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THE EUROPEAN PERINATAL HEALTH REPORT ON CORE INDICATORS IN 2015: INTRODUCTION AND METHODS

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This report presents the Euro-Peristat perinatal health indicators in 2015 from 31 European countries, including the 28 European Union member states and Iceland, Norway, and Switzerland. The indicators comprise the full set of 10 core indicators as well as two recommended indicators in the Euro-Peristat indicator set.[1] Other Euro-Peristat recommended indicators will be published at a later date.

2.1 SURVEILLANCE OF PERINATAL HEALTH IN EUROPE

MATERNAL AND NEWBORN HEALTH IN EUROPE IS A PRIORITY

Promoting healthy pregnancy and safe childbirth is a goal of all European countries. Despite continuing and significant reductions in maternal and perinatal mortality over recent decades,[1] mothers and their babies are still at risk during the perinatal period, defined as pregnancy, delivery, and the postpartum period. Over 5 million babies are born in European Union member states every year; approximately 23 000 are stillborn, 22 000 die before their first birthday, and 8 per 1000 suffer from severe sensory or cognitive impairments.[2,3] The principal pregnancy complications leading to perinatal mortality and morbidity are preterm birth, fetal growth restriction, and congenital anomalies. The increased or at best stable percentage of children born preterm in many countries[4,5] reflects limited achievements in prevention, compared with the medical advances that have reduced mortality among infants born preterm or with other perinatal complications. Maternal deaths are increasingly rare, but up to half are associated with substandard care. Although severe maternal morbidity is measured inadequately and inconsistently throughout most of Europe, it is estimated that between 1 and 3% of women receive a life-threatening diagnosis or require a life-saving procedure during their delivery hospitalisation.[6,7]

Poor maternal and newborn health have long-lasting consequences. Research on the early origins of adult diseases underscores the vital importance of perinatal events and underpins calls for public health interventions targeting the first 1000 days of life.[8,9] For instance, preterm birth and fetal growth restriction are associated with the development of chronic illnesses such as hypertension and metabolic disease in later life.[10] Risk factors for poor perinatal outcome, such as smoking and obesity, continue to exert an effect through the child's increased susceptibility to asthma, obesity, and developmental delays. The social context and consequences of these effects must also be considered, as the burden of poor health falls disproportionately on socially disadvantaged women and babies.[11,12] Adverse perinatal health outcomes perpetuate health and social inequalities within and between countries.

PERINATAL HEALTH SURVEILLANCE AT A EUROPEAN LEVEL ADDS VALUE TO NATIONAL INITIATIVES

High quality health information is needed to support decision-making about health practices and policies for pregnant women and newborns. Two principal reasons strongly justify the development of a European perinatal health information system from a public health perspective.

First, European countries face similar economic, demographic, and medical challenges. Many common economic and demographic pressures affect women and babies and require surveillance.

Because many countries are experiencing very low fertility rates, investments in young families and children constitute a strategic priority for them. The increase in almost all countries of risk factors for poor perinatal health, such as older age at childbirth and maternal obesity, requires healthcare services to adapt to the evolving needs of mothers and children. Similarly, questions about the optimal use of new health technologies, such as prenatal genetic screening or subfertility procedures, are of concern everywhere. These questions touch on a wide range of societal concerns, including quality of care, the expectations and satisfaction of pregnant women and their families, ethics decisions, and healthcare costs.

Second, European countries can benefit from pooling their experiences to improve health care delivery and public policy. Understanding how neighbouring countries manage these common risks and challenges adds to the range of solutions available for national policy makers. Great diversity in cultural, social, and organisational approaches to childbirth and infant care exists within Europe and raises important questions about the best use of healthcare interventions and the quality of care. Data on medical practices and health are essential benchmarks for evaluating these diverse models and identifying possible gains in efficiency and cost-effectiveness.
The benefits of having statistics on maternal and child health are obvious, and most individual countries have data that are used for surveillance on the national level. However, many key indicators of maternal and child health and health care are currently not available in international databases (Eurostat, OECD, or WHO) or are not sufficiently standardised to permit valid comparisons.[13]

