EUROPEAN PERINATAL HEALTH REPORT

by the EURO-PERISTAT project
in collaboration with
SCPE, EUROCAT & EURONEOSTAT

Data from 2004

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ABBREVIATIONS AND ACRONYMS

ART	Assisted reproductive techniques
CLD	Chronic lung disease
CMV	Conventional mechanical ventilation
CP	Cerebral palsy
ESPR	European Society for Paediatric Research
EU	European Union
ICD-10	International Classification of Diseases, 10th revision
ICU	Intensive care unit
IVF	In vitro fertilisation
IVH	Intraventicular haemorrhage
MMR	Maternity mortality ratio
n-CPAP	Continuous positive airway pressure
NEC	Necrotising enterocolitis
NICU	Neonatal intensive care unit
NMR	Neonatal mortality rate
PDA	Symptomatic patent ductus arteriosus
PIVH	Periventricular intraventricular haemorrhage
PPH	Postpartum haemorrhage
PVL	Periventricular leukomalacia
ROP	Retinopathy of prematurity
SCPE	Surveillance of Cerebral Palsy in Europe
SES	Socioeconomic status
SNMR	Standardised neonatal mortality rate
VLBW	Very low birth weight
WHO	World Health Organization

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EXECUTIVE SUMMARY

Health and care of pregnant women and babies in Europe

1 EXECUTIVE SUMMARY: HEALTH AND CARE OF PREGNANT WOMEN AND BABIES IN EUROPE

I. MONITORING PERINATAL HEALTH IN EUROPE

Promoting healthy pregnancy and safe childbirth is a goal of all European health care systems. Despite significant improvements in recent decades, mothers and their babies are still at risk during the perinatal period, which covers pregnancy, delivery, and the postpartum. Babies born too early are more likely to die than those born at term. They are also more likely to have neurological and developmental disorders that carry long-term consequences for their quality of life, their families, and for health and social services. The same is true for babies born with severe congenital anomalies. Many of them have important medical, social, and educational needs. Stillbirths have not decreased to the same extent as neonatal deaths, and their causes remain largely unknown. Maternal deaths are rare but tragic events, particularly because a significant proportion of these deaths are associated with substandard care.

In recent years research has also found connections between perinatal health and chronic diseases of adulthood. Babies born too small as a consequence of fetal growth restriction are more likely than others to develop diabetes and metabolic syndrome as adults. Other implications for adult health of adverse events during pregnancy are currently being explored. These relations make the monitoring of perinatal health outcomes more important than ever.

To improve outcomes, we need the right tools to assess perinatal health problems and their causes. We also need to monitor the impact of policy initiatives over time. This report is a first step towards providing Europe with such a tool, based on indicators recommended by the EURO-PERISTAT project. It brings together for the first time statistical information on the characteristics, health, and health care of pregnant women and their newborn babies in 25 member states of the European Union and Norway.

This report also includes key data and analyses from three other European projects that monitor perinatal health: Surveillance of Cerebral Palsy in Europe (SCPE), European Surveillance of Congenital Anomalies (EUROCAT), and the European Information System to Monitor Short and Long-Term Morbidity to Improve Quality of Care and Patient Safety for Very-Low-Birth-Weight Infants (EURONEOSTAT). Good quality reporting on congenital anomalies and cerebral palsy requires careful standardisation of diagnostic criteria and rigorous protocols for the identification of cases. Registries, most often at a regional level, are the best method for obtaining valid and comparable data on these health problems. EUROCAT, which began epidemiological surveillance of congenital anomalies in 1979, now includes registries that cover over 30% of Europe's births in 19 countries. SCPE, begun in 1998, brings together cerebral palsy registries in 16 European countries to provide analysis on a European level. EURONEOSTAT is a newer initiative to create a network of neonatal intensive care units within Europe and to provide hospital-based data on very low birthweight babies, weighing less than 1500 g.

This report is intended for all people with a stake in improving the health and care of pregnant women and babies, including health policy makers and planners, clinicians, researchers, and users of health care systems. In the first part, we begin by describing the surveillance of perinatal health and the data sources used for perinatal health monitoring. We then report the results for each EURO-PERISTAT indicator in four separate chapters: characteristics of childbearing women, the care of women and babies during pregnancy and the postpartum period, fetal and infant health, and maternal health. We explain why each indicator is important for monitoring perinatal health as well as the methodological issues that should be kept in mind in interpreting them. Chapters 8, 9, and 10 describe the indicators and data from the three other participating projects. The second part presents appendices with detailed reference data tables on all of the EURO-PERISTAT indicators. Most but not all of these data relate to births in 2004. Because cerebral palsy is best diagnosed at the age of 4 or 5, the SCPE data covers births from previous years and also covers several years; because EURONEOSTAT is a relatively new project, its data relate mainly to 2006.

Some of the differences in the indicators arise from differences in definitions, data quality, coverage by data collection systems, and completeness of recording. In what follows, we have tried to allow for these, but care should be taken in drawing conclusions from the differences observed. In addition, some of the indicators describe relatively rare events and are thus based on a small number of cases, especially in smaller countries. We have not made any formal attempt to test differences statistically. In most cases, the data needed for statistical comparisons are presented in the tables in the appendices for use by readers.

Key findings in this report and its recommendations for improving health reporting in the future are summarised below.

II. HIGHLIGHTS OF HEALTH AND HEALTH CARE IN EUROPE IN 2004

Fetal and neonatal mortality rates differ widely between European countries.
With a standardised definition including all births of at least 28 completed weeks of gestation, the fetal mortality rate in 2004 ranged from around 2.0 per 1000 births in the Slovak Republic and Finland to 4.9 in Latvia and France. The Netherlands and Scotland also had rates of over 4.0 per 1000, while Flanders (Belgium), Germany, Spain, Luxembourg, Austria, the Czech Republic, and Norway had rates under 3.0. When all stillbirths at 22 or more completed weeks of gestation were included, the range was much wider, from 2.6 to 9.1 per 1000 total births, but some of this variation was clearly due to differences in criteria for including fetal deaths in routine data collection systems and in completeness of ascertainment.

Neonatal mortality, that is, the rate of deaths from 0 to 27 days after live birth, ranged from around 2 per 1000 live births in Cyprus, Sweden, and Norway to 4.6 in Lithuania and 5.7 in Latvia. Countries with neonatal mortality rates over 4.0 per 1000 included Estonia, Hungary, Malta, and Poland. A majority of the European countries had rates under 3.5 per 1000, lower than those in other industrialised countries. For example, for 2004 the OECD Health Database reports a rate of 4.5 per 1000 live births in the USA, 4.0 in Canada, and 3.5 in Australia.

Differences in legislation and practices about pregnancy termination contribute to some of the observed variation in fetal and neonatal mortality.
The percentage of neonatal deaths attributed to congenital anomalies ranged from 20 to 40. This percentage was higher in Malta and Ireland, where terminations are illegal, than in other countries. Malta and Ireland also had higher overall rates of neonatal death. In contrast, where terminations of pregnancies after prenatal diagnosis of severe congenital anomalies can be undertaken at or after 22 weeks of gestation, and when these are recorded as fetal deaths, fetal mortality rates will

be higher. This is the case in France where terminations of pregnancy are a principal explanation for the very high fetal death rate (9.1 per 1000 total births).

The incidence of low birth weight ranges from 5 to 9% of all births and shows a marked geographical pattern.
The percentage of babies weighing less than 2500 g ranged from 4.2-4.3% of live births in Estonia, Finland, and Sweden to 8.5% in Greece, 8.3% in Hungary, and 7.4% in Spain. A geographical pattern characterised the incidence of low birth weight in Europe, with lower rates in the more northerly countries. Babies may have a low birth weight because of preterm birth or intrauterine growth restriction or for both these reasons. Some of the variation between countries could be due to physiological differences in body size. Very low birthweight babies, weighing less than 1500 g and therefore at the highest risk, accounted for 0.7 to 1.3% of all live births.

Preterm birth rates vary widely among European countries, ranging from 5.5 to 11.4%.
The percentage of live births before 37 completed weeks of gestation was highest in Austria (11.4), followed by Germany (8.9) and lowest in Finland (5.6), Latvia (5.7), Lithuania (5.3), and Ireland (5.5). Some of the variation between countries may be due to differences in the way that gestation is determined, and these differences should be explored. The variation in very preterm births, before 32 weeks of gestation, was less pronounced, and rates for most countries fell within a range of 0.9 to 1.1%.

An estimated 120 000 fetuses and babies had a major congenital anomaly in the EU-25 countries in 2004.
The overall incidence of major congenital anomalies diagnosed during pregnancy, at birth or in early infancy was 24 per 1000 births in 2004 according to EUROCAT data. This incidence has not decreased in recent decades, and there is a need to improve primary prevention policies reducing environmental risk factors in the pre and periconceptional period. Four fifths of cases were live births, the vast majority of whom survived the neonatal period, and may have special medical, educational or social needs. The largest group of congenital anomalies is congenital heart disease. An overall 0.93 perinatal deaths per 1000 births in 2004 were associated with congenital anomaly. The rate of termination of pregnancy for fetal anomaly (TOPFA) varies widely between countries from none (Ireland, Malta) to 10.7 per 1000 births (France), reflecting differences in prenatal screening policy and uptake, and differences in TOPFA laws, practices, and cultural attitudes. The live birth rate of certain anomalies such as spina bifida and Down Syndrome is inversely related to the TOPFA rate in the country.

Cerebral palsy registries make it possible to assess the longer term consequences of perinatal complications for the most common motor impairment in childhood.
Higher survival rates among very low birthweight babies and rising multiple birth rates have increased the proportion of children with cerebral palsy who are born from multiple pregnancies or who are of very low birth weight. For example, between 1980 and 1998 the proportion of very low birthweight babies with cerebral palsy who came from multiple births rose from around 17% to 24%. These increases in the population at risk of developing cerebral palsy have been offset by the decline in the overall prevalence of cerebral palsy among very low birthweight babies, which fell from 60.6 per 1000 live births in 1980 to 39.5 per 1000 in 1996. The significant decline, however, was confined to children with a birth weight between 1000 and 1499 g.

Maternal deaths are rare, but the data from some countries suggest that underascertainment is still a problem. Measuring the health of pregnant women during and after pregnancy remains a challenge.
The maternal mortality ratio (MMR) is defined as all deaths from the first trimester of pregnancy until 42 days post partum, from direct and indirect obstetric causes per 100 000 live births. It ranged between 2 and 10 per 100 000 live births for the majority of countries contributing data to this report. Ratios exceeded 10 in Estonia, Latvia, Slovenia, and Scotland (UK). The differences should be interpreted with caution as only six of these ratios are based on more than 20 deaths in the two year period 2003-04.

Maternal deaths are sentinel events pointing to the dysfunction of the health system, but they are hard to enumerate accurately since the pregnancy is not always noted on the death certificate. It is difficult to interpret the meaning of the variations in maternal mortality rates in Europe, because some of the countries with higher mortality may have systems to ascertain and count maternal death more thoroughly. Very low rates may simply indicate failure to ascertain maternal deaths.

Given the low incidence of maternal deaths, it is essential to develop indicators of maternal morbidity. EURO-PERISTAT found that data on severe morbidity associated with childbirth were not readily available from routine systems. Although many countries have hospital discharge data which could be used for this purpose, the diagnostic coding used was not sufficiently reliable. A European initiative is needed to improve the recording of severe maternal morbidity

The demographic characteristics of childbearing women differ greatly across Europe.
The differences in the distribution of demographic characteristics are important for interpreting differences in outcome because maternal age, parity, and multiple pregnancy are associated with risks of preterm birth, low birth weight, and fetal and neonatal mortality.

Adverse outcomes are more common among women older than 35 and among teenaged mothers. Similarly, specific medical complications, such as pregnancy induced hypertension and prolonged labour, occur more often among women giving birth for the first time. Teenaged mothers accounted for less than 2% of women giving birth in Denmark, Slovenia, the Netherlands, and Sweden and more than 7% in the UK, Estonia, the Slovak Republic, and Latvia. Fewer than 10% of the women delivering babies in the Slovak Republic, the Czech Republic, or Poland were aged 35 years or older, compared with 22% in Germany, 23% in Spain, and 24% in Italy and Ireland. The percentage of women giving birth for the first time ranged from 39% in Wales (UK) and 40% in Ireland to 56% in Spain.

Multiple births are much more likely than singleton births to be born before term and have higher rates of congenital anomalies and developmental disorders. Multiple birth rates ranged from 11 to 12 per 1000 women delivering a live or stillbirth in Poland, the Slovak Republic, and Estonia to 23.1 in Denmark, 25.0 in Cyprus, and 20.4 in the Netherlands. Some of the variation in multiple birth rates may be due to differences in the use of assisted reproductive techniques, which accounted for up to 5% of all births; only six countries could provide complete data on this indicator.

The wide diversity of practices in Europe raises questions about the appropriate level of intervention during childbirth.
Countries separated by only a few hundred kilometres have very different approaches to the management of pregnancy and childbirth. For example:

- Rates of caesarean section ranged from 14% in the Netherlands and 15% in Slovenia to 33% in Portugal and 38% in Italy.
- Instrumental delivery rates ranged from less than 3% of all deliveries in the Czech Republic and the Slovak Republic, and Slovenia to more than 12% in Ireland, Portugal and in the Valencia region of Spain.
- Labour was induced in less than 9% of all deliveries in Lithuania, Estonia, and the Czech Republic and more than 30% in Northern Ireland (UK) and Malta.
- Episiotomy rates ranged from 9.7% of vaginal deliveries in Denmark, 14.2% in Wales (UK), and 16.2% in England (UK) to 82% in Valencia (Spain), 63% in Flanders (Belgium), and 52% in Italy.

Not only do health care professionals in some countries intervene more than those in others in the natural process of childbirth, but there are also substantial differences in the types of intervention used. Greater use of intervention may be associated with higher rates of preterm birth or low birth weight or with characteristics of health care systems. These differences raise questions that should be explored in the future.

Diversity within Europe provides opportunities to learn from the differences in cultural and organisational models for maternity and neonatal care.
The long-standing debate about the risks and benefits of childbirth according to the size of maternity units has not ended. In some countries, deliveries still take place in smaller maternity units, with fewer than 500 deliveries per year. These units deliver 19% or more of all births in Cyprus, Latvia, Lithuania, Estonia, and Germany. Elsewhere these types of structures no longer exist or account for only a small percentage of births, less than 3% in Denmark, Sweden, Ireland, Portugal, and Scotland (UK). In countries in both the north and south of Europe, births are concentrated primarily in very large maternity units. Very large units have been criticised for being impersonal and in some cases have been shown to use more interventions during delivery.
Home births are rare almost everywhere, with the prominent exception of the Netherlands, which maintains its unique model of maternity care, with 30% of births taking place at home. In the UK, where home births are offered as an option to women with low risk pregnancies, this percentage ranged from under 1% in Northern Ireland to 3.1% in Wales.

Countries also differ in the models for care adopted for very preterm babies, those born before 32 weeks of gestation. These babies have lower mortality and morbidity when they are delivered in maternity units that have on-site neonatal intensive care. While many European countries have specified the types of specialised units where these babies should be delivered, these specifications and their classifications differ, and the percentage of very preterm babies born in units designated as most specialised ranges very widely – from 26 to 96%.

Behaviours promoting fetal and neonatal health differ in Europe
Smoking during pregnancy can harm the developing fetus and has longer-term consequences for health. Eleven countries could not provide information on the proportion of women who smoked during pregnancy and there were inconsistencies in the data which were provided. Where these data were available, rates ranged from 5-7% in Lithuania, the Czech Republic, Sweden, and Malta to 16% in Denmark and 21% in France. This basic indicator is essential for monitoring the

underlying patterns of smoking and the impact of smoking cessation programmes in the overall population and among pregnant women.

Breast feeding provides benefits to babies, including giving them nutritional advantages and improving their resistance to infections. In Europe, rates of breast feeding at birth ranged from under 46% in Ireland and 62% in France to almost 100% in the Czech Republic, Latvia, Slovenia, and Sweden. Only half of all countries could provide these data, however. Breast feeding during the first 48 hours after birth is an important indicator because its success often depends on the support, information, and assistance of health care professionals during pregnancy and the immediate postpartum period.

While some countries have better health outcomes overall than others, rankings vary by indicator. No country tops every list. Understanding the reasons for the differences in health indicators between the countries of Europe can provide insight into ways to improve perinatal health. The ranking of a country on a particular indicator can generate hypotheses about the reasons, and these can be further tested in more formalised research on a national and European level.

III. HEALTH INFORMATION SYSTEMS: LESSONS AND RECOMMENDATIONS

Routine perinatal health reporting is a realistic goal in Europe, but there are important gaps, notably maternal and child morbidity and social risk factors.
The breadth of information included in this report shows that routine reporting on a wide range of perinatal health indicators is possible in Europe. Data to construct the EURO-PERISTAT core indicators are available in almost all countries, and all indicators are available in at least one country. The goal of providing good quality data in a timely manner is realistic. This report also highlights the role of morbidity registries for monitoring child health information (eg, congenital anomalies, cerebral palsy) as well as of data collected in neonatal intensive care units for assessing care for very low birthweight infants.

Problems persist, however, and significant effort is necessary before all European countries can contribute the full set of EURO-PERISTAT indicators. More work is necessary to obtain good quality data for the surveillance of maternal morbidity, care during pregnancy, and the associations between social factors and health outcomes.

The differences in approaches to health information systems in Europe can provide new ideas for all countries.
Some countries, including many of the newer EU member states and the Nordic countries, have more developed perinatal health information systems than others, but improvements are possible everywhere. Each country has something to learn from its neighbours. Investments at a national level are essential to achieve our goal of effective health reporting at a European level.

European collaboration improves the quality of health indicators, but harmonisation at the European level is still necessary in some key areas.
Although many hours were spent standardising definitions in order to produce comparable indicators for this report, work is needed at a national level before this goal can be fully achieved. For instance, the fetal mortality rate, an important indicator of pregnancy outcome and care, is difficult to compare between countries because of differences in legislation and in the ways that early fetal deaths and terminations of pregnancy are recorded in statistical systems. Another

example is information on the timing of the start of antenatal care. It is often impossible to know if the first contact with a health care provider is actually recorded. These uncertainties can be resolved by collective action at a European level.

Priority areas for change and development

Focussing on the following steps would improve Europe's capacity to report on the health of mothers and babies:

1. Include in routine birth and death data collection systems the information necessary to compute EURO-PERISTAT core and recommended indicators. Data should be recorded on individual births to make it possible to construct standardised indicators.
2. Standardise criteria for inclusion of births and deaths in statistical reporting and enhance statutory civil registration systems with voluntary notification where necessary so that all births, including pregnancy terminations, from at least 22 completed weeks of gestation onwards can be included routinely.
3. Enable linkage between systems for recording data about births and deaths, including linkage between civil registration, medical birth registers, hospital discharge systems, and specialised registries. It is important to link information about deaths in the first year of life to data about pregnancy and birth. Linking data sources can also improve the quality of individual systems.
4. Achieve complete ascertainment of direct and indirect maternal deaths and standardise coding of the causes of death. Audits and confidential enquiries are a well proven method for improving reporting and for identifying aspects of health services that require improvement.
5. Develop methods for using routine systems such as hospital discharge data and medical birth registers to measure severe maternal and neonatal morbidity.
6. Harmonise definitions and protocols to improve data from routine sources about the social characteristics of pregnant women and their care during pregnancy.
7. Develop a common protocol for a European perinatal survey to be used by countries that do not have on-going routine systems for key data items. This approach is an effective way to obtain high quality data about perinatal practices and selected outcomes.

IV. THE FUTURE

This report presents primarily data from a single year and thus gives a static cross-sectional picture in time. The full value of having common and comparable indicators will only be realised when this exercise becomes continuous and assessment of progress is possible. Formalising links with data providers and statistical offices is also necessary to ensure that all available data on a national level can be provided in a timely manner.

Bringing together data from civil registration, medical birth registers, other registers, hospital discharge systems, and European surveys presents exciting research possibilities. This common framework could be used to develop epidemiological surveillance in perinatal heath and to provide opportunities for collaboration among health researchers in Europe who wish to undertake more focussed studies to gain knowledge about the specific causes of adverse perinatal outcomes, interventions for prevention and treatment, and the potential for improving perinatal health by improving the socioeconomic circumstances of parents and babies.

2

SURVEILLANCE OF PERINATAL HEALTH IN EUROPE

2 SURVEILLANCE OF PERINATAL HEALTH IN EUROPE

2.1 WHY MONITOR PERINATAL HEALTH IN EUROPE?

Perinatal health in Europe has improved dramatically in recent decades. In 1975, neonatal mortality ranged from 7 to 27 per 1000 live births in the countries that now make up the European Union (EU); by 2005 it had declined to and ranged 8 per 1000 live births.[1] Likewise, maternal deaths from childbirth have become increasingly rare. These across-the-board improvements in perinatal health reflect technological advances in obstetrical and neonatal care, the development of maternity and child health services, and improved standards of living across Europe.

Continuing Risks to Mothers and Babies
Despite this good news, pregnancy and childbirth still involve risk. Mothers in Europe still die in childbirth – approximately 5 to 15 women per 100 000 live births. Alarmingly, around half of these cases are associated with substandard care and are potentially avoidable. Despite the decline in infant mortality, there is still a significant burden of death and disability. Around 25 000 babies are stillborn every year in the EU, and another 25 000 die before their first birthday. More than 40 000 of the survivors (approximately 8 per 1000) have severe sensory or motor impairments[2] and a further 90 000 have major congenital anomalies.[3] Impairments that stem from the perinatal period, because they affect the youngest members of society, carry a disproportionate (and long-term) burden for children, their families, and social services.

Inequality in Perinatal Health
It is also important to note that these risks and burdens are not distributed equally. Large perinatal health inequalities exist between the countries of Europe, and within each country, poverty and low social status are associated with poor pregnancy outcomes.[4] These inequalities in perinatal health carry long-term consequences as studies increasingly show that a healthy pregnancy and infancy reduces the risk of adult illnesses, such as hypertension and diabetes.[5] Monitoring perinatal health is an important component in understanding and addressing health inequalities among adults.

Changing Technology = New Risks
Another reason to monitor perinatal health is that continuing medical innovations continue to create new risks and raise ethical issues. While babies born alive at 25 and 26 weeks of gestation now have a 50% chance of survival,[6,7] survivors have high impairment rates.[8,9] Medical procedures have made it possible for more and more couples to conceive, but those same procedures increase multiple births (twinning), which are associated with preterm delivery, and other adverse pregnancy outcomes.[10,11] European policy makers and health professionals are struggling with the challenges of how to optimise the use of new technologies while minimising their negative effects, and how to do this without over-medicalising pregnancy and childbirth for the large majority of women who have uncomplicated pregnancies. To meet these challenges, they need accurate and timely information about health outcomes and services.

Better Statistics for Better Health
Surveillance of perinatal health has a long history, but the data currently available are insufficient for today's needs. Many simple but important questions cannot be answered using existing international databases. Examples include:

1. What are the multiple birth rates?
2. What percentage of babies are born preterm?
3. What is the mortality of preterm babies?

4. How many women have babies after procedures for infertility?
5. How much antenatal care do women receive?
6. What are the rates of obstetrical interventions for low-risk pregnant women?

Additional problems with the data in existing international databases relate to their quality and comparability. As perinatal and maternal mortality have decreased, the absolute differences in rates between countries have declined. Differences between countries often result from differences in the registration of deaths rather than actual mortality levels. It is well known that improving health information systems increases reported mortality rates because more deaths are detected. As a result, many health professionals and policy makers have not given much credence to the data reported in international databases. But without better statistics, those who are working toward better perinatal health have no way of monitoring their progress. To monitor trends over time, compare outcomes between countries, and develop benchmarks to improve performance, valid and reliable indicators of perinatal health are needed.

2.2 PERINATAL HEALTH INDICATORS FOR EUROPE: THE EURO-PERISTAT PROJECT

The EURO-PERISTAT project's goal has been to develop valid and reliable indicators that can be used for monitoring and evaluating perinatal health in the EU.[12] The project began in 1999 as part of the Health Monitoring Programme (PERISTAT) and has continued into a third phase, with the ultimate aim of producing a European Perinatal Health Report and establishing a sustainable system for reporting perinatal health indicators.

This project has enlisted the assistance of perinatal health professionals (clinicians, epidemiologists, and statisticians) from EU member states and Norway and has consulted with members of other networks, such as EUROCAT, to help develop and test a recommended indicator list. In our first phase, we developed a set of indicators with members from the then 15 member states.[12] This indicator set was developed by a procedure that began with an extensive review of existing perinatal health indicators. The resulting list was used as the basis of a DELPHI consensus process, a formalised method in which a panel of experts respond to a successive series of questionnaires with the aim of achieving a consensus on key principles or proposals. Our first panel in 2002 was composed of clinicians, epidemiologists, and statisticians from the then 15 member states. We also invited the Surveillance of Cerebral Palsy in Europe (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. Finally, a third DELPHI process was conducted in 2006 with a panel of 2 participants (clinicians, epidemiologists, and statisticians) from each of the ten new member states.

The result of this multi-stage formal method is that we were able to achieve consensus on a list of 10 core and 24 recommended indicators of perinatal health. The EURO-PERISTAT indicators (presented in Table 2.1) are grouped into four themes: fetal, neonatal, and child health, maternal health, population characteristics and risk factors, and health services. We defined core indicators – those that are essential to monitoring perinatal health – and recommended indicators – those considered desirable for a more complete picture of perinatal health across the member states. We also identified indicators for further development – those that represent important aspects of perinatal health but require further work before they can be implemented within the member states. A study using data for the year 2000 was conducted to assess the feasibility of the EURO-PERISTAT indicators; the results were published in a special issue of the *European Journal of Obstetrics, Gynecology and Reproductive Biology*[13,14] and used for detailed analyses of health indicators in Europe.[15,16]

Table 2.1 EURO-PERISTAT indicators (C=core, R=recommended, F=further development)

FETAL, NEONATAL, AND CHILD HEALTH
C: Fetal mortality rate by gestational age, birth weight, plurality
C: Neonatal mortality rate by gestational age, birth weight, plurality
C: Infant mortality rate by gestational age, birth weight, plurality
C: Birth weight distribution by vital status, gestational age, plurality
C: Gestational age distribution by vital status, plurality
R: Prevalence of selected congenital anomalies
R: Distribution of Apgar score at 5 minutes
R: Causes of perinatal deaths due to congenital anomalies
R: Prevalence of cerebral palsy
F: Prevalence of hypoxic-ischemic encephalopathy
F: Prevalence of late induced abortions
F: Severe neonatal morbidity among babies at high risk
MATERNAL HEALTH
C: Maternal mortality ratio by age, mode of delivery
R: Maternal mortality ratio by cause of death
R: Prevalence of severe maternal morbidity
F: Prevalence of trauma to the perineum
F: Prevalence of faecal incontinence
F: Postpartum depression
POPULATION CHARACTERISTICS/RISK FACTORS
C: Multiple birth rate by number of fetuses
C: Distribution of maternal age
C: Distribution of parity
R: Percentage of women who smoke during pregnancy
R: Distribution of mother's education
F: Distribution of mother's country of origin
HEALTH CARE SERVICES
C: Mode of delivery by parity, plurality, presentation, previous caesarean section
R: Percentage of all pregnancies following fertility treatment
R: Distribution of timing of first antenatal visit
R: Distribution of births by mode of onset of labour
R: Distribution of place of birth (according to number of annual deliveries in the maternity unit)
R: Percentage of infants breast fed at birth
R: Percentage of very preterm babies delivered in units without a neonatal intensive care unit (NICU)
F: Positive outcomes of pregnancy (births without medical intervention)
F: Neonatal screening policies
F: Content of antenatal care

In italics, suggestions from DELPHI with new member states

2.3 OTHER EUROPEAN PERINATAL HEALTH PROJECTS

To enhance our understanding of mothers' and babies' health, EURO-PERISTAT has sought to build links with other research projects and networks that are adding to our knowledge about perinatal health. The following European initiatives have collaborated on producing this European Perinatal Health Report.

SCPE

In 1998, European Commission funding helped to establish a collaborative network of CP registers and population-based surveys. The reasons for this collaborative effort were: (1) the need for standardisation and harmonisation of the definition, inclusion/exclusion criteria, and characteristics used to describe children with CP, and (2) the need for large numbers to be able to analyse distinct subgroups of CP and, in particular, their trends over time. The Surveillance of Cerebral Palsy in Europe (SCPE) network started with 14 centres from eight countries and now includes 22 centres from 16 countries.

The SCPE network achieved a European agreement on the definition, inclusion criteria, and classification of CP, and a "minimum data set or minimum description" of a child with CP, ie, a common language that made it possible to construct a reliable database throughout Europe.

The SCPE harmonisation work highlighted interesting characteristics and trends in some subgroups of CP that needed large numbers for any analysis. Application of the common criteria for CP cases and pooling data from several centres allowed SCPE to show a four-fold increased risk of CP in multiple births, mainly explained by gestational age distribution,[18] a decreasing trend in infection as the cause of post-neonatal CP cases,[19] an optimal birth weight associated with a lower risk of CP,[20] and a decreasing CP prevalence rate in children with a birth weight between 1000 and 1500 g.[21]

EUROCAT

EUROCAT is a collaborative network of population-based registries for the epidemiologic surveillance of congenital anomalies in Europe. EUROCAT started in 1979 and was the first European public health surveillance network.[22] It was initially funded as an EC BIOMED concerted action and since 2000 has been funded by the DGSanco Rare Diseases Programme and then the Public Health Programme. EUROCAT is a World Health Organisation (WHO) Collaborating Centre for the Epidemiologic Surveillance of Congenital Anomalies. In 2008, it includes 32 full member registries, 6 associate member registries, and 11 affiliate member registries operating in 20 European countries. Full and associate member registries regularly transmitting data cover more than 25% of all births in Europe (see Chapter 9).

The objectives of EUROCAT are:

1. To provide essential epidemiologic information on congenital anomalies in Europe
2. To co-ordinate the establishment of new registries throughout Europe that collect comparable and standardised data
3. To co-ordinate the detection of and response to clusters and early warning of teratogenic exposures
4. To evaluate the effectiveness of primary prevention
5. To assess the impact of developments in prenatal screening
6. To provide an information and resource centre and a collaborative research network to address the causes and prevention of congenital anomalies and the treatment, care, and outcome of affected children.

Cases with one or more congenital anomalies are ascertained among live births, stillbirths and fetal deaths from 20 weeks of gestation, and terminations of pregnancy for fetal anomaly following prenatal diagnosis (at any gestational age). The methodology of each registry is described at http://www.eurocat.ulster.ac.uk/memberreg/memberreg.html. Each registry annually transmits a standard anonymised data to the EUROCAT Central Registry, using the EUROCAT Data Management Program (EDMP) software. This software's incorporation of validation routines, reporting functions, and statistical software for detecting trends and clusters underpins the successful fulfillment of EUROCAT's first three objectives. Prevalence rates of 95 subgroups of congenital anomalies, updated twice a year, are freely available at http://www.eurocat.ulster.ac.uk/pubdata/tables.html. An annual statistical monitoring report details time trends and clusters detected in each registry and the results of investigations into their causes.

In recent years, EUROCAT has played an important role in: a) pointing out the lack of success in Europe in preventing neural tube defects due to the lack of success in raising periconceptional folate status;[23,24] b) surveying the differences in prenatal screening policy and laws and practices regarding termination of pregnancy between European countries;[25, 26] c) describing the differences in prenatal detection rates of a range of congenital anomalies between countries;[25,27] d) documenting the extent to which the rate of Down Syndrome among live births has been influenced by the trend toward increasing maternal age in all countries and counteracted by the trend toward increasing prenatal detection and termination rates in some countries;[28] e) developing pharmacovigilance (adverse drug effect reporting systems) for the teratogenic effects of drugs taken during pregnancy;[29] and f) documenting the increase in prevalence of gastroschisis, an abdominal wall anomaly, across Europe.[30] A complete list of publications on these and other topics can be found at http://www.eurocat.ulster.ac.uk/pubdata/Publist.html.

EURONEOSTAT

EuroNeoStat is a project funded by the European Commission intended to reduce neonatal morbidity and mortality, to improve both the safety of very-high-risk preterm babies and their health status at 2 years, and to detect any inequalities that might exist within and between countries. Our ultimate aim is for any infant to have the same chance of intact survival no matter where he or she happens to be born.

To achieve those goals we developed a European Information System to assess and improve the quality of the health care received by very preterm (before 32 weeks of gestation) and very low birthweight infants (VLBW, birth weight <1.501 g). We designed, collected, and validated a standardised set of indicators specific for birth weight and gestational age and related to prenatal events, neonatal interventions, and long-term outcome at two years of age to assess the quality of care received in participating NICUs.

The main achievements of the EuroNeoStat project are:

1) Collection of data from more than 3000 VLBW infants a year from 60 NICUs, data that can now be used to perform standardised comparisons of results between these institutions and with others, to identify areas where care can be improved, and to monitor the success of these quality improvement efforts;
2) Provision of indicators for health organisations to evaluate the health programs, resources, and priorities for the short- and long-term care of VLBW infants;

3) Insights obtained from the observed clinical variability into better ways to deliver care and to promote wide-scale consensus in policies and strategies for care of these high-risk infants;
4) Dissemination among neonatologists of the concept that gestational age rather than birth weight should be used to assess care;
5) Development of a consensual minimal follow-up dataset to assess the health status of surviving infants at 24 months of corrected age;
6) Assessment of the value of perinatal indicators for predicting the gestational age-specific health status of survivors at 24 months of corrected age; and up-to-date information technology tools;
7) Development of an e-platform that uses up-to-date information technology tools to record, transfer, validate, standardise, and compare the data collected and up-to-date Internet-based technologies to facilitate incoming data and the outflow of standardised comparative results.

We believe that the EuroNeoStat project has achieved its planned objectives and has provided benchmarks for the neonatal care of very high-risk infants in European NICUs. Several areas require further development to improve the care process for them, in particular, the implementation of quality improvement initiatives to prevent hospital-acquired infections and adverse events and a further assessment of neurological development at an older age.

2.4 CONCLUSIONS: ADVANTAGES OF BUILDING INFORMATION SYSTEMS AT THE EUROPEAN LEVEL

This report is the first of what we hope will be a series of regular reports on perinatal health in the EU. Our aim is to provide data that can be used as a point of comparison for individual countries. Because this report reveals the strengths and weaknesses of perinatal health information systems in each member state, countries can use their neighbours' experiences to expand their information systems to cover the entire spectrum of EURO-PERISTAT indicators. For those indicators for which there are reliable data, this report makes it possible to benchmark performance in providing effective health services and promoting the health of mothers and their newborns. Beyond outcomes, these data also underline the varied approaches to care provision in the countries of Europe and raise interesting questions about ways to optimise the care and health of women and babies. By pooling European experiences, data, and expertise, we aim in the future to develop research capacity and to produce evidence to support policy decisions about these important questions. Regular reporting on the EURO-PERISTAT indicators is a first step in this direction.

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3

DATA SOURCES FOR PERINATAL HEALTH MONITORING IN EUROPE

3 DATA SOURCES FOR PERINATAL HEALTH MONITORING IN EUROPE

This report presents perinatal health indicators from national and regional perinatal health information systems in the European member states that participated in the EURO-PERISTAT project and Norway (26 countries) as well as data collected by three other European collaborations on more specific themes: SCPE (for cerebral palsy), EUROCAT (for congenital anomalies) and EURONEOSTAT (for very-low-birthweight infants). Information on data collection and sources for the latter three projects is included in the chapter on each project (8, 9, and 10).

3.1 EURO-PERISTAT DATA COLLECTION

Each country's representative on the EURO-PERISTAT scientific committee was responsible for overseeing the collection of the data from his or her country (see Appendix A1 for list of contributors). In some cases this person nominated another person to be in charge of gathering EURO-PERISTAT indicators[1,2] at the national level. In others, the national representative contacted different data providers and compiled the data for the project. This was the case, for example, for the United Kingdom, where many data sources cover populations within only one or two of the four countries (England, Wales, Scotland, and Northern Ireland). The first aim was to gather data at the level of the member state. If these were not available, data for regions or constituent countries were collected, as in Belgium, Spain, and the UK. The second aim was to get population-based data from existing routine data sources – administrative or health registers or statistical systems or routine surveys. Data from ad hoc surveys were not used.

