Registration of vital data: are live births and stillbirths comparable all over Europe?

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International comparisons of the perinatal mortality data derived from vital registration statistics can be made in different ways. In this article we examine the legal and administrative definitions of vital events (live births and stillbirths) in the 27 European countries that participated in an in-depth survey conducted in 1991 by the Institute of Demography, University of Louvain, Belgium.

The impact of the various definitions in use on the comparability of vital event data over time and in different countries is illustrated by discussing some of the anomalies exhibited by published data (e.g., age at death in different European countries and the trends in infant mortality or stillbirth rate in selected countries).

Analysed is the potential for vital registration systems to produce standardized perinatal mortality data that satisfy WHO recommendations for international comparisons, taking into account the contents of the vital registration forms and the data processing (record linkage) methods used in different countries.

Introduction

Infant mortality rate (risk) is one of the most widely and commonly used indicators of the social and economic development of a population, while the perinatal mortality rate is supposed to monitor the quality of perinatal care, including pregnancy. Very often used for international comparisons, or to evaluate the progress achieved over time within specific countries, these indicators are probably not as accurate as might be expected, in view of the quality of vital registration systems. Although vital statistics offer many advantages for the production of health and mortality indicators, they are still a by-product of legal obligations and therefore depend closely on the legal definitions of the vital events to be declared: stillbirths (or late fetal deaths), live births, and deaths.

Since the beginning of the twentieth century, various attempts have been made to recommend international definitions in order to solve the comparability problems arising from differences in national or local legal definitions, data processing methods, and declaration practices (*1*). Such differences have only a very limited impact on birth statistics and the related fertility data, since they chiefly concern a small number of children who die very shortly after birth. The impact of these differences on infant mortality depends clearly on its general level, but is largely governed by the distribution of age at death within the first year of life. When infant mortality was high in Europe and mainly postneonatal, these differences could not cause gross misclassification of countries in this respect. However, the present situation is dramatically different: infant mortality is very low in Europe and occurs more and more frequently in the very early days or even hours of life. Simultaneously, improvements in neonatal care during the 1980s led to a redefinition of the de-facto viability criteria, which vary probably within and between countries according to the availability of adequate neonatal care (*2, 3*). Obstetrical practice changed accordingly, and the decision to proceed to elective delivery of very preterm fetuses at risk of dying *in utero* has exerted a significant impact on the overall incidence of very preterm infants. This may lead to a shift towards registration of a live birth instead of a stillbirth (or of no registration at all, if the fetal death occurred below the minimum specified gestational age for a stillbirth). Consequently it has been suggested that, as a global indicator, perinatal mortality no longer reflects adequately improvements in perinatal care, which increasingly rely on the availability of highly specialized services, causing mixing of antenatal and neonatal factors as well as of registration rules and practices (*4*). Accordingly, the impact of differences in legal definitions in the related declaration practices and data processing methods is increasing, particularly when early neonatal and perinatal mortality indicators are considered.

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Materials and methods

The first comprehensive study that analysed the comparability of statistics produced by the vital registration systems all over the world was conducted by the United Nations in 1950 (*1*). The study presented an extremely detailed overview of the history of vital event registration together with the event definitions in use in 1950, the declaration procedures, the information collected at registration, and the data processing and publication procedures. Also, recommendations were made about improving the international comparability of the data. From 1976 to 1979, the United Nations conducted a survey on the vital registration statistical methods to update the 1950 study (*5*).

In 1979 the WHO Regional Office for Europe set up a Perinatal Study Group to study and report on the issues surrounding delivery and birth care. A total of 23 European countries participated in a survey that was conducted in 1981–82. A very small part of the survey was devoted to vital registration; unfortunately, most of the tables and figures were published in aggregate form, precluding any possibility of comparing their results with the more detailed 1950 survey (*6, 7*).

The survey undertaken in 1991 by the Institute of Demography, Catholic University of Louvain, was preceded by two more qualitative investigations:

— An in-depth comparative study in Belgium and in the French region of Nord-Pas-de-Calais revealed the importance of the legal definitions of vital events registration and also that of the administrative management of the registration procedure itself: the period allowed before an event has to be declared, the contents and shape of the civil registration forms, the coding, data processing and publication of the registered statistical information, etc. (*8*).

— A qualitative survey conducted in a sample of maternity wards in Belgium underlined the variation in the perceptions of a newborn's viability and of the definitions in use, which had been highlighted also by other workers (*2, 9*).[a]

Based on these findings, we designed a questionnaire and sent it by mid-1991 to all 27 national statistical offices in Europe in order to gain a comprehensive picture of the 1991 vital event registration situation and its effects on the comparability of perinatal and early neonatal mortality statistics. The accuracy of the information provided by the first survey questionnaire was assessed by sending provisional tables to all the participating countries and individuals. In many instances, cross-checking using two or more informants was useful. By mid-1992, all 27 European countries were participating actively in the survey (see below).