THE EURO-PERISTAT PROJECT: SURVEILLANCE AND ANALYSIS OF PERINATAL HEALTH IN EUROPE

The Euro-Peristat project's goal is to develop valid and reliable indicators that can be used for monitoring and evaluating perinatal health in Europe. The project began in 1999 as part of the Health Monitoring Programme and has enlisted the assistance of perinatal health professionals (clinicians, epidemiologists, and statisticians) from European Union member states and Iceland, Norway, and Switzerland as well as other networks, notably SCPE (a network of European cerebral palsy registries), ROAM (Reproductive Outcomes and Migration Collaboration), and EUROCAT (a network of European congenital anomaly registries), to develop its recommended indicator list.

It thus aims to (1) assess maternal and infant mortality and morbidity associated with pregnancy, delivery, and the postpartum period; (2) describe the changes in risk factors for perinatal health outcomes in the population of childbearing women, including demographic, socio-economic and behavioural characteristics, and (3) monitor the use and consequences of medical interventions in the care of women and babies during these same three periods.

In its first phase, the Euro-Peristat Project developed a set of indicators with members from the then 15 member states of the European Union.[14] This indicator set was developed by a procedure that began with an extensive review of existing perinatal health indicators and was used as the basis of a DELPHI consensus process, a formalised method in which selected experts respond to a successive series of questionnaires with the aim of achieving a consensus on key principles or proposals. Our first panel of experts in 2002 was composed of clinicians, epidemiologists, and statisticians. We also invited the SCPE network to assist with the indicator on cerebral palsy. A second DELPHI process was also conducted in 2002, with a panel of midwives to ensure that their perspectives on perinatal health were represented. A third DELPHI process was conducted in 2006

with a panel of 2 participants (clinicians, epidemiologists, and statisticians) from each of the 10 newest member states of the European Union. Minor updates to this list were undertaken again before collection of 2010 and 2015 data. The changes to the indicator list reflect the emergence of new priorities as well as our experience testing the feasibility and utility of collecting and presenting the indicators.

This feasibility testing has simultaneously enabled Euro-Peristat to use these indicators to evaluate perinatal health in Europe. The first publication was a special issue of the *European Journal of Obstetrics, Gynecology, and Reproductive Biology*. We then produced two European Perinatal Health Reports (in 2008 based on 2004 data and in 2013 based on 2010 data).[2,3] Our group and others using our open access databases have published more than 60 scientific articles based on Euro-Peristat data. These publications focus on methods – how to create better, more comparable indicators – and on evaluating health and health care across Europe. A list of the Euro-Peristat publications is available on our website (http://www.europeristat.com/reports/scientific-publications.html).

The Euro-Peristat network includes one Scientific Committee representative per country and other data providers and experts who make up the team for each country (see http://www.europeristat.com/our-network/country-teams.html and Appendix A for the list of contributors). Because Bulgaria and Croatia joined the network in 2016, it is now able to provide complete coverage of all European Union members.

Currently Euro-Peristat is funded as part of a European Joint Action, InfAct, on health information. InfAct (Information for Action), launched in March 2018, includes 40 partners in 28 EU and associated countries. It aims to provide a sustainable solution for health information networks in Europe and better coordination of health information surveillance strategies and data collection in Europe (https://www.inf-act.eu/). Data compilation and analysis for this report was funded by the BRIDGE Health project, which provided support for Euro-Peristat from May 2015 to October 2017. This funding did not cover collection of the full set of Euro-Peristat indicators, which is why this report focuses on the core indicators and two recommended indicators.

Euro-Peristat is also supported by participating institutions that provide routine statistical data to the Euro-Peristat coordination team and our network of experts who contribute their time and expertise. Appendix A lists all contributors to this report.

EURO-PERISTAT INDICATORS

The current Euro-Peristat indicator list includes 10 core indicators and 20 recommended indicators and are grouped into 4 themes, as shown in the table below: (i) fetal, neonatal, and child health, (ii) maternal health, (iii) population characteristics and risk factors, and (iv) health services. We defined core indicators as those that are essential for monitoring perinatal health and recommended indicators as those considered desirable for a more complete picture of perinatal health across the member states. We also identified several indicators for further development; they are defined as those that represent important aspects of perinatal health but require further work before they can be implemented.