Aggregated data were collected with an Excel-based system in a format that covered all the core and recommended indicators. Some data were collected for the indicators for further development, although we present only four of them in this report. Cerebral palsy data must be collected through data registries and are compiled by members of the SCPE Network. Although the prevalence of cerebral palsy is part of the EURO-PERISTAT indicator set, the data were not collected in the EURO-PERISTAT study. We asked for data for 2004 or, if data were not available for 2004, for the latest available year. TNO, the representative from the Netherlands, was responsible for developing the data collection instrument and overseeing the collection process.

Instruments were constructed to include checks to verify data quality, such as verification of totals and minimum or maximum values. When TNO received the completed Excel data collection instruments, the project coordinators looked them over to ensure that the data were filled in correctly. Queries were made to each country at this point. The indicators were then tabulated and sent to the scientific committee members and data providers for a first review. The EURO-PERISTAT project then held a meeting in Warsaw in April of 2008 to discuss the results. This process also made it possible to identify outlying values and consider questions related to indicator definitions. Data providers had a final chance to check all the indicators and endorse the EURO-PERISTAT tables before publication of this report.

3.2 DATA SOURCES

The EURO-PERISTAT scientific committee representative for each company, in collaboration with data providers, decided which data sources to use. The number of data sources used for each country varied between 1 (Slovak Republic) to 17 (for the four countries of the UK). All data from

Belgium were regional and most data for the UK related to constituent countries . While Belgium has a national system for collecting data on births, this system cannot provide timely data. In the UK, legislation about civil registration ensures some degree of harmonisation of vital statistics, but data about health care vary considerably in their scope and definition between the four constituent countries. Spain also provided data on many of the EURO-PERISTAT indicators from the region of Valencia.

The extent to which scientific committee members obtained data for regions and constituent countries when data were not available on a national level varied between member states. The types of data source used to provide the requested perinatal data are described below. The data source used is given in all data tables in Appendix B, and Appendix C provides more detail on each data source.

3.2.1 CIVIL REGISTRATION BASED ON BIRTH AND DEATH CERTIFICATES, INCLUDING CAUSE-OF-DEATH REGISTRATION:

These data systems are used in Austria, Belgium (Brussels), Cyprus, the Czech Republic, Estonia, Finland, France, Germany, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Slovenia, Spain, Sweden, and the UK (which has three separate civil registration systems, one for England and Wales, one for Scotland, and one for Northern Ireland. Data from these systems can be combined to provide UK totals for some indicators based on birth and death registration).

All EU member states have a civil registration system that covers all births and deaths. Registration is obligatory and the data usually cover citizens and permanent residents very well. Non-residents are usually but not universally excluded. Member states used this source to provide the number of live births, stillbirths, infant deaths, and maternal deaths. Some could also provide data about background characteristics, such as maternal age, parity, plurality (singleton, twin, or triplet or higher order pregnancies) or birth weight. In most countries, the data source includes only a limited number of variables related to perinatal health. Some countries, such as France, conduct regular perinatal surveys to gather the medical information that is not available through routine civil registers.[3] Civil registration is completed by an obligatory registration of deaths and their causes.

Birth and death certificates were linked together to get more complete data for the infant mortality indicator in two member states (Austria and Ireland), two countries of the UK (England and Wales), and two regions (Brussels in Belgium and Valencia in Spain). In Scotland, death registration data were linked to data derived from hospital records. In other countries that use separate sources to compute mortality rates, problems arise because the inclusion criteria vary by data source. More generally, using denominators and numerators from different sources can cause statistical inconsistencies.

3.2.2 MEDICAL BIRTH REGISTERS (PERINATAL DATABASES):

Flanders in Belgium, the Czech Republic, Denmark, Estonia, Finland, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, the Slovak Republic, Slovenia, and Sweden.

In Northern Ireland, data came from birth notifications to four population-based child health systems and in Wales, Apgar score data came from its child health system. Beginning in 2005, data from birth notifications to the National Health Service Register in England and Wales have been linked to civil birth registration data.

Many countries have introduced a medical birth register to monitor maternal and perinatal health. Data provision is mandatory in most of the countries, although it was voluntary for four medical birth registers. Midwives, nurses or doctors usually provide information to the registers from the delivery hospitals, either on a data collection form or directly from electronic patient data systems. Seven registers were exclusively hospital-based, while the others included home births. The coverage of medical birth registers is usually high, from 97% to 100%. Data linkage to civil registration (birth and death certificates) makes coverage nearly complete. These registers contain information on the background of parents, especially mothers, on diagnosis, care and interventions during pregnancy and delivery, and on the babies' perinatal health, diagnosis, care, and interventions. The majority of EURO-PERISTAT core and recommended indicators are available in these medical birth registers.

In Italy, a medical birth register (Birth Certificates Register) was in force up to 1998, when it was dismantled following changes in the data protection legislation it was later rebuilt and entrusted to the Ministry of Health, rather than to the National Institute of Statistics as it had been.[4] This caused some organisational problems, and in 2003 the coverage for the new system was still only 84%. These data have been weighted, however, to sum up to the total number of births in Italy that year.

The Netherlands, which has introduced professional-based registers to monitor perinatal health, is a special case. There are four national perinatal registries in the Netherlands, all monitored by the Netherlands Perinatal Registry. It includes the National Perinatal Registry for Primary Care (LVR1), which is a register of midwife-assisted births (home and hospital) and the National Perinatal Registry for Secondary Care (LVR2), which covers obstetrician-assisted births. The National Perinatal Registry, for general practitioner-assisted births (LVR-h) contains only few births completely managed by a general practitioner and is not yet linked with the other databases. Finally, there is a National Neonatal Registry (LNR) for paediatricians and neonatologists, which is merged with LVR1 and LVR2 to create a national perinatal database.

The German medical birth register is chiefly used as a basis for benchmarking individual obstetric units on a range of performance indicators. These indicators are compiled on an annual basis and reflect quality of medical care and obstetric outcome in terms of unit-specific rates. Appropriate follow-up measures are taken when national targets are not met.

3.2.3. OTHER DATA COLLECTION SYSTEMS

a) Hospital discharge data systems:
Austria, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, Poland, Portugal, Spain, and England, Wales, and Scotland in the UK

Most European countries have a hospital discharge system, which also gathers information on all hospital births. It usually has no information on home births, and those that attempt to include them have difficulty capturing them. Some countries also exclude hospital care in private institutions or do not have comprehensive coverage of these institutions. Information on all hospital births and interventions during the hospital stay, for example, caesarean or instrumental deliveries, on maternal diagnoses during pregnancy, birth, and hospital care after delivery, and on interventions and diagnoses before discharge of the babies can be derived from hospital discharge data systems. Diagnostic information usually covers only specialised hospital care for delivery. These systems usually do not cover antenatal and postnatal use of primary healthcare services or home births.

Hospital registers are generally set up for financial, planning, or other administrative reasons and not for health monitoring and epidemiological surveillance. The data items may therefore not be standardised for international use. Furthermore, financial incentives may also cause bias in some data, especially for diagnoses and surgical procedures.

The use of this data source to estimate incidence or prevalence data may result in overestimates when the discharge information cannot be clearly distinguished by a unique identifier. It can however be used for delivery and birth characteristics that occur only once. Furthermore, data from some countries do not distinguish between confirmed and suspected diagnoses. This too can lead to overestimation of, for example, congenital anomaly rates.

b) Registers of induced abortions:
Estonia, Italy, Norway, Scotland, and England and Wales

Several countries use their registers of induced abortions to obtain information on stillbirths and induced abortions due to congenital anomalies. These data sources are based on reports that doctors performing the induced abortion must complete and send to statutory authorities.

c) Registries of congenital anomalies:
Finland, France (Paris), Malta, Norway, Poland (Wielkopolska region), Sweden, and the UK (Wales and parts of England)

Four member states, two countries of the UK, and two regions used their congenital anomaly registers to provide information on certain congenital anomalies. These information systems are usually based on specific reporting forms for observed congenital anomalies, sometimes complemented with information from other sources, such as cause-of-death registers, routine death registration, and other health registers.

These registers may have different definitions for particular major congenital anomalies as well as different inclusion and exclusion criteria. Several registries follow the exclusion list used by EUROCAT.[5] Not all registries collect information on induced abortions performed due to congenital anomalies. Chapter 9 discusses in more detail the collection and sources of data on congenital anomalies and the association between EUROCAT and EURO-PERISTAT indicators.

d) Other registers
In addition, the following specific health registers were used:
- Denmark: the Fertility Register of the Danish Fertility Society
- Spain: Metabolopathies Register (metabolic diseases)
- UK Northern Ireland: Neonatal Intensive Care Outcomes Research and Evaluation (NICORE)
- UK Human Fertilisation and Embryology Authority Register
- Portugal: National Registry of Very Low Birth Weight

3.2.4. SURVEY DATA

a) Perinatal surveys:
France, Italy, and Spain

Three countries use special surveys to monitor perinatal health. In France, one-week surveys of all births were conducted in 1995, 1998, and 2003; the next one is planned for 2009. This survey abstracts data from medical records and also from interviews with mothers after delivery. Coverage is good – up to 99%. In Spain, a 10% sample of all pregnancy summary sheets is collected to supplement the information gathered by civil registration. The Italian statistics authority has collected information from a 10% sample of all live births in the population register since 2000-2001. Cyprus is currently is introducing such a survey, but these data were not available during our data collection.

The content of perinatal surveys is similar to that of medical birth registers, but it is easier than in routine registry collection to add or remove questions related to factors such as exposures during pregnancy and birth experiences. Both the quality of the information and the breadth of the questions that can be added are better when the mother is interviewed.

b) Confidential enquiries and audits:
France, Netherlands, and the UK (England, Wales, and Scotland)

Confidential enquiries or audits collect more complete information for certain deaths. In France and the Netherlands, audits cover maternal deaths; in the Netherlands and in England, Wales, and Northern Ireland, they cover stillbirths and infant deaths. This data collection method uses detailed anonymised case information data to evaluate whether substandard care or other avoidable factors contributed to the maternal death, stillbirth, or infant death. In England, Wales, and Northern Ireland, the confidential enquiry provides information about stillbirths at 22 and 23 weeks of gestation (see registration limits below). The four countries of the UK also conduct a Confidential Enquiry into Maternal Deaths, but the deaths included here are restricted to those ascertained through civil registration. In the Netherlands, stillbirths and infant deaths in specific years are audited, but these data are not linked yet to the other perinatal registers in the Netherlands and were thus not used for these EURO-PERISTAT indicators.

c) Other surveys:
Spain, the Netherlands, and the UK

The other surveys used in this EURO-PERISTAT data collection exercise covered specific health themes, such as antenatal care and infant feeding. In the UK, an Infant Feeding Survey is conducted every five years on a sample of all births. It also collects data on the mothers' lifestyles, including whether they smoked before or during pregnancy.

3.2.5. AGGREGATE DATA SOURCES:
Czech Republic, Estonia, and Poland

Three countries reported some perinatal health indicators based on data from aggregated data sources. In Estonia and Poland, the Ministries of Social Affairs and of Health, respectively, collect information on health outcomes from hospitals in aggregated format. Similarly, the Czech Society of Perinatal Medicine collects aggregated information from delivery hospitals.

3.3 DATA AVAILABILITY

Figure 3.1 presents the percentage of countries that provided the EURO-PERISTAT core indicators and Figure 3.2, the recommended indicators. In general, availability for the core indicators was good. Almost all countries provided information on the distribution of birth weight, maternal age, and gestational age, and on the number of multiple births. Stillbirth and neonatal mortality rates were also usually available, although their inclusion criteria varied. Fewer countries could provide infant mortality by gestational age and birth weight or maternal mortality by mode of delivery. Fewer countries could provide data for the recommended than for the core indicators, although availability was generally good for the Apgar score, maternal mortality by cause of death, mode of onset of labour, and place of birth. Not as many countries could provide data on breast feeding, births after fertility treatment, or the five components of severe maternal morbidity.

3.4 QUESTIONS COMPLICATING INTERNATIONAL COMPARISONS

3.4.1. REGISTRATION CRITERIA

EURO-PERISTAT requested data for all stillbirths and live births from 22 weeks of gestation and after for the indicators in the report. However, countries applied several different sets of criteria for registration of stillbirths, and some had different limits for live births, as shown in Table 3.1. Some countries were nonetheless able to provide data for births that occurred below the lower limits for legal registration, and this is noted in the table. Most countries followed the WHO criteria (birth weight of 500 g or gestational age of 22 weeks), although some used gestational age and others birth weight. Because official registration of stillbirth starts later than 22 weeks in Hungary (24 weeks), Portugal (24 weeks), Sweden (28 weeks), and Luxembourg (180 days for civil registration, 28 weeks for the birth register), their stillbirth rates are underestimated. In Italy, registration of stillbirths begins at 180 days (25 weeks + 5 days), but fetal deaths below this limit are recorded in the spontaneous abortion register, so Italy was able to provide data according to the EURO-PERISTAT cutoff point. In all four countries of the UK, the lower limit for civil registration of a fetal death as a stillbirth is 24 completed weeks of gestation, but data about late fetal deaths at 22 and 23 weeks of gestation are provided voluntarily and recorded. In still other countries, the limits for official registration of births and those used for inclusion in birth registers differ or some data sources can use different inclusion criteria. In the Czech Republic, fetal deaths are registered at 22 weeks and over and these data were provided; however, they are registered as 'births' once the fetus weighs 1000 g. In Ireland, the vital statistics office registers stillbirths at 24 weeks of gestation or at 500 g or more, whereas the National Perinatal Reporting System (NPRS) has only a 500 g limit.

Most countries had no limits for the registration of live births, but the Czech Republic and Poland had a 500 g limit, and France and the Netherlands had a gestational age or birthweight limit. Lithuania had a gestational age limit. In Luxembourg, the recommendation remains 28 weeks of gestation for the inclusion of births in the national birth register, but in practice, babies are registered under this limit, although not systematically. For live birth registration in Ireland, vital registration has no limit, but the NPRS has a limit of 500 g. Finally, in Malta, there is no limit for live birth registration in the National Obstetrics Information System, but a limit of 22 weeks or 500 grams in the National Mortality Register.

3.4.2. COVERAGE OF DATA COLLECTION

Hospital-based data collection systems are likely to exclude planned births outside hospitals, as well as accidental home births and births during transportation to hospital, unless a special data collection scheme has been introduced for these cases. In some countries, for example in Cyprus, data collection is mandatory for public hospitals only, so that information from private hospitals may be less complete or even completely missing.

Civil registration and health registration systems may also have different inclusion criteria for non-residents. Civil registration usually includes citizens and permanent residents only, while health registration includes all cases in the registration area, for example, all births, regardless of nationality or residence status. This can cause discrepancies between the total numbers even for basic indicators, such as total number of births. This is especially true for countries with large numbers of people without permanent residence status, including immigrants, refugees, and asylum seekers as well as visitors and women from other countries seeking health care.

3.4.3. DEFINITIONS OTHER THAN THOSE RECOMMENDED

In several cases, national data sources were unable to follow the EURO-PERISTAT recommendations. For example, not all countries could provide the requested denominators, 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. Countries may also have different criteria for calculating indicators, either by birth cohort, with infant deaths followed for up to one year and linked to birth data, or by calendar year, with infant death rates calculated according to the number of births and deaths during the same year. Both methods yield similar estimates, unless the number of births or deaths varies substantially from year to year. When the definition used does not correspond to the EURO-PERISTAT definition, this is noted in data tables.

3.4.4. DENOMINATORS AND NUMERATORS

In some cases, the denominator and numerator came from different sources and may thus have produced inaccurate estimates, for example, for gestational age- and birthweight-specific mortality rates. In some cases, rates were too low, approaching 0; alternatively they exceeded 1000 per thousand.

3.4.5. MISSING DATA

There is no systematic way of handling missing data in the various perinatal information systems. Ideally, the data should be collected with "unknown" as a separate potential answer. This is not always the case, 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, we systematically calculated rates and percentages excluding cases with missing data.

3.4.6. REGISTER AND SURVEY DATA

Survey data are most often sample-based and collected during a certain period of time, nationally, regionally, or locally. Such data collection faces the same problems as any survey, including the risks of various types of bias affecting response, research, and reporting. Surveys are, however, the best way to get information that is not suitable for routine aggregated or register-based data collection. Examples of this type of information include detailed demographic or social variables, health behaviours, and experiences of and opinions about care during pregnancy and delivery. Surveys often pay more attention to standardising questions and ensuring the quality of data. In addition, regular surveys are more flexible in their ability to add new variables, while routine data collection is often rigid and slow.

3.4.7. RANDOM VARIATION

The largest EU 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 (around 4000), Luxembourg (around 5500), and Cyprus (around 8000). Estonia and Slovenia as well as Brussels in Belgium have only 14 000-18 000 births per year. For these areas, the data for a single year may not contain sufficient numbers of events to construct reliable rates to measure rare events or rare maternal or child outcomes. There are also fewer births when data come from surveys or when coverage is not national.

3.5 CONCLUSIONS AND RECOMMENDATIONS FOR IMPROVING HEALTH REPORTING

The strengths of our data collection exercise were the standardised definitions and uniform collection of aggregated data. All data were also carefully checked. One weakness was that the exercise took more time than expected, and the data presented here are four years old. Furthermore, we had to rely on the expertise of the scientific committee members. They may have missed some relevant data sources, or had more knowledge of local or regional data collection activities than of the national data collection systems we would have preferred to use.

While mortality data were usually available, we had problems obtaining information on the morbidity of newborn babies and their mothers. We faced similar problems for the indicators describing social factors, such as maternal education or national origin. For these indicators, national health information systems should be enlarged to fill in these information gaps.

Standardising the definition of stillbirths is still a priority for international comparisons.[6] If national criteria cannot be harmonised, a suitable post-harmonisation method should be developed. The current WHO recommendation[7] to include only newborns weighing at least 1000 g is no longer relevant for developed countries, where many preterm babies with a birth weight under 1000 g survive. It is therefore essential to ensure that data on birth weight and gestational age are included in all data collection systems. Furthermore, it is important to generate a short list of causes of perinatal and neonatal deaths for international comparisons.[8] Finally, ascertainment of causes of deaths for stillbirths and neonatal deaths can be improved in some countries.

We did not collect information on the quality of the data from national and regional sources. Previous studies have shown that information on maternal and pregnancy-related deaths, for example, is often incomplete due to data collection problems.[9] We observed that the same was true for morbidity data and data about maternal social and demographic background. Studies of data quality are recommended for national and regional perinatal health information systems to validate their basic data. Continued international collaboration is needed to improve definitions and prioritised data collection methods for several perinatal health indicators.

Most of our indicators came from individual-level data, such as vital registration systems, birth registers, and other health registers. These often provided better data than aggregate data collection methods. Collection of data at the individual level requires appropriate legislation, since the collection of, for example, informed consent for all parturients is not usually feasible. It should be noted that the EU directive on personal data does not preclude this type of data collection.[10]

Data linkage between different registers may improve the data. A system of unique identification numbers makes these types of data linkage technically simple, but even in countries lacking such a system, matching algorithms have been shown to be feasible for linkage. On the other hand, these kinds of data linkage between civil registration and health information systems, or between register data from statistical and health authorities may be difficult due to difficulties of coordination between different administrations, the strictness of data protection regulations, or the rigour of their interpretation. These problems should be solved nationally, although the major problems should also be discussed at the EU level, that is, as part of statistical collaborations and the creation of European health monitoring and information systems.

There is currently no uniform health monitoring system for the European Union: the European Community Health Indicator Monitoring (ECHIM) system is still under development. International organisations, such as Eurostat, OECD, and WHO, collect relatively few indicators useful for perinatal health monitoring. Instead, data have been collected for specific EU-funded projects, such as EURO-PERISTAT, which collected data from 2000 from 15 EU member states[11] and from 2004 from the EU-25 and Norway. Similarly, EUROCAT has collected data on congenital anomalies since 1979[4] and SCPE on cerebral palsy since 1998.[12] As the ECHIM system is constructed, various public health subthemes should be separately discussed to facilitate theme-specific data collection.

Our data collection has proven the feasibility of the collection of basic perinatal health indicators. Yet, important questions still remain open. These include how often to collect these data, and which organisations should be responsible for collection, analysis, and reporting. An ideal solution might be to give the responsibility to a virtual European Perinatal Health Monitoring Centre, with national correspondents in each EU member state.

Health monitoring activities should be rounded out by active research networks, to analyse the existing perinatal data, collect more detailed information, such as medical birth registers for specific topics, and develop new indicators and data collection methods. At the European level, collaboration for perinatal and maternal death audits or rare outcomes, for example, can easily be justified.

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Figure 3.1 Percentage of countries providing core indicators

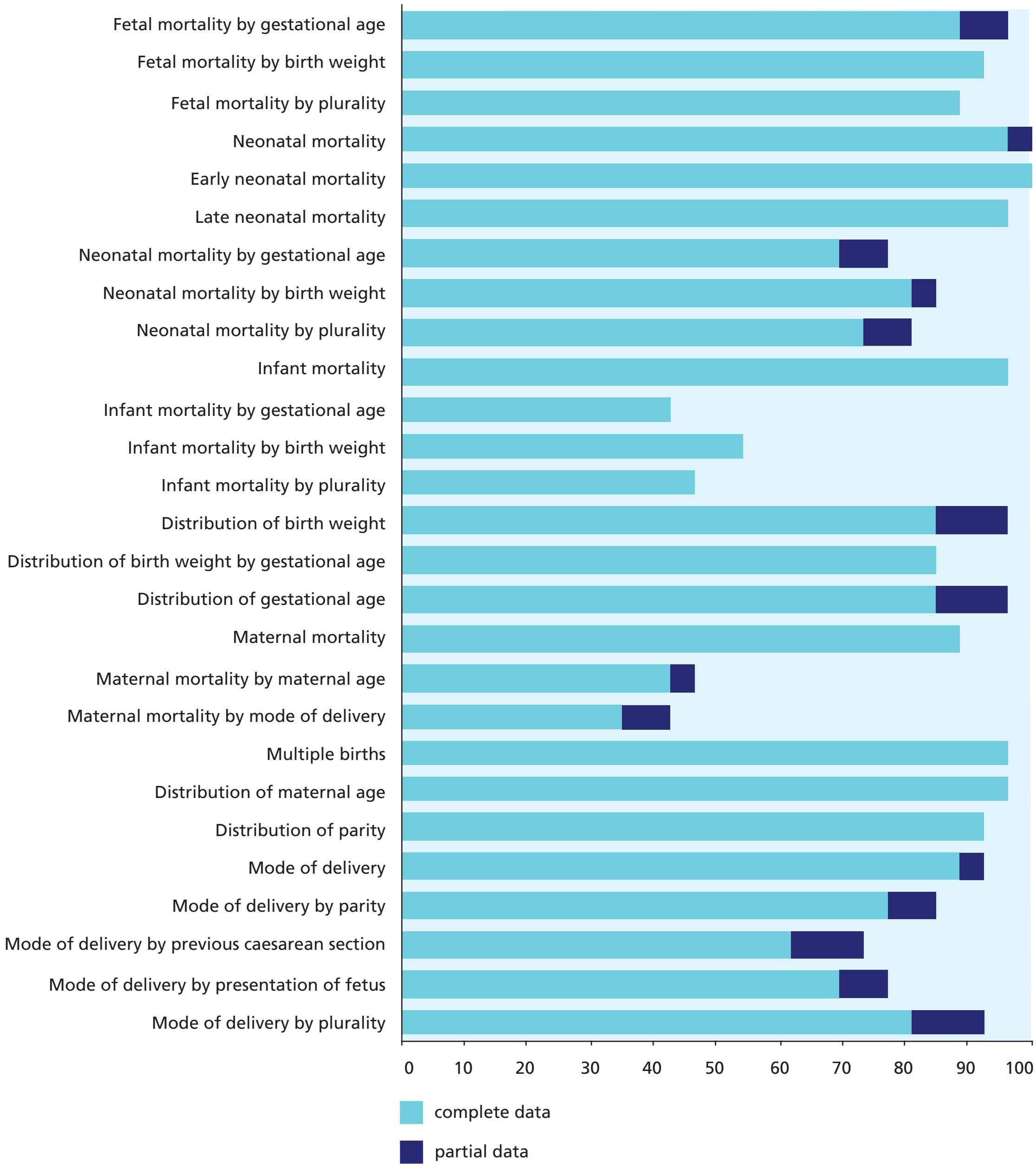

Figure 3.2 Percentage of countries providing recommended and further indicators

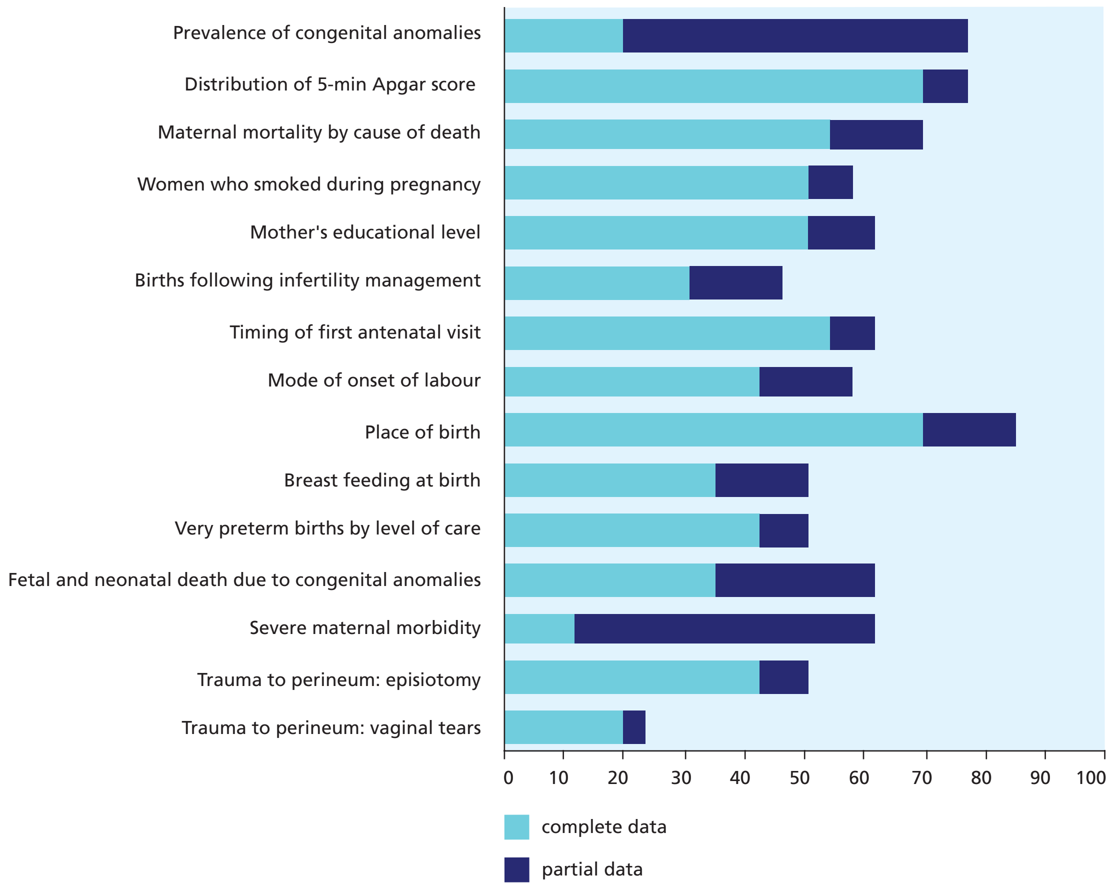

Table 3.1 Lower limits of registration of stillbirths and live births

	Lower limits for registration	
Country/coverage	Stillbirths	Live births
Belgium		
Flanders	≥ 500 g	no limit
Brussels	≥ 22 weeks or ≥ 500 g	no limit
Czech Republic	≥ 22 weeks, official registration at 1000 g	≥ 500 g or any BW surviving first 24 hours
Denmark	≥ 22 weeks	no limit
Germany	≥ 500 g	no limit
Estonia	≥ 22 weeks or ≥ 500 g	no limit
Ireland	≥ 24 weeks or ≥ 500 g for civil registration, ≥ 500 g for the national perinatal register	No limit for civil registration, ≥ 500 g for the national perinatal register
Greece	≥ 28 weeks	na
Spain	no limit	no limit
Valencia	> 22 weeks	no limit
France	≥ 22 weeks or ≥ 500 g	≥ 22 weeks or ≥ 500 g
Italy	Registered at 180 days (25 weeks + 5 days), but fetal deaths at 24, 23, and 22 weeks are available in register of spontaneous abortions	no limit
Cyprus	No register of stillbirths	no limit
Latvia	≥ 22 weeks	Heartbeat present, GA or BW criterion not specified
Lithuania	≥ 22 weeks	≥ 22 weeks
Luxembourg	Official civil registration at 180 days (25 weeks + 5 days). For birth registry, recommendation is 28 weeks, but many nurses and doctors report babies with lower gestational age	Official civil registration at 180 days (25 weeks + 5 days). For birth registry recommendation is 28 weeks, but many nurses and doctors report babies with lower gestational age
Hungary	≥ 24 weeks	no limit
Malta	≥ 22 weeks or ≥ 500 g	No limit for National Obstetrics Information System, ≥ 22 weeks or ≥ 500 g for National Mortality Register
Netherlands	≥ 22 weeks or ≥ 500 g, if GA is unknown	≥ 22 weeks or ≥ 500 g, if GA is unknown
Austria	≥ 500 g	no limit
Poland	≥ 500 g	≥ 500 g
Portugal	≥ 24 weeks	no limit
Slovenia	≥ 500 g	no limit
Slovak Republic	≥ 22 weeks	no limit
Finland	≥ 22 weeks or ≥ 500 g	no limit
Sweden	≥ 28 weeks	no limit
United Kingdom	≥ 24 weeks is the legal limit, but voluntary notification at 22 and 23 weeks	no limit
Norway	≥ 12 weeks	≥ 12 weeks

GA: gestational age; BW: birth weight; na: not available.

4

CHARACTERISTICS OF CHILDBEARING WOMEN

4 CHARACTERISTICS OF CHILDBEARING WOMEN

CORE

Multiple birth rate by number of fetuses
Distribution of maternal age
Distribution of parity

RECOMMENDED

Percentage of women who smoked during pregnancy
Distribution of mother's educational level

FURTHER DEVELOPMENT

Distribution of mother's country of origin

Pregnancy outcome varies considerably between social and demographic groups within populations. An understanding of the social and demographic structure of childbearing populations is therefore crucial to interpreting differences between outcomes in EU member states. This section describes six social and demographic indicators – three of them core indicators, two recommended, and one for further development. There are considerable inter-relationships between them.

The first core indicator is the rate of multiple pregnancy. Maternal and infant mortality rates are higher in multiple than singleton pregnancies. Multiple pregnancy rates have been rising in many European countries and vary markedly between them. Moreover, this is associated with the second core indicator – distribution of women's age at childbirth. Multiple pregnancy rates are higher among older women, as are infertility problems. These can lead to the use of ovarian stimulation and assisted conception, both of which carry a significantly increased risk of multiple pregnancy.

The risks of teenage pregnancy are well known, but these account for a relatively small proportion of pregnancies in most countries. In contrast, the proportions of pregnancies in women aged 35 and older are higher and are rising in many countries. Women in this age group are more likely to experience pregnancy complications as well as multiple pregnancies and to have babies with congenital anomalies and low birth weights, who will thus have higher rates of fetal and infant death.

The third core indicator is the distribution of parity. As adverse outcome is higher among first births and among births to women of high parity, this distribution may have an impact on the overall association with adverse outcome.

The two recommended indicators, smoking in pregnancy and mother's educational level, represent lifestyle and social characteristics respectively. Smoking has both direct adverse effects on health in general and on developing fetuses in particular. In addition, in some countries, women who are more likely to experience adverse outcome for other reasons may also be more likely to smoke. Pregnancy outcome is associated with socioeconomic status (SES) in general, but the measures used vary widely between countries. Educational level is used as a measure of SES in some countries, while others use occupationally-based measures. Mother's educational level was chosen in the hope that it would be measured most consistently.

Migration from former colonies, from countries where there is political unrest, and from economically less favoured to more affluent parts of Europe, is an increasingly important factor to consider when interpreting differences in pregnancy outcomes, because outcomes are poorer in some immigrant groups. There is considerable debate about which variables and classifications to use for international comparisons of pregnancy outcome by mother's country of origin. This is summarised as a signpost for further development and an interim indicator is presented.

4.1 MULTIPLE BIRTHS

INDICATOR TITLE: (C7) MULTIPLE BIRTHS BY NUMBER OF FETUSES PER 1000 WOMEN WITH ONE OR MORE LIVE OR STILLBIRTHS

Justification
Compared with singletons, babies from multiple births have higher rates of stillbirth, infant mortality, preterm birth, low birth weight, and subsequent developmental problems. All of these have consequences for families and for society.[1-4] Rates of multiple birth vary between countries and over time. They are influenced by differences in the proportions of older women giving birth, the extent of use of ovarian stimulation and assisted conception, and the policies for preventing multiple pregnancies when using them, as well as by other factors.[1,5] They therefore contribute to differences between the overall rates of stillbirth and of mortality and morbidity in infancy and childhood, both geographically and over time. Consequently, they may influence variations in many of the health indicators in this report.

Definition and presentation of indicator
Figure 4.1 shows the rates of twin and triplet and higher order births, expressed as numbers of women with twin and with triplet or higher order births per 1000 women giving birth to one or more fetuses.

Data sources and availability of indicator in European countries
Almost all countries provided data for this indicator. The data for Cyprus related to live births only. By and large the data came from civil registration systems and other population-based systems, but data for Flanders, the Czech Republic, Germany, Slovenia, Lithuania, and Sweden came from hospital-based systems, while those for the Netherlands came from linked professional registers.

Methodological issues in the computation, reporting, and interpretation of the indicator
In civil registration systems, the pregnancies included relate to the laws governing the births requiring registration. These affect the extent to which multiple births in which one or more babies die before birth or registration are included. In addition, multiple births are rare events, particularly in small populations such as those of Cyprus, Malta, and Luxembourg, so confidence intervals and year-to-year variation are relatively wide.

Results
Multiple birth rates vary from under 12 per 1000 women with live or stillbirths in Lithuania, Poland, and Latvia to more than 20 per 1000 in the Netherlands, Denmark, and Cyprus. There is no apparent association between the rates for triplet and higher-order births and for twin births. Only Italy and Germany had notable numbers of quadruplet and higher-order births.