[a] **Gourbin C.** *Les pratiques de déclaration des événements "naissance vivante" et "mort-né" en Belgique.* Master's thesis in demography, University of Louvain, 1991.

Vital registration of live births and stillbirths in Europe, 1991

Legal definitions

The need to compare, a growing concern. The search for comparability of vital event definitions is a twentieth century concern. In 1925, the League of Nations proposed international recommendations for the registration of births (live births and stillbirths) and deaths. Since death is the permanent disappearance of any sign of life following a live birth, its definition is far less equivocal and closely dependent on the definition of a live birth. The key questions were the following: How can a non-declarable fetal death be distinguished from a "late" fetal death or stillbirth that has to be declared? How can a live birth be defined and distinguished from a deadborn or stillborn infant? The answers, although they may change with time, refer to the presence of vital signs for live births and, if absent, to an additional viability criteria for registering "late" fetal losses or stillbirths.

In 1925, the Committee for Hygiene of the League of Nations recommended that the presence of breathing be used as the vital sign to define a live birth, whatever the gestational age or duration of life; this definition was not adopted by the majority of European countries. In 1950 WHO recommended the "any sign of life" criterion, which was retained in the 1975 definition used in the Ninth International Classification of Diseases (ICD-9), and is the criterion used in ICD-10.

For the purpose of defining late fetal loss or stillbirth, the absence of breathing (1925 definition) or of any sign of life (1950 and 1975 definitions) is insufficient and this was addressed by a viability criterion defined as the "capacity for the fetus to survive independently of its mother" (*10*). In 1925, the League of Nations considered that viability of the dead product of conception would be set at a minimum gestational duration of 28 weeks or 35-cm body length (crown–heel), the latter being preferred. The 1950 WHO definition restricted again the viability criterion to a minimum gestational duration of 28 weeks and made use of gestational age to distinguish "late fetal deaths" (≥28 weeks) from total fetal losses.

Following the publication of ICD-9 in 1975, birth weight has been used as the key criterion for the elaboration of national and international perinatal mortality statistics (*11*). For the elaboration of national perinatal mortality statistics, the correspondences between the quantitative criteria were fixed as follows: birth weight (500 g); gestational duration (22 weeks); and body length (25 cm), the criteria being applied to live births and to fetal losses. For international comparisons, standardized perinatal mortality statistics should be calculated on the basis of a minimum of 1000 g, 28 weeks, or 35 cm, respectively.

The definitions and standards for fetal, perinatal, neonatal and infant mortality rates used in ICD-10 (*12*), reinforce use of the birth-weight criterion for producing standard statistics for the perinatal period; they provide, however, more detailed rules for determining the denominator of the related ratios and rates and explicitly define standard measures for the various fetal–infant mortality rates.

The situation in Europe in 1991. Despite a general tendency towards the adoption of common definitions for vital registration of live births and stillbirths in European countries (*7*), in 1991 there were still significant differences between the 27 participating countries (Table 1). Although the majority of countries (20 out of the 27) were using the WHO signs-of-life criteria to define a live birth, some still restricted vitality to the presence of a set of explicitly defined signs of life. Furthermore, some countries imposed additional viability criteria if the newborn's weight or gestational age was below legally defined limits. For example, the minimum duration of life required for official registration of the birth varied from 24 hours (Czechoslovakia and Poland) to 168 hours (former USSR).

Vital registration of fetal deaths is mainly restricted to late fetal deaths or stillbirths, according to the WHO definition. Such deaths are defined by the absence of any sign of life and the additional viability criterion of a minimum gestational duration of 28 weeks or the corresponding birth weight (1000 g) or length (35 cm). Portugal and Finland register fetal deaths from 500 g or 22 weeks' gestational duration onwards. The preferential use in almost every country of gestational duration rather than of birth weight is in disagreement with WHO recommendations, the more so since the correspondence between 28 weeks' gestational duration and 1000-g birth weight is far from systematic (*13, 14*).