Table 2.1 Euro-Peristat's 10 core and 20 recommended indicators

FETAL, NEONATAL, AND CHILD HEALTH

C1: Fetal mortality rate by gestational age, birth weight, and plurality
C2: Neonatal mortality rate by gestational age, birth weight, and plurality
C3: Infant mortality rate by gestational age, birth weight, and plurality
C4: Distribution of birth weight by vital status, gestational age, and plurality
C5: Distribution of gestational age by vital status and plurality
R1: Prevalence of selected congenital anomalies
R2: Distribution of 5-minute Apgar scores
R3: Fetal and neonatal deaths due to congenital anomalies
R4: Prevalence of cerebral palsy

MATERNAL HEALTH

C6: Maternal mortality ratio
R5: Maternal mortality by cause of death
R6: Incidence of severe maternal morbidity
R7: Incidence of tears to the perineum

POPULATION CHARACTERISTICS/RISK FACTORS

C7: Multiple birth rate by number of fetuses
C8: Distribution of maternal age
C9: Distribution of parity
R8: Percentage of women who smoked during pregnancy
R9: Distribution of mothers' educational level
R10: Distribution of parents' occupational classification
R11: Distribution of mothers' country of birth
R12: Distribution of mothers' prepregnancy body mass index

HEALTHCARE SERVICES

C10: Mode of delivery by parity, plurality, presentation, previous caesarean section, and gestational age
R13: Percentage of all pregnancies following treatment for subfertility
R14: Distribution of timing of first antenatal visit
R15: Distribution of births by mode of onset of labour
R16: Distribution of place of birth by volume of deliveries
R17: Percentage of very preterm babies delivered in units without a neonatal intensive care unit
R18: Episiotomy rate
R19: Births without obstetric intervention
R20: Percentage of infants breast fed at birth

2.2 DATA COLLECTION AND AVAILABILITY

The Euro-Peristat indicators are compiled from population-based data at the national level from routine sources (ie, administrative or health registers, statistical systems or routine surveys). However, if data at the national level are not available, countries can submit population-based data from regions or from constituent countries, as the UK does. Scientific Committee representatives are responsible for overseeing data collection for their country in collaboration with their country team members.

Data collection began in January 2017. We asked for data on births in 2015 or the most recent year if 2015 data were not yet available. Euro-Peristat collects aggregated data by using a standardised Excel-based instrument developed and adapted by the Netherlands Organisation for Applied Scientific Research, TNO Healthy Living in Leiden, the Netherlands. In this data collection exercise, some countries tested a program to automatically generate the aggregated data sheets from disaggregated multivariate tables, an approach that Euro-Peristat would like to develop in the future to improve quality and standardisation. Information on data sources and data quality were also collected. Data were reviewed by the project coordination team based at Inserm in France, and queries were then sent to individual country teams (ie, Scientific Committee members and data providers) for review.

Members of the Euro-Peristat network met in the Netherlands in April of 2018 to review the preliminary results and discuss explanations for observed geographical and temporal variations, with a particular focus on possible differences in indicator definitions. Scientific Committee members checked data for the indicators, endorsed the Euro-Peristat output tables, and contributed to writing and reviewing the written text before publication of this report.

DATA SOURCES

Countries used multiple sources including civil registers based on birth and death certificates, medical birth registers, hospital discharge systems, and survey data. Most countries used at least 2 separate data sources; the number of sources varied between 1 (Greece, Norway, and Sweden, for instance) and 15 (for the UK and its four constituent countries). However, some databases centralise data from multiple sources; for instance, Norway's medical birth register is routinely linked with civil registration data, the ART registry, and abortion data (for terminations of pregnancy) and would therefore be considered a single source. Table 2.2 summarises countries' main sources of data for perinatal health reporting. If several data sources were available for a given indicator, Scientific Committee members were asked to select the best source based on quality and comprehensiveness. For each indicator, the data source is identified in the summary tables in Appendix B. More details on each of these data sources can be found in Appendix C.