KEY POINTS
When born very preterm, some multiple births impose considerable costs on health services, families, and societies. High rates due to either delayed childbearing or subfertility management raise questions about the need for policies to encourage earlier childbearing and to prevent multiple pregnancies in assisted conception. In the absence of data about ovarian stimulation and assisted conception, age-specific multiple birth rates can provide an indication of the extent of their use.[1]

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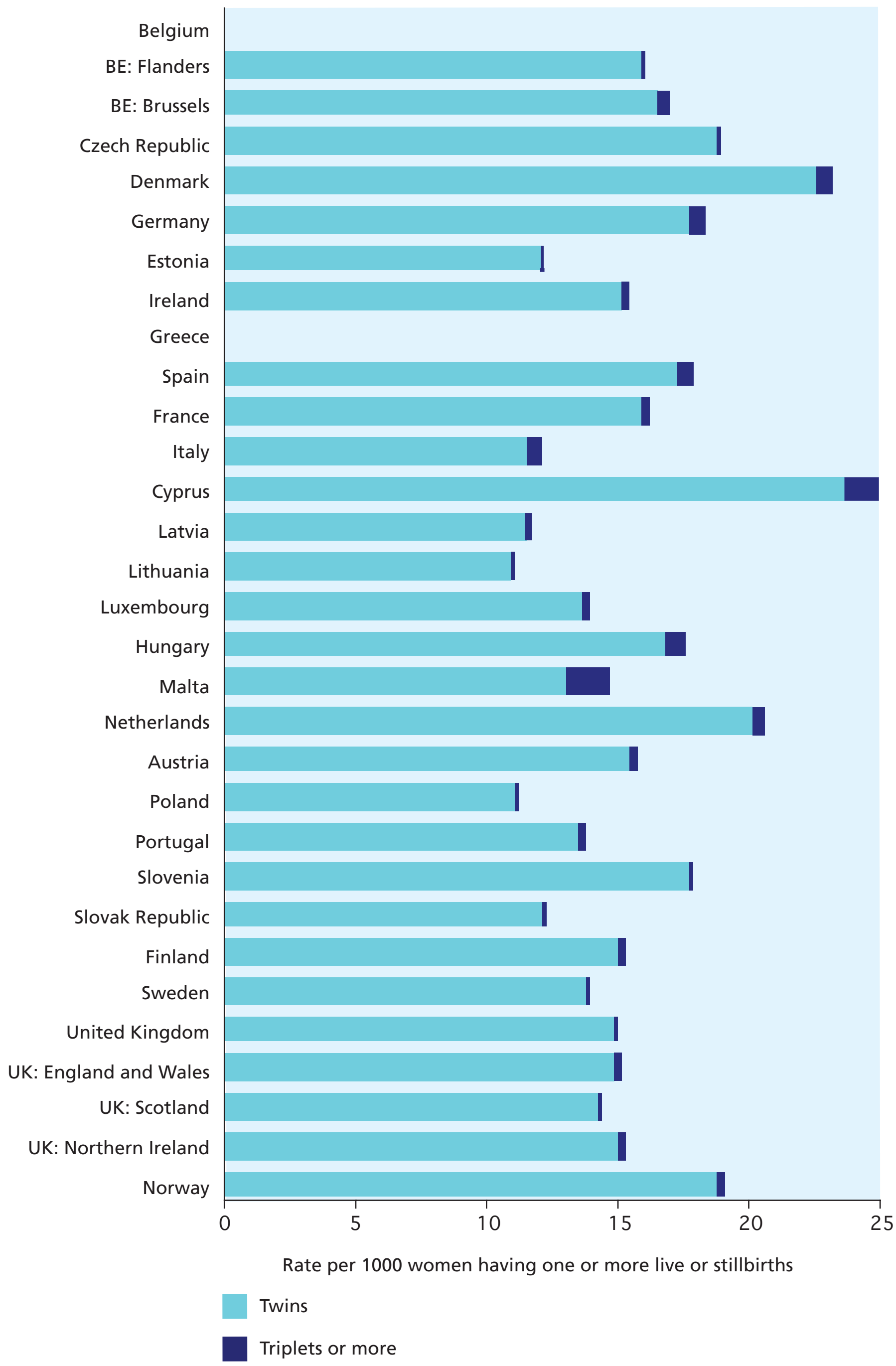
Figure 4.1 Multiple birth rates per 1000 women with live or stillbirths, by number of fetuses



4.2 MATERNAL AGE

INDICATOR TITLE: (C8) MATERNAL AGE AT DELIVERY FOR WOMEN WITH A LIVE OR STILLBIRTH

Justification

Both early and late childbearing are associated with higher than average rates of preterm birth, growth restriction, and perinatal mortality.[1-4] Increased risks for younger mothers have been associated with social and healthcare factors, including lack of antenatal care, unwanted or hidden pregnancies, poor nutrition, and lower social status. Older mothers have a higher prevalence of pregnancy complications, including some congenital anomalies, hypertension, and diabetes. Older maternal age is a significant risk factor for maternal mortality and morbidity. Older mothers are more often delivered by caesarean section. Multiple pregnancies are also associated with older maternal age (see 4.1).

Because of the association between maternal age and perinatal health outcomes and because the age at which women in European countries bear children differs widely, the maternal age distribution must be considered in comparisons between countries. Furthermore, mothers are increasingly having children later in life throughout Europe, and this can affect trends in perinatal health outcomes. Policy issues include the orientation of antenatal surveillance towards the needs of older pregnant women and the provision of information about the risks associated with delayed childbearing. The prevention of teenage pregnancy is a policy concern in many countries.

Definition and presentation of indicator

This indicator is defined as the distribution of age in years at delivery for women delivering a live or stillbirth. The recommended presentation is: 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, and 45 and older. This summary presentation focuses on the extremes of the childbearing distribution, defined as younger than 20 years and as 35 years and older (see data tables in Appendix B for full distribution).

Methodological issues in the computation, reporting, and interpretation of this indicator

Some civil registration systems record the age the mother reaches during the year of birth and not her age at delivery. In some situations, age may be recorded during antenatal visits but not updated at delivery. These data are often presented in relation to total births or live births, while EURO-PERISTAT recommends consideration of the total number of women giving birth instead. However, the differences between these two numbers are due to multiple births, which are a relatively small proportion of total births, so this is not a major problem.

Data sources and availability of indicator in European countries

Almost all countries were able to provide this indicator, although Belgium did not provide national data.

Results

The percentage of teenaged mothers (those younger than 20) varied from 1.3 in Denmark to 9.3 in Latvia. Figure 4.2 maps the proportion of women delivering a live or stillbirth under 20 years of age in three categories: countries with a low proportion of births to teenaged mothers, defined as less than 3% of all births, those in an intermediate position (3-5%), and those where 5% or more are in their teens. Actual percentages are provided for countries in the latter group to show the variation between countries.

The geographical pattern of childbearing at older ages in Europe is shown in Figure 4.3. The percentage of older mothers, defined as women giving birth at 35 years or older, ranged from a low of 7.5 in Slovakia to a high of 24.3 in Ireland. This map divides countries into three groups of equal size. High percentages of older childbearing women (over 20%) are found in the Netherlands, Valencia in Spain, Germany, Italy, and Ireland.

KEY POINTS

In many EU countries, births to teenaged mothers account for less than 3% of all deliveries, but this proportion is much higher in others, especially some newer member states.

The proportion of women bearing children later in life varies substantially. It is smallest in the countries that have recently joined the EU. In some countries, one of five women giving birth in 2004 was at least 35 years old.

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Figure 4.2 **Proportion of mothers giving birth in 2004 who were younger than 20 years of age**

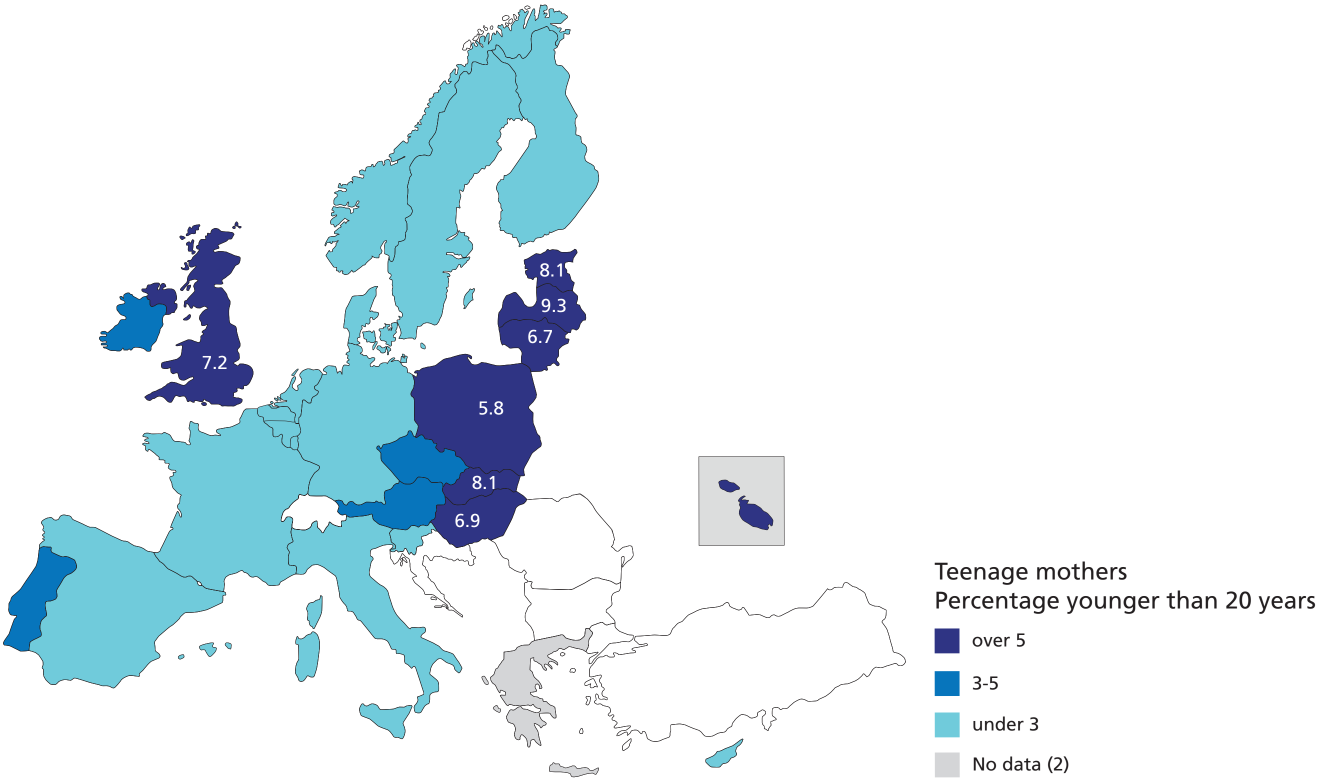
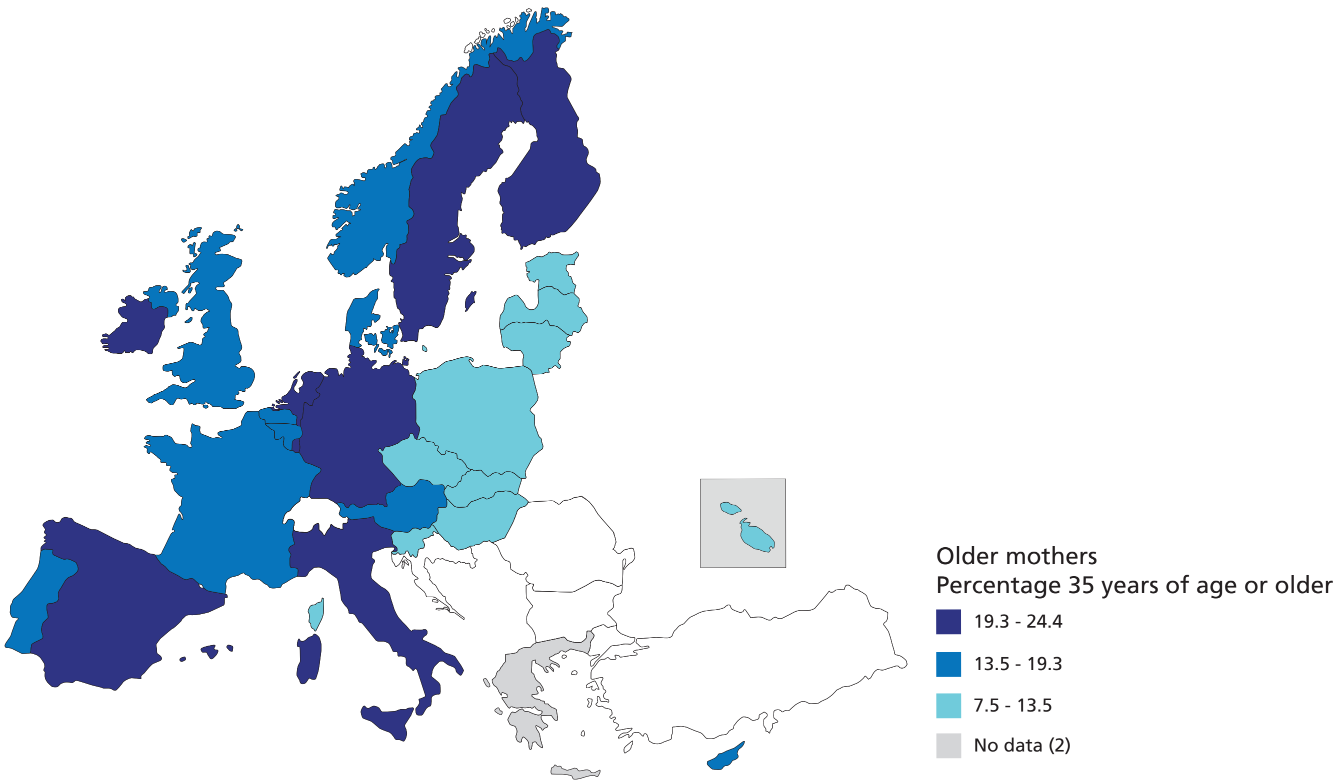


Figure 4.3 **Proportion of mothers giving birth in 2004 who were 35 years of age or older**



4.3 PARITY

INDICATOR TITLE: (C9) DISTRIBUTION OF PARITY FOR WOMEN WITH LIVE AND STILLBIRTHS

Justification
The incidence of maternal conditions such as hypertension and preeclampsia[1-3] differs by parity, as do use of services and interventions during pregnancy, labour, and delivery.[4] Primiparous women (ie, those giving birth for the first time) are at above average risk of adverse outcomes compared with multiparous women (those with at least one previous delivery). Their stillbirth rate, for example, is higher. Risks are also higher for women who have had many previous births (grand multiparous women).[5]

Definition and presentation of indicator
Parity is defined as the number of previous live or stillbirths (0, 1, 2, 3, or 4 or more previous births. The distribution of parity is presented as a percentage of women with live or stillbirths. Figure 4.4 shows the distribution of parity in three categories: primiparous women, women giving birth for the second or third time, and those giving birth for at least the fourth time.

Data sources and availability of indicator in European countries
Most countries were able to provide data on parity. Hungary provided data on parity at the level of the child (number of live and stillbirths) rather than the mother, as requested. For Belgium, data were available only for the Flanders region.

Methodological issues in the computation, reporting, and interpretation of the indicator
Many civil registration systems do not count previous stillbirths as a birth in the computation of parity. Attention should also be paid to the recording of previous multiple births. WHO defines a woman who had twins as having two previous births.

Results
The percentages of first births ranged from 39.4% to 55.6%, and the percentages of fourth and later births ranged from 2.3% to 13.8%. The lowest percentages of primiparaous women were seen in England (39.4%) and Ireland (40.1%), while the highest percentages were seen in Spain (55.6%), Portugal (54.2%), and Latvia (53.1%). The percentage of women with a fourth or higher-order birth was lowest in Slovenia (3.3%), Portugal (3.8%), and Spain (2.3%) and highest – over 10% – in Wales, Ireland, the Slovak Republic, and Finland.

KEY POINTS
Demographic patterns of childbearing differ within Europe, and they can affect the distribution of risk factors in the population.

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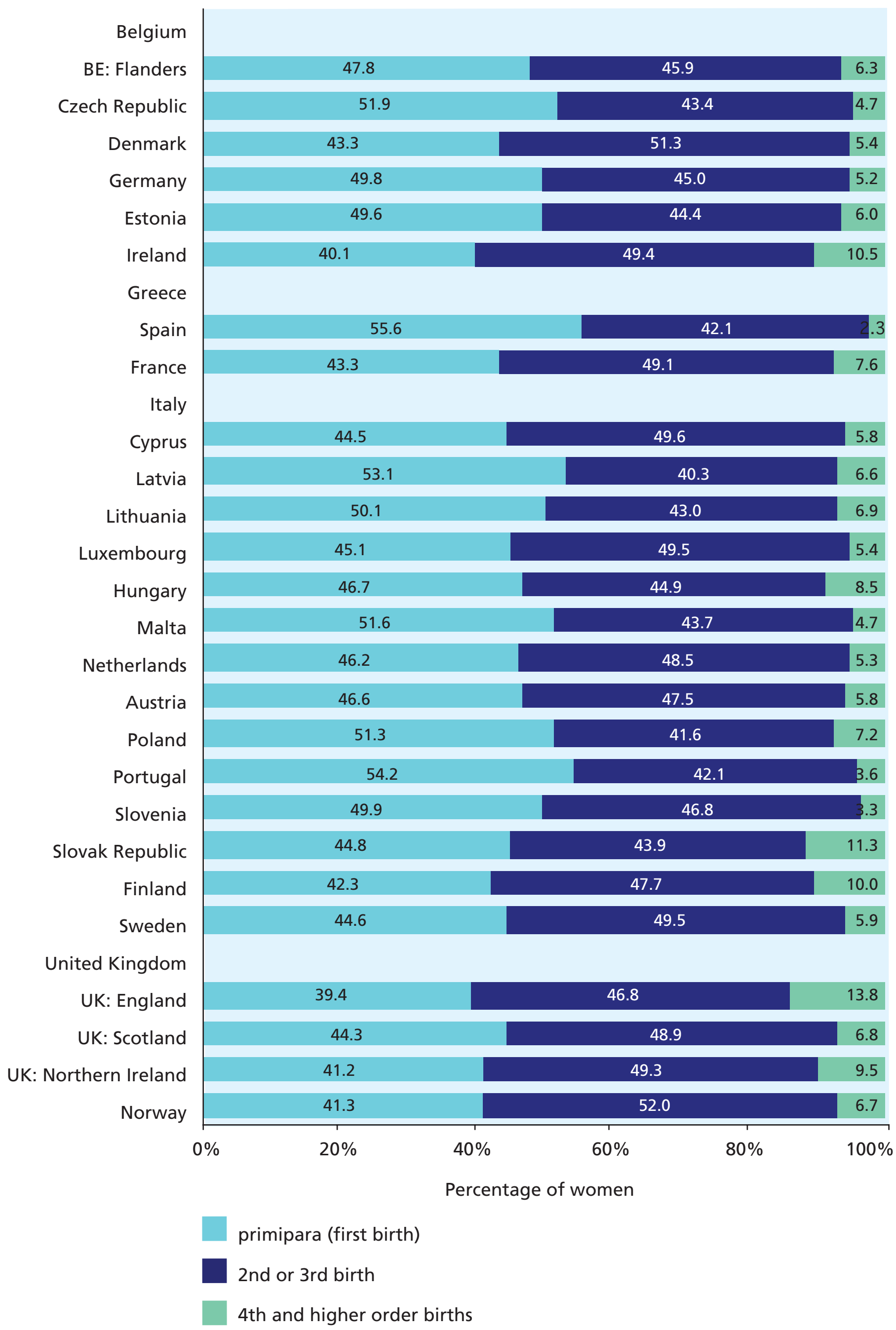
Figure 4.4 Distribution of parity



4.4 SMOKING DURING PREGNANCY

INDICATOR TITLE: (R4) SMOKING DURING PREGNANCY FOR WOMEN WITH LIVE AND STILLBIRTHS

Justification

Maternal smoking during pregnancy is a well-established risk factor for adverse perinatal outcomes. It impairs normal fetal growth and development, resulting in an increased prevalence of low birth weight, preterm birth, and intrauterine growth restriction.[1] Maternal smoking not only influences outcomes during the perinatal period but probably has life-long and long-term consequences. Although not all of these have yet been recognised, they are known to include obesity later in childhood and behavioural problems in adolescence.[2,3]

Over the past two decades, smoking among pregnant women has declined by about 60–75% in developed countries. It nonetheless continues to account for a substantial proportion of fetal and infant morbidity and mortality.[4] Maternal smoking may be considered the most important preventable factor associated with adverse pregnancy outcome.[5] Smoking cessation is one of the most effective interventions for improving mothers' and children's health[6] and thus serves as an indicator of the quality of antenatal preventive healthcare services.

Definition and presentation of indicator

Smoking during pregnancy was defined as the proportion of women who smoked during pregnancy among those with live or stillborn babies. When possible, data were collected for two time periods: an earlier (ideally, first trimester) and a later (ideally, third trimester) phase.

Data sources and availability of indicator in European countries

Some countries provided data based on routine surveys (France, the Netherlands, and the UK). The UK data come from the five-yearly infant feeding survey. In Spain, data come from the region of Valencia. Belgium, Ireland, Italy, Cyprus, Luxembourg, Hungary, and Austria provided no data on maternal smoking. Both Poland and Portugal provided data on maternal smoking from specific studies, but these were not included in tables because these data are not available on a routine basis.

Methodological issues in the computation, reporting, and interpretation of the indicator

To be able to compare countries or regions or to evaluate time trends, a common time frame is essential. This is important because many women stop smoking during pregnancy. If a single measure is the most practical option, it should consider the last trimester of pregnancy so that the length and timing of exposure can be considered. The type of data source (antenatal care records, birth registers, medical records, birth surveys, and surveys after birth) is an additional source of potential bias, for these sources provide information of diverse quality. Some data sources may record a woman as a non-smoker if smoking is not recorded in medical records. The rate of missing data varied from 0% (Czech Republic, Germany, Latvia, and Spain) to 20.4% (Norway). Finally, there is evidence that some women may under-report smoking, as they know that they should not be smoking during pregnancy. Misclassification and inaccurate estimates of smoking may thus result.

Results

Table 4.1 presents information on the time periods covered by the data and the proportions of smokers during both periods. Data on smoking in the second period (during pregnancy or in the last trimester) varied from 5-7% in Lithuania, the Czech Republic, Sweden, and Malta to 16% in Denmark and 21% in France. Data from the non-routine surveys showed that 13.6% of women in Poland and 14.7% in Portugal smoked during the third trimester. When prevalence was available for two periods, smoking prevalence was always lower closer to delivery. No information was available on the proportion of women who stopped smoking, but the difference between the two periods could be inferred to be a minimum percentage.

KEY POINTS

In many countries in Europe, more than 10% of women smoke during their pregnancy.
Not all countries could provide data on maternal smoking during pregnancy, and standardised collection procedures are necessary to improve comparability for those countries that did. Tobacco cessation during pregnancy can only be indirectly inferred. Given the adverse effects of smoking on fetal and infant health and since pregnancy care is considered an ideal setting for intervention, accurate information on smoking during pregnancy would seem to be a sensitive indicator for multiple purposes.

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Table 4.1 **Estimates of proportion of women smoking during pregnancy in routine data sources and according to period for which data are collected**

Countries	Period 1	Period 2	Smokers (%) Period 1	Smokers (%) Period 2
Belgium				
Czech Republic		During pregnancy		6.1
Denmark		During pregnancy		16.0
Germany		During pregnancy		10.9
Estonia	First trimester	After first trimester	11.9	9.9
Ireland				
Greece				
Spain (Valencia)	First trimester		19.6	
France	Before pregnancy	Third trimester	35.9	21.8
Italy				
Cyprus				
Latvia		During pregnancy		11.3
Lithuania	Before pregnancy	During pregnancy	7.9	4.8
Luxembourg				
Hungary				
Malta		During pregnancy		7.2
Netherlands		During pregnancy		13.4
Austria				
Poland*				
Portugal*				
Slovenia	First trimester		10.9	
Slovakia				
Finland	First trimester	After first trimester	15.4	12.4
Sweden	First trimester	Third trimester	8.9	6.3
United Kingdom	Before or during pregnancy	Throughout pregnancy	33.0	17.0
Norway	At start of pregnancy	At delivery	17.7	10.7

* Poland, Portugal: data on smoking available but not from routine surveys.

4.5 MOTHER'S EDUCATIONAL LEVEL

INDICATOR TITLE: (R5) DISTRIBUTION OF MOTHER'S EDUCATIONAL LEVEL

Justification

Social disadvantage is a major determinant of all poor perinatal, child, and maternal outcomes. Maternal mortality, preterm birth, and duration of breast feeding are all related to the social characteristics of pregnant women. There are no direct measures of social disadvantage, social position, or SES. Accordingly, surrogate indicators are systematically used. These include social class based on occupation, education, ethnicity, migration status, housing, lack of access to care, illegal residency, and many more. Nor is there any consensus about which indicator might be the most relevant.[1] A further complication is that within the European Union, each country has developed its own markers of social disadvantage, which it considers to be most appropriate. Our EURO-PERISTAT group, using the Delphi process, selected mother's educational level as the surrogate indicator of choice for social disadvantage. Education level has many advantages as an indicator of social position in the context of maternal and perinatal health. These include:

- It is a stable indicator and can only move in one direction – forward – for any given individual, compared with occupation, which can change rapidly and in both directions. It is therefore a good marker for women who are not employed, particularly those who are recent migrants, sometimes from countries with high female illiteracy rates.
- The United Nations, UNESCO, and the Millennium Development Goals all use educational level as an indicator and target. An additional advantage as an indicator for use in the context of international comparisons is that UNESCO has established an international classification, also adopted by the EU Directorate General on education and culture.[6]
- Educational level is well correlated with perinatal outcome.[2]
- It remains relevant even in the Nordic countries, where there is strong social support from the state.[2]
- Higher levels of education are also associated with use of specific types of health services, such as home births.[3]

Definition and presentation of indicator

This study used the International Standard Classification of Education (ISCED), established by UNESCO, which defines education as "all deliberate and systematic activities designed to meet learning needs. It is understood to involve organised and sustained communication designed to bring about learning." The classification comprises the following categories:

- Level 0 - Preprimary education
- Level 1 - Primary education or first stage of basic education
- Level 2 - Lower secondary or second stage of basic education
- Level 3 - (Upper) secondary education
- Level 4 - Postsecondary non-tertiary education
- Level 5 - First stage of tertiary education
- Level 6 - Second stage of tertiary education

Not all countries were fully using this classification at the time these data were collected. For practical and visual reasons we have finally used only three categories:

- Primary school completed, or started, or no formal education
- At least one cycle (3 years) of secondary school completed
- Postsecondary

Data sources and availability of indicator in European countries

Fifteen of 26 countries provided information on the educational level of childbearing women. As shown in Figure 4.5, there was no information on education from two of the larger countries (Germany and UK). Of the Nordic countries, only Finland provided data. Of the countries that provided data on education, most were not able to provide it according to the ISCED definition. The lack of data from certain countries, from the UK and Germany, for instance, reflects a preference for social class based on occupation as the marker of social circumstances, for information on occupation is routinely recorded. In other countries, this may reflect a hesitancy by care providers to collect this item since it is considered private information.

Methodological issues in the computation, reporting, and interpretation of the indicator

As mentioned earlier, education is one indicator of social position among others, but it is not collected in all countries, some of which use mother's and father's occupation. Concerns about its use include:

- its frequent incompleteness
- lack of implementation of the ISCED classification in some European countries, even though it was first described more than 10 years ago
- the different tracks of secondary education: students in vocational training in many European countries are still more likely to come from less affluent social backgrounds, but the ISCED classification does not differentiate between the different types of secondary education.

Results

Figure 4.5 describes the availability of data on education and its distribution in European countries. There is a wide variation in the proportion of the childbearing population with postsecondary education (from 13% to 45%) as well as with only a primary school education (4-29%). Some of this variation may be related to differences in the measurement of educational level. On the other hand, there are large differences within Europe in the proportion of young people receiving a postsecondary education.

KEY POINTS

Social disadvantage is a major component and perpetuator of poor outcomes in maternal and child health, and therefore some systematic routine data collection on this topic is warranted. Unfortunately, current recommendations for the coding of educational level are not widely used, and this information is not collected everywhere, although many countries have added educational level to their routine data collection. The next step for the EURO-PERISTAT group is to verify that its indicator on educational level, as measured and reported here, can be used to monitor social inequalities in outcomes across countries.

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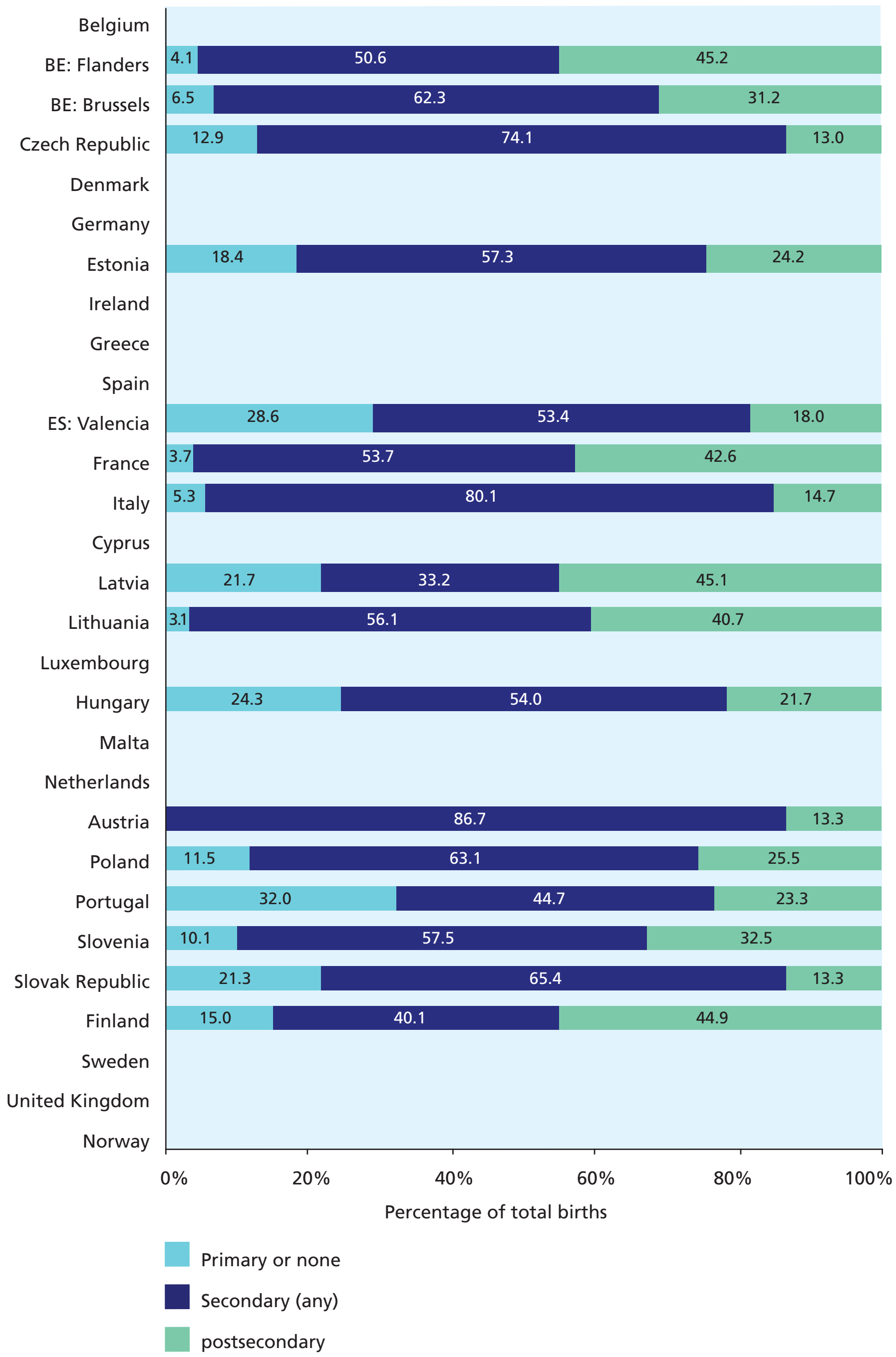
Figure 4.5 Distribution of mother's education



4.6 MOTHER'S COUNTRY OF ORIGIN

INDICATOR TITLE: (F8) MOTHER'S COUNTRY OF ORIGIN

Justification
International migration to industrialised countries has been accompanied by health disparities in perinatal outcomes between migrants and women born in receiving countries. Studies show worse perinatal health outcomes and poorer care for migrants, including increased rates of obstetrical interventions, perinatal mortality, low birth weight, and preterm birth.[1-6] In some contexts, however, migrant women have outcomes that are better than or similar to those of women born in the receiving country, and outcomes can vary according to the migrant's country of birth.[2,6]

Comparing the health of and care provided to migrant women in diverse settings can help to identify factors associated with suboptimal care. These factors may include more limited access to care during pregnancy and differential care due to language limitations and cultural differences. This indicator represents one social measure of subpopulations of women and children potentially at risk for adverse outcomes in the perinatal period. EURO-PERISTAT has collaborated with the ROAM (Reproductive Outcome And Migration: an international research collaboration) project to study this question and to develop international indicators.

Definition and presentation of indicator
Mother's country of origin is defined as the country of birth of a woman with a live or stillborn baby. The ROAM collaboration and EURO-PERISTAT recommend that this indicator be presented in two ways: (1) geographic regions, classified according to the UN list of world macro regions and components, with Europe further subdivided into the EU-27 and the non-EU, and (2) regions grouped by income level, as classified by the World Bank (see appendix) or by the United Nations, using regions defined by income distribution. Because this indicator is still in development, we collected only summary data that make it possible to test its feasibility.

Methodological issues in the computation, reporting, and interpretation of the indicator
It is important to ensure that the data relate to mother's country of birth and not maternal origin, ethnic group, or nationality. Because not all countries collect data by individual country of birth, it may be difficult to compute standardised reporting categories. Research has shown that looking at outcome by 'migrant' versus 'non-migrants' is not informative because 'migrants' are an extremely heterogeneous group. It is thus difficult to unravel results obtained from such comparisons to determine their relevance for policy and practice.

RESULTS
Table 4.2 presents those countries that collect data on mother's country of birth or other data about country of origin if country of birth was not collected. Ten member states provided data on mother's country of birth. Some other member states could provide information on nationality, ethnicity, or permanent residency. The Netherlands collects data on mother's origin but does not provide an exact definition. Care providers thus use their own criteria. Countries also provided this information with different levels of detail. Many countries, however, record each country, so that it should be possible to classify women by region of birth, as recommended.

In those countries providing data on country of birth, mothers born outside of the country accounted for 7-31% of all births.

KEY POINTS

In many EU countries, a sizable proportion of births are to women born outside of the country. Data are available in many countries to permit an analysis of health outcomes by maternal country of birth. In some countries, changes to data systems are needed to standardise this indicator.

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Table 4.2 **Data collected on mother's national origin and proportion of women with live or stillbirths who were of foreign origin defined by country of birth (or foreign nationality or ethnicity)**

Countries	Definition	Number of Categories	Total Births	Births to women born outside of country (or other definition of foreign origin)	
			Number	Number	Percentage
Austria	Foreign nationality	2	79 229	20 402	*25.8*
Belgium					
BE: Flanders	Country of birth	all countries	52 135	6530	12.5
Cyprus	Country of birth	89	8119	2505	30.9
Denmark	Country of birth	97	63 157	8908	14.1
Estonia	Country of birth	12	13 879	1018	7.3
Finland	Country of birth	100	57 920	3853	6.7
France	Nationality	85	802 867	120 879	*15.1*
Germany	Country of origin	7	636 733	121 576	19.1
Ireland	Country of birth	34	61 437	11 147	18.1
Italy	Country of birth	3	534 568	80 757	15.1
Latvia	Foreigners vs residents	2	20 255	23	*0.1*
Netherlands	Depends on the caregiver completing the form (country of birth, nationality, or ethnicity)	8	178 774	32 576	*18.2*
Portugal	Nationality	24	109 356	8482	7.8
Spain	Country of birth	99	43 691	5927	13.6
United Kingdom	Country of birth				
UK: England and Wales	Country of birth	240	633 728	134 041	21.2
UK: Scotland	Country of birth	all countries	53 957	4219	7.8
UK: Northern Ireland	Country of birth	all countries	22 318	1855	8.3

Note: n of categories refers to the level of detail provided about country of origin.

5

THE CARE OF WOMEN AND BABIES DURING PREGNANCY AND THE POSTPARTUM PERIOD

5 THE CARE OF WOMEN AND BABIES DURING PREGNANCY AND THE POSTPARTUM PERIOD

CORE

Distribution of births by mode of delivery according to parity, plurality, presentation, and previous caesarean section

RECOMMENDED

Percentage of all pregnancies following infertility treatment
Distribution of timing of first antenatal visit
Distribution of births by mode of onset of labour
Distribution of place of birth
Percentage of infants breast fed at birth
Percentage of very preterm births delivered in units without a NICU

FURTHER DEVELOPMENT

Positive pregnancy outcomes (birth without obstetric intervention)
Trauma to the perineum (episiotomy and tears)

The development of systematic reviewing and the promotion of the concept of evidence based health care in the field of maternity care began in the late 1980s. The tradition of evaluating medical practices and working to find a balance between insufficient or excess intervention might be expected to lead to similarities between the patterns of maternity care in Europe. The indicators in this section were therefore devised to assess the extent to which this has occurred, despite the differences in systems for providing care during pregnancy, labour, delivery, and the neonatal period.

This section contains one core indicator, six recommended indicators, and two indicators for further development. They are presented and discussed in that order, rather than as a chronological reflection of the pathway through pregnancy, delivery, and the postnatal period. The indicator on trauma to the perineum, originally classed under maternal health, is presented in this section because the data most reliably collected pertain to episiotomies, which are obstetric interventions rather than health outcomes.

The recommended indicator of assisted reproduction aims to compare its use and its contribution to the numbers of pregnancies in each member state and to assess the extent to which the use of assisted conception and ovulation induction is correlated with multiple birth rates.

Turning to care during pregnancy, the aim of the recommended indicator of the timing of the first antenatal consultation is to compare the extent to which women start their maternity care at an early stage in pregnancy.

Over the last half of the 20th century, there was a pronounced move away from home birth and birth in small maternity units managed by midwives and a trend toward concentrating maternity care in ever larger units. More recently, in some countries, there has been a move away from this, back toward home birth and delivery in small units, with care by midwives, for women with uncomplicated pregnancies. The recommended indicator of place of birth explores differences in the sizes of maternity units in Europe and in home birth rates.