Facts and figures. Differences and changes in the legal criteria employed have an impact on the usual infant mortality indicators and their comparability. For example, in Czechoslovakia (Fig. 1) after 1965 there was a sudden upward trend of the first-day infant mortality risk as a consequence of the adoption of the WHO definition of a live birth. Furthermore, until 1985 first-day mortality was calculated by difference in calendar days, leading to an important underestimation of the real first 24-hour mortality, the remainder of the early neonatal mortality being overestimated

The new political situation in the Baltic Republics has allowed the adoption of the WHO recommendations for elaboration of national statistics. Consequently, since 1991 in Lithuania and Latvia and from 1992 in Estonia stillbirths have been registered from a weight of 500 g or from 22 weeks' gestational duration. For the registration of live births below the legal limits of weight (500 g) or gestational duration (22 weeks), Latvia imposes a minimum lifespan of seven completed days. The sudden and important rise in the Lithuanian infant mortality rate that occurred in 1991 (*15*) is a direct consequence of these changes in legal definitions (Fig. 2).[b]

Similar situations will probably continue for a good while, since in some countries changes in the legal definitions used are planned or have been implemented since our reference date (1 January 1991), and still do not always meet the WHO recommendations (Table 2). For example, in the Netherlands and the United Kingdom the minimum gestational duration has been fixed at 24 weeks for registration of stillbirths. Furthermore, in the Netherlands, a child born alive before this minimum period should survive for 24 hours' postpartum before being declared a live birth.

Administrative limitations

Not only differences in vital event definitions, but also registration modalities and data processing methods, including publication of the collected data, may further distort comparability between countries.

Delay in notification and registration. The delays permitted for registration of births and deaths are usually fixed by law. These vary widely by country, ranging from 24 hours for registration of a live birth (Czechoslovakia and Hungary) to 3 months (former USSR), with one country (Sweden) having no delay fixed at all. Very long delays may result in an under-registration of very early neonatal deaths (since both birth and death are not registered). Among the 18 countries where the delay permitted is at least 7

[b] Under the legislation in the former USSR, a live birth weighing <1000 g was registered only if the infant survived 7 days.

Table 1: **Legal criteria for registration of a live birth and a stillbirth in 27 European countries, 1 January 1991**

	Criteria:			Stillbirths[b]		
	Any signs of life	Specified signs of life[a]	Lower limit, minimum lifetime[b]	GD (weeks)	BW (g)	Length (cm)
Austria	—	B, H, P	—			35
Belgium	WHO	—	—	28		
Czechoslovakia	WHO	—	If BW <500 g, ≥24 hours of life		1000	
Denmark	WHO	—	—	28		
England and Wales	WHO	—	—	28		
Finland	WHO	—	—	22		
France	—	B[c]	If GD <28 weeks, alive at registration	28		
Former GDR[d]	—	B, H	—		1000	
Former FRG[d]	—	B, H, P	—		1000	
Greece	WHO	—	—	28		
Hungary	WHO	—	—	28		
Iceland	—	B, H	?	28		
Ireland	WHO	—	—	28		
Italy	WHO	—	—	26		
Luxembourg	WHO	—	—	26		
Netherlands	WHO	—	—	28		
Northern Ireland	WHO	—	—	28		
Norway	WHO	—	—	28		
Poland	WHO	—	If 601 g ≤BW≤1000 g, ≥24 hours of life		1001	
Portugal	WHO	—	—		500	
Romania	WHO	—	If BW <1000 g, alive at registration		1000	
Scotland	WHO	—	—	28		
Spain	WHO	—	—	28		
Sweden	WHO	—	—	28		
Switzerland	—	B, H	—			30
Former USSR	—	B	If GD < 28 weeks or BW <1000 g, ≥ 168 hours of life	28		
Yugoslavia	WHO	—	—	28		

[a] B = breathing; H = heart beat; P = pulse in umbilical cord.
[b] GD = gestational duration; BW = birth weight.
[c] Or other signs of life.
[d] GDR = German Democratic Republic; FRG = Federal Republic of Germany.

Fig. 1. **Early neonatal mortality in Czechoslovakia, 1950–90.**

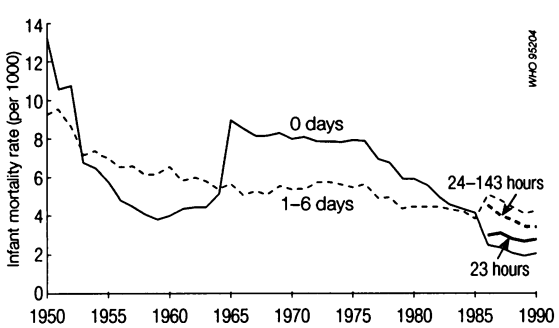

Fig. 2. **Early neonatal mortality and infant mortality in Lithuania, 1980–91.**

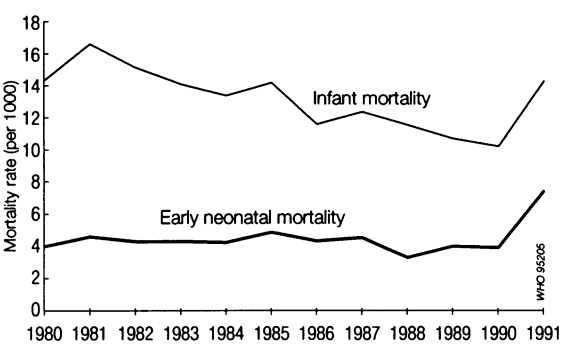

Table 2: **Planned changes in the legal or administrative definitions of stillbirths and live births in various European countries as of 1 January 1991**