Civil registration systems collect information related to perinatal health and vital statistics related to all births and deaths. Some civil registration systems also record background characteristics, such as mother's age, parity, and plurality, or babies' birth weights, but most countries record only a limited number of variables related to perinatal health. Civil registration is required by law and is very complete for citizens and permanent residents. Most countries also register information about births to women who are non-residents. Many countries derive numbers of live births, stillbirths, infant deaths, and maternal deaths from civil registration. This includes a compulsory medical certification of causes of death in all countries, although some process this separately.

While all countries have civil registration, the majority of Euro-Peristat core indicators are derived from medical birth registers. These registers contain more specific information about maternal characteristics and about diagnoses, care, and interventions during the perinatal period for mothers and children. Data provision is mandatory in most countries, but even registers that are voluntary (eg, Luxembourg, Malta, and the Netherlands) have good coverage. Midwives, nurses, or doctors record information for the medical birth registers in maternity and neonatal units, either on a data collection form or on electronic patient data systems from which they are subsequently abstracted.

Civil registration and medical birth register data are the most comprehensive at the population-level; coverage is usually close to 100%. Appendix C reports the percentage of coverage estimates for each of the data sources used in this report.

Besides civil registration and medical birth registers, other data sources include hospital discharge systems that record information about hospital births. These healthcare system databases include information about all care provided in the relevant area, including births to women without permanent residence status (immigrants, refugees, and asylum seekers) as well as visitors and women from other countries seeking health care. This can cause discrepancies in the total number of births when compared with civil registration data, which may have different inclusion rules.

Hospital discharge systems record data about births and interventions during the hospital stay (ie, caesarean or instrumental deliveries, clinical diagnoses during pregnancy and at birth, hospital care after delivery, interventions and clinical diagnoses in mothers and babies until discharge). However, these systems usually do not cover use of primary healthcare services or home or other out-of-hospital births. Use of these databases presents other methodological concerns. For instance, their use to estimate incidence or prevalence data may result in overestimates if the systems do not use a unique identifier to record multiple admissions of the same person.[15] This is of particular concern for newborns or mothers who may be admitted to intensive care in another hospital. For some countries, such as Portugal, data collection is mandatory only for public hospitals. If the diagnoses or interventions in the hospital discharge systems are used for financial purposes (ie, health insurance funds), there may be bias related to the tendency to include only or especially care with more complicated diagnoses or only the diagnoses or procedures that provide funding for the hospitals.

To collect more information about maternal and infant mortality, some countries organise confidential enquiries or audits to ascertain all cases and examine whether substandard care or other avoidable factors could have contributed to the death.[16] Table 2.2 specifies the countries performing such audits. Finally, routine surveys are another source of information on births, as in France where a national survey is conducted about every five years in all maternity units during one week of the year. Further analysis of the data sources used to report on perinatal health in participating countries can be found in publications by the Euro-Peristat group.[13,15,17]

LINKING DATA SOURCES

Euro-Peristat has studied methods for improving data for perinatal health surveillance. Data linkage of patient records across population-based registers has been identified as one way to improve the range and quality of data available about each birth. Countries that link data routinely are able to produce more of the Euro-Peristat core and recommended indicators.[18]

For this data collection exercise, 20 of the 31 participating countries reported linking data sources. Some countries perform these linkages routinely by linking birth and death certificates or medical birth register data to civil registration data to increase the completeness of data on deaths after the perinatal period. Other types of linkages, for example to education or specific disease registers (ie, cancer, ART, and congenital anomalies) can also enrich the information available on outcomes during childhood or later on in life. In a few countries, linkages can only be done for ad hoc statistical or research purposes. The availability of unique identification numbers facilitates linkage between data sources, but other techniques exist. They rely on probabilistic matching of information, such as the mother's name, date of birth, and address, as well as information about the newborn, including, for example, gestational age and birth weight.[18]

Structural differences in data quality and privacy frameworks across Europe can hamper countries' capacities to link data systems. Nonetheless, Euro-Peristat recommends broader adoption of data linkage to increase the breadth and quality of information available for perinatal health research and surveillance.[13,15,17,18]