Four indicators relate to care during labour and delivery. The core indicator of method of delivery, the recommended indicator of mode of onset of labour, and the further indicators of births without obstetric intervention and trauma to the perineum are interrelated. They aim first to compare the levels of use of obstetric procedures and then to look more positively at the extent to which women are giving birth without obstetric intervention. Concern about the iatrogenic effects of obstetric intervention in women who do not have a clinical need for it has put "normal" birth firmly on the agenda for the 21st century. The further indicator on births without obstetric intervention has been constructed as an attempt to produce a positive indicator in response to concerns about the need to move towards "normality" in birth.

5.1 MODE OF DELIVERY

INDICATOR TITLE: (C10) NUMBER OF BIRTHS BY MODE OF DELIVERY

Justification

The substantial rise in caesarean section rates since the 1970s in most developed countries, together with the associated maternal morbidity and the major variations in practices between countries, is a long standing cause of concern.[1-4] The rise has continued despite the statement by the WHO in 1985 that "There is no justification for any region to have caesarean section rates higher than 10-15%."[5] Several factors probably contributed to the increase, including fear of litigation, the perception that caesarean section is a safe procedure, and lack of awareness of its possible adverse consequences. Women's requests for caesarean section are also cited,[6] although there is no clear documentation about the extent to which this is true or what information they are given related to any such choice.

Countries also vary in their use of operative vaginal delivery, either with forceps or vacuum extraction.[3]

In addition to wide variations between countries, operative delivery rates also vary by parity, previous caesarean section, presentation, and plurality. It is accordingly informative to compare methods of delivery according to each of these factors. Because operative delivery, especially caesarean section, may increase the risk of repeated operative delivery in subsequent pregnancies, it is useful to compare caesarean section rates among primiparous women, especially as their complication rates are higher than those of women who have already given birth.

Rates of operative delivery among women with previous caesarean section can highlight variations in practice, as some countries routinely apply a policy of "once a caesarean, always a caesarean", while others do not. Comparing rates by presentation is useful in charting the impact of controversies about how to deliver breech births.[7,8] Opinions are also divided about the evidence on how best to deliver multiple births.

Definition and presentation of indicator

This indicator was defined as the percentage distribution of all births, live and stillborn by method of delivery for all women and then subdivided by parity, previous caesarean section, presentation, and plurality.

Methodological issues in the computation, reporting and interpretation of the indicator
Countries differ in the ways that they classify caesarean sections. Some countries subdivide them according to whether they were undertaken before or during labour. Others use the subdivision into elective caesarean sections, which include all those planned before the onset of labour and thus include a few that take place after labour has started, and emergency or unplanned caesarean sections. Sometimes, as in the Scottish Audit of Caesarean Section, emergency caesarean sections include those performed before the onset of labour in response to a clinical emergency.[9]

In Flanders, Estonia, Italy, Lithuania, Malta, Slovenia, the Slovak Republic, and Finland, rates were reported per woman. This may result in slight underestimates of operative deliveries, as multiple births to one woman will be counted only once.

Data sources and availability of indicator
Method of delivery was provided everywhere except Greece and Cyprus. Data from Spain were provided from one region, and it is not clear whether this region is typical of Spain as a whole. Poland did not subdivide vaginal deliveries to identify instrumental vaginal deliveries. Information about whether caesarean sections took place before labour or were elective was not provided in Spain, Ireland, Lithuania, Luxembourg, Hungary, Austria, Poland, Portugal, or the Slovak Republic. Rates by parity were not recorded in Brussels, Italy, Hungary, Poland, or Wales. Whether the woman had a previous caesarean section was not recorded in Brussels, Ireland, Italy, Luxembourg, Hungary, Austria, Poland, the Slovak Republic, England, Wales, or Northern Ireland. Fetal presentation was not recorded in Spain, Ireland, Hungary, Austria, Poland, Portugal, England, Wales, or Northern Ireland. Rates by multiplicity were not available for Hungary, Poland, or England.

Results
Italy had the highest overall caesarean rate, at 37.8%, followed by Portugal with 33.1%, as Figure 5.1 shows. Rates everywhere else were below 30%. They were in the 25-29% range in Germany, Ireland, Luxembourg, Hungary, Malta, Poland, Wales, and Northern Ireland. The lowest rates were in Slovenia (14.4%) and the Netherlands (15.1%), with Flanders, Brussels, the Czech Republic, Estonia, Latvia, Lithuania, Finland, Sweden, and Norway also having rates less than 20%. There was no clear inverse correlation with rates of instrumental vaginal delivery, which exceeded 10% in Ireland, Flanders, Spain, France, the Netherlands, Portugal, England, Scotland, and Northern Ireland. For the countries with available data, caesarean section rates were subdivided into those planned or undertaken before labour and those where the decision or the caesarean were undertaken after the onset of labour.

Many countries with high overall caesarean section rates also had high rates among primiparous women. These included Germany and Northern Ireland which had rates over 30% among primiparous women, and Ireland, Spain, Luxembourg, Malta, Austria, and Scotland, where over a quarter of births to primiparous women were by caesarean section (see tables in Appendix B). Countries with high overall rates of vaginal instrumental birth tended to have high rates for primiparous women, but there was no clear association between these and rates among multiparous women. There was also considerable variation in caesarean section rates among women who had had a previous caesarean section. These were relatively low, between 45-55%, in the Netherlands, Norway, Finland, and Sweden. They ranged from 70-80% in Estonia, Spain, Malta, Portugal, Slovenia, and Scotland and reached 81% in Lithuania and 91% in Latvia.

Breech deliveries accounted for a relatively small proportion, around 4%, of all births. In 9 of the 19 countries or regions for which data were available, 80% or more of breech babies were delivered by caesarean section. In contrast, only 35% of those in Lithuania, 55% of those in Italy, 65% of those in Slovenia, and 66% of those in Norway were by caesarean section.

Variations in practice were also observed for multiple births. Between 70 and 90% of multiple births in Germany, Spain, Italy, Luxembourg, Malta, and Austria were by caesarean section. Only 36% of those in the Netherlands, between 40 and 50% in Slovenia, Lithuania, Finland, and Norway, and just over half in Flanders, Brussels, Estonia, Ireland, France, and Sweden were by caesarean section.

KEY POINTS

Data about mode of delivery show marked variations, with relatively low levels of intervention in Slovenia, the Nordic countries, the Netherlands, and the Baltic countries, and higher levels in the more southern countries, notably Italy, Portugal, Spain, and Malta, as well as in the countries of the United Kingdom, most notably Northern Ireland. These differences in practice raise questions about clinical effectiveness and the role of evidence.

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Figure 5.1 Percentage of births by mode of delivery

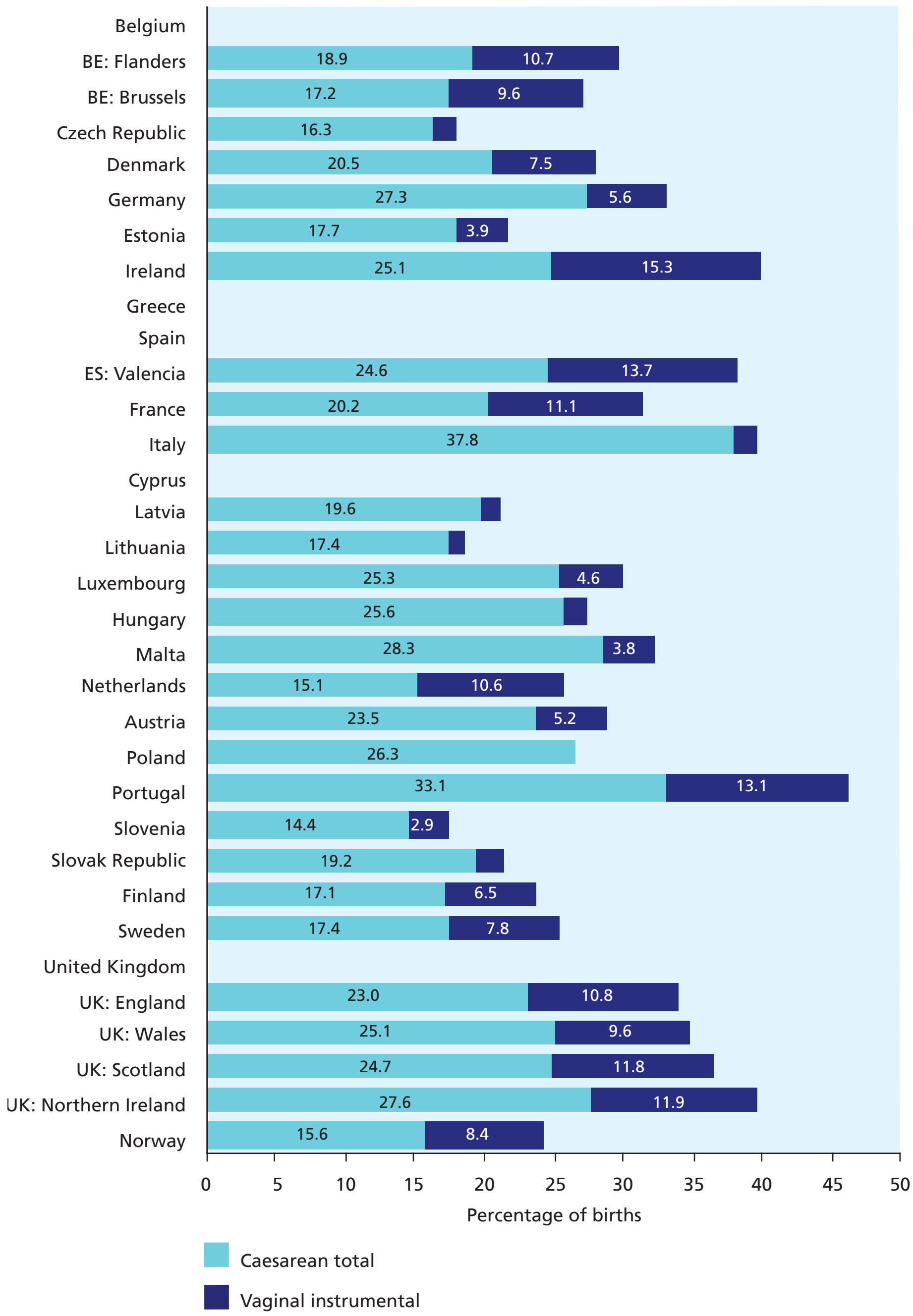
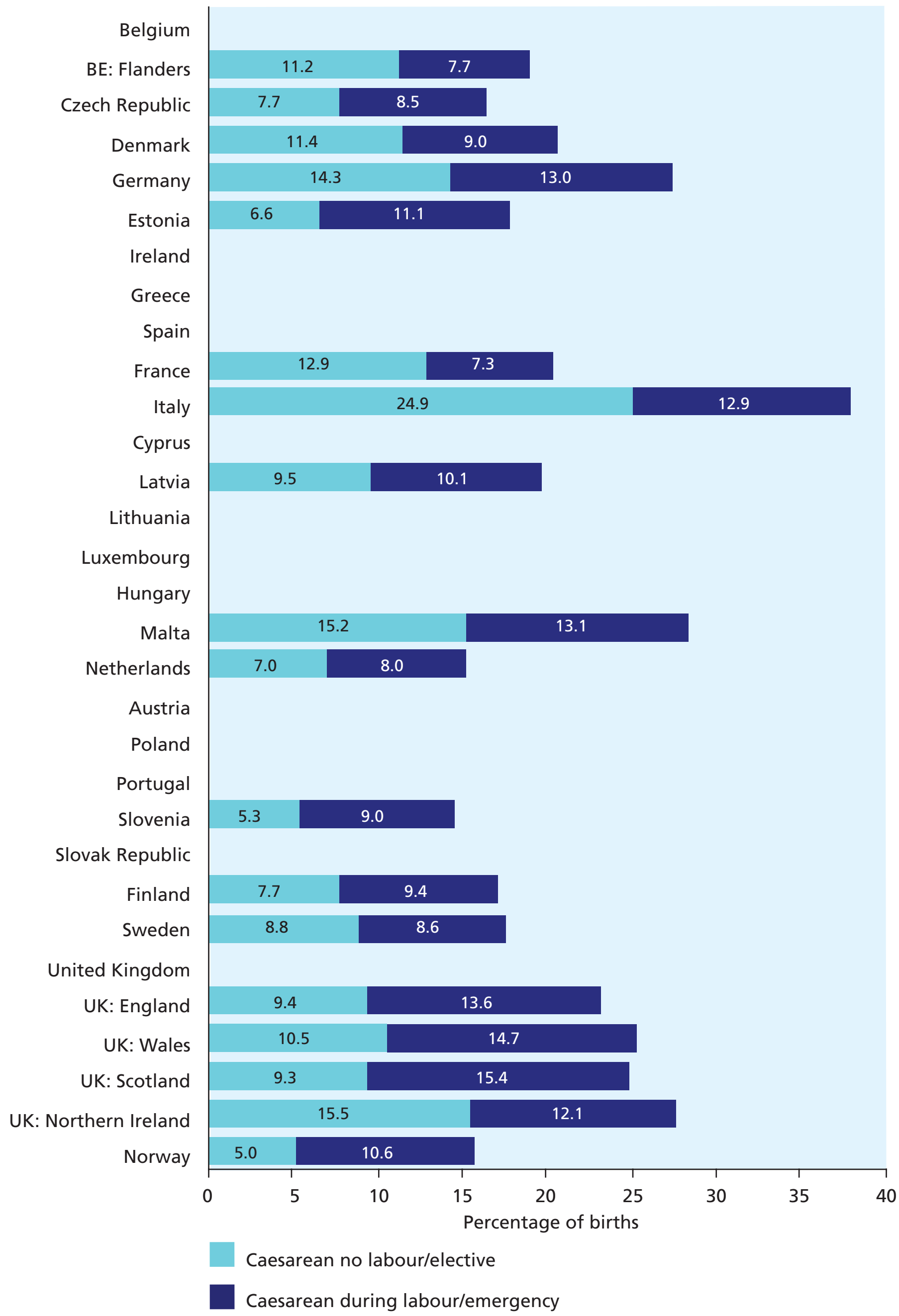


Figure 5.2 Percentage of births by type of caesarean section



5.2 PREGNANCIES FOLLOWING INFERTILITY MANAGEMENT

INDICATOR TITLE: (R6) ASSISTED REPRODUCTIVE TECHNIQUES

Justification

Although the percentage of births that follow assisted reproductive techniques is low, these births are the subject of great interest in many countries. This percentage will continue to increase due to demographic changes such as rising maternal age and new developments in assisted reproductive techniques (ART). Compared with spontaneously conceived children, those conceived with ART have a higher risk of adverse outcomes,[1-3] specifically perinatal death, preterm delivery, low birth weight, and congenital anomalies.[1-5] ART are also more likely to result in multiple pregnancies.[1,5] It is still unclear whether the higher risk of adverse outcomes that has been observed is associated with factors related to the assisted conception procedures or to characteristics related to the parents' subfertility. A combination of both is also a possibility.

Definition and presentation of indicator

ART are defined as: (i) ovulation induction, (ii) intrauterine insemination with or without ovulation induction; or (iii) in vitro fertilisation (IVF), which may include intracytoplasmic sperm injection; in vitro maturation, and frozen embryo transfer. Figure 5.3 presents data on ART: the number of women with live or stillbirths after fertility procedures as a percentage of all women with live born or stillborn babies.

Data sources and availability of indicator in European countries

Thirteen countries were able to provide some data for this indicator. The Czech Republic, Denmark, Estonia, and Norway could provide data only on IVF. Germany and Malta provided the total number of fertility procedures without subdividing them according to type. Only six countries/regions (Flanders, France, Italy, the Netherlands, Slovenia, and Finland) could provide data by type of ART procedure. In the UK, the Human Fertilisation and Embryology Authority maintains a register of procedures covered by legislation. Data are usually tabulated by year of procedure and include some non-residents who have assisted conception in the UK but return home to give birth.

Methodological issues in the computation, reporting, and interpretation of the indicator

The major problem with this indicator is that it is difficult to know whether the relevant information is systematically collected for all pregnancies or is noted only when the obstetrical team is aware that ART were used. This problem is particularly acute for the use of less invasive procedures, such as ovulation induction or artificial insemination, because the midwife or the obstetrician managing the delivery is less likely to be aware of them. When women are asked about these procedures at delivery, they may be hesitant to report their use. A related problem is the proportion of missing data. Information about the type of procedure was missing for 6.6% of procedures in France, 4.7% in Flanders (Belgium), but only 0.2% in Italy. Slovenia and Finland reported no missing data. The absence of missing data might indicate either that data were recorded for all women or that women without this information were assumed not to have used ART.

Results

In all, 4.9% of women giving birth in France, 4.5% in Flanders, 2.6% in the Netherlands, 2.5% in Slovenia, 2.1% in Finland, and 1.7% in Italy had become pregnant after some form of ART. Information is most widely available for IVF pregnancies. The percentage of women giving birth following IVF procedures ranged from 0.5% in Italy and Estonia to 2.3% in Flanders and 1.7% in France. The highest proportion of women using any ART was seen in France, according to data from a representative survey where all women are asked a question about the use of these techniques. In other countries, this item is included in some medical birth registers, which probably contributes to lower estimates. Other countries have specialist registers.

KEY POINTS

Up to 5% of births in some countries may occur after use of some form of ART, although the use of the less invasive procedures appears to be under-reported in most data systems. Births after IVF represent up to 2% of all births.

To evaluate health services provided to couples with difficulties conceiving, member states should consider implementing population-based systems to record all types of fertility management.

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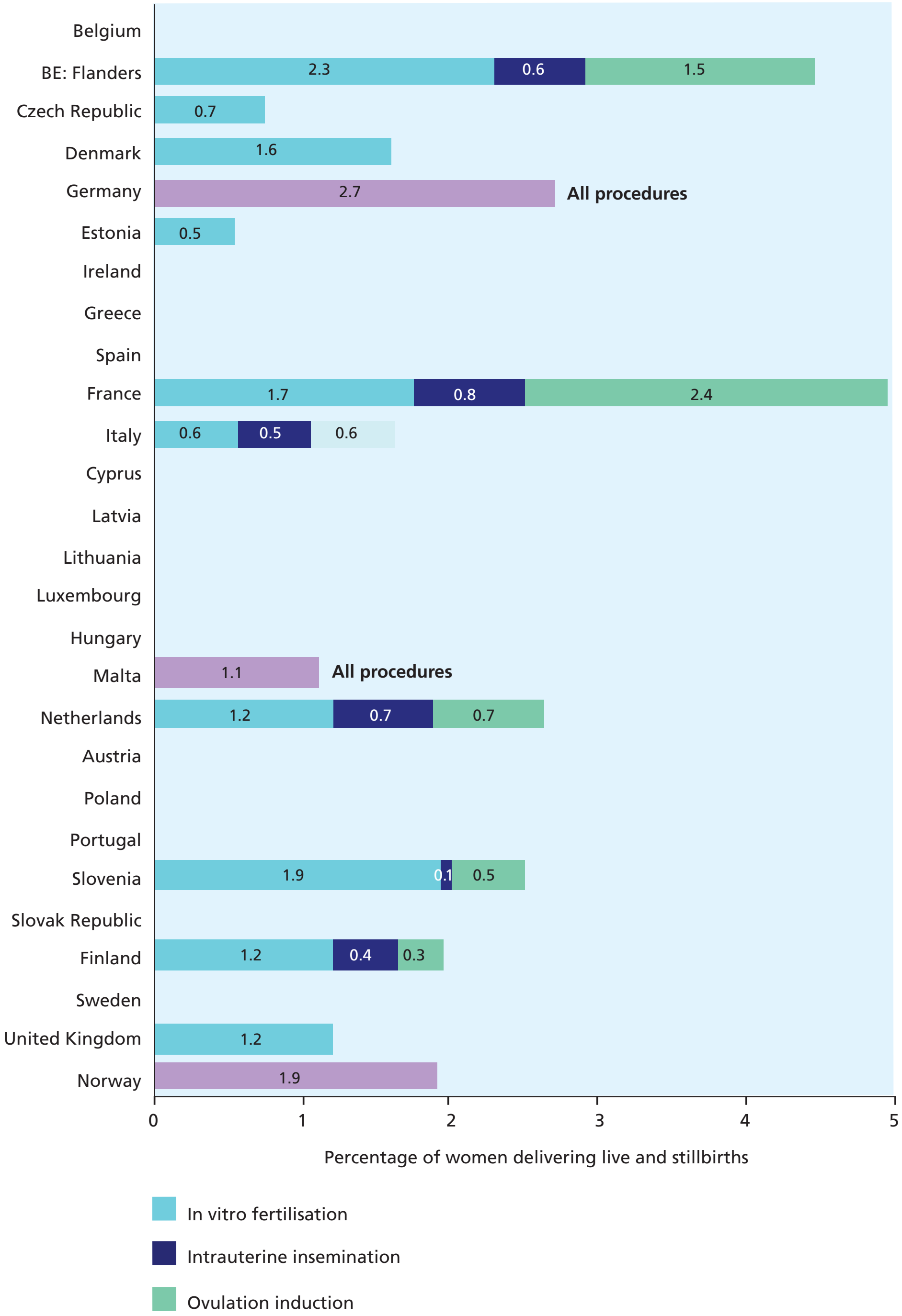
Figure 5.3 Percentage of women with live and stillbirths following assisted pregnancy procedures



Some countries can only provide first category, on in vitro fertilisation

5.3 FIRST ANTENATAL VISIT

INDICATOR TITLE: (R7) TIMING OF FIRST ANTENATAL VISIT

Justification
There are wide differences in the recommended content and extent of antenatal care, but it is widely accepted that it should begin during the first trimester of pregnancy.[1,2] Early antenatal care makes it possible to identify specific conditions that may need careful surveillance throughout pregnancy, to recognise social problems for which women may need help from social or mental health services at the earliest possible stage of pregnancy, and to inform women about appointments, antenatal screening and its schedule, major risk factors, and health behaviour during pregnancy. Timing of the first antenatal visit provides an indicator of access to antenatal care, which can be influenced by both maternal social conditions and organisation of care.[3,4] It is less likely than the recommended number of antenatal visits to be affected by policy differences between member states.

Definition and presentation of indicator
This indicator is defined as the distribution of timing of the first antenatal visit by trimester of pregnancy for all women with live or stillborn babies. Trimesters are defined as follows: the first trimester is before 15 weeks, the second trimester is 15-27 weeks, and the third is from 28 weeks until delivery. Table 5.1 presents the distribution of trimester of first visit per 100 women with live or stillborn babies; the distribution also includes no care during pregnancy.

Data sources and availability of indicator in European countries
Data on the timing of the first antenatal visit were not provided by Belgium, Denmark, Spain, Cyprus, Greece, Luxembourg, Hungary, the Netherlands, Austria, Poland, and Norway. Data were missing for about 60% of the women in England. Poland provided no data, but the Ministry of Health has been working on a system of reporting aggregate data on number of consultations in outpatient clinics.

Methodological issues in the computation, reporting, and interpretation of the indicator
The definition of what the first visit entails may range from the prescription of a pregnancy test, to first contact with an obstetrician, midwife, or general practitioner, to booking in a particular maternity unit, or with a particular set of professionals. In systems where much antenatal care is given outside hospitals or is often combined between community and hospital, the information recorded may be the first hospital visit for a scan or booking and not the first contact with a healthcare provider. This may be the case in Malta, Ireland, and the countries of the UK. In France, statistics report the timing of the notification of pregnancy to the organisation that administers maternity benefits; this usually occurs after the first ultrasound examination, during the second visit.

Countries also vary in their definition of trimesters, which may be expressed in terms of days or weeks and which may use different thresholds. For example, Latvia collects data on visits in the first 12 weeks, since the Ministry of Health advises that antenatal care starts before this time; Estonia also collects data using this cutoff point.

The method and timing of data collection also vary, and there can be differences in recall bias if some women are interviewed after giving birth or later. In countries that reported no women without antenatal care before delivery, these women may have been missing altogether from the information system.

Results

In most countries that had reliable data, more than 90% of women had their first visit during their first trimester. These were the Czech Republic, Germany, France, Italy, Latvia, Portugal, the Valencia region of Spain, Slovenia, Finland, and Sweden. The proportion was lower in Estonia (86%), Lithuania (74%), the Slovak Republic (80%), England (66%), and Scotland (78%). It is important to note, however, that Estonia defines trimesters as 12-week periods, and this may explain the lower rates.

KEY POINTS

It is difficult to collect data about the first antenatal visit from medical birth registers or hospital discharge systems because it is too easy to confuse the first consultation with a health professional and the first visit to a hospital or maternity unit. In general, where data are recorded retrospectively, recall bias is possible. It is therefore important to record this information accurately during pregnancy.

In countries where this indicator is consistently recorded, between 5 and 10% of women begin care after the first trimester. Given the importance of starting care early in pregnancy, this raises questions about whether the most vulnerable women in each country have access to appropriate health care. Using this indicator in conjunction with the level of education (R5) and country of birth (F8) could be a useful basis for comparing the functioning of healthcare systems.

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Table 5.1 **Percentage of pregnant women by timing of first antenatal visit.**

	Percentage of pregnant women by timing of first antenatal visit			
Country/coverage	1st trimester	2nd trimester	3rd trimester	No care recorded
Belgium				
Czech Republic	92.5	6.7	0.8	0.0
Denmark				
Germany	93.9	5.0	1.1	0.0
Estonia*	86.0	11.4	1.6	1.0
Ireland	71.3	23.2	5.0	0.5
Greece				
Spain				
ES: Valencia	91.7	6.1	2.2	0.0
France†	95.0	4.3	0.5	0.1
Italy	94.5	3.6	0.9	1.0
Cyprus				
Latvia*‡	91.8			3.2
Lithuania	74.5	21.2	4.3	0.0
Luxembourg				
Hungary				
Malta§	66.3	30.5	3.2	0.0
Netherlands				
Austria				
Poland				
Portugal	91.2	7.7	1.1	0.0
Slovenia	91.1	7.5	0.9	0.5
Slovak Republic	79.5	14.9	2.5	3.1
Finland	95.9	3.2	0.7	0.2
Sweden	91.5	6.5	2.0	0.0
United Kingdom				
UK: England** ††	65.3	24.8	9.8	0.0
UK: Scotland**	78.3	17.3	4.4	0.0
Norway				

NOTE: First trimester: Less than 15 completed weeks of gestation; Second trimester: 15-27 completed weeks of gestation; Third trimester: 28 completed weeks of gestation or more.

* In Estonia and Latvia first antenatal visit is within 12 weeks of gestation.

† In France, timing of the registration visit corresponds to the first or second visit.

‡ Latvia provided data on timing of first antenatal visit as follows: 18 606 women with first antenatal visit within 12 weeks of gestation and 619 women without any antenatal visit. Latvia also reported that 1036 women (5.1%) received care after the first trimester, but could not specify whether they started in the second or third trimester.

§ Data from Malta are based on first antenatal visit to hospital. Pregnant women often start antenatal care in the private sector and come for antenatal visits in the hospital later on.

** Sometimes first visit to hospital for scan or booking

†† England has data missing for 58.6% of deliveries.

5.4 MODE OF ONSET OF LABOUR

INDICATOR TITLE: (R8) MODE OF ONSET OF LABOUR

Justification
There is widespread concern about the high rates of obstetric intervention, including induction and caesarean section, during labour and delivery, along with growing pressure by women to avoid their unnecessary use. At the beginning of the 21st century, about half of all caesarean sections in the 15 EU member states were planned or undertaken before the onset of labour.[1]

Although these decisions were taken in the belief that they would benefit mothers and their babies, they might have had unintended side effects and may have led to subsequent intervention in labour and delivery. There is no evidence that a high rate of induction of labour increases the risk of delivery by caesarean section, either among term or post-term deliveries,[2,3] provided, however, that they are undertaken in accordance with good practice guidelines.[4] Data about the onset of labour are essential to the interpretation of data about mode of delivery (see 5.1). They also make an important contribution to the definition of birth without obstetric intervention (see 5.8).

Definition and presentation of indicators
Mode of onset of labour is described by the numbers of babies born after spontaneous onset of labour, induced labour, and caesarean section, either planned or undertaken before labour per 100 live and stillbirths.

Data sources and availability of indicator in European countries
Mode of onset was not provided in Greece, Ireland, Cyprus, Luxembourg, Poland, Portugal, Hungary, or Austria. Inductions were not recorded in the Slovak Republic. Records from Brussels, the Valencia region of Spain, and Italy did not subdivide caesarean sections to distinguish those planned or undertaken before labour. In the last two cases, induction of labour appeared to be recorded for only for vaginal births, while caesareans were grouped with missing data.

Methodological issues in the computation, reporting, and interpretation of the indicator
The definition of induction may vary between countries or even between maternity units within the same country, according to the use and timing of the procedures. In some places, induction includes the use of drugs for cervical ripening and oxytocin for induction. In other places, including Malta, Norway, England, and Scotland, artificial rupture of membranes is also included. These differences may have a significant impact on rates: in England, labour was induced with oxytocics in 15.4% of cases, and in a further 4.1% by artificial rupture of the membranes alone.[5] There is also some uncertainty about whether these data include other uses of oxytocics, including for augmentation of labour. This misclassification can occur if augmentation is not recorded separately.

Countries also differ in the ways that they classify caesarean sections. Some subdivide them according to whether they were undertaken before or during labour. Others use the definition of elective caesarean section, which include all those planned before the onset of labour and thus include a few that take place after labour has started. For example, the Scottish Audit of Caesarean Sections in 1994 explained that caesarean sections that had been scheduled as elective but carried out as an emergency after the woman went into labour unexpectedly were still categorised as elective. This answer was intended to clarify why some elective caesareans were done at night: about 5% of all elective caesarean sections were undertaken between 18.00 and 9.00.[6] If these were elective caesarean sections after the onset of labour and if they occurred at the same rate during the day, overall they would account for 8% of all elective caesareans. In addition, unscheduled caesarean sections undertaken for emergency reasons before labour accounted for 14.1% of all caesarean deliveries.

Rates in Flanders, Estonia, Italy, Lithuania, Malta, Slovenia, Slovakia, and Finland were reported per woman. This may produce slight underestimates as all the babies from multiple births are counted as only one.

In England data were missing for 25% of births, but rates were estimated with the the available data.[5] In some other countries, the data were not consistent with the total number of births, but no information was provided about the population used or the missing data.

Results

The rate of caesarean sections planned or undertaken before labour was less than 8% in Estonia, the Netherlands, Slovenia, Finland, and Sweden, and greater than 14% in Lithuania, Malta, and Northern Ireland. Variations in the rate of induced labour were wider, ranging from less than 9% in the Baltic countries and the Czech Republic to 37.9% in Malta, 30.7% in Northern Ireland, and 27.6% in Flanders. In 8 of the 17 regions or countries for which complete data were available, onset of labour was spontaneous in fewer than 75% of cases.

KEY POINTS

The fact that most countries record the onset of labour points to the importance attached to this indicator in Europe. The impact of the difference between caesarean section before labour and elective caesarean section seems small compared to the substantial differences between countries in their overall caesarean section rates. Decisions taken before labour about caesarean section are therefore likely to have a strong influence on the overall rate, as there is no sign of the indicator on the mode of delivery (see 5.1) or elsewhere that high rates of planned or pre-labour caesarean section are offset by low rates of caesarean section during labour.[7]

The definition of induction must be harmonised within and across countries and induction and augmentation should be clearly distinguished to improve the rigour of comparisons between countries, especially in the case of induction without well established indications.

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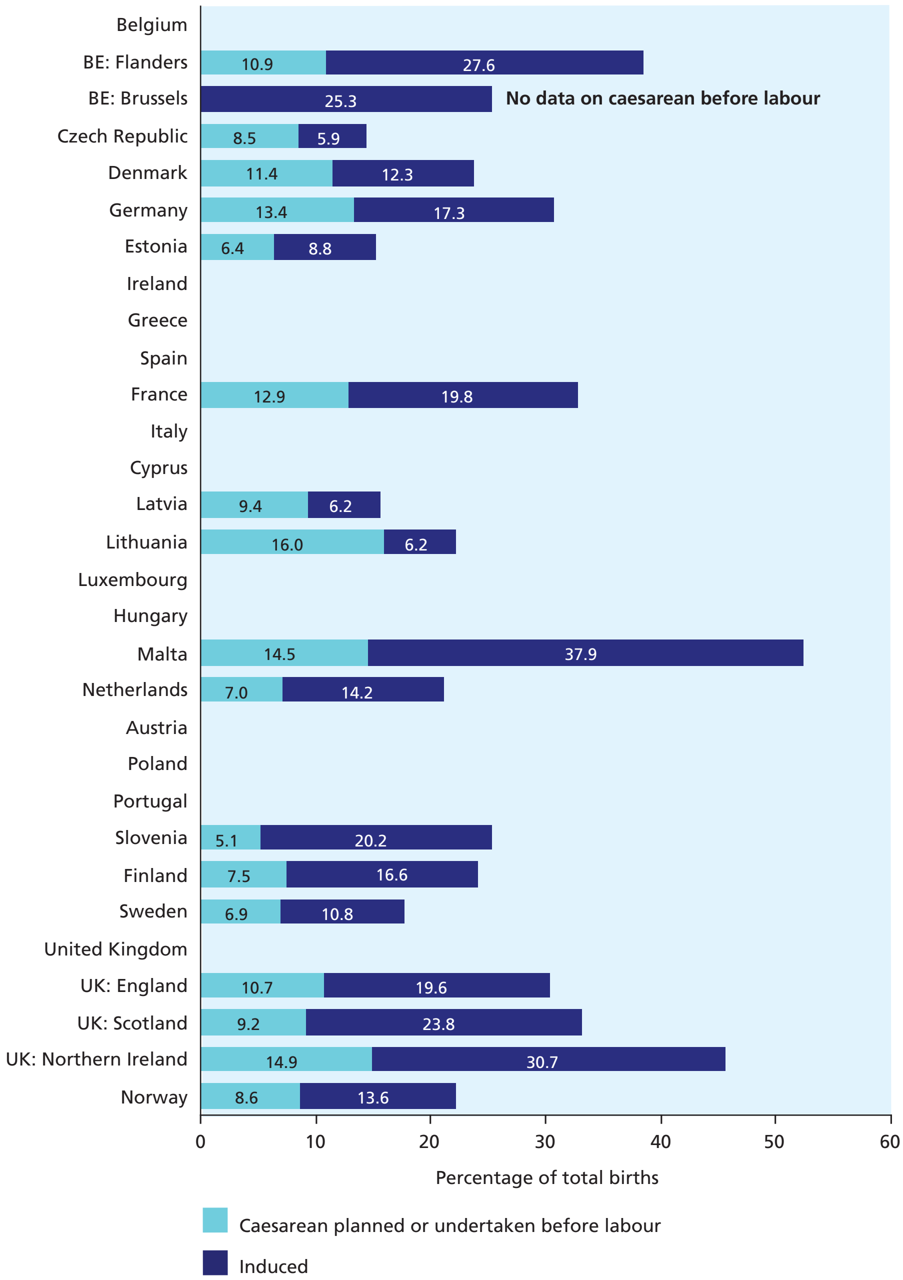
Figure 5.4 Inductions of labour and caesarean deliveries before labour



5.5 PLACE OF BIRTH

INDICATOR TITLE: (R9) DISTRIBUTION OF PLACE OF BIRTH

Justification

There is an ongoing debate about the association between the size of maternity units and quality of care. The low volume of deliveries in very small maternity units may lead to suboptimal care for women with obstetric complications, while very large maternity units may be unwieldy and impersonal.[1-4] The concentration of births into larger units may also lead to longer travel time for pregnant women and thus possibly an increase in unintended out-of-hospital deliveries.[5] Furthermore, units that provide care for a higher proportion of high-risk pregnancies may also impose more obstetric interventions on women without complications.[6-8] An indicator presenting data on the number of births per maternity unit is also important for monitoring the impact of maternity unit closures, which are occurring throughout Europe. This indicator also includes information on home births, which are rare in most European countries, but demanded by some women. Home births are offered to low-risk women in the Netherlands and in the United Kingdom.

Definition and presentation of indicator

This indicator describes the number of births occurring at home or in maternity units of various sizes and is defined by the total number of births in the same year at home, and in hospitals with fewer than 300, 300-499, 500-999, 1000-1499, 1500-1999, 2000-3999, and 4000+ deliveries. Because the debates associated with maternity unit size focus on the extremes of the distribution, we illustrate below the proportion of births in small maternity units, defined here as those units with fewer than 500 births per year, and those in larger units, with more than 2000 births per year. Data on the distribution over the entire spectrum of values and for home births are presented in the output tables in Appendix B.