		Criterion for:	
	Effective on:	Stillbirths	Live births
Belgium	1994	≥500 g	≥500 g
England and Wales	1 Oct. 1992	24 weeks	—[a]
Estonia	1 Jan. 1992	≥500 g	≥500 g
Latvia	1 Jan. 1991	≥500 g	≥500 g
Lithuania	1 Jan. 1991	≥500 g	≥500 g
Netherlands	1 Jul. 1991	24 weeks	24 weeks
Northern Ireland	1 Oct. 1992	24 weeks	—[a]
Poland	1 Jul. 1994	≥500 g	≥500 g
Scotland	1 Oct. 1992	24 weeks	—[a]

[a] No lower limit.

days, only five (Austria, Belgium, England and Wales, Northern Ireland, and Scotland) require compulsory birth notification (live births and stillbirths) by maternity wards within a shorter period (24–168 hours). Compulsory notification of births by maternity wards usually occurs independently of their vital registration and may help to overcome underregistration. No delay is fixed in some countries for registration of stillbirths (France, Hungary, Sweden) or deaths of liveborn children (Belgium, Luxembourg, Sweden). Since registration is usually requested for burial, it is reasonable to assume that when a live birth is registered death does not escape registration.

Controlling for the adequacy of legal definitions. De-facto registration may differ from the legal requirements in two ways: births are registered even if they do not match the minimum legal criteria; or births escape registration even when they are "declarable" from a legal point of view. Although underregistration is still difficult to evaluate without ad-hoc in-depth surveys, there are various ways to control for overregistration. One of these is to control at registration for compliance with legal rules and related criteria. Also controls can be carried out during data processing, leading to either a revision of the birth registry or suppression of the out-of-range events from officially published data.

To carry out controls, the legal criteria for registration need to appear on the registration form and the information has to be accessible. Registration could be refused by the registrar or by the administration in charge of data processing (usually the national statistical institute). It is still difficult to evaluate the respective importance of the interventions made by either the registrars or the national statistical institutes in this matter.

A total of 22 countries do not fix any quantitative threshold below which a live birth should not registered, precluding the necessity of making controls (Table 1). For the five countries that have minimum requirements for registration, control for compliance is not always possible.

The relevant information is available on the stillbirth registration form for 19 countries and is accessible to the registrar in 18 of those countries. In Belgium (medical information is concealed from the registrar) and the Netherlands (information is notified on a confidential death certificate) the information is forwarded directly to the national statistical institute. With the exception of Belgium, where all the registered stillbirths are published, 19 countries comply with the legal criteria for officially published data on stillbirths.

The situation in practice

The decision to declare (or not to declare) an event is a necessary condition for registration. This decision rests mainly with the birth attendant, his/her knowledge of the definitions (*9, 18*), and, for very preterm births, on his/her confidence in their chances of survival (*16*). Furthermore, legal aspects, social and cultural factors, and the political importance given today to mortality data could be responsible for selective declarations. Clearly most instances of wrong or under-registration are concerned with highly preterm births (either stillborn or born alive) of children who die very shortly after birth; hence, stillbirth and early neonatal rates are more directly affected by different practices than are death rates for older age groups. The decision to declare may vary from no declaration at all (the child, whether born alive or not, is considered as a non-declarable event) to a declaration of a stillbirth instead of a live birth (followed by a neonatal death) (*19*) and the converse. This is the case in France, where the legal rules for declaration of stillbirths apply also to liveborn children who die before their birth is registered. Thus a minimum gestational duration of 28 weeks is required for such early neonatal deaths, but not for neonatal deaths that occur after their birth registration. A survey conducted in the Nord-Pas-de-Calais region of France showed that this practice results in 12% under-registration of total early neonatal deaths (*8*).

Attitudes to viability of preterm infants. Quantifying the effects of attitudes to viability on perinatal mortality figures is difficult. However, evidence from two in-depth studies shows that viability, and hence registration decisions, is influenced by differences in the delivery management of very preterm infants (*2*) and by differences in the proximity or accessibility

of neonatal intensive care units.[c] Liveborn infants considered to be non-viable are usually not registered unless they satisfy the minimum gestational duration necessary for a declarable stillbirth.