INCLUSION CRITERIA FOR BIRTHS AND DEATHS

Euro-Peristat requested data for all stillbirths and live births from 22 weeks of completed gestation or, if gestational age was not available, a birth weight cutoff of 500 grams. Because most countries do not have legal registration limits for live births, defined as any birth with signs of life, they are able to provide data based on Euro-Peristat's inclusion criteria. For fetal deaths, most countries were able to provide data for deaths at or after a gestational age limit of 22 weeks, but some countries use other criteria, such as birth weight (ie, 500 grams) or higher gestational age limits (eg, 24 weeks). If countries cannot provide data according to the Euro-Peristat inclusion criteria, they are asked to provide data by using their national criteria. This can lead to differences in the lower inclusion limits for births and deaths for data provided to Euro-Peristat. In some countries, legal limits for registration are different from those used to provide data for Euro-Peristat because the data do not come from civil registration data. The Netherlands and Italy, for example, were able to provide data for stillbirths below the lower limit for legal registration, ie, over 22 weeks of gestational age in both countries, because they used data registers that include stillbirths at lower gestations. The descriptions of the fetal (see C1) and neonatal (see C2) mortality indicators include the exact inclusion criteria for participating countries.

Because of differences in legislation and practices for registering births and deaths, it is essential to report on mortality statistics that use common gestational age limits, to make these rates more comparable between countries. Based on results of research using data collected in previous years,[19, 20] the Euro-Peristat network excludes deaths at very early gestational ages, which are the most likely to be affected by registration differences: 22–23 weeks for neonatal mortality and 22–27 weeks for fetal mortality.[20] We focus on gestational age thresholds because most countries base inclusion criteria for stillbirths on gestational age and also because we found that using a birth weight of 1000 grams versus a gestational age cutoff of 28 weeks underestimated the burden of third trimester stillbirths.[19] In this report, we also include comparisons of fetal mortality rates between 24 and 27 weeks of gestation, to provide more complete reporting of stillbirths, as explained in the section on fetal mortality (see C1).

For this report, we requested data about notification of late terminations of pregnancy. Some of the variation in fetal mortality between European countries is due to differences in reporting

of terminations at 22 weeks and later.[21] Some countries register these terminations as stillbirths, whereas elsewhere terminations are recorded in a separate system or not reported at all. This information is presented in the section on fetal mortality, and rates are provided with and without terminations to allow readers to take these differences into consideration.

While differences in the recording of births and deaths at the limits of viability can have a large impact on mortality rates, they have less impact on other perinatal health indicators because these births and deaths account for a very small proportion of all births.[22] On average, births below 24 weeks of gestation make up less than 0.1% of total births.[22]

COMPARING PERINATAL HEALTH INDICATORS BETWEEN COUNTRIES

In defining our indicators, the Euro-Peristat network aims to reduce variation in indicators attributable to differences in definitions or recording practices from country to country. This has been accomplished by selecting definitions most likely to be feasible and by carefully designing the data collection instrument. Nonetheless, not all countries can produce data according to the recommended definitions. For example, the requested denominators are not always available – such as childbearing women rather than births, or total births rather than live births. Some countries were able to provide information for all births, but not separately for singletons and multiples. Data for the requested time frames were also not always available. For instance, we requested mortality information for 2011-2015, but some countries were only able to provide data for 2010-2014 or 2008-2012. These differences are noted in the relevant tables and figures.

Another issue that can affect the comparability of indicators is the management of missing data. Euro-Peristat collects data along with the number of "unknown" or "missing" cases. These data are not always available, however. If check-box answers are interpreted as a positive answer (yes), missing data tend to be automatically, but erroneously interpreted as a negative answer (no). The data tables in Appendix B report the number of missing cases for each indicator, when this information is available, in the column labelled "not stated". In our data exercise, unless noted otherwise, we calculated rates and percentages by excluding cases with missing data.