Data sources and availability of indicator in European countries

This information comes from birth registers, hospital discharge data, and perinatal surveys. Twenty-three countries provided data on this indicator, although only 20 could provide national data. In Belgium, data were only available for Flanders, in the UK, only Scotland, Northern Ireland and Spain provided data only for the Valencia region. Norway provided data according to different categories.

Methodological issues in the computation, reporting, and interpretation of the indicator

When data collection systems are hospital-based, home births may not be included. Otherwise, where systems cover the entire population, this indicator should be readily available and of good quality. It must be interpreted, however, within the context of the referral system and levels of care specific to each country. For instance, "large" maternity units may differ substantially in their services for high-risk newborns and pregnant women and in their provision of choice for women, for example, the availability of midwife-led wards.

Results

Figures 5.3 and 5.4 illustrate the diversity of the maternity care provided in Europe by focusing on the proportion of births in very small or very large units. Overall, few births occur in maternity units with fewer than 500 annual deliveries. In 10 of the countries providing data, these accounted for fewer than 5% of all births. In Cyprus and Lithuania, however, these proportions were much larger, with more than one-fifth of births taking place in such units.

The proportion of births in larger maternity units, defined in Figure 5.4 as those with 2000 or more deliveries per year, is an indicator of the centralisation of births. Many countries, such as the Nordic countries, Portugal, and Spain, have implemented a policy of closing smaller units and concentrating deliveries in these units. As shown in the figure, there is a geographic pattern to the concentration of births in large maternity units. Larger units are more common in northern Europe, Scotland, the Republic of Ireland, Portugal, and Spain. They are rare in central and eastern Europe. Most countries reported negligible rates of home births (<1%), with slightly higher percentages in England (2.2%) and Wales (3.3%). In the Netherlands, however, where home births are a usual option for women with low risk pregnancies, 30% of all births occurred at home (data presented in Appendix B).

KEY POINTS

The organisation of maternity services varies greatly throughout Europe. Data on this indicator are available in most countries and can thus be used to monitor trends over time.

Comparisons of health outcomes, health practices, and costs of care in these different contexts would provide insights into the advantages and disadvantages of diverse models of organisation.

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Figure 5.5 **Percentage of births in maternity units with fewer than 500 deliveries per year.**

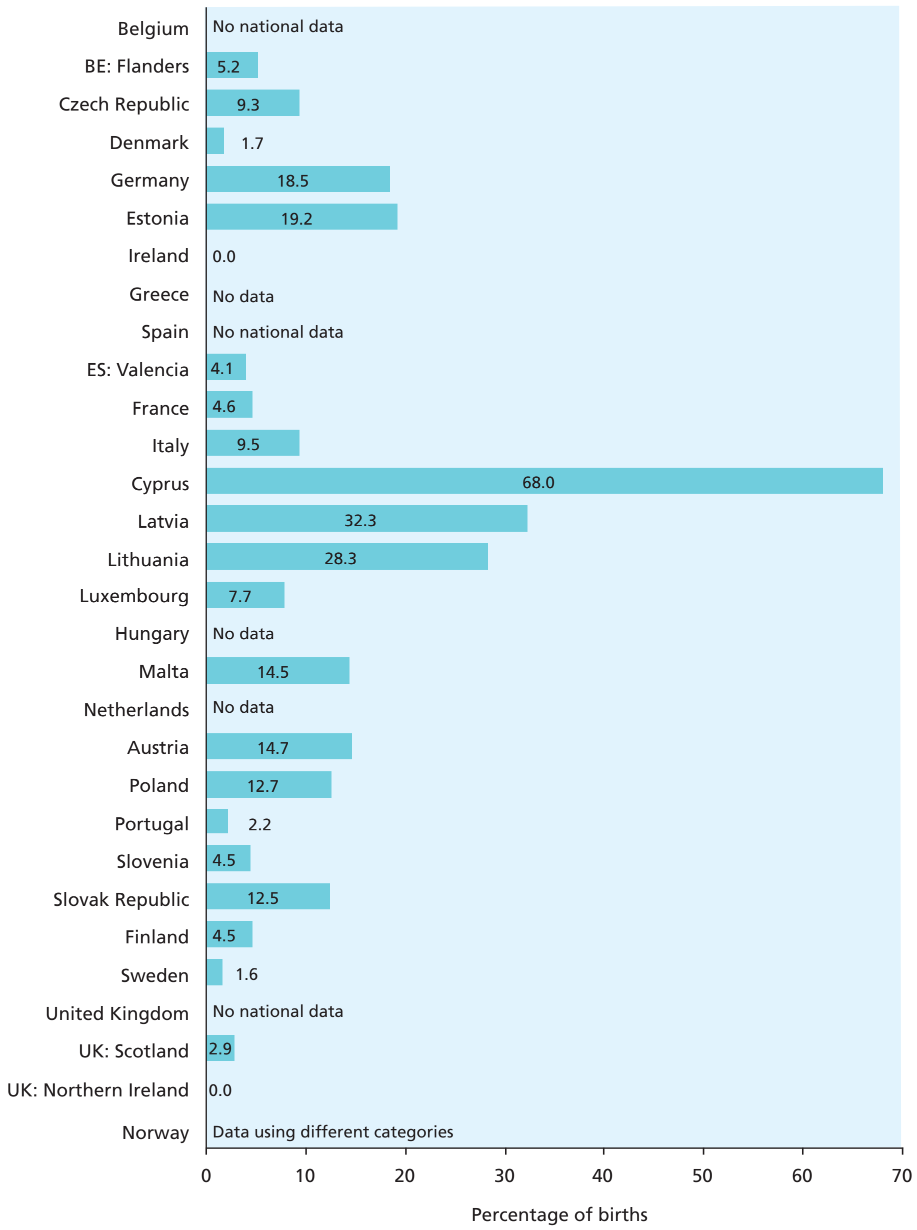
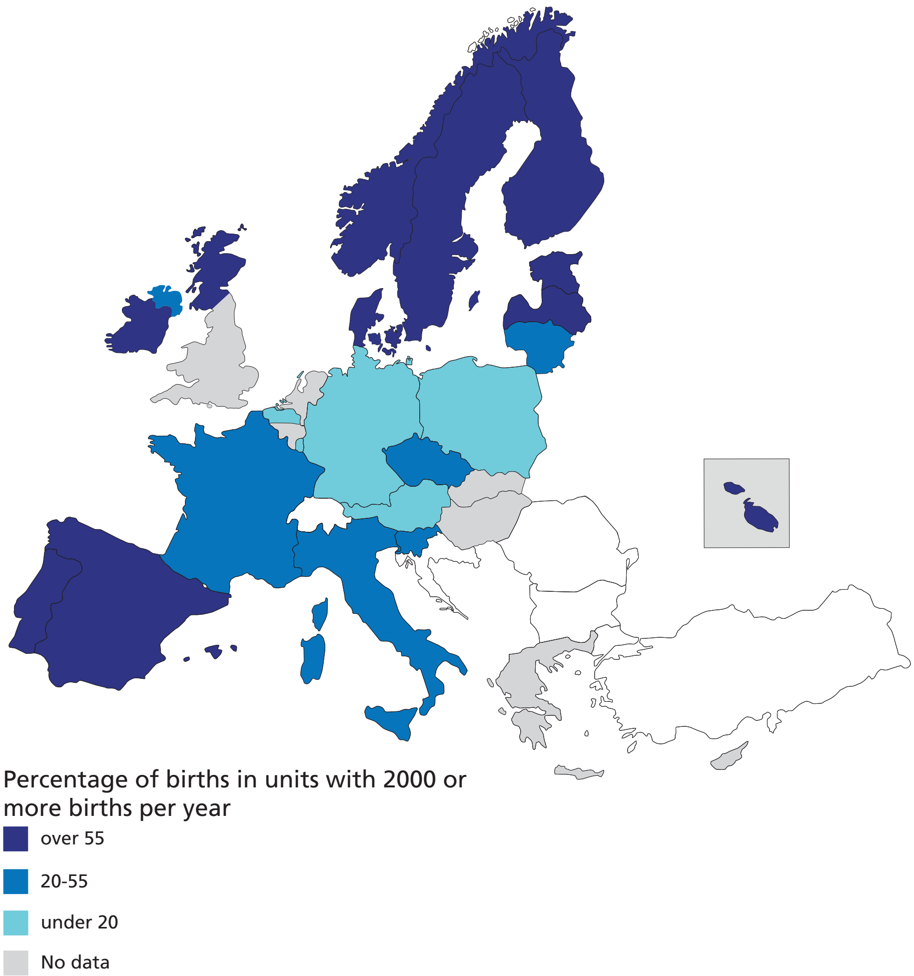


Figure 5.6 **Percentage of births in maternity units with 2000 or more deliveries per year**



5.6 BREAST FEEDING AT BIRTH

INDICATOR TITLE: (R10) BREAST FEEDING IN THE FIRST 48 HOURS AFTER BIRTH PER 100 LIVE BIRTHS

Justification

Breast feeding during the first 48 hours after birth is an important indicator because such feeding is beneficial for the baby's health and because its success often depends on the support, information, and assistance of healthcare professionals during pregnancy and the immediate postpartum period.[1-3] Breast feeding is considered to give babies crucial benefits, including important nutritional advantages and improved resistance to infections.[4,5] Although recommendations about the length of time breast feeding should continue vary substantially between and within countries, there is general agreement about its benefits for babies and thus about the importance of the initial postpartum intake.[6] Records of feeding in the first 48 hours provide an indication of support to women and their newborns.

Definition and presentation of indicator

Babies breast fed in the first 48 hours after birth are defined as: (i) the number of newborn babies who are exclusively breast fed (baby receives breast milk and is allowed to receive drops and syrups) or (ii) the number of newborn babies who receive mixed food (baby receives breast milk and is allowed any food or liquid including non-human milk), or it can be defined as its opposite (iii) the number of newborns who are not breast fed throughout the first 48 hours of age as a percentage of all newborn babies.[7]

This indicator provides one measure in the perinatal period, which is complemented by recommended indicators from the CHILD and EURODIET projects of the Health Monitoring Programme, both of which extend past the perinatal period and through infancy.

Breast feeding in the first 48 hours after birth is presented as a percentage of all newborns. Figure 5.7 shows the percentages and distribution of babies who are exclusively, mixed, and not breast fed during the first 48 hours.

Data sources and availability of indicator in European countries
As Figure 5.7 shows, data on breast feeding are available from 13 countries (Czech Republic, Spain, France, Ireland, Italy, Latvia, Malta, the Netherlands, Poland, Slovenia, the Slovak Republic, Sweden, and the UK). These data come mostly from population-based surveys and hospital discharge data. Data on breast feeding in Cyprus will be collected soon. Denmark does not collect data on breast feeding because over 95% of all newborns in Denmark are breast fed exclusively for at least the first 48 hours. In Hungary approximately 40% of infants are breast fed exclusively during the first six months. The Netherlands and Poland could not distinguish between exclusive and mixed breast feeding. The Czech Republic provided percentages of breast feeding based on hospital discharge data for the years 2000-2005 combined.

Methodological issues in the computation, reporting, and interpretation of the indicator
There were differences in the period of breast feeding considered, even though the indicator specified feeding status in the first 48 hours. Many countries, such as Malta; Ireland, and the Slovak Republic, collect data on breast feeding at discharge, which may not always be close to 48 hours. France provided data on breast feeding collected from an interview at the second or third day post partum, while Sweden provided data on it at the age of one week. It is unclear how these differences in the time period at which the data are recorded affect estimates of breast feeding at birth.

Results
Figure 5.7 illustrates the large differences in rates of breast feeding in Europe. In some countries, almost all babies receive some breastmilk at birth (Czech Republic, Latvia, Slovenia, and Sweden). In these countries, most mothers were exclusively breast feeding their babies. Rates of breast feeding were also high in Italy, Poland, the Slovak Republic, and the Valencia region of Spain. Ireland had the lowest percentage (46%), followed by France (62%), Malta (68%), and the UK (76%).

KEY POINTS
Many countries were unable to provide data on this important indicator of child health and care at birth. In those countries that were able to provide data, rates of breast feeding at birth varied greatly. In some European countries, almost all newborns receive some breast milk at birth; in France and Ireland, rates are considerably lower.

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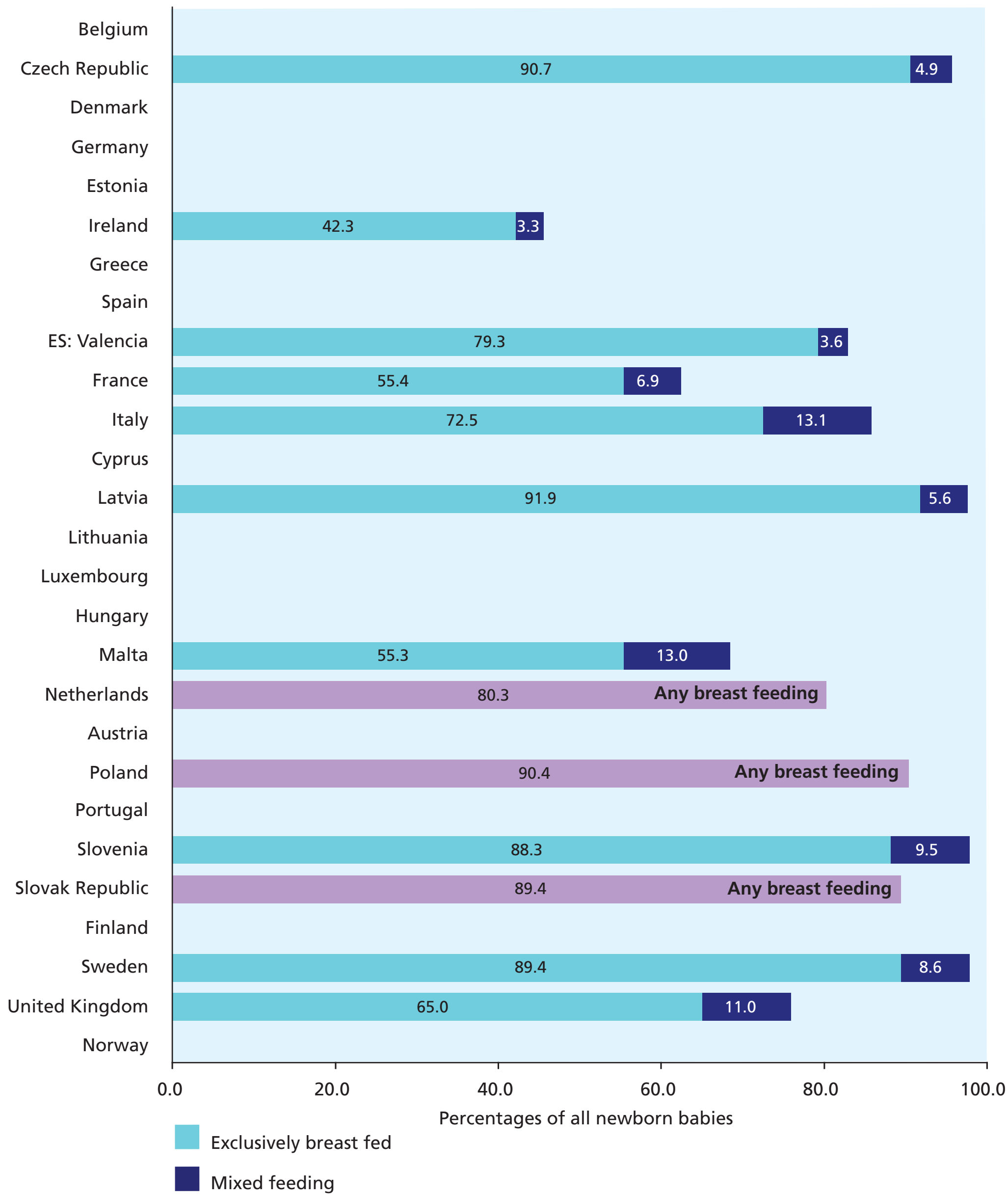
Figure 5.7 Distribution of exclusive and mixed breast feeding for the first 48 hours.



5.7 VERY PRETERM BIRTHS DELIVERED IN UNITS WITHOUT A NICU

INDICATOR TITLE: (R11) PERCENTAGE OF VERY PRETERM BIRTHS DELIVERED IN MATERNITY UNITS WITHOUT AN ON-SITE NEONATAL INTENSIVE CARE UNIT (NICU)

Justification
Access to intensive care for very preterm infants determines their survival and future quality of life. Most perinatal deaths and severe handicaps related to perinatal events occur in babies born before 32 weeks of gestation. The challenge is to provide these 1-1.5% of total births with the best access to specialised care. Birth at a maternity unit with an on-site neonatal intensive care unit (NICU), often called a level III unit, reduces their risk of mortality and morbidity.[1-5] These units concentrate technical expertise and experience for the care of very preterm babies, and the presence of an on-site NICU eliminates the need for transport by ambulance.

Definition and presentation of indicator
This indicator is defined as the proportion of all births (live and stillborn) between 22 and 31 weeks of gestation delivered in units without an on-site NICU. Because there is no consensus definition of an "on-site neonatal intensive care unit", we collected and present these data based on local classifications of units.

Data sources and availability of indicator in European countries:
Austria, Cyprus, Germany, Greece, Hungary, Ireland, Italy, the Netherlands, Norway, Poland, Sweden, and the UK provided no data on very preterm births by level of care. The two principal reasons for this are: 1) there is no agreed-upon classification for maternity units, and it is thus impossible to know what type of care they provide to very preterm babies, and 2) data are unavailable.

Methodological issues in the computation, reporting, and interpretation of the indicator
The principal difficulty in interpreting this indicator is the absence of a common definition of a NICU. Future work on this indicator should focus on developing a common European classification.

RESULTS
Table 5.2 provides information on the types of classifications of maternity units in European countries. This indicator makes it possible to determine whether countries have policies to define maternity units appropriate for the care of very preterm babies and whether information is routinely collected for evaluating these policies. Many countries have official classifications for specialised maternity units that provide on-site neonatal care. There was, however, significant variation in the classifications, especially the number of levels of care. In some countries, all maternity units appear to have a neonatal ward, but in others there are maternity units without on-site neonatal units. Some countries also have "intermediate" levels that provide some neonatal care for high-risk babies. Classifications of levels of care even when they use similar labels (such as level I, II, and III) are probably not comparable and the structures classified as most specialised undoubtedly have quite different characteristics in different countries.[6]

This may explain in part the wide variation in the proportion of very preterm babies born in the highest level of care. This percentage varied widely from about one-third in Latvia to over 90% in Denmark and Malta.

KEY POINTS

Many, but not all, countries in Europe have clearly designated levels of care that make it possible to define specialised maternity units where high-risk babies should be born. Most of these countries also have data on their place of birth. The proportion of very preterm babies born in the most specialised units varies widely.

It would be useful to develop a common European classification for maternity and neonatal units to facilitate monitoring the care of these high-risk babies.

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Table 5.2 Existence of "level of care" classifications for maternity units and percent of very preterm babies born in the most specialised units

Country	Lowest level	Intermediate I	Intermediate II	Highest level		% of babies born in highest level
BE: Flanders		Level II	--	Level III (maternity unit with intensive care for mothers and newborns)	Official classification	68.0
Czech Republic	Other hospitals	Intermediate care perinatal centre	--	Regional perinatal centre	Official classification	85.8
Denmark	Without a neonatal or paediatric unit	--	--	With a neonatal or paediatric unit	Code used to classify units (code 80)	94.0
Estonia	Lower level	--	--	Higher level (maternity units with NICU to which high risk pregnancies are referred)	Unofficial classification	89.3
ES: Valencia	Without NIC			With NIC (maternity unit with NICU)	Official classification	38.0
France	Level 1	Level 2A	Level 2B	Level 3	Official classification	61.7
Latvia	Level I	Level II		Level III	Official classification	33.0
Lithuania	Level I (outpatient antenatal maternity centre)	Level IIA (district hospitals without NICU)	Level IIB (Regional hospitals with intensive care)	Level III (University hospitals with intensive care)	Official classification	67.8
Luxembourg	300-499 births/year, obstetrical service without neonatology	500-999 births/year, without neonatology		1999 births/year, obstetrical unit with neonatology unit	Unofficial classification	63.2
Malta		No NICU but all other facilities		Maximum level (including NICU)	Only one hospital on the islands has an official NICU	96.9
Portugal		Level II		Level III	Official classification	93.2
Slovenia		Level 2 no NICU		Level 3 with NICU	Official classification	88.0
Finland	Other hospitals	Regional hospitals	Central Hospitals	University Hospitals	University hospitals, central hospitals, regional hospitals, other hospitals	81.5

5.8 POSITIVE OUTCOMES OF PREGNANCY: BIRTH WITHOUT OBSTETRIC INTERVENTION

INDICATOR TITLE: (F7) BIRTH WITHOUT OBSTETRIC INTERVENTION

Justification

Concern about rising levels of obstetric intervention and the focus on adverse outcomes gave rise to a debate about how to define and achieve "normal birth".[1-2] The World Health Organisation published the following definition of a normal birth in 1997.

> "Spontaneous in onset, low-risk at the start of labour and remaining so throughout labour and delivery. The infant is born spontaneously [without help] in the vertex position [head down] between 37 and 42 completed weeks of pregnancy. After birth mother and baby are in good condition."[3]

This definition includes both the process and the outcome but the latter is difficult to assess without more complete data than usually found in routine data collection systems. Attempts to devise a proxy measure of "normality" have thus reflected the need to construct it largely from data recorded routinely to monitor intervention rates and thus relate mainly to process. In the UK, the group BirthchoiceUK worked with the Department of Health to devise an indicator of normality in which

> "a normal delivery is one without induction, without the use of instruments, not by caesarean section and without general, spinal or epidural anaesthetic before or during delivery. Excluded are any other procedures not relating to an unassisted delivery except repair of laceration."

Deliveries following augmented labour are therefore included in this definition of normal births because of the absence of any information about augmentation. For some years this definition has been used to construct data about "normal" births in England and Scotland, data included in official publications and published in parallel on the BirthchoiceUK web site.

To develop an indicator for EURO-PERISTAT a review was undertaken of data items recorded in participating European countries. Draft indicators were constructed based on the data actually available in the member states of the EU and were circulated for discussion. It was found that very few countries had data about anaesthesia, but some had data about augmentation. It was decided to construct an indicator of birth without obstetric intervention. A preferred indicator of "straightforward delivery", Option 1, was defined as the percentage of women who gave birth after spontaneous onset of labour without induction and had spontaneous vaginal delivery, without augmentation of labour or an episiotomy but only the Czech Republic, Germany, Estonia, the Netherlands, Slovenia, and Finland were able to provide the data to construct this indicator. This was mainly because augmentation of labour was not recorded elsewhere. For this reason, only Options 2 and 3 are presented here. In addition, there were incompatibilities in the data provided for the Czech Republic and Germany.

Definition and presentation of indicators of straightforward delivery

Straightforward delivery, Option 2

Spontaneous onset of labour (no induction)
Spontaneous delivery (with or without augmentation)
No episiotomy

Denominator: Number of women delivering one or more live or stillborn babies.

Option 3, the minimum definition, was used for countries that record no information about episiotomy.

Straightforward delivery Option 3

Spontaneous onset of labour (no induction)
Spontaneous delivery (with or without augmentation)

Denominator: Number of women delivering one or more live or stillborn babies.

Data sources and availability of indicator in European countries

The Czech Republic, Germany, Estonia, Latvia, Malta, the Netherlands, Slovenia, Finland, England, and Scotland provided data for Option 2. These countries plus France provided data to construct Option 3. As the data for the Czech Republic and Germany showed incompatibilities with the data about the state of the perineum provided for indicator F3, they were omitted.

Methodological issues in the computation, reporting, and interpretation of the indicator

Anaesthesia and analgesia could not be included in the definition because so few countries had relevant data. Methodological issues relevant to the reporting of this indicator have already been discussed in the sections on mode of delivery, onset of labour, and state of the perineum.

Results

Using the Option 2 definition, the percentage of straightforward deliveries ranged from 26.2% in Malta and 32.9% in Slovenia to 55.7% in Finland, 57.5% in Estonia, and 59.1% in Latvia. Elsewhere the percentage varied from 49 to 70%. When the less stringent Option 3 definition was used, the percentage of straightforward deliveries changed very considerably in some countries and very little in others, depending on their use of episiotomy, as Figures 5.7 and 5.8 show. This percentage ranged from 39.9% in Malta to 71.9% in Estonia, 74.4% in Latvia, and 76.7% in Finland.

KEY POINTS

The percentages of births which were deemed to be straightforward were sensitive to the selection of data items to be included in the definition. This means that year to year changes in the constituent interventions may influence the overall percentage disproportionately. Even so, the most striking feature is the wide range within each definition. As with C10, method of delivery, and R8, onset of labour, this points to wide differences in the extent of obstetric intervention and raises questions about the evidence base for it. In order to construct better indicators of "normal birth" a fuller range of data items should be recorded and links with outcome and women's views of their care should be established. In addition, the debate about what constitutes "normality" in childbirth continues both between and within countries and healthcare systems.

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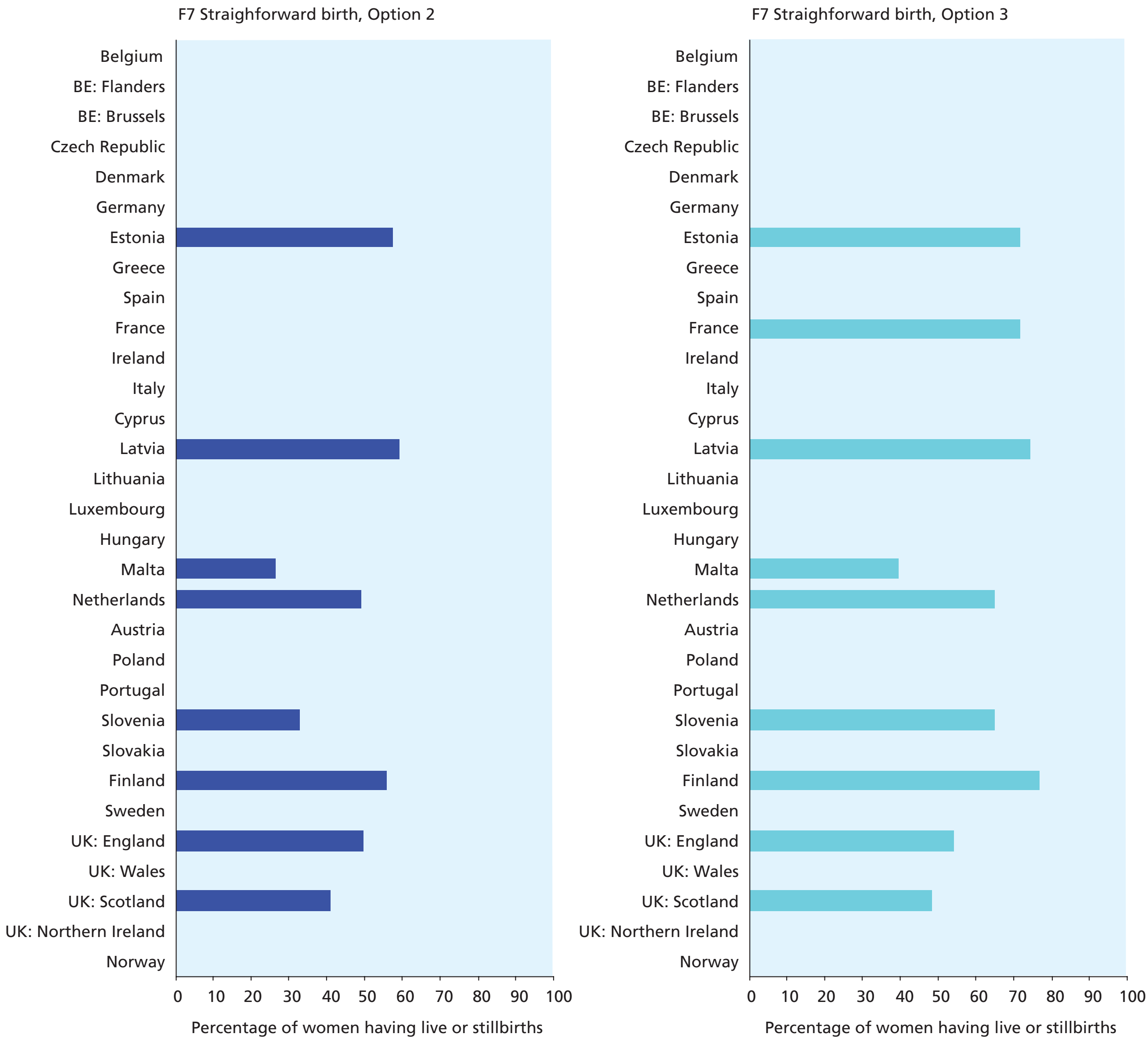
Figure 5.8 Births without obstetric intervention, option 2 and 3



5.9 STATE OF THE PERINEUM

INDICATOR TITLE: (F3) STATE OF THE PERINEUM

Justification

The aim of episiotomy is to prevent severe perineal tears. Its use became more common in the first half of the 20th century, with the move from home to hospital birth and the greater involvement of obstetricians in maternity care.[1] Policies of routine use of episiotomy were instituted in some settings, particularly in the United States and Latin America, but also in Europe. This policy was called into question by a midwife-led trial in West Berkshire, England, in the early 1980s[2,3] and by others conducted elsewhere.[1]

The routine use of episiotomy has also been questioned by women who want a more "normal" birth. The performance of an episiotomy substantially changes the percentage of births defined as without intervention (indicator F7), especially in contexts where rates are high. A Cochrane review to assess the effects of restrictive use of episiotomy compared with routine episiotomy during vaginal birth concluded that restrictive episiotomy policies appeared to have a number of benefits compared to routine episiotomy policies.[1] It therefore seemed appropriate to compare the rates of episiotomy and vaginal tears in Europe.

Definition and presentation of indicators

These indicators are defined as the percentage of women who delivered vaginally and had an episiotomy, and the percentage of women who delivered vaginally and had a tear, by degree of severity of tear.

Data sources and availability of indicators in European countries

Most of the data came from hospital databases. Episiotomy data were available for Flanders, the Czech Republic, Denmark, Germany, Estonia, the Valencia region of Spain, Italy, Latvia, Malta, the Netherlands, Slovenia, Finland, England, Scotland, and Norway. Data about tears were available only for Denmark, Germany, Estonia, Valencia, Italy, Portugal, Slovenia, the Slovak Republic, Finland, England, and Scotland. Norway provided data on 3rd and 4th degree tears only.

Methodological issues in the computation, reporting, and interpretation of the indicator

Estonia recorded only third- and fourth-degree tears, while Valencia and Slovakia recorded all tears but not their severity. As the rationale for episiotomy is linked to severe tears, Figure 5.8 shows only second- and third-degree tears, and the latter were combined with fourth-degree tears, both because of difficulties in making the distinction between them and because they occur in only a small percentage of all vaginal deliveries. Data for Italy included all live and stillbirths after 180 days of gestational age. Data were not collected about the number of women who had an intact perineum, with neither an episiotomy nor a tear.

Results

Episiotomy rates varied widely: roughly 80% of vaginal deliveries in Valencia and Portugal, 50-67% in Flanders, the Czech Republic, Italy, and Slovenia, to only 16.4% of those in England and 9.7% in Denmark.

The percentage of women with vaginal deliveries who had a third- or fourth-degree tear ranged from 0.2% in Italy, 0.3% in Slovenia, and 0.4% in Portugal to 3.5% in Denmark. Norway also reported that 3.5% of women had 3rd and 4th degree tears (data not in graph). Percentages of women with second-degree tears ranged from 1.4% in Finland to 3.0% in Italy and 3.1% in Portugal

KEY POINTS

The wide variations in the use of episiotomy illustrate the variability in medical practices that exists between the countries in Europe. The very highest rates were observed in places where medical intervention during pregnancy is highest, but there were no clear patterns at a lower level. Because of the small numbers of countries with data on tears, it was not possible to speculate about possible inverse associations with episiotomy rates, and we had no available data about the proportions of women with intact perinea.

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Figure 5.9 Episiotomy rates

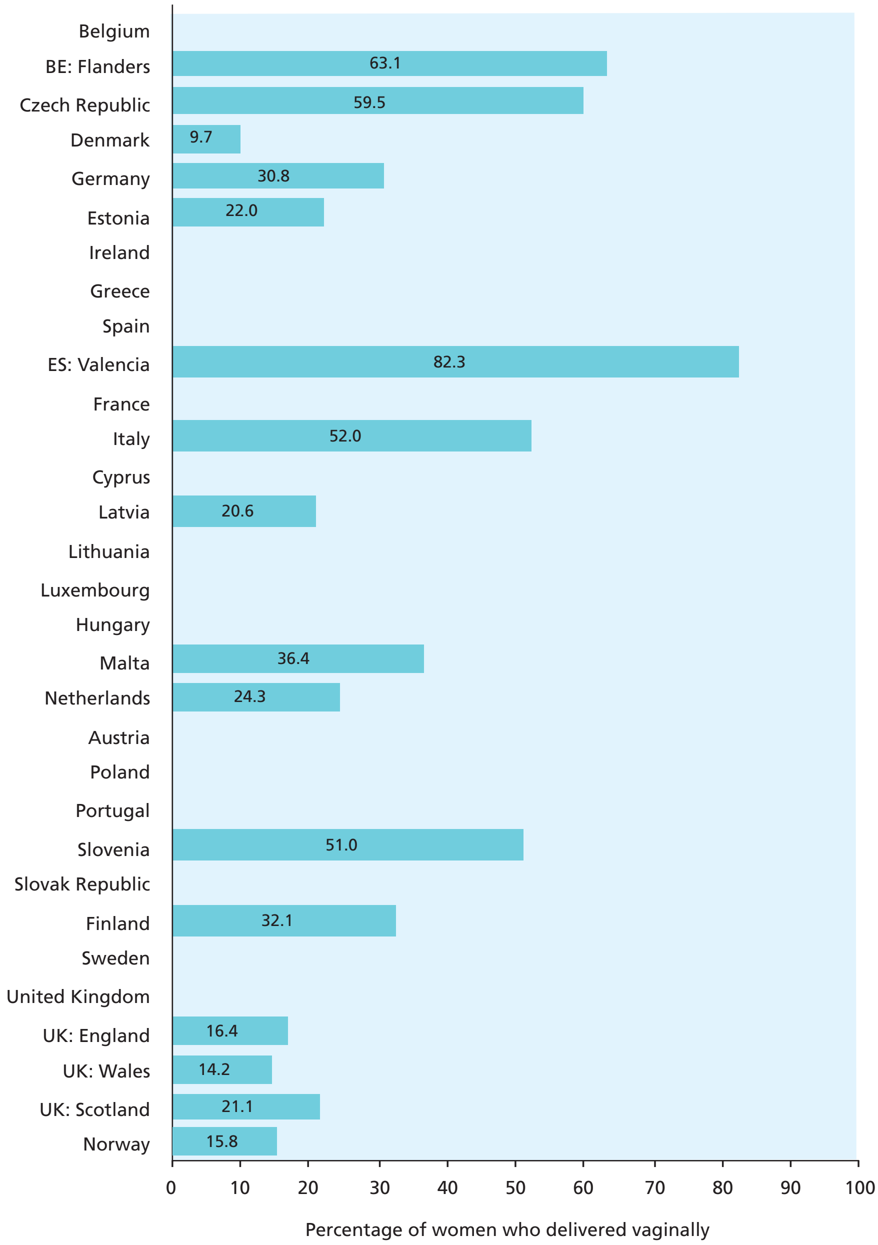
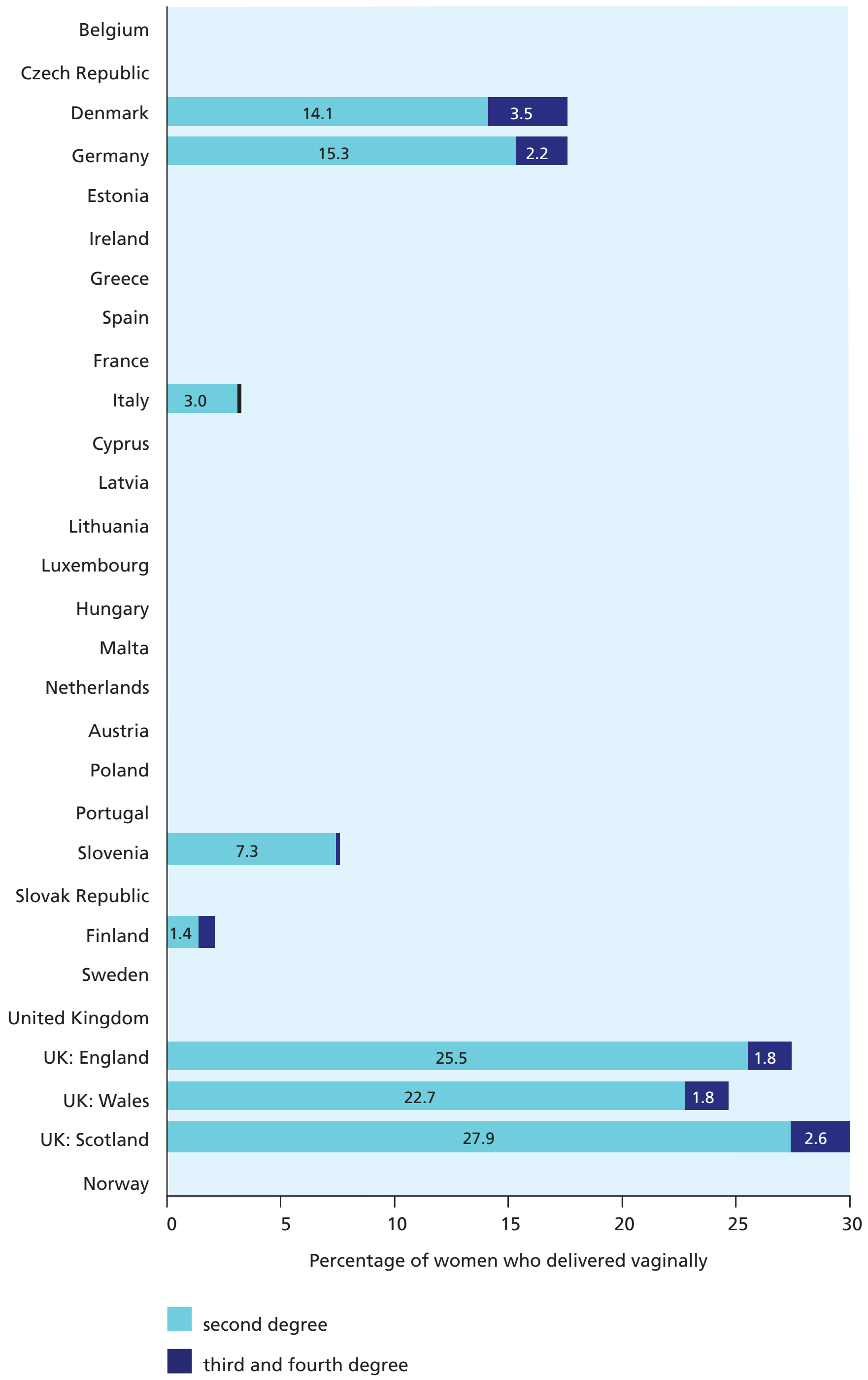


Figure 5.10 Vaginal tears by severity



6

MOTHERS' HEALTH: MORTALITY AND MORBIDITY ASSOCIATED WITH CHILDBEARING

6 MOTHERS' HEALTH: MORTALITY AND MORBIDITY ASSOCIATED WITH CHILDBEARING

CORE

Maternal mortality ratio by age, mode of delivery

RECOMMENDED

Maternal mortality ratio by cause of death
Prevalence of severe maternal morbidity

Each year more than five million women give birth in the EU. Another two million women have failed pregnancies – spontaneous and induced abortions as well as ectopic pregnancies. Maternal mortality is considered a major marker of health system performance, and overall each year from 335 to 1000 women die in Europe during and because of pregnancy or delivery. Maternal mortality results from several much more frequent obstetric complications and diseases. Maternal morbidity is not, however, measured well, mainly because there is no international agreement about its definition and thus about methods for estimating its prevalence.