Legal, social, and psychological factors. Attitudes to viability can be influenced by factors other than access to adequate care. When a pregnancy outcome is considered to be a fetal death not to be declared, all the rights linked to a legally recognized birth are denied the parents: maternity leave, birth allowance, burial of the child, etc. Psychological, social, economic and even cultural factors are to some extent involved (*17*) in the decision to declare and how to declare a live- or stillbirth for very preterm births and deaths that occur shortly after birth. Psychological considerations to facilitate the normal mourning process for the parents (*20, 21*) may prompt the birth attendant to overestimate the gestational duration in order to declare the birth. In contrast, some parents may wish to be spared the funeral costs in borderline circumstances (*22*). Social considerations may also lead to either over- or under-registration; for example, in the case of an adverse outcome to an unmarried teenager, the birth may remain unregistered at the official level, while the social advantages associated with a live birth rather than a stillbirth may lead to an over-registration of early neonatal deaths.

At the political level. The importance attached to infant mortality indicators at both international and national levels as one of the key measures of a country's health and social development could result in adverse practices, leading to an artificial lowering of the official data.

The most extreme example of this known to us is Romania. The delay for declaration of a live birth was 15 days. If a liveborn child weighed less than 1000 g at birth, its birth was declared only if it survived the legal delay of 15 days and its declared weight referred to that on the day of registration. If the child died before it reached 15 days of age the birth was considered to be a miscarriage and was only mentioned in medical files.

Generally speaking, the use of perinatal or infant mortality rates to assess the quality of care provided at the hospital or regional level in order to adjust health policies or to selectively finance specialized care units according to their performances creates the temptation to produce "good results".

[c] See footnote *a*, p. 450.

Ambiguity and inaccuracy of the perinatal mortality rate

Grouping stillbirths and early neonatal deaths together into a unique global indicator may further bias comparisons between countries and over time. Late fetal deaths are included in the national statistics in 22 European countries on the basis of the 28 weeks' gestational criterion. With the sole exception of Portugal, these countries do not follow WHO's recommendations to rely first on birth weight for establishing national perinatal statistics.

On the other hand, vital registration of very preterm liveborn infants with gestational durations as low as 24–26 weeks is no longer an exception even though the mortality risks are extremely high. Perinatal mortality figures thus often mix adverse pregnancy outcomes with different gestational durations. Since vital registration statistics usually do not standardize their perinatal mortality data for birth weight or gestational duration, the events concerned (stillbirths and early neonatal deaths) are defined by increasingly divergent viability criteria.

Even though the majority of European countries (Table 1) employ the WHO definition for the registration of a live birth, six countries impose legal or administrative restrictions for liveborn children who do not meet a given minimum gestational duration or birth weight. The usual additional requirement for those out-of-range liveborn children was (Spain, up to 1978) and still is (in 1991) (France, Netherlands, former USSR, Czechoslovakia, Poland, and Romania) their survival over a defined period, often 24 hours. The period is extended to the time of registration in France (and since 1 July 1991 also in Netherlands), and before 1991 was 15 days in Romania and a week in the former USSR.

Despite such legal or administrative restrictions, the 24-hour survival criterion is far more common in everyday practice than would be supposed. As far as the accuracy and comparability of neonatal or global perinatal mortality figures are concerned, the most worrying fact is that if preterm infants are not registered as live births, they usually also fail to meet the minimum requirements to be considered as stillbirths, and are thus not registered at all. A global perinatal mortality measure is therefore misleading. Very early deaths need to be considered separately from those that occur later. It has been suggested that a cut-off of survival at 24 hours of age be taken, since deaths occurring during the first day of life are the most subject to underreporting (*25*). Comparable early neonatal figures could then be obtained for the remaining days of the first week of life (the denominator of the risks would then be survivors at 24 hours).

The age-at-death pattern for total infant (live-born) deaths over the period 1985–89 in 24 European countries (Fig. 3) shows that almost 50% of infant deaths occur within the first week of life and that 50% of such deaths (i.e., 25% of the total infant deaths) occur during the first 24 hours of life. Clearly, several countries do not conform to this pattern. For some, the causes of their (apparently) very low first-day mortality are easy to identify, as described below.