Finally, account must be taken of random variation in making comparisons. The largest member states – France, Germany, Italy, and the UK – each have more than half a million births per year. The annual number of births is smallest in Malta and Iceland (around 4500), Luxembourg (around 6500), and Cyprus (around 9500). Estonia and Slovenia have 14 000-20 000 births per year. For smaller countries, the data for a single year may not contain sufficient numbers of events to construct reliable rates to measure less frequent maternal or child outcomes. For maternal mortality, which is extremely rare, rates are measured using data for five years, but this does not solve the problem in smaller countries. The Euro-Peristat group has studied the best ways to present data to call attention to the variation in indicators due to small population size.[23] In this report, we present data on changes in the Euro-Peristat indicators between 2010 and 2015 with relative risk ratios and their 95% confidence intervals. We have also included the number of births in the first graph of each section so that the reader can interpret the data with the number of annual births in mind.

Because of the importance of these methodological issues, for each indicator in the report, we detail the specific questions that should be kept in mind when interpreting variations. We urge our readers to look closely at these sections.

DATA AVAILABILITY

All countries provided data for 2015, with the exception of Bulgaria, Poland, Sweden, and Switzerland whose data refer to births in 2014. Figure 2.1 presents the percentage of countries that provided each of the Euro-Peristat indicators for this report, overall and by subgroup. Partial availability refers to situations where some data are available but with significant differences from the Euro-Peristat definition or with coverage that is not nationwide. Coverage that is complete, but based on several subnational systems that have not been merged to provide a national value (as for some indicators in the UK), is considered fully available. Countries using different years were similarly considered to have full availability.

In general, availability for the core indicators was good – as would be expected as these are basic population health indicators. However, not all countries can provide these indicators by key subgroups, such as gestational age, birth weight, or plurality. This issue is most acute for infant deaths. Linkage of birth and death certificates should make this possible in most countries, and Euro-Peristat urges all countries to achieve full availability on this core indicator set.

Data for the two recommended indicators – on smoking (R8) and prepregnancy body mass index (R12) – came essentially from medical birth registers and from a perinatal survey in France. Data availability for these two indicators in the participating countries is not as good as that for the core indicators. Smoking and prepregnancy body mass index are known risk factors for adverse perinatal health outcomes and provide useful information for interpreting the baseline prevalence and risk of other indicators (ie, low birth weight, preterm birth).

COMPARISONS WITH 2010

There have been some positive changes in data availability since our data collection in 2010. Cyprus now has national data as opposed to survey data, and Greece is lowering its registration criteria for stillbirths to 22 weeks of gestation. France has also put into place a new system for monitoring stillbirths and the gestational age and birthweight distribution from its hospital discharge data since 2012; in our 2010 report, national data came from the French Perinatal Survey, which is a nationally representative sample of births. In Belgium, data are now available nationally for all births, whereas in our previous reports, data were reported separately by region.

For this report, several countries provided new or updated data from 2010 which allowed us to compare their data for these two years. For instance, Belgium provided national level data for 2010 and Greece was able to provide data from 2010 which were not included in our last report. Spain provided data on caesarean section rates in 2010, as their new data included private hospitals, whereas reported data in 2010 only covered the public hospitals. In comparisons with 2010, we aimed to maintain the same data sources. For instance, in France, because national data were not available in 2010 for stillbirths, preterm births, or low birth weight, comparisons with 2010 use data from the most recent French Perinatal Survey.

2.3 PRESENTATION OF DATA IN THE REPORT

In this report, the figures and tables order countries alphabetically according to each country's official name, in accordance with the convention used for European Union publications. This ordering was used in the first Euro-Peristat report and continued in subsequent reports. Therefore, figures and tables can be compared between reports as well with other European data tables, such as those produced by Eurostat.

While sorting indicators – from lowest to highest, for instance – makes graphs easier to read, presenting data in this way can lead to erroneous interpretations. Ordering countries creates a performance ranking that implies that each country can be clearly placed on a scale with respect to all other countries. However, because of random variation from year to year, we would expect countries with similar performance on a given indicator to have small differences in values from year to year. One option for emphasising this random variation is to add confidence intervals for all indicator values. In this report, confidence intervals are used for maternal mortality ratios because the variability is very marked for some countries. Because adding confidence intervals makes figures more complex, however, we have not included them elsewhere. Nonetheless, as mentioned above, some graphs include information on the number of births to highlight differences in population sizes between countries. Another problem with sorting indicators is that it is not possible to sort countries with no data. Identifying gaps in surveillance capacity is one of key objective of Euro-Peristat and presenting countries alphabetically highlights missing information.