Maternal health has received less scientific attention over the years than the health of babies. The EURO-PERISTAT group nonetheless agreed that indicators of maternal health were indispensable and included these in the EURO-PERISTAT project.[1] This category includes both mortality and morbidity – an indicator that has come to be seen in recent years as highly informative and important.[2]

Although there remain some difficulties in ensuring the application of internationally approved definitions, the indicators of maternal mortality and obstetric causes of death are well constructed. Maternal death is defined as the death of a woman while pregnant or within 42 days of the termination of pregnancy, irrespective of the duration and site of the pregnancy, for any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. Maternal deaths are subdivided into direct and indirect obstetric causes of death. A special chapter of the 10th revision of the International Classification of Diseases (ICD-10) is devoted to the set of obstetric causes of death.[3]

The situation is very different for maternal morbidity, an indicator that has no widely agreed-upon definition. This lack of consensus became apparent during the first phase of the EURO-PERISTAT project. Although the group had identified severe maternal morbidity as an important indicator, there was little agreement on its definition or available data sources. Accordingly, this data collection exercise sought to gain a preliminary understanding of the indicators of severe maternal morbidity available in Europe. These morbidity data are presented in this chapter along with the indicators of maternal mortality routinely collected in Europe: maternal mortality ratios (MMR), MMR by age group, MMR by mode of delivery, and maternal deaths classified by obstetric causes.

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6.1 MATERNAL MORTALITY RATIOS

INDICATOR TITLE: (C6) MATERNAL MORTALITY RATIO (MMR) BY MATERNAL AGE AND MODE OF DELIVERY

Justification

Maternal mortality in Europe is not simply a "concern of the past."[1,2] This indicator is a proxy for the probability that a woman will die during a single pregnancy and a major marker of the performance of the health system in a given country.[3] In any developed country with a generalised high level of care for a population with access to health care, each maternal death can be seen as avoidable. Maternal deaths in Europe are therefore sentinel events that raise questions about the administration of effective treatment and the provision of substandard care.

Beyond providing statistics, studying the circumstances that surround maternal mortality – the chain of events that lead up to each death – helps to prevent these avoidable deaths in the future. Confidential enquiries into maternal deaths are conducted in many European countries, with especially strong traditions in France, the Netherlands, and the United Kingdom. These investigations serve as a powerful tool for identifying weaknesses in the provision of care and recommending improvements to health policy makers.[4,5]

Because not all member states conduct confidential enquiries, routine collection of the MMR is important to help us make comparisons and understand trends over time. Comparing the MMR between European countries can help to identify factors related to maternal deaths within each country.

Definition and presentation of indicator

The MMR is the number of all maternal deaths, from the first trimester of pregnancy until 42 days post partum, from direct and indirect obstetric causes, per 100 000 live births.

Our definition of maternal death is that published by WHO in ICD-10.[3] Because the number of annual cases is so low in most countries, we used data covering at least two years (2003 and 2004).

Data sources and availability

The sources differ by country, but the data are generally extracted from national cause-of-death data systems, which record deaths coded according to ICD-10. All countries contributed data except Cyprus, Ireland, and the Slovak Republic.

Methodological issues in the computation, reporting, and interpretation of the indicators
The first major difficulty in assessing maternal mortality is that maternal deaths tend to be under-reported.[3,6] Not all deaths that are directly or indirectly associated with childbearing are so recorded. The European countries (Austria, France, Finland, the Netherlands, and the UK) that have implemented a specific system to analyse maternal deaths have also conducted studies showing that underestimation of maternal deaths varies from 30% to 50%, depending on the initial level recorded in the routine national cause-of-death records.[3,5,6]

The second difficulty comes from the small numbers recorded and the resulting statistical variability. Taken together, these two problems make it difficult to compare one country with another. For example, no maternal death was registered in Malta in the years covered in our data exercise. This does not necessarily mean that Malta has a lower maternal mortality ratio; with about 4000 live births a year, if Malta had the average European MMR – about 6.6 per 100 000, we would expect to 0.5 maternal deaths per year or one every two years, and there is a large probability that no maternal deaths would occur at all in any given year or even two-year period.

Results
The total number of maternal deaths officially reported by country and by year varied from zero in Slovenia in 2004 (compared with four in 2003) and in Malta to 55 in both France and the UK in 2003. To address the difficulties described above related to the low numbers of deaths, maternal mortality ratios were calculated with data from two years combined, as shown in Table 6.1. Data for Luxembourg cover a period of 5 years. Nonetheless, the number of deaths for some countries is still very low, and it would be useful to have data over a longer time span for comparisons.

Among the countries reporting these data, the highest ratio was observed in Estonia with 29.6 per 100 000 live births, compared with 0 in Malta (see Table 6.1 and the map in **Figure 6.1**). Of the countries between these two extremes, four – Belgium, Austria, France, and Hungary – had ratios around the mean level derived for the EU as a whole from the national data provided (6.6 per 100 000 live births).

Because of the methodological difficulties described above, it is difficult to interpret differences between the European member states. A common methodology for collecting, classifying, and verifying deaths is necessary to obtain a consistent picture and to make comparisons possible. Generally speaking, however, the maternal mortality ratio in Europe is low, due both to a very low fertility level (less than 1 child per woman) and high levels of care. We can consider, however, that there should be no maternal deaths at all, and in that case even one death can be considered a warning signal of some dysfunction in the provision of care. Implementing confidential enquiries into all pregnancy-related deaths can make it possible to understand what happened and to propose recommendations for prevention.

The map (Figure 6.1) presents three levels of MMRs. The highest and darkest (MMR> 9.9) are principally located in eastern Europe, while the lowest and lightest are in the south (Spain, Italy, Greece) and centre (Sweden, Germany) of Europe. It is noteworthy that the countries that have enhanced their system of recording maternal deaths also have high to medium levels of maternal mortality. The implementation of systems to improve ascertainment leads to more complete identification of maternal deaths that would otherwise be missed, and to higher reported MMRs.[5]

Figure 6.2 presents the MMRs by maternal age group. In view of the small numbers, we pooled the data from contributing countries and focused on three age groups: under 25 years, 25-34 years, and 35 years and over. This figure illustrates the association between maternal age and maternal mortality. The MMR for women aged 35 years or older is about twice as high as that for women aged 25-34 years and three times higher than those younger than 25. Detailed data for each country can be found in Appendix B. The number of deaths in each group, which can be small, must be borne in mind when interpreting these data.

Only 11 European member states provided maternal deaths by mode of delivery. Eight of those 11 also provided data on maternal deaths for which the mode of delivery was not stated. Note that there can be maternal deaths among women who do not deliver if the death occurs in the first or second trimester of pregnancy. We do not know how mode of delivery was recorded for these cases. Table 6.2 presents available data on MMR associated with vaginal and caesarean deliveries. These results show that MMRs are higher in cases of caesarean section. This finding is expected, for the caesarean section is usually performed because of the maternal complication associated with the death, even though it has been shown that caesarean sections are an independent risk factor for mortality.[7]

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Table 6.1 Maternal mortality ratio (numbers and ratios per 100 000 live births) in 2003-2004

Country/coverage	Number of live births	Number of maternal deaths			Maternal Mortality Ratio per 100 000 live births
		All	Year 2003	Year 2004	
Belgium					
Flanders	119 167	5	4	1	4.2
Brussels*	32 400	2	1	1	6.2
Czech Republic	191 349	19	11	8	9.9
Denmark	129 466	12	7	5	9.3
Germany†‡	692 802	37	NA	37	5.3
Estonia	27 028	8	4	4	29.6
Ireland§					
Greece§	104 355	2	2	NA	1.9
Spain	896 472	41	20	21	4.6
France	1 529 280	107	55	52	7.0
Italy*†	539 066	17	17	NA	3.2
Cyprus§					
Latvia	41 340	5	3	2	12.1
Lithuania	61 017	6	1	5	9.8
Luxembourg†	27 252	2	total for five years		7.3
Hungary**	190 274	14	7	7	7.4
Malta	7 923	0	0	0	0.0
Netherlands	362 012	32	18	14	8.8
Austria	155 912	10	2	8	6.4
Poland	707 203	31	14	17	4.4
Portugal	221 945	17	8	9	7.7
Slovenia††	34 907	4	4	0	11.5
Slovak Republic§					
Finland	114 018	9	2	7	7.9
Sweden*	200 316	4	2	2	2.0
United Kingdom	1 411 545	108	55	53	7.7
England and Wales	1 261 190	91	45	46	7.2
Scotland	106 389	13	7	6	12.2
Northern Ireland	43 786	4	3	1	9.1
Norway	113 409	4	4	0	3.5

* Brussels, Italy, and Sweden provided data on maternal death without the number of live births. The number of live births was estimated by the number of live births from 2004, which was 16 200 for Brussels, 539 066 for Italy, and 100 158 for Sweden.

† Data on maternal deaths were provided for one year only by Germany (2004), Greece (2003) and Italy (2002), and for five years by Luxembourg (2000-2004).

‡ Germany provided data on maternal deaths by number of women (pregnancies) rather than by the number of live births.

§ Cyprus, Ireland, and the Slovak Republic provided no data on maternal deaths.

** Hungary provided data on maternal deaths for the years 2003 and 2004, but did not provide the number of live births for 2003. The number of live births for 2003 was estimated using the number of live births for 2004.

†† Slovenia provided data on maternal deaths for the years 2001 and 2002.

Figure 6.1 Map of maternal mortality ratios in European Union member states

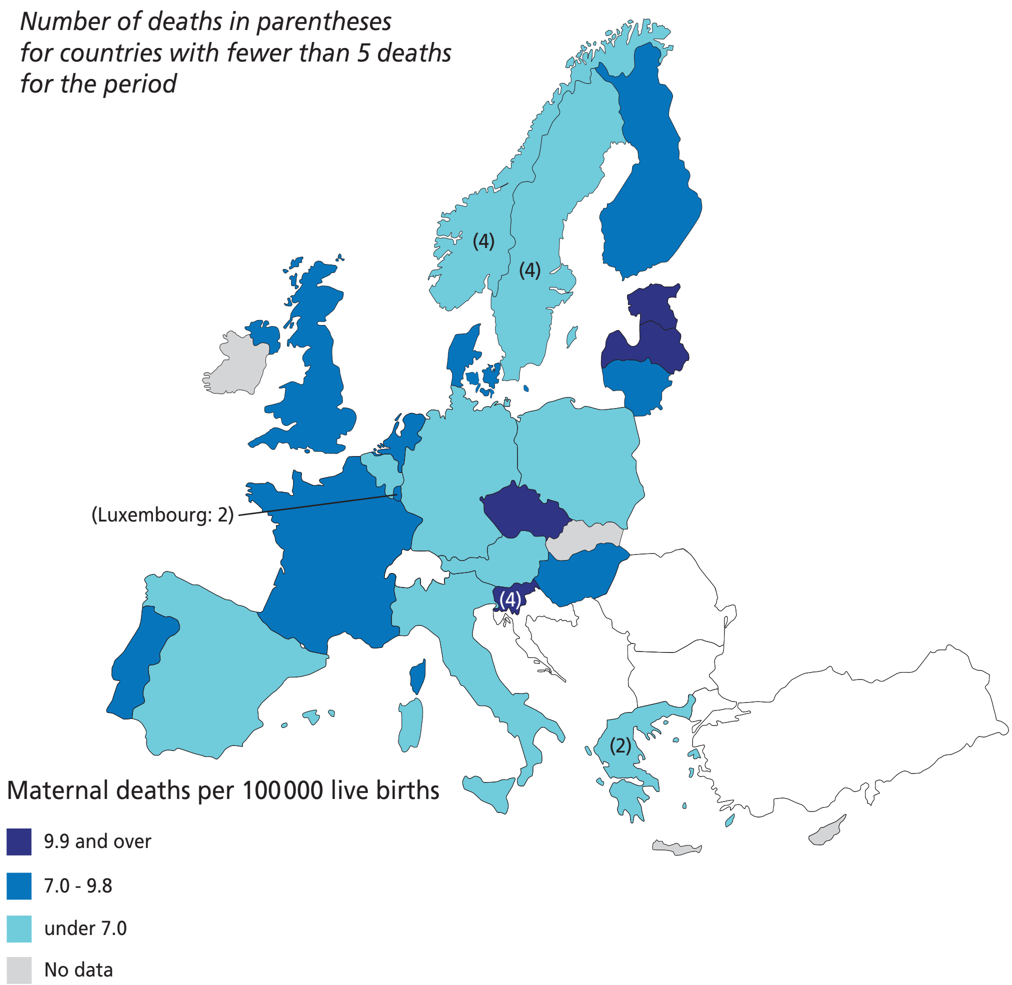

Figure 6.2 Maternal mortality ratios in Europe by maternal age

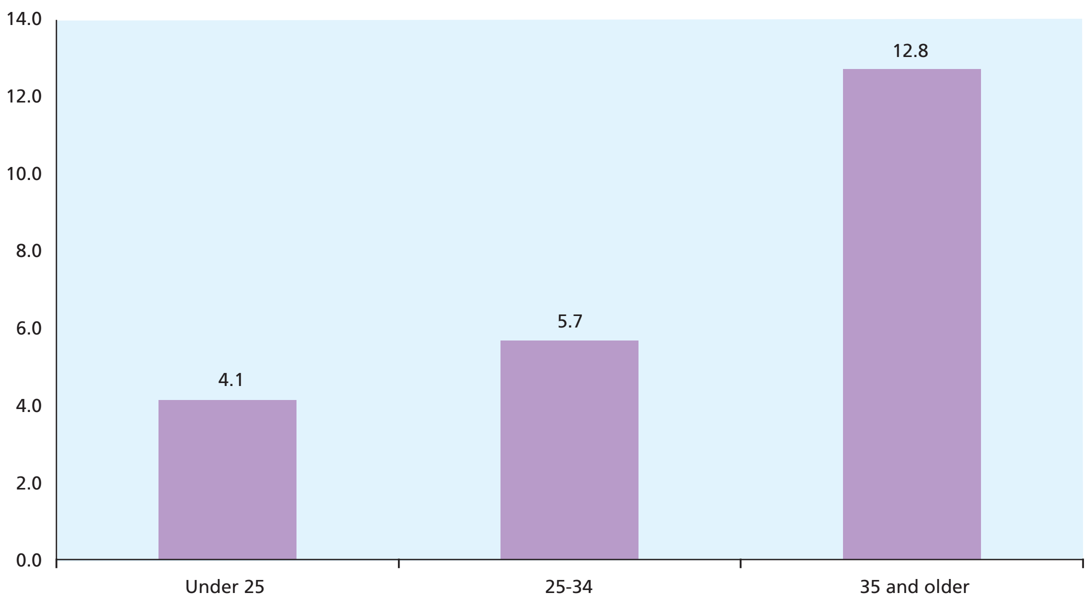

Table 6.2 Maternal mortality ratios by mode of delivery

	Mode of delivery				
Country/coverage	Spontaneous	Instrumental vaginal	Caesarean - no labour	Caesarean - during labour	Caesarean - total
Belgium					
Flanders	2.4	15.5	7.5	0.0	4.4
Czech Republic	3.9	32.8	0.0	12.7	6.7
Denmark	2.2	20.3	19.8	0.0	11.0
Germany*	3.6	5.4	15.0	13.4	14.2
Estonia†	9.2	0.0	0.0	128.8	80.7
Ireland					
Greece					
Spain					
France	2.4	5.5	NA	NA	20.5
Italy					
Cyprus					
Latvia	16.2	0.0	50.2	0.0	24.5
Lithuania					
Luxembourg					
Hungary‡§	5.2	0.0	NA	NA	12.3
Malta					
Netherlands‡	4.1	2.6	NA	NA	0.0
Austria					
Poland					
Portugal					
Slovenia	3.4	0.0	64.1	66.3	65.5
Slovak Republic					
Finland	3.4	13.5	11.4	9.5	10.3
Sweden					
United Kingdom					
Norway					

* Data from Germany is based on number of women (pregnancies) and includes births <22 weeks of gestation.

† Estonia provided data on maternal mortality by mode of delivery for the year 2004 only (4 maternal deaths).

‡ Hungary and the Netherlands provided data on maternal death and live births for total caesareans.

§ Hungary provided data on maternal deaths by mode of delivery for the years 2003 and 2004, but did not provide the number of live births by mode of delivery for 2003. These were estimated using the numbers from 2004.

6.2 CAUSES OF MATERNAL DEATH

INDICATOR TITLE: (R3) MATERNAL MORTALITY BY CAUSE OF DEATH

Justification
A useful aspect of the maternal mortality ratio is that it helps to show the association between maternal deaths and their causes. An earlier European study, the European Concerted Action on Mothers' Mortality and Severe Morbidity (MOMS), found that patterns of causes and timing of death and age-specific mortality ratios varied between countries with different levels of MMR. In countries with higher MMRs, a higher proportion of deaths resulted from haemorrhage and infections, whereas hypertensive disease and indirect obstetric deaths formed a higher proportion of the deaths in countries with lower MMRs.[1] Deaths from infection and haemorrhage are more often associated with substandard care.

Definition and presentation of indicator
Because of the small number of deaths in each country, we did not compute a MMR by cause of death. Instead we calculated the proportion of all deaths due to each specific cause by taking the number of deaths attributed to each category of causes as a proportion of total maternal deaths. Countries were asked to report the number of deaths that corresponded to the ICD-10 codes for the following causes: amniotic fluid embolism, other thromboembolic causes, hypertension, haemorrhage, chorioamnionitis/sepsis, abortion/ectopic pregnancy, anaesthesia, uterine rupture, other direct causes, indirect causes, or unknown cause.

Data sources and availability
The availability of the data generally depends on what information is written on death certificates and how this is coded by the national statistics office responsible for processing data from death certificates. There are two sorts of limitations: firstly, the same problem of under-reporting of deaths associated with pregnancy described above and, secondly, a specific problem of application of the coding rules recommended by the WHO in the ICD. A maternal death is usually the consequence of a series of unexpected obstetric complications and possibly also adverse social circumstances which in combination lead to the death of a woman who is generally young and in good health. As a result, the choice of the underlying cause and therefore its coding (attribution of the appropriate digit code of the ICD) is not easy and differs from one country to another. For example, before 1998 in France maternal deaths from pulmonary embolism were classified in the ICD chapter on respiratory diseases and not in the chapter on complications of pregnancy. We know that these differences exist between some of the European countries.[2]

Results
Appropriate interpretation of the causes of maternal deaths requires particular attention to the proportion of unknown causes. "Unknown" was selected as the cause of maternal death in 13.4% of EU cases, but countries varied dramatically in their attribution of cases to this category. Seven countries did not use this category at all, while others attributed many deaths to it. It was most heavily utilised by the Netherlands (18.8%), Belgium-Flanders (40.0%) and Germany (46.5%), as shown in Table 6.3.

Nevertheless, the general European profile of known direct obstetric causes of death, as presented in Figure 6.4, shows that postpartum haemorrhages (PPH) account for the greatest proportion of maternal deaths in the EU (13.1%). In countries that reported it as a direct obstetric cause of maternal death, its proportion ranged from 5.6% in the UK to 50% in Slovenia. Three other direct causes each accounted for around 9 to 10% of maternal deaths in the EU: thromboembolisms (10.4% overall, ranging from 3.2% in Poland to 25% in Slovenia), complications of hypertension (9.2%, ranging from 2.3% in Germany to 25% in Valencia, Spain), and amniotic fluid embolism (10.6%, ranging from 4.7% in Germany to 20% in Latvia and Estonia).

"Other direct obstetric causes" were reported as the cause of 16.7% maternal deaths in the EU. In the countries using this category, the percentage ranged from 3.1% in the Netherlands to 50% in Lithuania. Indirect obstetric causes were identified as the primary cause of maternal death in 16.9% of EU deaths, with a range from 0% in several countries to 50% in Austria and 60% in Latvia.

Overall, the variation in countries' utilisation of these three categories – other direct obstetric causes, indirect obstetric causes, and unknown – makes it difficult to draw broad conclusions about causes of maternal death in the EU or to make comparisons between countries. Germany, for example, attributed nearly 80% of deaths to "other direct", "indirect", or "unknown" causes and therefore reported very few deaths in every other category.

KEY POINTS

Maternal deaths occur today in relatively small numbers, but an analysis of their causes is essential for developing strategies to prevent them. Surveillance of maternal mortality by conducting confidential inquiries helps to improve our understanding of the healthcare system and how it performs and to make recommendations to prevent these tragic events. Better and more uniform coding and recording of the causes of maternal death in European countries would facilitate comparisons between countries and improve our understanding of the sequences of events that can lead to maternal death.

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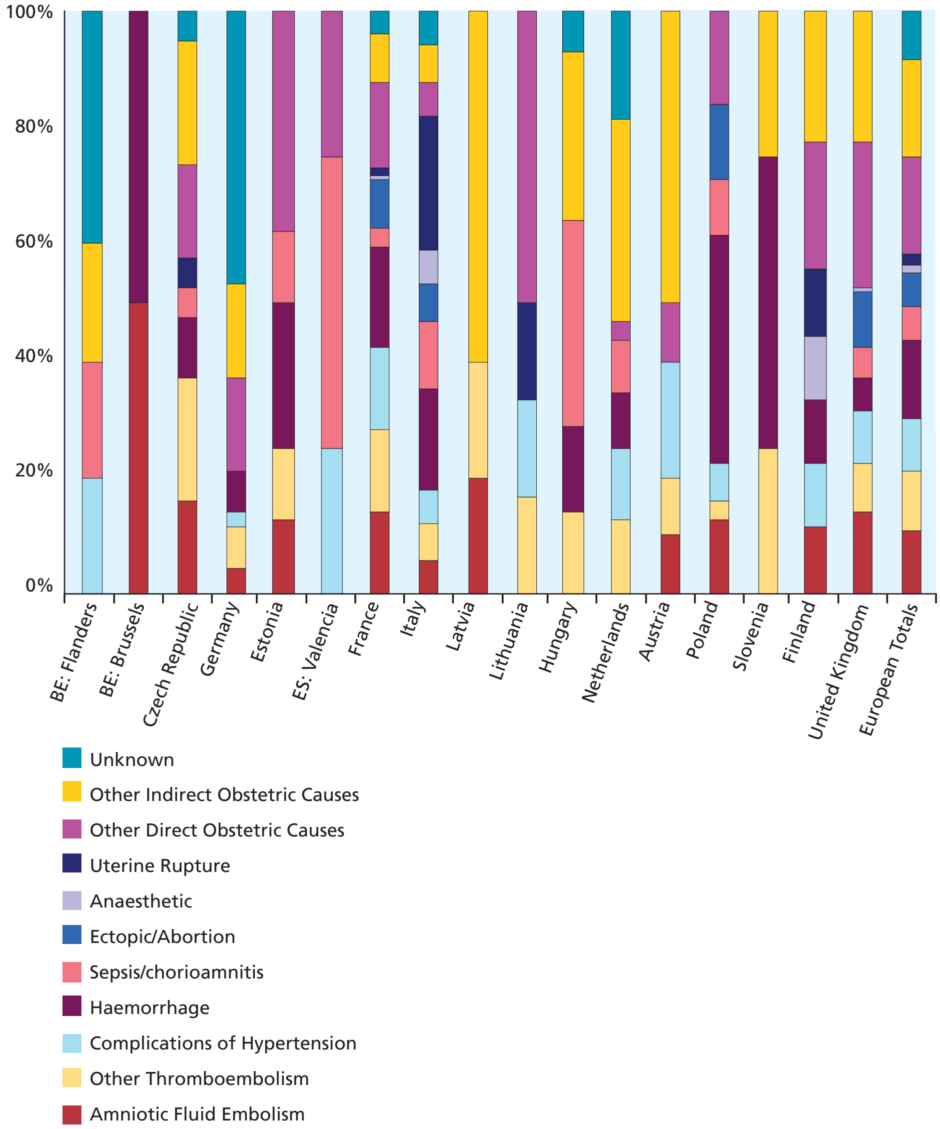
Table 6.3 Distribution of maternal deaths according to obstetric causes (in %) by country, in 2003-2004

Country/region	N Of DEATHS	AMNIOTIC FLUID EMBOLISM	OTHER THROMBOEMBOLISM	COMPLICATIONS OF HYPERTENSION	HAEMORRHAGE	SEPSIS CHORIOAMNITIS	ECTOPIC ABORTION	ANAESTHETIC	UTERINE RUPTURE	OTHER DIRECT OBSTETRIC CAUSES	OTHER INDIRECT OBSTETRIC CAUSES	UNKNOWN	TOTAL
Belgium													
Flanders	5	0.0	0.0	20.0	0.0	20.0	0.0	0.0	0.0	0.0	20.0	40.0	100
Brussels	2	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100
Czech Republic	19	15.8	21.1	0.0	10.5	5.3	0.0	0.0	5.3	15.8	21.1	5.3	100
Denmark													
Germany	43	4.7	7.0	2.3	7.0	0.0	0.0	0.0	0.0	16.3	16.3	46.5	100
Estonia	8	12.5	12.5	0.0	25.0	12.5	0.0	0.0	0.0	37.5	0.0	0.0	100
Ireland													
Greece													
Spain													
Valencia	4	0.0	0.0	25.0	0.0	50.0	0.0	0.0	0.0	25.0	0.0	0.0	100
France	107	14.0	14.0	14.0	17.8	2.8	8.4	0.9	0.9	15.0	8.4	3.7	100
Italy	17	5.9	5.9	5.9	17.6	11.8	5.9	5.9	23.5	5.9	5.9	5.9	100
Cyprus													
Latvia	5	20.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.0	0.0	100
Lithuania	6	0.0	16.7	16.7	0.0	0.0	0.0	0.0	16.7	50.0	0.0	0.0	100
Luxembourg													
Hungary	14	0.0	14.3	0.0	14.3	35.7	0.0	0.0	0.0	0.0	28.6	7.1	100
Malta	0												
Netherlands	32	0.0	12.5	12.5	9.4	9.4	0.0	0.0	0.0	3.1	34.4	18.8	100
Austria	10	10.0	10.0	20.0	0.0	0.0	0.0	0.0	0.0	10.0	50.0	0.0	100
Poland	31	12.9	3.2	6.5	38.7	9.7	12.9	0.0	0.0	16.1	NA	0.0	100
Portugal													
Slovenia	4	0.0	25.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	25.0	0.0	100
Slovak Republic													
Finland	9	11.1	0.0	11.1	11.1	0.0	0.0	11.1	11.1	22.2	22.2	0.0	100
Sweden													
United Kingdom	108	13.9	8.3	9.3	5.6	5.6	9.3	0.9	0.0	25.0	22.2	0.0	100
Norway													
Totals of data provided to EURO-PERISTAT	425	10.6	10.4	9.2	13.2	6.4	5.6	0.9	1.9	16.7	16.9	8.2	100

Figure 6.3 Profile of obstetric causes of maternal deaths by European country



6.3 SEVERE MATERNAL MORBIDITY

INDICATOR TITLE: (F2) SEVERE MATERNAL MORBIDITY PER 1000 WOMEN WITH LIVE AND STILLBORN BABIES

Maternal mortality is the measure traditionally used to evaluate the status of women's health in pregnancy. During the 20th century, however, maternal death rates have decreased dramatically: women die in childbirth quite rarely now in Europe and in other developed nations – around 0.1 for every 1000 births. This welcome decline has given rise, however, to concerns about the statistical power and validity of studies based on such small numbers. The rarity of maternal death in developed countries does not mean that pregnancy is a safe condition. For every maternal death, there are many serious, even life-threatening episodes of pregnancy complications. For example, research from the United States reports 128 hospital admissions for every 1000 deliveries,[1] and severe maternal morbidity has been estimated to occur at rates ranging from 9.5 to 16 cases per 1000 deliveries throughout Europe.[2] Other work to establish the level of maternal morbidity within different European countries has produced estimates ranging from 1.0 to 10.1 per 1000 deliveries, but there are no widely accepted definitions or inclusion criteria.[3-6]

The EURO-PERISTAT study set up a working group to conduct an extensive review of potential maternal morbidity indicators, to develop a consensus around their definition for EURO-PERISTAT, and to analyse the validity of morbidity indicators based on hospital data from participating countries. Results from this review were presented during a working group meeting in Porto (June 2008), and consensus was reached about the indicators of severe maternal morbidity that should be collected and validated. These included four indicators adopted during the first phase of the project (eclampsia, surgery, blood transfusion, and ICU admission), and embolisation, which was added as a fifth indicator.

Definition and presentation of indicator

The proposed EURO-PERISTAT indicator includes both management-based and disease-specific criteria. It is defined as the number of women experiencing any combination of the following conditions or procedures, as a proportion of all women with live and stillborn babies: eclamptic seizures, surgery (other than tubal ligation or caesarean section) or embolisation, blood transfusion, a stay of more than 24 hours in an intensive care unit, or embolisation.

Data availability

We had expected that these data on the prevalence of embolisation, eclampsia, blood transfusion, and surgery for postpartum haemorrhage would be easy to collect through the data files existing at the hospital level. We know that most member states have financial systems that allocate funding to the hospitals delivering care and consequently systems for recording the number of patients with conditions such as severe maternal morbidity. However, these systems do not appear to be able to produce data on these complications at this time.

Results

Sixteen member states provided at least one of the components of the maternal morbidity indicator, as shown in Table 6.4. Only three provided all the categories, however, including admission to an ICU: France, the Netherlands, and Germany.

Figure 6.5 presents MMRs for hysterectomy for postpartum haemorrhage and eclampsia, the two complications most frequently reported. This figure shows large disparities in these measures between countries. Further investigation is required to understand these differences.

KEY POINTS

This is the first time that an attempt has been made to gather data on severe maternal morbidity at the European level through routinely collected data. The only previous attempt to compare maternal morbidity in Europe involved a European Concerted Action limited to 14 countries[7] that used a specific survey. Our objective was to make use of existing routinely collected hospital data, but our results show that more research on these data will be necessary before a comparable measure of maternal morbidity can be included in routine reporting on the European level.