- In France, the gestational duration of babies who die before registration accounts for the decision to or not to register them. Moreover, for all births (still-births and live births) registered after death, a distinction is made between children who breathed (considered to be live births and included in the early neonatal death statistics), children who never breathed (counted as stillbirths), and children for whom no information was available about their breathing (also counted as stillbirths). The last-mentioned category represented about 13% of the total stillbirths in 1987 (*24*) and this approach to compiling stillbirth statistics probably contributes to a further significant underestimation of very early neonatal mortality.
- In Czechoslovakia, the first day of life was calculated using differences in calendar days, and not completed periods of 24 hours, usually leading to an underestimation of the first-day mortality. However, since 1985 data for both these periods have been available.
- In the former USSR, survival for a week was required for infants weighing less than 1000 g at birth. In addition to this administrative rule, infant mortality, in general, and early neonatal mortality, in particular, were seriously under-reported. Under-reporting is more severe in some republics, but the data have still to be evaluated (*23*).
- In Italy, in contrast, the early neonatal mortality is very high in relation to the general infant mortality level, and in Portugal the first-day mortality is rather high. Even taking into consideration that both these countries register stillbirths at an earlier stage (26 weeks in Italy and 22 weeks in Portugal), which can cause earlier registration of live births, their practices clearly need in-depth investigation.

Beyond published data

Apart from inconsistencies in the published perinatal statistics, closer examination of the contents of the vital registration forms (live birth, stillbirth, and death records) and of the data processing methods (record linkages) routinely or occasionally performed by national statistical institutes, provides some indication of the feasibility of producing adequate and comparable perinatal statistics. In view of the heterogeneity of birth definitions between countries, comparability requires standardization of mortality data by birth weight or gestational duration. For this purpose at least one of the following requirements must be fulfilled:

— if birth weight or gestational duration are recorded on the birth registration form, individual record linkages should be performed between birth and death records, automatic procedures being preferred to manual ones (*26*); and

— if record linkage is impossible for legal or technical reasons, birth weight or gestational duration need to be recorded on all the relevant registration forms.

Only five countries (Table 3) (Austria, England and Wales, Hungary, Poland and Switzerland) standardize their mortality data by record linkage. Eight countries fulfil or fulfilled the second of the above requirements (Belgium, Czechoslovakia, former German Democratic Republic/Federal Republic of Germany, Ireland, Italy, Poland, and Portugal), with Poland being the sole country where both requirements are met. Thus, 12 of the 27 countries in the survey have the capacity to produce standardized perinatal mortality figures following WHO's recommendations for international comparisons, given the general constraints on the registration of stillbirths. However, in doing so, do they adequately monitor recent progress in perinatal and neonatal care? Clearly, not: resuscitation and keeping alive children weighing less than 1000 g are now possible. The viability limit fixed at 28 weeks' gestation in 1925 by the Organisation d'Hygiène de la Société des Nations and adopted in 1950 by WHO to define late fetal deaths or stillbirths is no longer acceptable and needs to be modified.

The restriction of our analysis to vital registration forms points a somewhat pessimistic picture of the ability of countries to produce comparable statistics. The medical birth registries developed many years ago in the Nordic countries collect information such as birth weight and gestational duration and are routinely linked with vital registration records. After being in operation for a reasonable period and organized on a compulsory basis, these birth registries cover almost 100% of births, but usually fail to obtain a similar coverage of perinatal deaths. Furthermore, some differences exist in the coverage, objectives, event definitions, contents, access, data processing systems, and publication between the vital registration system and the medical birth registries, where both coexist. Clearly, such registries