Another issue in reporting European data concerns how to summarise each indicator for Europe overall. Providing an average of the indicators for all countries is not very meaningful, as this will be affected by outliers and because the number of countries providing data differ depending on the indicator. A Europe-wide value based on all contributed births is also not ideal, as a few large countries would account for a disproportionate number of births. As a solution, we have provided median values and information about the range of values (interquartile and overall). To assess Europe-wide changes between 2010 and 2015, we also estimated pooled risk ratios with meta-analysis techniques. These statistical techniques, which integrate information about the variability in population size, are appropriate for evaluating trends across Europe. We report a random effects pooled risk ratio, calculated with the method of DerSimonian and Laird, which is interpretable as the association in an average country in Europe. Meta-analysis also makes it possible to provide a statistical measure of the heterogeneity in indicator values throughout Europe. We report the I^2 statistic, which provides an estimate of the proportion of the variation from country to country due to real differences and not just chance variation. Finally, we also present data with maps that illustrate geographic patterns in the distribution of the indicators. In these maps, countries are classified into six groups based on the geometrical interval classification method (ArcGIS 10.5).

KEY POINTS

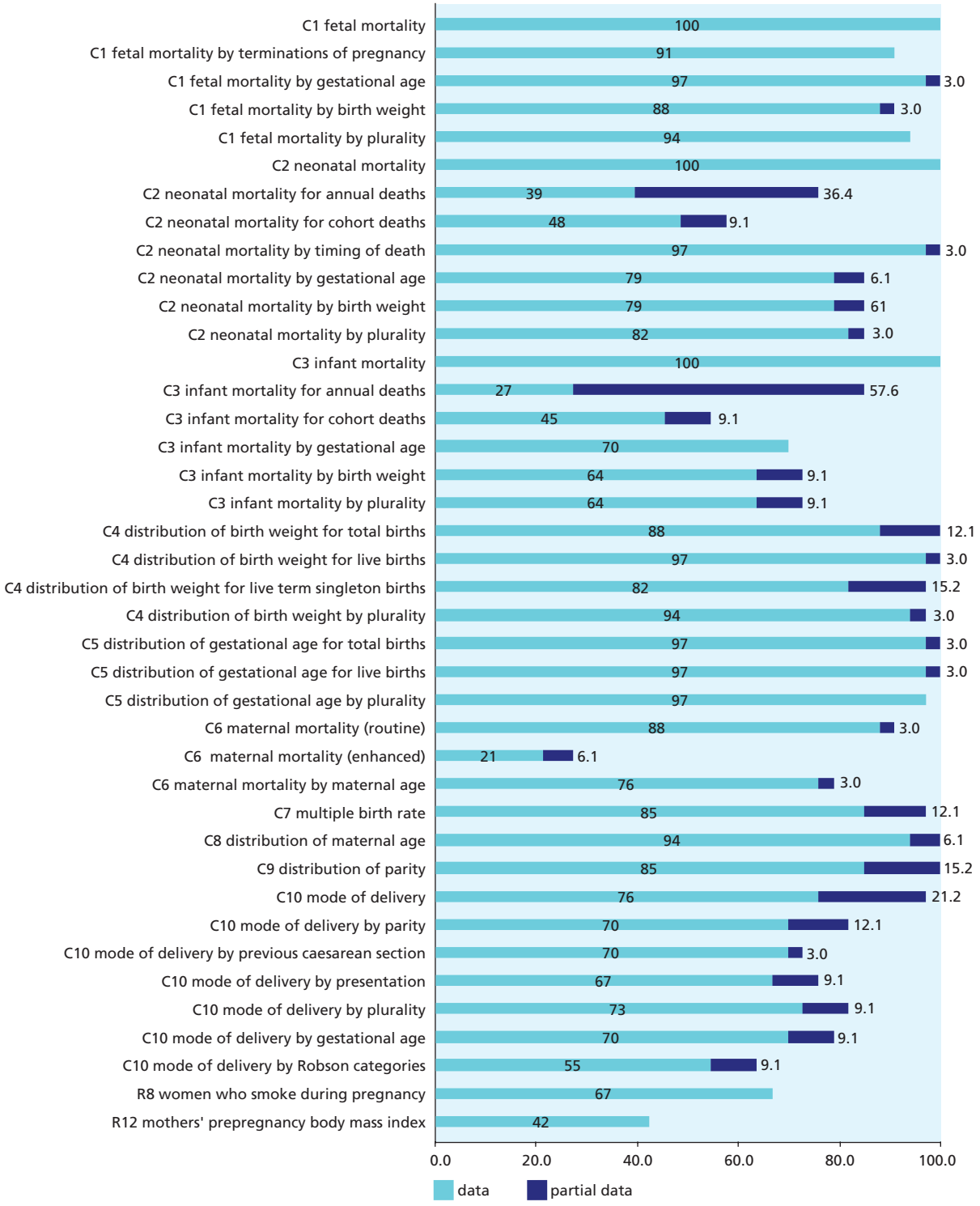
- The strengths of the Euro-Peristat indicators are their standardised definitions, the uniform collection of aggregated data, and the expertise brought to data collection and interpretation by Euro-Peristat Scientific Committee members and data providers, who are statisticians, epidemiologists, health researchers, physicians, midwives, and university researchers.
- All data were checked, based on a protocol involving several rounds of internal validation within the network.
- This and the previous Euro-Peristat reports testify to the feasibility and importance of the collection of indicators of maternal and infant health and of routinely compiling currently available data.
- Euro-Peristat also highlights shortcomings in current routine data systems, which must be considered in interpreting variation between countries.
- Regular reporting of perinatal health indicators on a European level makes it possible to identify these weaknesses and to encourage countries to make changes to obtain better statistics on maternal and newborn health.
- The use of Euro-Peristat data for research, by public health policy planners and public health specialists, confirms the importance of routinely compiling available perinatal health data for the surveillance of trends in risk factors and outcomes.