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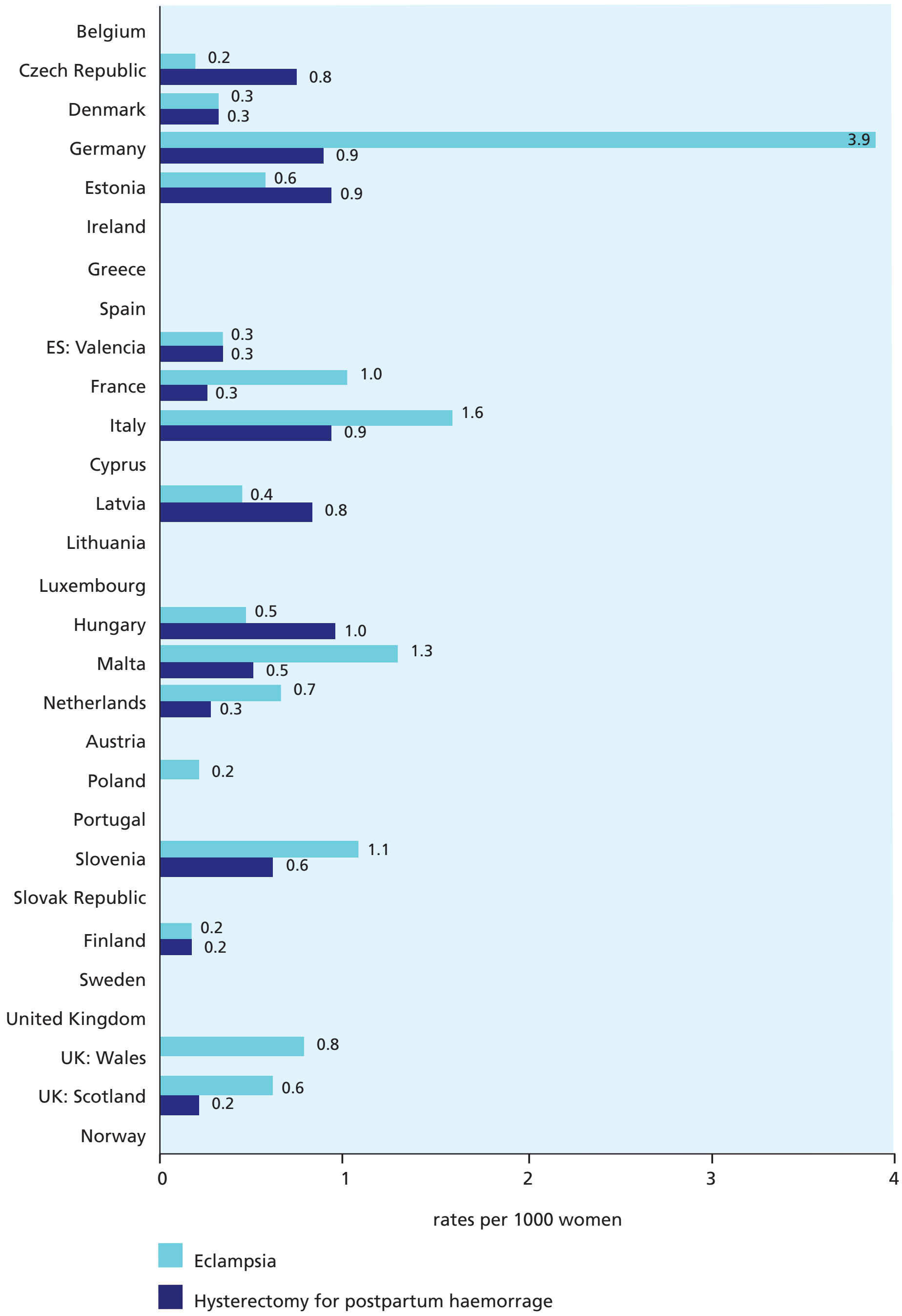
Table 6.4 Severe maternal morbidity rates

Country/ coverage	Number of women	Rates per 1000 women							
		Eclampsia	ICU admission	Blood transfusion				Hyster-ectomy	Embolisa-tion
				3 units or more	5 units or more	other amount	no units specified		
Belgium									
Flanders	59 956	NA	NA	NA	NA	NA	11.5	NA	NA
Czech Republic	96 771	0.2	NA	NA	NA	NA	NA	0.8	NA
Denmark	63 781	0.3	NA	0.2	0.1	5.9	5.1	0.3	0.0
Germany *†	636 844	3.9	2.8	NA	NA	10.7	NA	0.9	0.0
Estonia	13 879	0.6	NA	NA	NA	NA	NA	0.9	NA
Ireland									
Greece									
Spain									
Valencia	38 389	0.3	NA	NA	NA	NA	6.5	0.3	NA
France	774 870	1.0	0.5	NA	NA	NA	2.1	0.3	0.3
Italy	534 568	1.6	NA	NA	NA	NA	4.6	0.9	0.0
Cyprus									
Latvia	20 256	0.4	NA	NA	NA	NA	NA	0.8	NA
Lithuania									
Luxembourg									
Hungary	93 913	0.5	NA	NA	NA	NA	NA	1.0	0.0
Malta	3 838	1.3	NA	1.8	0.5	3.4	0.0	0.5	NA
Netherlands	187 910	0.7	2.2	NA	2.0	4.4	NA	0.3	0.3
Austria									
Poland	213 190	0.2	NA	NA	NA	NA	NA	NA	NA
Portugal									
Slovenia	17 629	1.1	NA	NA	NA	NA	10.6	0.6	NA
Slovak Republic									
Finland*	56 878	0.2	NA	NA	NA	NA	0.1	0.2	0.2
Sweden									
United Kingdom									
Wales	29 569	0.8	NA	NA	NA	NA	NA	0.0	NA
Scotland	53 342	0.6	NA	NA	NA	NA	NA	0.2	NA
Norway									

* Number of women delivering considered for calculating the eclampsia rate for Germany – 105336; Number of women delivering for calculation the rates of eclampsia for Finland - 4646.6

† Data from Germany is estimated from the region of Bavaria

Figure 6.4 **Maternal morbidity ratios for eclampsia and hysterectomy for postpartum haemorrhage**



7

BABIES’ HEALTH: MORTALITY AND MORBIDITY DURING PREGNANCY AND IN THE FIRST YEAR OF LIFE

7 BABIES' HEALTH: MORTALITY AND MORBIDITY DURING PREGNANCY AND IN THE FIRST YEAR OF LIFE

CORE

Fetal mortality rate by gestational age, birth weight, and plurality
Neonatal mortality rate by gestational age, birth weight, and plurality
Infant mortality rate by gestational age, birth weight, and plurality
Birth weight distribution by vital status, gestational age, and plurality
Gestational age distribution by vital status and plurality

RECOMMENDED

Prevalence of selected congenital anomalies (reported in Chapter 9)
Distribution of 5-minute Apgar scores

FURTHER DEVELOPMENT

Causes of perinatal death/deaths due to congenital anomalies

Outcomes related to the health of babies in the first year of life, specifically mortality rates, are often used as a measure of the health status of a population or of the quality of the perinatal healthcare system. The principal determinants of perinatal death include congenital anomalies, very preterm birth, and stillbirths associated with fetal growth restriction. Maternal age, parity, multiple pregnancies, maternal conditions such as preeclampsia and diabetes, socioeconomic and migration status, and behaviours such as smoking are well-known risk factors for perinatal mortality and morbidity in Western countries. The quality of care during pregnancy, delivery, and the neonatal period also influences the chances of mortality and morbidity in babies.

For live births, the risk of mortality and morbidity is directly related to the degree to which a birth is preterm. The highest death rates occur in babies born before 28 weeks of gestation and especially in those born before 26 weeks. Nonetheless, the morbidity and mortality rates of late preterm births, between 32 and 36 completed weeks of gestation, are also elevated compared to those of term births. Since late preterm births are on average five times more common than births before 32 weeks of gestation, the public health effects may be substantial. Since mortality is so closely related to the degree to which a baby is preterm, stratification of mortality by different gestational age groups is very important for purposes of comparison. The incidence of preterm birth has been increasing since the early 1980s in many Western countries. The causes of this increase are not fully clear. Major advances in neonatal care technology have improved the survival of very preterm infants markedly, but survivors often suffer long-term morbidity. Being small for gestational age (SGA), or growth restricted, is also related to perinatal mortality and morbidity, independent of duration of pregnancy. Within each gestational age group, lighter infants have worse survival chances.

Congenital anomalies, such as neural tube or cardiac defects, are related to the risk of mortality. Over 2% of babies have a major congenital anomaly, defined as those associated with high mortality or other serious medical or functional consequences. In this report, congenital anomalies are addressed in depth in the chapter contributed by EUROCAT, which presents data from EUROCAT registries as well as EURO-PERISTAT indicators on congenital anomalies.

European countries vary in their policies on the resuscitation of babies at the threshold of viability, and both neonatal and fetal death rates may be higher where there is less intervention in cases of very preterm birth. Mortality rates are also affected by policies and practices related to antenatal screening and termination of pregnancy for congenital anomalies. When terminations of pregnancy are registered as fetal deaths in routine systems, then fetal mortality rates increase as screening and termination policies become more active. On the other hand, when these pregnancies are not terminated, fetuses with lethal anomalies may die after birth and increase neonatal and infant mortality rates. When terminations occur before the legal limit for registration or when induced abortions are not included in official statistics, these deaths are not recorded. Both fetal and neonatal mortality rates are then lower. These issues are discussed in more detail below as well as in Chapter 9 on congenital anomalies.

7.1 FETAL MORTALITY RATE

INDICATOR TITLE: (C1) FETAL MORTALITY RATE

Justification
Half of all deaths in the perinatal period are fetal deaths. When analysed by gestational age and birth weight, the fetal mortality rate provides information on avoidable mortality and quality of perinatal care.[1-3] Fetal mortality is particularly subject to under-reporting at low gestational ages.[4,5] Computing rates by gestational age and birth weight is necessary to derive comparable indicators when registration practices diverge. Differences in policies and practices of screening for congenital anomalies also affect fetal mortality rates.[6,7] Fetal death can be divided into death before labour (antepartum death), and death during labour (intrapartum death). Fetal mortality can be decreased by improved general maternal health, by preconception care, and by adequate care during pregnancy and delivery.

Definition and presentation of indicators
The fetal mortality rate is defined as the number of fetal deaths at or after 22 completed weeks of gestation in a given year, expressed per 1000 live and stillbirths in the same year. Fetal mortality rates are presented in the appendix tables as the total fetal mortality rate, the rate for fetuses weighing ≥1000 g and the rate for fetuses at and over 28 completed weeks of gestation. Figure 7.1 presents the total fetal mortality rate and the mortality rate for births at and after 28 weeks of gestation. The percentage of fetal deaths by gestational and birthweight groups are also presented for all countries together in Figure 7.2 and for countries individually in the appendices. Fetal mortality rates are presented for singleton and multiple births in Figure 7.3.

Data sources and availability of indicators in European countries
Most participating countries and regions were able to provide data on fetal deaths according to the EURO-PERISTAT definition, despite differences in the rules for registering births. Chapter 3 provides details on the rules for registering fetal deaths in participating countries and the inclusion of these deaths in routine reporting systems. Countries that recorded only those fetal deaths with a birth weight of 500 g or more included Flanders, Germany, Austria, and Poland. Sweden has a gestational age limit of 28 weeks and Hungary of 24 weeks for the registration of stillbirths. In Luxembourg the official limit for recording stillbirths in the birth register is 28 weeks. Babies under this limit are

included by doctors, nurses, and midwives, but not systematically. In Ireland (National Perinatal Register) the limit is 500 g or 24 weeks of gestation. In the UK, fetal deaths <24 weeks of gestation are not registered, but there is voluntary notification of late fetal deaths at 22 and 23 weeks. Notifications from Scotland and Northern Ireland are included in the number of fetal deaths. Almost all countries could also provide fetal deaths by gestational age and birth weight. France could provide this data only for a small sample of births as it does not record the gestational age and birth weight of fetal deaths nationally. Greece provided these data for gestational age, but not for birth weight. Data sources include civil and medical registers and hospital discharge data.

Methodological issues in the computation, reporting, and interpretation of the indicator
Differences in European legislation governing the lower limit for inclusion of fetal deaths makes it difficult to compare rates at low gestational ages. Computing rates by gestational age and birth weight is necessary to derive comparable indicators when registration practices diverge. WHO recommends using a lower limit of 1000 g for international comparisons, but since the guidelines for registration are based primarily on gestational age, a cutoff based on gestational age is presented here. The EURO-PERISTAT project thus chose to present fetal mortality rates per 1000 total births at or after 28 weeks of gestation.

Another important issue relates to whether terminations of pregnancy are included as fetal deaths. Some countries include terminations of pregnancy in their registers of fetal deaths, while others record these births in separate registers. For instance, in Denmark, Italy, Germany, and Norway, terminations were not included in the statistics provided to EURO-PERISTAT as they are not in the register of fetal deaths. Italy provided us with data on terminations and spontaneous fetal deaths to derive estimates of the impact of including terminations on overall rates. Germany was able to provide the number of terminations at 23 weeks of gestation. In contrast, France and the Netherlands included terminations in fetal deaths. The project did not systematically ask for this information, however, since the different practices related to the registration of terminations of pregnancy came to our attention after the data had been collected. The number of terminations of pregnancy that occur at or after 28 weeks of gestation is low in most European countries,[7] so computing the fetal mortality using this cutoff point also partially addresses this problem.

Finally, even when the indicator of fetal mortality is constructed to be comparable, its interpretation must also take into consideration the legislation and policies on and practices of induced abortions for congenital anomalies that may be registered as fetal deaths. Separating out fetal mortality rates into spontaneous deaths versus terminations would be useful for understanding differences between countries.

Results
When all registration criteria were considered together, fetal mortality rates ranged from lows around 3 per 1000 live and stillbirths in Spain, the Slovak Republic, Luxembourg, Germany, and Sweden to 7.0 and 9.1 per 1000 in the Netherlands and France, respectively. Fetal mortality rates were much lower when computed only for births at or after 28 weeks of gestation; these ranged from 1.7 per 1000 live and stillbirths in the Slovak Republic to 4.9 per 1000 in Latvia and France. France has the highest overall fetal mortality rate (9.1), due in large part to the practice of late terminations of pregnancy.[7] Because France does not include gestational age in its civil registration data, it was not possible to estimate a national rate of death with a 28 week gestational age cutoff. Using data from the perinatal survey, however, made it possible to produce an estimate of 4.9 per 1000 for fetal mortality for births at 28 weeks or later. While this rate was high, it was more in line with rates in other European countries, such as Scotland (4.6) and the Netherlands (4.3).

Data provided by Italy, where terminations are recorded in a separate register, made it possible to compare fetal mortality rates with and without terminations in this country. If the 570 recorded terminations are added to spontaneous fetal deaths, the total fetal mortality rate becomes 6.5 per 1000 total births versus 5.4 per 1000 without terminations. In Germany, 200 terminations were recorded at 23 or more weeks of gestation; the total number of spontaneous fetal deaths in Germany at all gestations was 2261. In Denmark, pregnancy terminations after 21 weeks are estimated to be rare, about 3 per year.

Close to 30% of fetal deaths occurred to babies delivered before 28 weeks of gestation and weighing less than 1000 g, as shown in Figure 7.1, which illustrates the distribution of fetal deaths by birth weight and gestational age for all countries that contributed data about all deaths occurring at or after 22 weeks of gestation. About one third of fetal deaths occurred to babies at term or over 2500 g. These data are provided for each country in the data tables in Appendix B.

Figure 7.2 illustrates the higher risks of fetal mortality associated with multiple births. Multiples have a risk of fetal death from two to four times higher than singletons. The fetal mortality rates for multiples should be interpreted with caution because of the small numbers of cases in many countries.

KEY POINTS

There is a large variability in fetal mortality rates in European countries. Some of this variation is due to differences in definitions, related to lower limits for inclusion of deaths as well as whether terminations of pregnancy are included.

A priority for European information systems in the future is to standardise inclusion criteria for fetal deaths. While excluding the most immature babies makes rates more comparable, a significant proportion of deaths occur in the very preterm period, and this information is important for the surveillance of perinatal health.

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Figure 7.1 Fetal mortality rate per 1000 total births

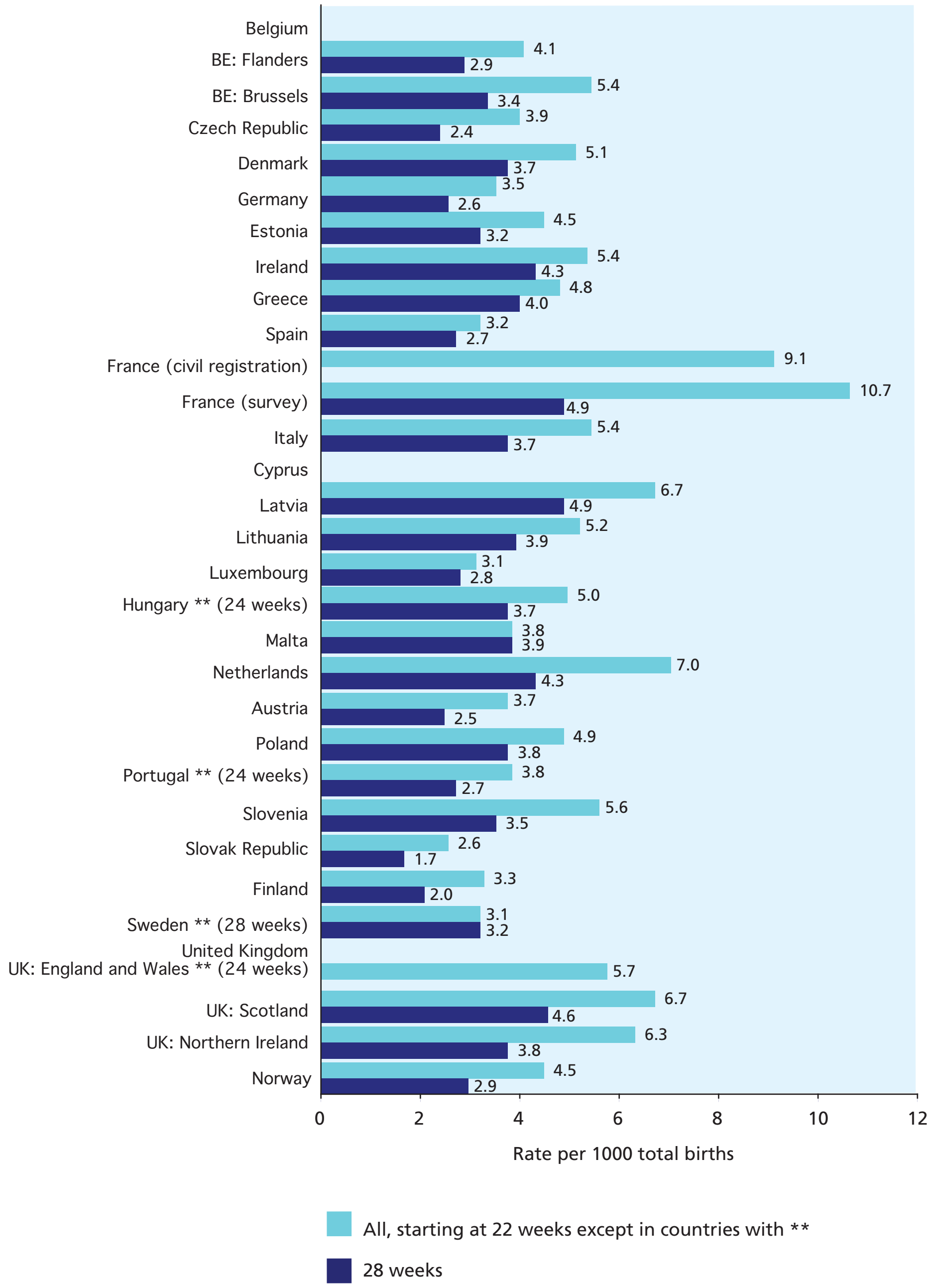


Figure 7.2 **Percentage of fetal deaths by gestational age and birthweight group in all countries contributing data**

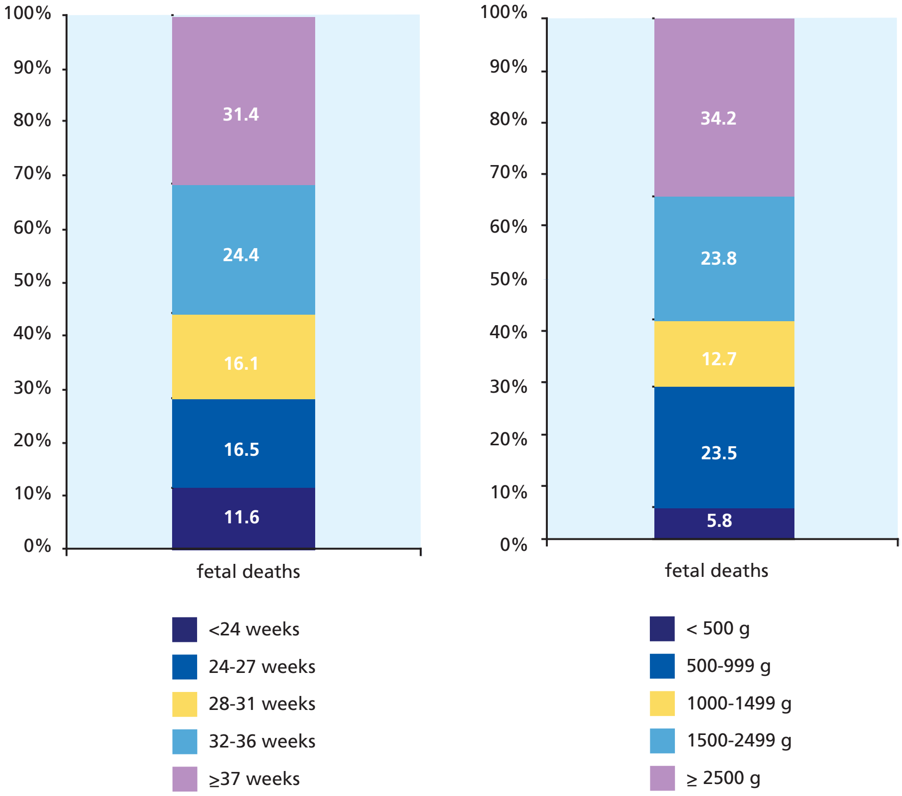
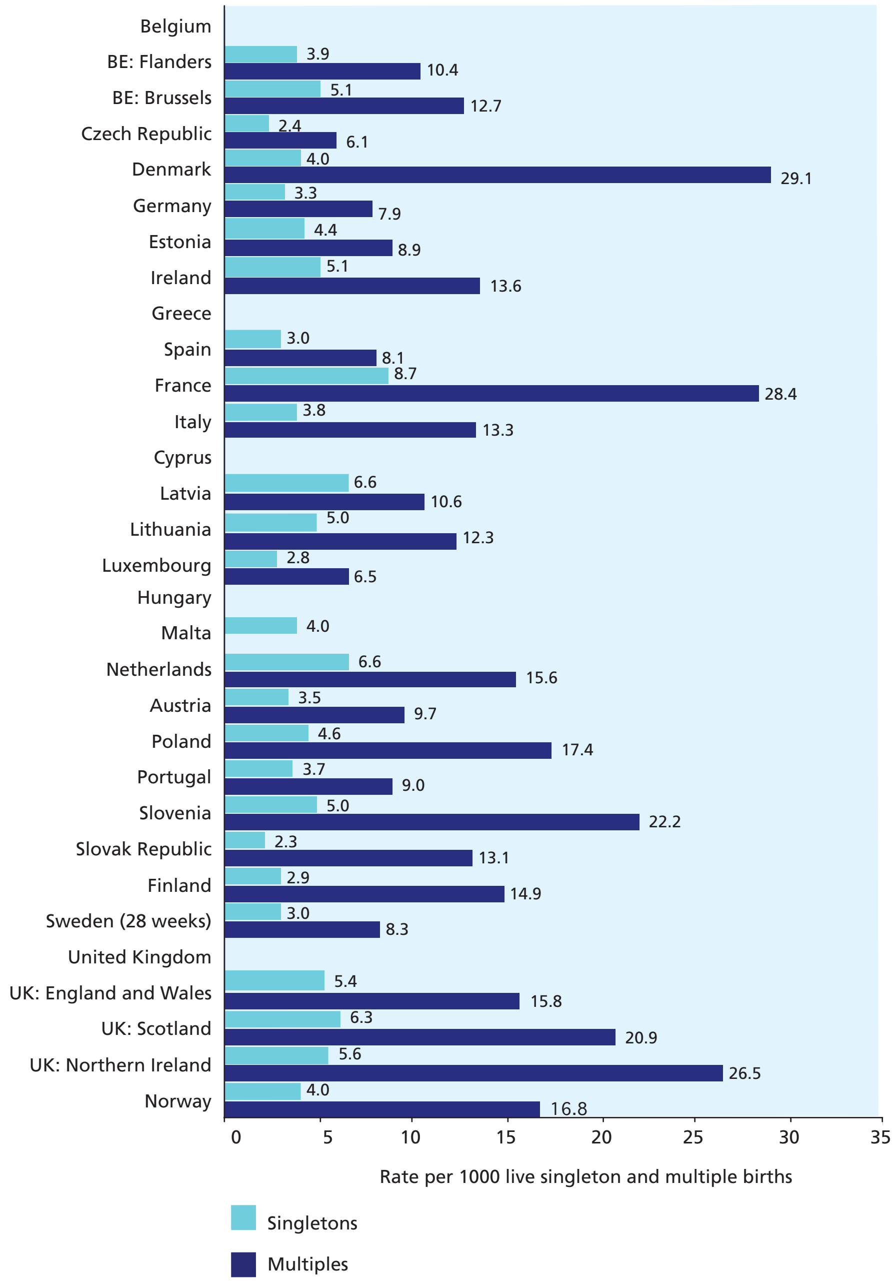


Figure 7.3 **Fetal mortality rate per 1000 singleton and multiple births.**



7.2 NEONATAL MORTALITY RATE

INDICATOR TITLE: (C2) NEONATAL MORTALITY RATE

Justification

The neonatal mortality rate is a sensitive measure of health in the perinatal period. Neonatal deaths are subdivided by timing of death into early neonatal deaths (at 0-6 days after live birth) and late neonatal deaths (at 7-27 days after live birth). When analysed by gestational age, birth weight, and plurality, the neonatal mortality rate provides a good comparative measure of outcome and is associated with the extent of early neonatal care. Most neonatal deaths are associated with preterm birth and congenital anomalies.[1,2] Care factors play a role; for example, for very preterm births, delivery in a maternity unit with on-site neonatal intensive care is associated with lower mortality.[3] Variation in neonatal mortality between countries may also reflect differences in policies between European countries related to the resuscitation of babies at the limit of viability.[4] Suboptimal care is associated with a substantial proportion of neonatal deaths that occur later in pregnancy and these factors contribute to an explanation of the variation in mortality rates between European countries.[5,6]

Definition and presentation of indicators:

The neonatal mortality rate is defined as the number of deaths during the neonatal period (up to 28 completed days after birth) at or after 22 completed weeks of gestation in a given year, expressed per 1000 live births in the same year. Neonatal mortality rates are presented below as early and late neonatal deaths and by plurality. The data tables in Appendix B present neonatal mortality rates per 1000 live births for specific gestational age and birthweight subgroups.

Data sources and availability of indicators in European countries

Most countries were able to provide data on neonatal deaths. Cyprus provided data on total neonatal deaths only. France, Greece, and Cyprus provided no data on neonatal deaths by gestational age, birth weight, or plurality. Italy provided no data on neonatal deaths by gestational age or birth weight. The Czech Republic and Hungary provided no data on neonatal deaths by gestational age or plurality. Finally, we note that the data from England and Wales on neonatal deaths by gestational age is for 2005, since this information was not available previously. While Luxembourg provided data on neonatal mortality, deaths at low gestational ages are under-ascertained because there are no clear rules about the lower limit for registration for births and deaths before 28 weeks of gestation.

Methodological issues in the computation, reporting, and interpretation of the indicators

Comparisons of neonatal mortality rates at early gestational ages must be combined with an analysis of fetal mortality rates, since it is possible that early neonatal deaths may be recorded as fetal deaths. Some data recording systems impose a lower limit of 22 weeks or 500 g for registration of births, which can create bias when comparing neonatal mortality rates at low gestational ages (see Chapter 3 and below, Figure 7.5). There is also the question of whether deaths pertain to the births in the given year or are defined as the deaths that occur in that year (even if the birth took place the previous year).

Results

The neonatal mortality rate ranged from around 2.5 per 1000 live births in Luxembourg, Cyprus, Sweden, and Norway to over 4.5 in Estonia (4.2), Latvia (5.7), and Poland (4.9). Most neonatal deaths occur in the 7 days following birth: 58% (Czech Republic) to 89% (Northern Ireland) of the total neonatal deaths were early neonatal deaths. Late neonatal death rates ranged from 0.3 to 1.9 per 1000 live births. Figure 7.5 illustrates the impact of removing births under 500 g from the computation of neonatal mortality rates. In countries where there is a 500-g limit for inclusion of live births in statistics, the two rates are the same. In other countries, however, live births under 500 g are registered and this can affect mortality rates, as seen for Denmark, the Czech Republic, Germany, Estonia, Hungary, the Netherlands, and the countries of the UK. Finally, Figure 7.6 reports rates for singletons versus multiples. Multiples are at a much higher risk of death in the neonatal period, due in large part to their higher probability of preterm birth. Multiples are from 4 to 8 times more likely to die in the neonatal period than singletons. Again, variations in the neonatal death rate for multiples must be interpreted cautiously, as the number of multiples can be low.

KEY POINTS

Neonatal mortality rates vary from about 2 to 5 per 1000 live births in Europe. Many countries with the highest neonatal mortality rates are newer member states. However, there is substantial variation between the older member states as well. These data raise questions about the reasons for these disparities in health outcomes. While methodological issues related to registration are less problematic for neonatal than for fetal mortality rates, the inclusion criteria of 500 g used in many countries results in lower neonatal mortality rates than in countries where there in no limit for inclusion. Differences in ethical decisions in cases of very preterm birth may also contribute to the variability observed.

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Figure 7.4 Early and late neonatal mortality rates per 1000 live births

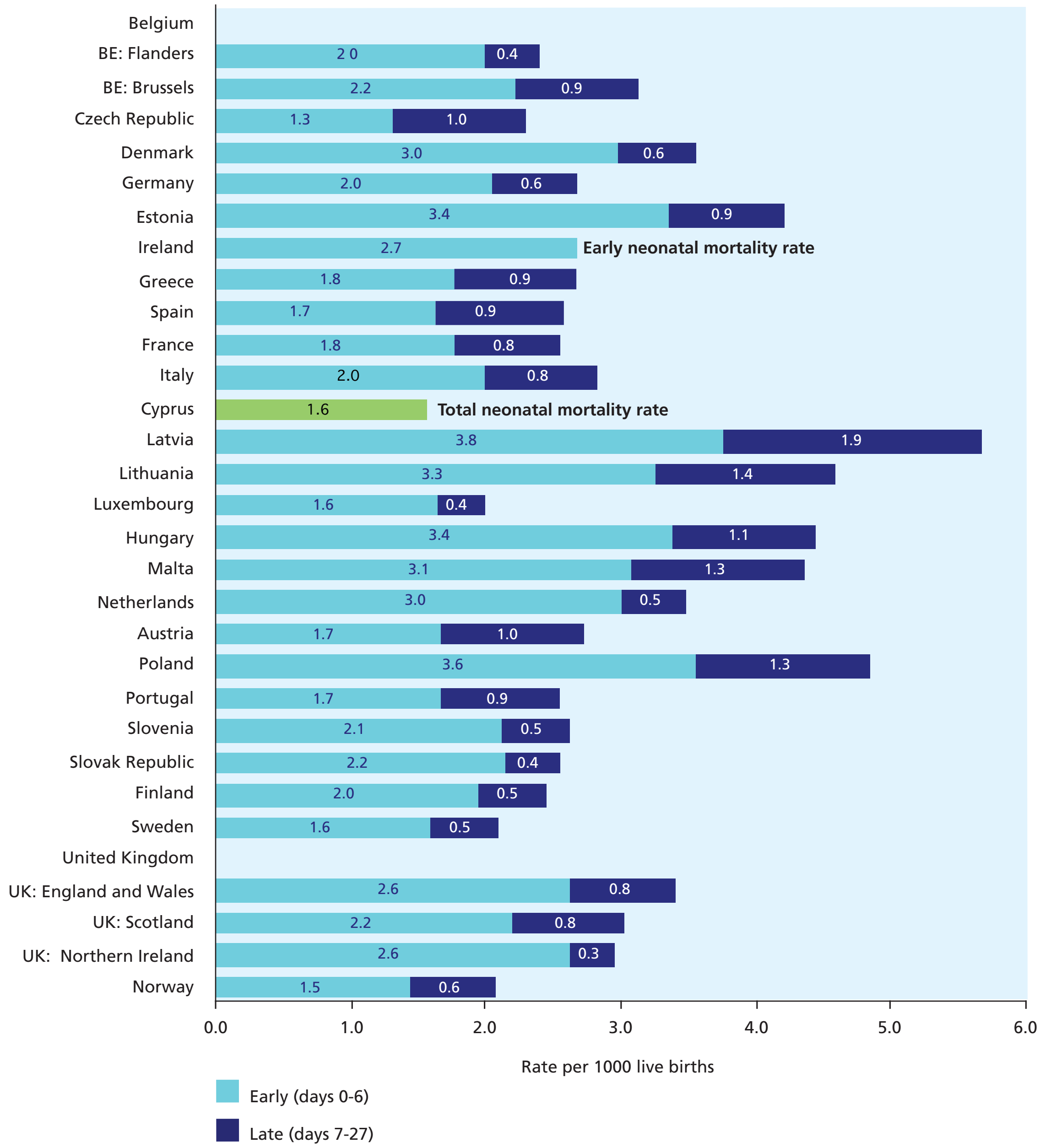


Figure 7.5 Neonatal mortality rates (with and without births less than 500 g)

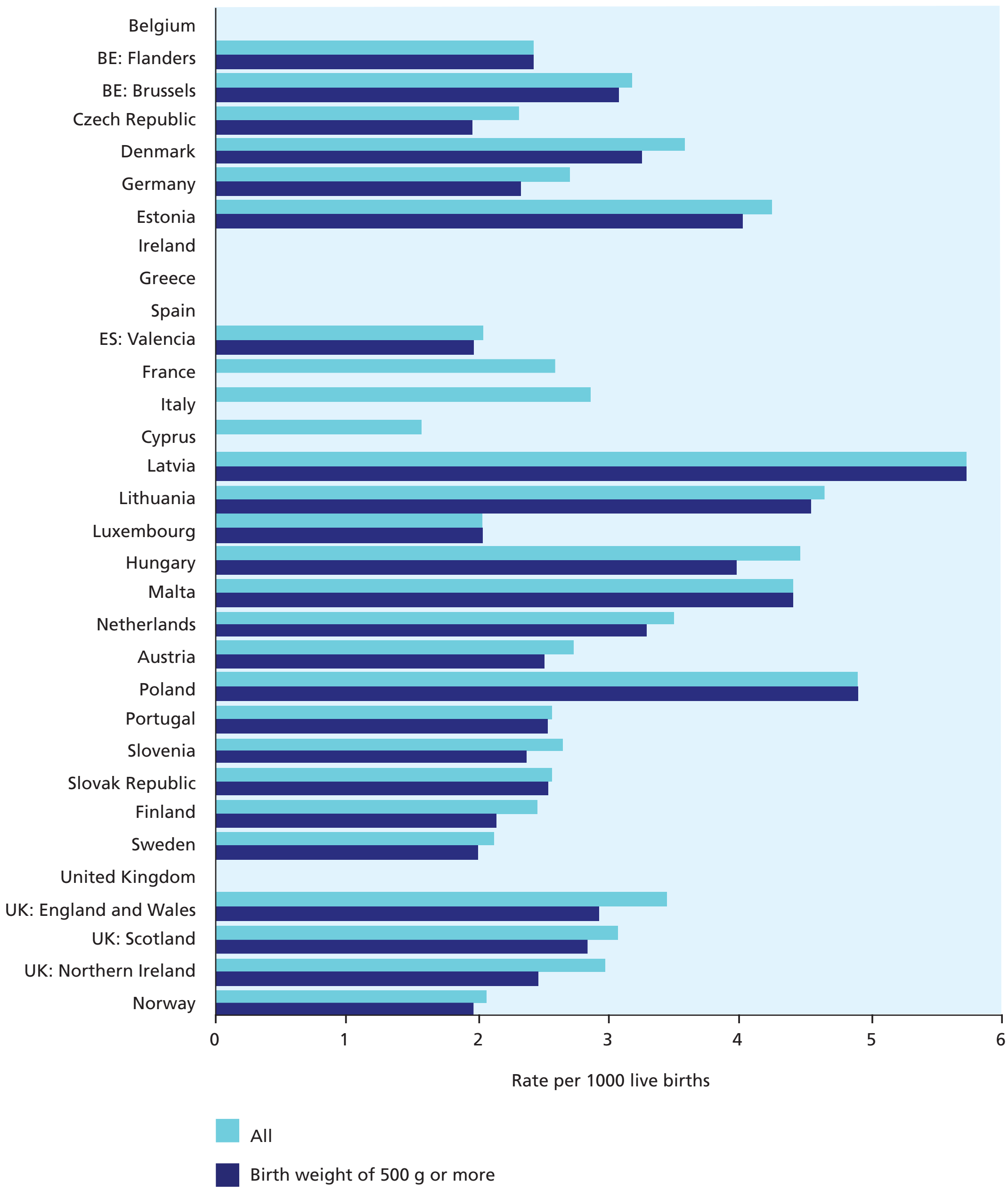
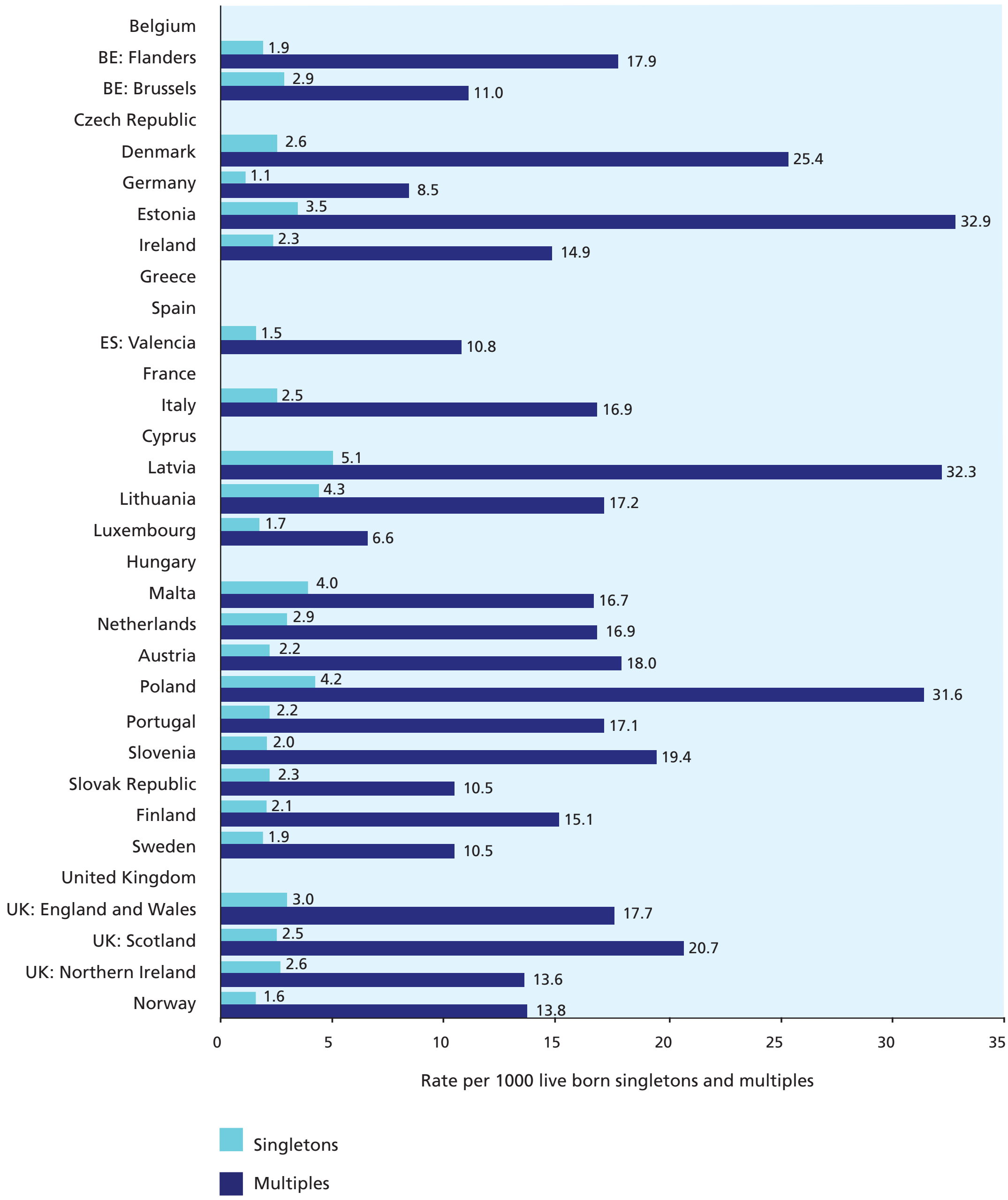


Figure 7.6 Neonatal mortality rates per 1000 live singleton and multiple births



7.3 INFANT MORTALITY RATE

INDICATOR TITLE: (C3) INFANT MORTALITY RATE

Justification

The EURO-PERISTAT group included the infant mortality rate (mortality during the first year of life) as a core indicator, even though it extends beyond the perinatal period. The infant mortality rate, when presented by gestational age and birth weight, measures the longer-term consequences of perinatal morbidity for high risk groups, such as very preterm and growth-restricted babies. While most infant deaths due to perinatal causes occur soon after birth, high risk babies hospitalised in neonatal units after birth can die after the neonatal period. Advances in neonatal care for these high risk babies are associated with a higher proportion of infant deaths after the neonatal period and should be taken into consideration in comparisons of mortality over time.[1,2.] The principal causes of death in the post-neonatal period include accidents and infections, which are often preventable, and the post-neonatal mortality rate is more highly correlated with social factors than is the neonatal mortality rate.[3-6] This indicator thus serves as a measure of the quality of medical care and preventive services.