Fig. 3. **Pattern of infant deaths, by age, in 24 European countries, 1985–89.**

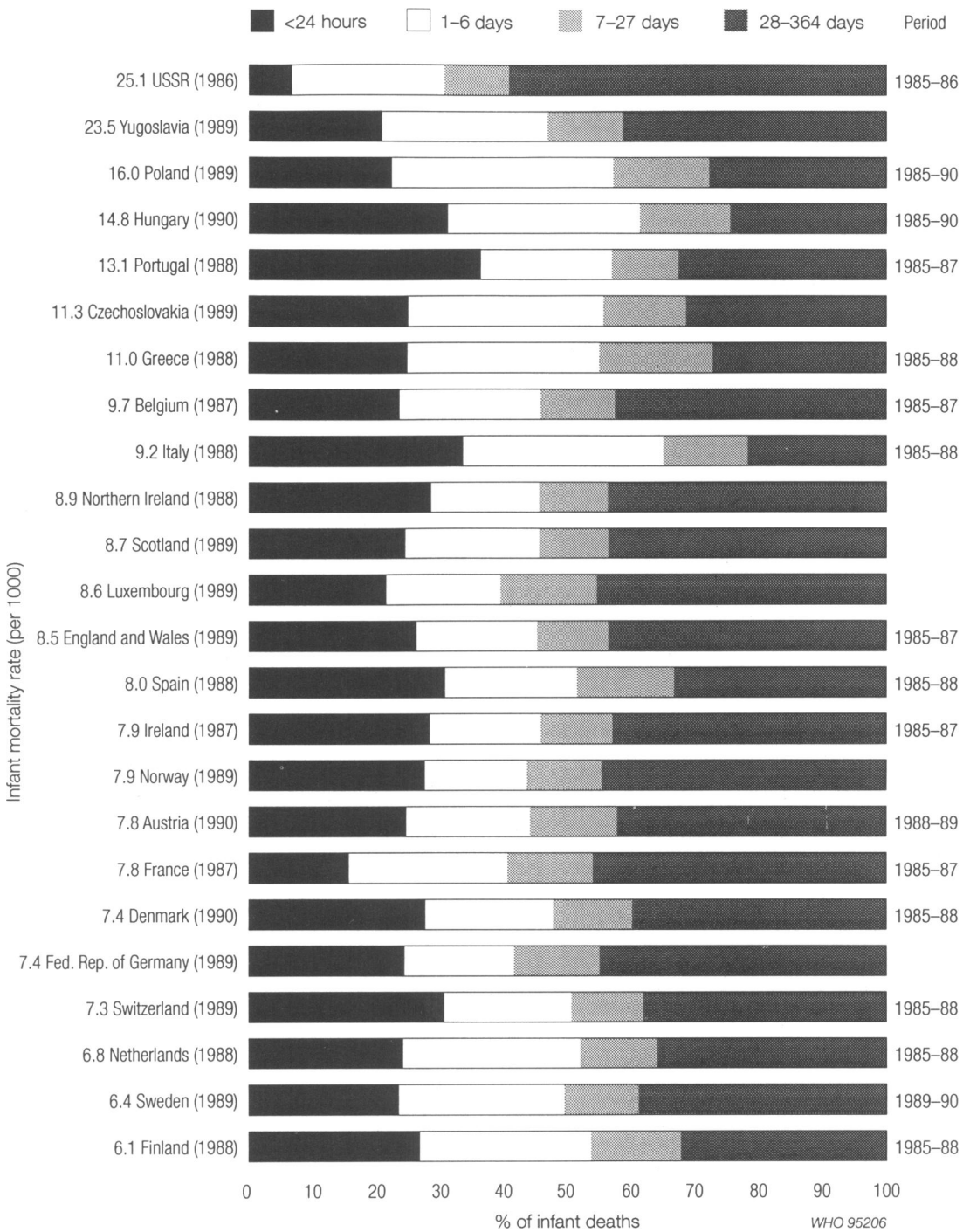

Table 3: **Availability, by year, of birth weight and gestational duration data for specific infant mortality rates in European countries, 1 January 1991**

	Birth weight:			Gestational duration:			
	Live birth	Stillbirth	Deaths <1 year	Live birth	Stillbirth	Deaths <1 year	Record linkage
Austria	1965	1965	1970–83	1984	1984	—	1984 →
Belgium	1979	1979	1979	1979	1979	1979	1974–75
Czechoslovakia	1950	1950	1950	1965	1965	—	—
Denmark	—	—	—	—	—	—	1973[a] →
England and Wales	1975	1970	—	—	1927	—	1975 →
Finland	—	1955	1955[b]	—	1955	1955[b]	1975[a] →
France	—	—	—	—	1907	—	
Former GDR[c]	Yes	Yes	Yes	—	—	—	—
Former FRG[c]	1979	1979	1979	—	—	—	1973
Greece	1968	1968	—	1968	1968	—	—
Hungary	1950	1950	—	1950	1950	1950[b]	1980 →
Iceland	Yes	Yes	—	—	—	—	1972[a] →
Ireland	1984	1984	1984[d]	1984	1984	1984[d]	—
Italy	1954	1954	1974	1954	1954	1974	1975
Luxembourg	—	—	—	—	—	—	—
Netherlands	—	—	Yes[d]	—	Yes	Yes[d]	1953 →
Northern Ireland	—	1961	—	—	1961	—	—
Norway	—	—	—	—	—	—	1966[a] →
Poland	1974	1974	1971	—	—	—	1980 →
Portugal	1980	1980	1980[d]	1980	1960	1980[d]	—
Romania	—	—	—	—	—	—	
Scotland	—	1968	—	—	1968	—	1980[a] →
Spain	1980	1980	—	1960	1960	1960–74	—
Sweden	—	—	—	—	—	—	1973[a] →
Switzerland	1979	1979	—	—	—	—	1979 →
Former USSR	—	—	—	—	—	—	—
Yugoslavia	—	—	—	—	—	—	—

[a] Linkage with medical birth registry.
[b] For neonatal deaths only.
[c] GDR = German Democratic Republic; FRG = Federal Republic of Germany.
[d] For early neonatal deaths only.

need to be further investigated in order to obtain a more precise description of their complementarity or specificity relative to existing vital registration systems.