Table 2.2 Main sources of data used by Euro-Peristat

	Register Data			Other				
Country	Births in 2015* (N)	Civil registration/ vital statistics	Medical birth register or child health system	Hospital discharge system	Routine survey	Confidential enquiry	Professional registry	Linked data
Belgium	122 838	x						Yes
Bulgaria (2014)	68 079	x	x	x				No
Czech Republic	111 162	x	x	x				No
Denmark	57 847	x	x	x				Yes
Germany	728 825	x	x					Yes
Estonia	13 961	x	x	x				Yes
Ireland	65 913	x	x			x		No
Greece	92 159	x						No
Spain	421 590	x						No
France	761 880	x		x	x	x		No*
Croatia	37 428	x	x					Yes
Italy	486 557	x	x	x	x		x	Yes
Cyprus	9425	x	x					Yes
Latvia	21 826	x	x					Yes
Lithuania	31 601	x	x					Yes
Luxembourg	6862	x	x					Yes
Hungary	92 206	x						Yes
Malta	4453	x	x				x	No
Netherlands	169 234		x			x	x	Yes
Austria	83 884	x	x	x				Yes
Poland (2014)	376 968	x		x				No
Portugal	86 048	x		x				No
Romania	201 760	x		x				Yes
Slovenia	20 336	x	x					No
Slovakia	55 824	x						No
Finland	55 759	x	x					Yes
Sweden (2014)	115 710	x	x	x			x	Yes
United Kingdom						x		Yes
UK: England and Wales	698 970	x						Yes
UK: England	645 244	x		x				Yes
UK: Wales	32 338	x		x				Yes
UK: Scotland	54 513	x		x				Yes
UK: Northern Ireland	24 544	x	x					Yes
Iceland	4098	x	x					Yes
Norway	59 928	x	x					Yes
Switzerland (2014)	85 206	x		x				Yes

Note: *Linkage was used for enhanced maternal mortality data in France, but the other data are not linked.
Figure 2.1 Data availability for core and two recommended Euro-Peristat indicators in 2015

Figure 2.1 Data availability for core and two recommended Euro-Peristat indicators in 2015



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