length; Australia, Canada and the USA, on the other hand, require registration at 20 weeks or more (1).

The specification of a minimum gestational age appears to add to the confusion among doctors about what constitutes a live birth. It is likely that many are influenced by the definition of fetal death when making decisions about the notification of live births. This would probably lead doctors in countries with a comparatively low minimum gestational age for stillbirths to report more neonates of extremely low birth weight than doctors in countries with a higher age requirement. Data in fact exist which demonstrate that the proportion of infants dying on the first day after birth is comparatively high in Australia, the USA, and other countries with a stillbirth definition tied to a gestational period of 20 weeks or more (2). An average of 48% of infants die on the first day in countries using 26 or 28 weeks, whereas in those using 20 weeks the corresponding figure is 69%; possibly more babies die on the first day in the latter group, but a more probable explanation of the higher value is that a larger number of deaths are reported by doctors influenced by the lower birth-weight definition of stillbirth.

It is worth noting that in Japan, which has the lowest infant mortality rate in the world, there are doubts about the validity of the data because of the possibility of abortions being registered as stillbirths. Similar complications undoubtedly occur elsewhere.

Clearly, there is justification for the use of minimum weights when international comparisons are being made. In the tenth revision of the International classification of diseases, however, the calculation of infant and perinatal mortality rates is based on a minimum weight of 1000 grams or more with respect to fetuses and infants, or, in the absence of weight data, on 28 complete weeks' gestation or a length of 35 cm from crown to heel; a different minimum birth weight, namely 500 grams, is recommended in relation to infant deaths resulting from malformations (3). Unfortunately, the use of different minimum weights is likely to make the existing problems even worse.

The best way forward is probably to adopt one simple definition for live birth and another for fetal death, together with a minimum weight (or minimum gestational age and crown-to-heel length when weight data are not available). The following definitions are suggested.

**Live birth**

The complete expulsion or extraction from its mother of a product of conception weighing 500 grams or more, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached. Each product of such a birth is considered live born. If a product of conception weighing less than 500 grams shows evidence of life 24 hours after birth it should be considered as a live birth. (When birth weight is unavailable the gestational age (22 weeks) or
body length (25 cm from crown to heel) corresponding to 500 grams should be used.)

Fetal death (stillbirth)

Fetal death is death prior to the complete expulsion or extraction from its mother of a product of conception weighing 500 grams or more, irrespective of the duration of the pregnancy. Death is indicated by the fact that after such separation the fetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles. (When the birth weight is unavailable the gestational age (22 weeks) or body length (25 cm from crown to heel) corresponding to 500 grams should be used.)

The taking of decisions on these definitions requires agreement among the Member States of WHO and inter-and nongovernmental organizations. Such agreement is well worth pursuing in readiness for the eleventh revision of the International classification of diseases.

References


Comments

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Lawson & Mayberry are less than fair in taking WHO to task for failing to achieve satisfactory definitions and identify satisfactory methods. In 1975 it was intended to introduce definitions of "live birth" and "fetal death" very like those recommended by the authors into the International classification of diseases. This proved impossible, however, because other interest groups, e.g., lawyers, had to be taken into consideration, and the basic definitions on signs of life at birth were therefore retained. At the same time, instructions were issued for the collection, analysis and reporting of perinatal mortality data (1, 2), indicating that national statistics should cover all delivered fetuses and infants weighing at least 500 grams, whether alive or dead, and that international comparisons should be confined to those weighing at least 1000 grams because of the unreliability of reporting in instances of extremely low birth weight.

The full instructions for reporting perinatal mortality statistics in the tenth revision of the International classification of diseases include the following definition: "The perinatal period commences at 22 completed weeks (154 days) of gestation (the time when birth weight is normally 500 g) and ends seven completed days after birth."(3).

Furthermore, it is recommended that perinatal death resulting from malformation should, if possible, be categorized as being associated with live birth or fetal death, and with birth weights of 500–999 grams or 1000 grams or

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more, allowing the statistics to be reported with or without the inclusion of deaths caused by malformation (3), which do not, in general, reflect the quality of perinatal care.

This recommendation is in line with a lead given by the International Federation of Gynaecology and Obstetrics in 1982 (4) and offers a clear and concise way of reporting perinatal mortality statistics which has already proved satisfactory in practice (5).

The proposal made by Lawson & Mayberry that newborns weighing under 500 grams who survive after 24 hours be included in the “live births” category would solve the practical but not the ethical problems associated with these children. It would also complicate the selection of the denominator for calculation of the subsets of infant mortality.

A change in the definition of “live birth” requires both the approval of the World Health Assembly and a process of consulta-

tion with other bodies in the United Nations family. The suggestions offered by Lawson & Mayberry are a possible first step in this direction.

References