Discussion

Deaths in early infancy tend to occur increasingly during the first few days of life; hence the importance given today to early neonatal mortality, which accounts for about 50% of total infant mortality in Europe. Of these early neonatal deaths, more than half involve low-birth-weight and preterm infants, whose expected viability is improving because of elective delivery of those diagnosed to be at risk and of the steadily improving efficacy of neonatal intensive care techniques. Extremely low-birth-weight (< 1000 g) and extremely preterm (<28 weeks' gestation) infants were and are still the subjects of discussion concerning their viability and their official recognition through vital registration. Apart from the various possible arguments, whether social, economic, cultural, medical or even political, that may be raised in some borderline situations, analysis of the legal criteria and the related infant mortality figures has shown that even small differences in legal rules defining the "registrability" of a birth have an increasingly greater impact on their comparability over time and between countries.

WHO has attempted to overcome the problem by recommending the production of standardized perinatal mortality figures. However, only 12 out of the 27 European countries surveyed have the capacity to do this. In 1991 the overwhelming majority of the legal definitions of stillbirth used in Europe showed a preference for gestational age, which is completely at odds with the internationally recommended use of

birth weight as the key criterion. Even the recent revisions of the definitions in the Netherlands and the United Kingdom do not comply with the international recommendations.

Combining stillbirths and early neonatal deaths into a unique perinatal mortality indicator may further bias comparisons over time and between countries, as outlined below.

— If standardization procedures are impossible to apply, the perinatal mortality rate often mixes adverse pregnancy outcomes with different gestational durations, stillbirths often being assigned a greater lower limit for gestational age than are live births (Table 1).

— In practice, the legal or de-facto 24-hour survival is applied to live births of very preterm or very low-birth-weight infants, leading to an underestimation of the first-day mortality and of the early neonatal mortality figures.

Finally, from the point of view of the mourning process, the very rigid cut-off used to define the declarability of a deadborn infant (whether 28, 24 or 22 weeks' gestation) has extreme consequences: below the cut-off it is considered to be a miscarriage with no existence, and hence there can be no funeral; at the cut-off point and above, the reverse is true with (in some countries) additional advantages such as birth allowances, etc. There should therefore be some flexibility in the sometimes extremely rigid administrative and legal procedures involved.

Recommendations

The recommendations outlined below can be made.

• Published mortality figures, whether reported in international or national sources, should be fully documented with the current definitions of birth (live birth and fetal death), the way controls were made, and whether figures are standardized or not, as recommended in ICD-10.

• Since problems regarding registration of very immature infants are very common, more attention should be given to informing and training birth attendants in order to enhance their compliance with the legal definitions. More emphasis should also be given to reporting complete and accurate information in the vital registry in order to produce more reliable coverage of births and infant deaths and their related characteristics, since the quality of vital registration data depends closely on the quality of the observations.

• Stillbirth figures should be published separately from early neonatal deaths, and deaths within the first week of life should be disaggregated by distinguishing those that occur within the first 24 hours from the remainder. It is noteworthy that the first-day mortality is still not calculated correctly in some countries.

• In addition to the international recommendations for enhancing worldwide comparability of infant and perinatal mortality figures, more precise recommendations need to be determined for low-mortality regions, such as Europe, in order to produce truly comparable figures. Data should be suitable for monitoring care and for correct evaluation of inequalities between and within European countries; these recommendations should involve data collection and processing. Birth weight and gestational age should be collected for all the events involved: live births, stillbirths, and infant deaths. Detailed tabulations of births and deaths should be produced and published according to standard disaggregation of birth weight and gestational age.

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Résumé

Enregistrement des données d'état civil: comparabilité des naissances vivantes et des mort-nés en Europe

La comparabilité internationale des indicateurs et mesures de mortalité périnatale calculés à partir des statistiques d'état civil a été évaluée à différents niveaux. Les définitions légales et administratives des événements concernés (naissance vivante, mort-né) ont été analysées à partir d'une enquête approfondie menée par l'Institut de démographie (Université Catholique de Louvain, Louvain-la-Neuve, Belgique) en 1991 auprès de 27 pays d'Europe. Leurs incidences sur la comparabilité des indicateurs ont été illustrées à partir de données publiées (structure par âge des décès infantiles en Europe; évolutions de la mortalité infantile et de la mortinatalité dans certains pays). Les possibilités de production de mesures standardisées de mortalité périnatale (selon les recommandations de l'OMS) ont été évaluées pour les différents pays, par une analyse du contenu des bulletins d'état civil et des méthodes de traitement de l'information (appariements) en usage.

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