Definition and presentation of indicator

The infant mortality rate is defined as the number of infant deaths (days 0-364) after live birth at or after 22 completed weeks of gestation in a given year, expressed per 1000 live births in the same year. The data tables in Appendix B present infant mortality rates per 1000 live births for specific gestational age and birthweight subgroups.

Data sources and availability of indicator in European countries

Almost all countries provided data on overall infant mortality rates. However, many fewer were able to provide data on infant mortality rates by gestational age or birth weight, since infant deaths are registered in separate systems and not linked to perinatal data. These data were available for gestational age only from Flanders and Brussels in Belgium, Denmark, Estonia, Latvia, Malta, Austria, Poland, Finland, Sweden, the UK, and Norway.

Methodological issues in the computation, reporting, and interpretation of the indicator

The same issues as those mentioned for registration of live births and the neonatal mortality rate apply here. Moreover, if these data are to be used for follow-up of high risk groups, birth cohort mortality rates would be appropriate.

Results

The infant mortality rate for babies born at or after 22 completed weeks of gestation ranged from 3.0 per 1000 live births in Sweden and Norway to over 6.5 per 1000 live births in Latvia (9.4), Lithuania (8.1), Hungary (6.6), Poland (6.8), and the Slovak Republic (7.0). Slovenia did not provide infant death rates in its perinatal system but estimated a rate of 3.7 per 1000 live births. In general, infant mortality was higher in new EU member states (range: 3.5-9.4 per 1000 live births) than in older EU member states (range: 3.0-4.9 per 1000 live births).

KEY POINTS

Infant mortality rates varied substantially between European countries, with rates highest among new member states.

Older member states were less likely to be able to present infant mortality data by gestational age and birth weight, which is necessary if this indicator is to be used to monitor longer-term outcomes of high risk births.

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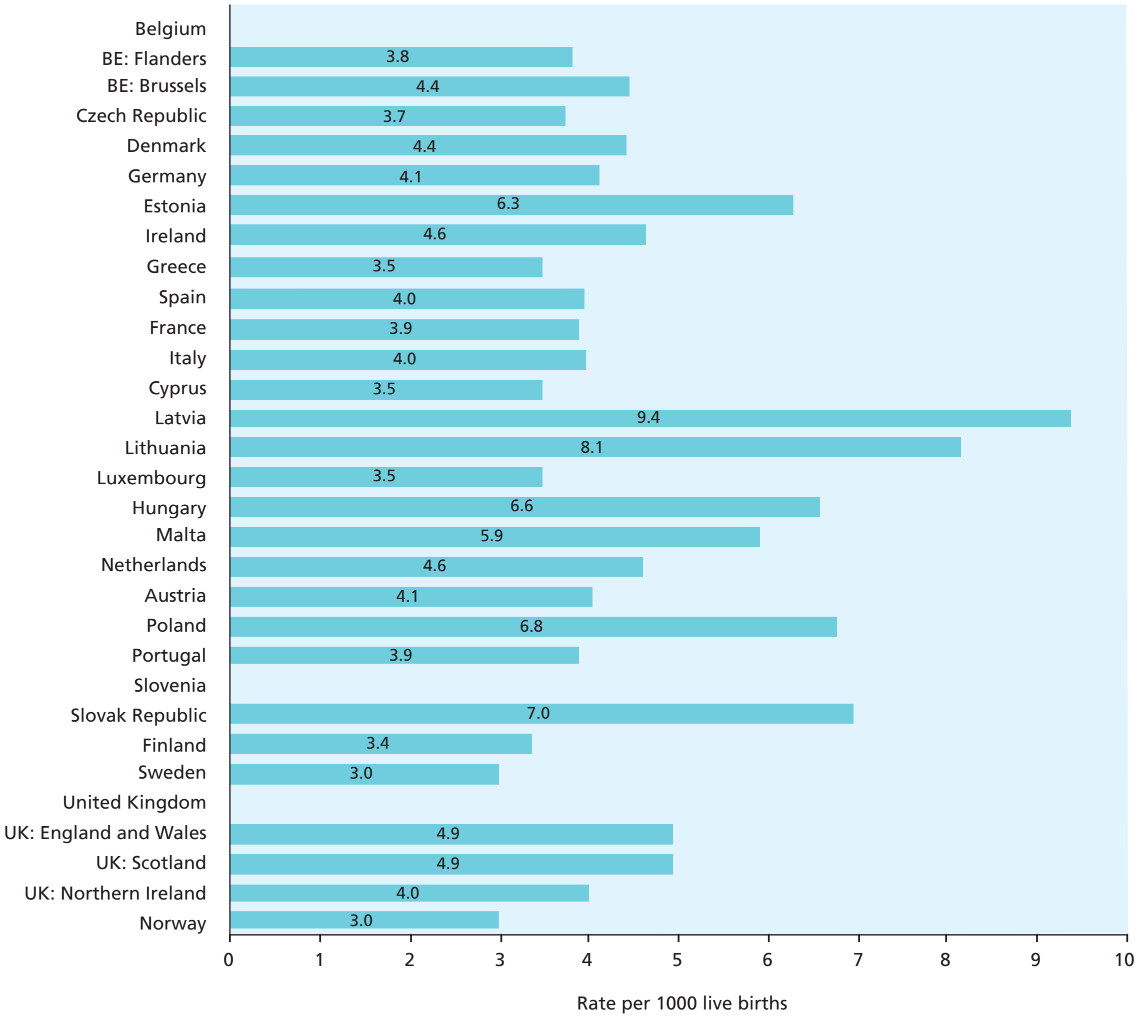
Figure 7.7 Infant mortality per 1000 live births



7.4 BIRTHWEIGHT DISTRIBUTION

INDICATOR TITLE: (C4) DISTRIBUTION OF BIRTH WEIGHT

Justification
Babies with a low birth weight are at higher risk of poor perinatal outcome and of long-term cognitive and motor impairments. The proportion of babies with a birth weight under 2500 g is a widely used indicator for assessing the population at risk, and historical series exist for many countries. Babies with a birth weight under 1500 g are termed very low birthweight (VLBW) babies and are at the highest risk. Twins and triplets have much higher rates of low birth weight than singletons.

Babies have a low birth weight because of preterm birth or intrauterine growth restriction (IUGR) or for both these reasons. Growth restriction is a major complication of pregnancy and is a cause of stillbirth, poor neonatal outcome, and impairments later in life.[1-5] When analysed by gestational age, birthweight distributions provide an indication of growth restriction. IUGR has many causes: maternal (eg, maternal chronic diseases, congenital uterine anomalies, and malnutrition), fetal (eg, congential anomalies), and maternal-fetal (reduced uteroplacental flow due to pregnancy-related diseases, such as preeclampsia, or to chronic maternal diseases). Low birth weight may also have serious consequences in adult life: it has been associated with a higher prevalence of ischaemic heart diseases, other cardiovascular diseases, obesity, diabetes, and the so-called metabolic syndrome.[6] Management of IUGR during pregnancy consists in monitoring the fetus and inducing delivery when there are clinical signs of hypoxia. However, the best time to deliver growth restricted babies still needs to be determined.[7]

Macrosomia or high birth weight (4500 g and over) is also associated with pregnancy complications.[8] Higher extremes of birth weight may be connected to maternal diabetes. As the population of pregnant women in Europe becomes older, there are more diabetic pregnant women. Fetal macrosomia connects maternal diabetes to obstetric complications such as shoulder dystocia and caesarean delivery. Birth weight is also increasing over time, thereby increasing the proportion of babies with a birth weight exceeding 4500 g independently of maternal diabetes.

Definition and presentation of indicator
This indicator is defined as number of births within each 500-g weight interval, expressed as a proportion of all registered live and stillbirths. It is computed by vital status at birth, gestational age, and plurality. The indicators selected for inclusion in this summary are live births weighing less than 1500 and 2500 g. This second indicator is habitually presented in international comparisons of births. We focus on live births because registration of live births is more homogenous in Europe than the registration of stillbirths, and this indicator will thus be more comparable (for a discussion of this issue, see the indicator on fetal mortality and Chapter 3). The complete distribution of birth weight by vital status and multiplicity is presented in Appendix B.

Data sources and availability of indicator in European countries
This indicator was available in almost all countries, although not all countries presented it by multiplicity. Since low birthweight babies are under-ascertained in Luxembourg, there were very few babies with a birth weight under 1500 g.

Methodological issues in the computation, reporting, and interpretation of the indicator
Birth weight is an accurately measured indicator, but its interpretation is not always obvious. Low birth weight includes two distinct complications of pregnancy: preterm birth and IUGR. Ideally, growth restriction should be measured with respect to the third or tenth percentile of birth weight at each gestational age (small-for-gestational age or SGA). However, agreed-upon norms for birth weight do not exist. The existence of physiological variability in birth weight in Europe must be taken into consideration when interpreting differences between countries. In other words, some populations may have a lower average normal birth weight than others due to genetic variations in population size. It has been shown that the birth weight associated with the lowest mortality rates differs between European countries.[9]

Results
The percentage of live births with a birth weight under 2500 g ranged from 4.2% to 8.5% of all births in the countries providing data on this indicator. A north/south gradient was observed: some countries from southern Europe had the highest percentages of low birth weight (Spain and Portugal), while rates were much lower in the Nordic countries (Finland, Sweden, and Norway). Most of the variability in overall rates is due to births between 1500 and 2499 g. The proportion of VLBW babies ranged from 0.7 to 1.4, but was mainly between 0.9 and 1.1, even in countries with very different rates of overall low birth weight.

KEY POINTS

About one in 20 babies born in Europe in 2004 weighed less than 2500 g at birth. This proportion varied by a factor of 2 between countries. However, some of this variation may be due to physiological differences in size between countries.

A common European approach should be developed to distinguish between constitutionally small babies and those with growth restriction.

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Figure 7.8 **Birth weight under 1500 g and 1500-2499 g among live births**

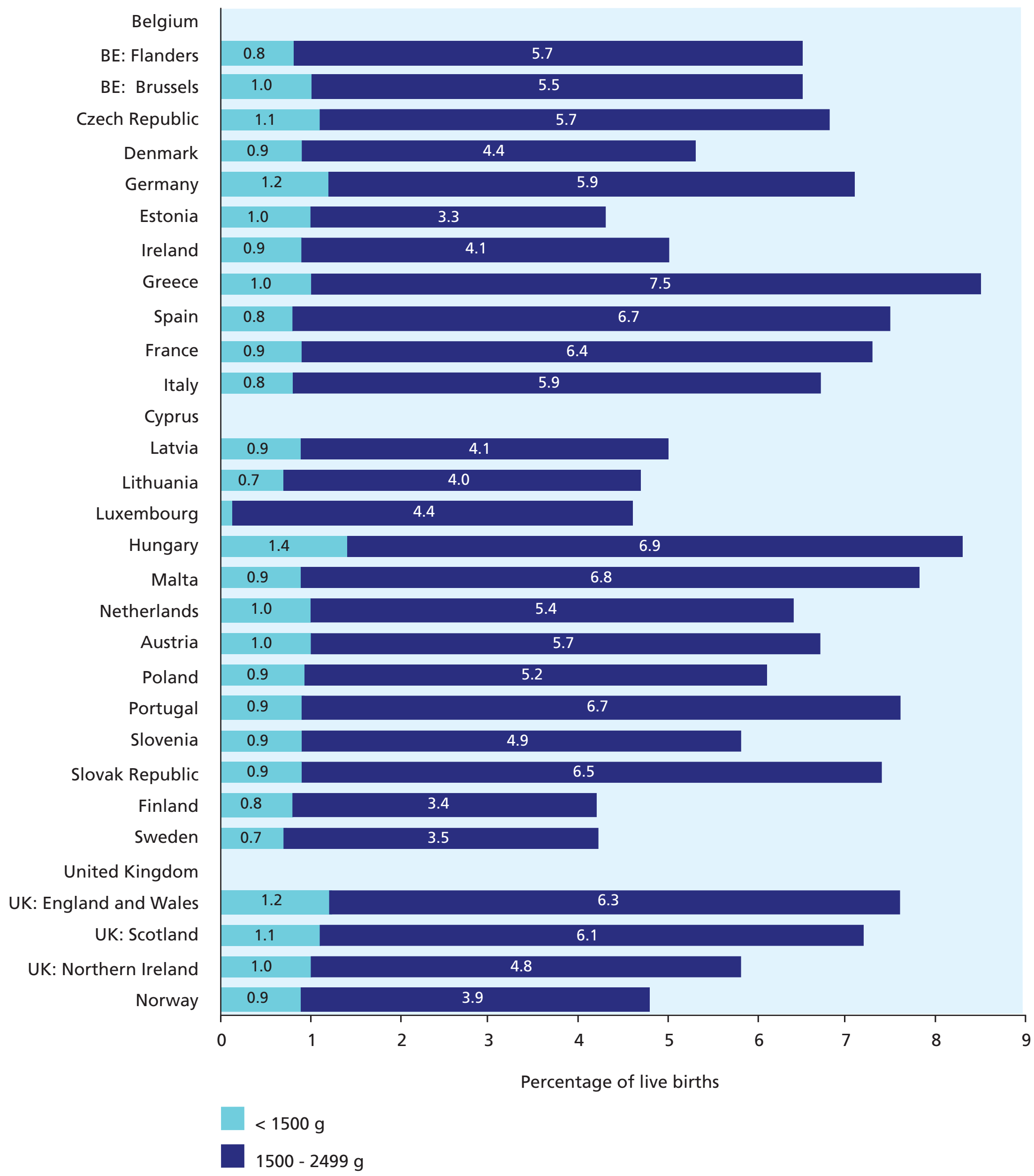
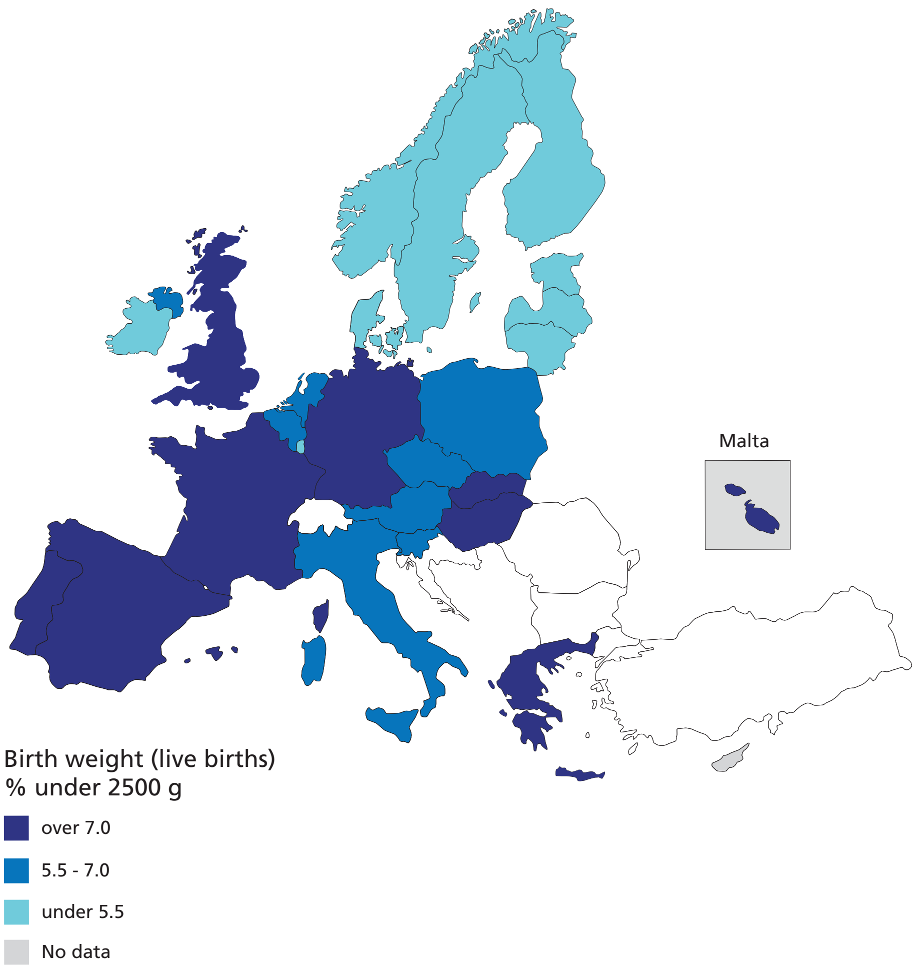


Figure 7.9 Low birth weight (under 2500 g) among live births



7.5 GESTATIONAL AGE DISTRIBUTION

INDICATOR TITLE: (C5) DISTRIBUTION OF GESTATIONAL AGE

Justification
Very preterm birth is one of the principal determinants of perinatal death and childhood impairment in Europe today.[1-4] Very preterm babies have the highest rates of long-term health problems, including cerebral palsy, severe learning disabilities, chronic lung disease, visual and hearing impairments, and poor growth. However, babies born between 32 and 36 weeks of gestation, often termed mildly or moderately preterm births, also have higher mortality and a greater likelihood of motor and learning difficulties than term babies do.[5-7] The preterm birth rate has increased in many countries over the past decade;[8] these trends must be monitored.
Post-term births are also associated with poor outcomes, and large variations in rates in Europe illustrate differences in approaches to the management of prolonged pregnancies.[9]
Preterm birth rates are 7 to 10 times higher for multiple births than for singleton births, and EURO-PERISTAT recommends that preterm birth rates be computed by multiplicity.

Definition and presentation of indicator
This indicator is defined as the number of live births and fetal deaths at each completed week of gestation (starting from 22 weeks), expressed as a proportion of all live and stillbirths. This distribution is presented as follows: 22-36 weeks of gestation (preterm births); 37-41 weeks (term births); 41+ weeks (post-term). Preterm births can be subdivided as 22-27 weeks (extremely (preterm), 28-31 weeks (very preterm), and 32-36 weeks (moderately preterm). This indicator is computed by vital status at birth and plurality. The summary indicators presented below are computed for live births.

Data sources and availability of indicator in European countries
This indicator is available in most European countries.

Methodological issues in the computation, reporting, and interpretation of the indicator
In most countries, data on gestational age is based on the "best obstetrical estimate", which combines clinical and ultrasound data, but some countries favour use of last menstrual period and others use only ultrasound estimates. There are also differences within countries. The method of determining gestational age can influence the gestational age distribution; use of ultrasound estimates tends to shift the distribution to the left and increase the preterm birth rate, although not all studies have found that this is the case. Research on methods used within Europe for determining gestational age and their impact on the gestational age distribution should be undertaken to validate the comparability of this indicator.

Results
The preterm birth rate for live births varied from about 5% to 11% in Europe. We observed relatively lower preterm birth rates in Finland, the Baltic countries, France, and Sweden, and higher rates in Austria (11.4%) and Germany (8.9). Rates were around 8% in the Flanders region of Belgium and in Spain. Some of this variability may be explained by the prevalence of multiple births, which have higher rates of preterm birth. Very preterm births, that is, births before 32 weeks of gestational age, accounted for about 1% of all births (range: 0.8 to 1.4). Because of a problem with under-ascertainment, the rate in Luxembourg underestimates the proportion of very preterm births. As with the birthweight distribution, variation was more pronounced for moderately preterm births than very preterm births. Unlike the birthweight distribution, there was no clear geographic pattern of preterm birth.

KEY POINTS

Gestational age is an essential indicator of perinatal health but is not currently included in international data sets, although the data are available almost everywhere and should be routinely reported.

The most vulnerable babies, those born before 32 weeks of gestation, account for about 1% of all births.

There is a large variability in preterm birth rates in European countries. This variability is independent of the variation observed for low birthweight babies. A better understanding of the reasons for this variability could be useful for the development of policies to reduce the preterm birth rate.

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Figure 7.10 Percentage of live births with a gestational age <32 weeks and between 32-36 weeks

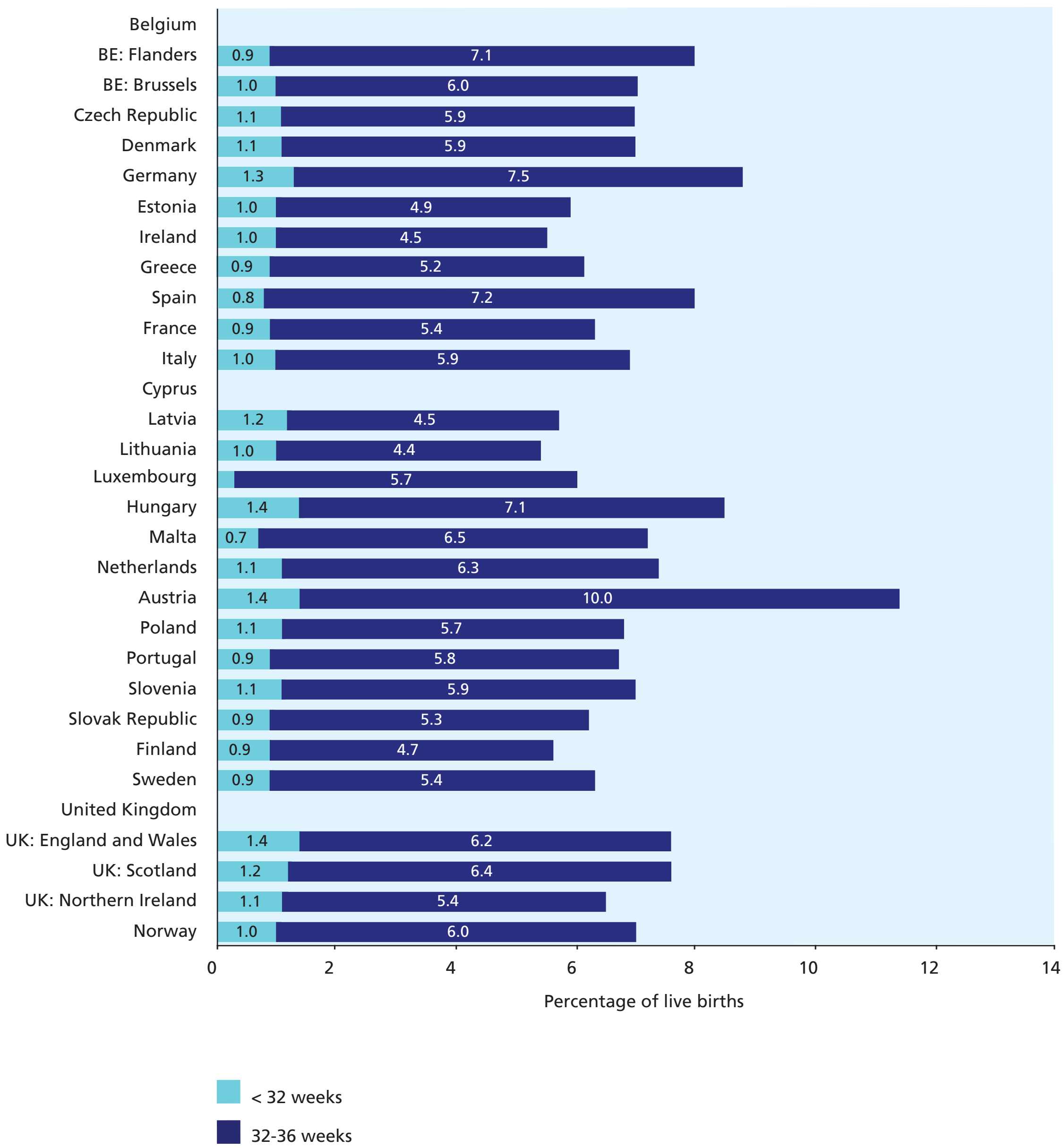
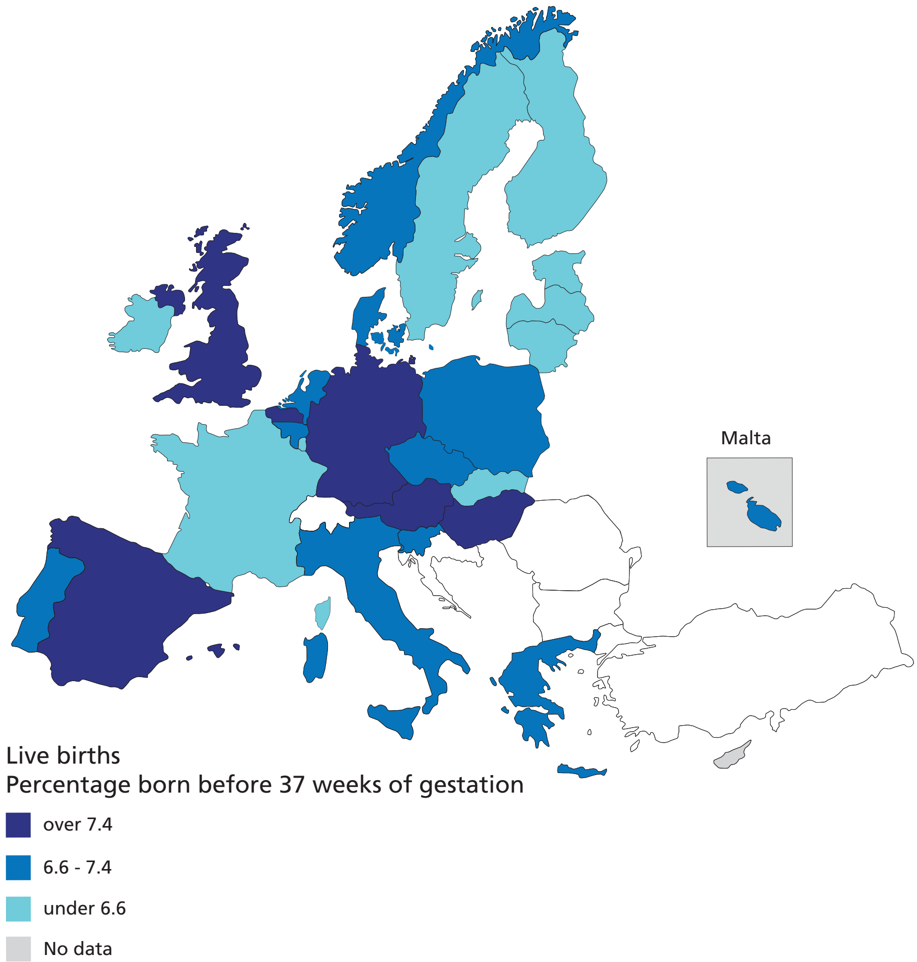


Figure 7.11 Preterm (before 37 weeks of gestation) live births



7.6 FIVE-MINUTE APGAR SCORE

INDICATOR TITLE (R2): FIVE-MINUTE APGAR SCORE AS A PERCENTAGE OF LIVE BIRTHS

Justification

The Apgar score was defined by Dr Virginia Apgar in 1952.[1] It is a standardised assessment of newborns that comprises five items: heart rate, respiratory effort, muscle tone, reflex irritability, and colour. Each item is scored 0, 1, or 2, and thus the total score ranges from 0 to 10. It is usually assessed at 1 min, at 5 min, and at 10 min after birth in most facilities in most countries. Both term and preterm infants with an Apgar score of 0 to 3 have a higher risk of early neonatal death. At 1 min, the Apgar score can be used to determine which children need resuscitation and at 10 min, which children still require resuscitation.

The value of the Apgar score at 5 min is highly correlated with neonatal mortality and provides the best predictive value for mortality. Used alone, it does not predict later neurological impairment, but then it was not developed for this purpose.[2]

A low Apgar score was retained recently as one of the elements that suggest intrapartum asphyxial insult as the cause of cerebral palsy.[3] The Apgar score provides good information about the infant's activity and responsiveness, but should not be used alone to predict survival without brain injury or disability, especially in preterm infants.[4]

Definition and presentation of indicators

This indicator is collected as the distribution of the Apgar score for all live births at or after 22 completed weeks of gestation. The two cutoff points at which the indicator is presented here — less than or equal to 4 and less than 7 — are those most often encountered in the literature.

Data sources and availability of indicator in European countries

Austria, Belgium, the Czech Republic, Denmark, Germany, Estonia, France, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Slovenia, the Slovak Republic, Finland, Sweden, Wales, Scotland, and Norway provided data on Apgar scores at 5 min. Greece, Italy, Spain, Ireland, Cyprus, Hungary, Poland, and Portugal provided no data. The proportion of missing value varied greatly between countries, from 0% in the Czech Republic to 19% in Finland.

Methodological issues in the computation, reporting, and interpretation of the indicator

Although the Apgar score is supposed to be a standardised measure, there can be some subjectivity and differences between countries in the value retained for each element of the Apgar score. Percentages are calculated on valid values (excluding those not stated). Another difficulty is due to the counting of missing values: missing values must not be coded as 0 and included in the group of 0-3 values.

Results

Overall less than 2% of children had low 5-min Apgar scores. The highest proportion of 5-min Apgar scores <4 was observed in Scotland and Finland (both 0.7%); these countries also had the highest proportion of 5-min Apgar scores <7. In some places this proportion seems rather low. The data collection process may partially explain these low proportions.

KEY POINTS

One to two percent of children born alive have difficulties at birth that require resuscitation.

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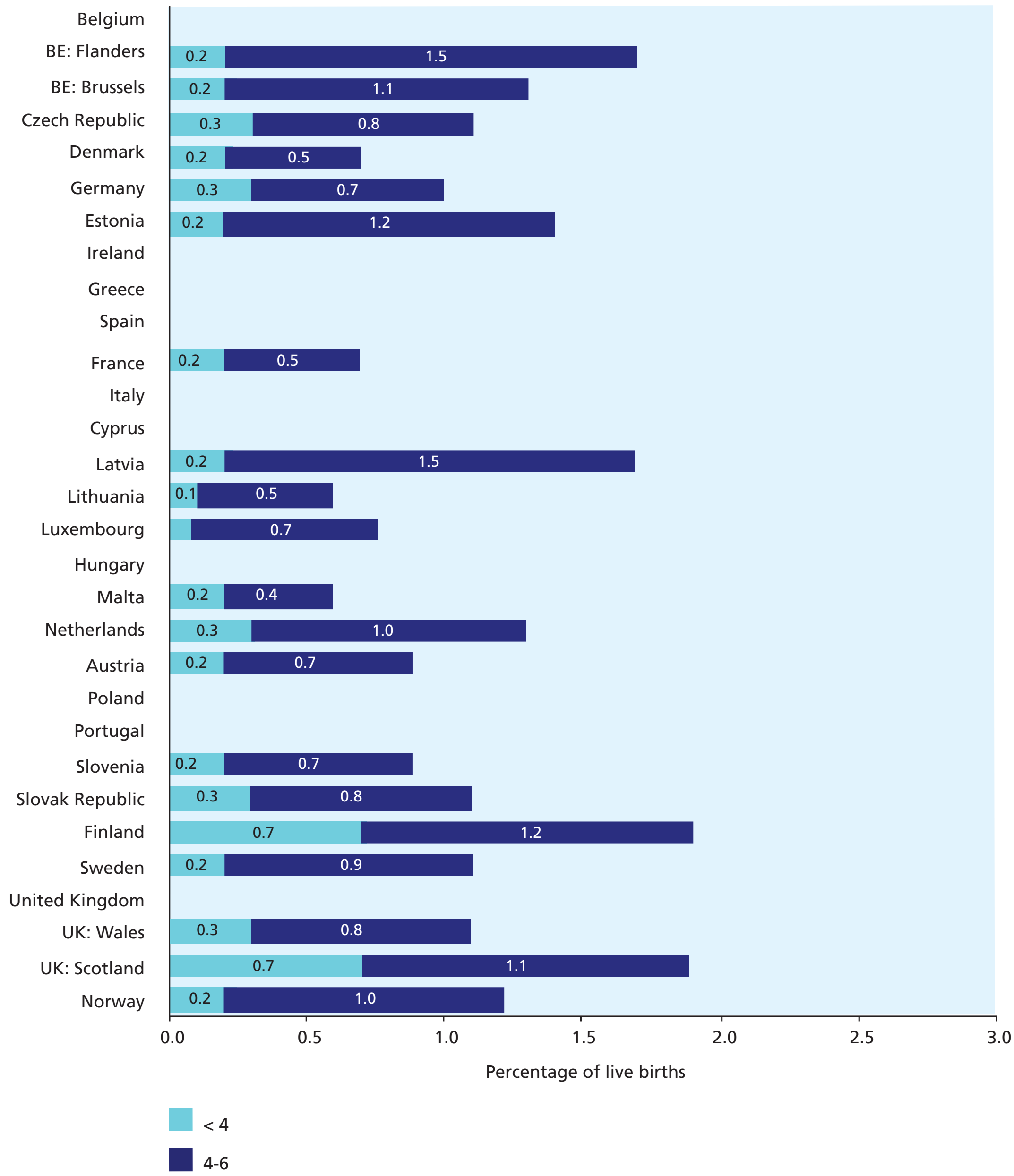
Figure 7.12 **Percentage of live births with an Apgar score at 5 minutes less than 4 and between 4 and 6**



7.7 DEATHS DUE TO CONGENITAL ANOMALIES

INDICATOR TITLE: (F1) FETAL AND NEONATAL DEATHS DUE TO CONGENITAL ANOMALIES

Justification

Congenital anomalies are a leading cause of fetal and neonatal deaths. There are wide international variations in prenatal screening policies, regulations regarding the termination of pregnancies and its timing, and medical attitudes about children born alive with a severe malformation.[1-3] Differences in these policies and medical practices affect fetal and neonatal mortality rates as well as the proportion of deaths due to congenital anomalies.[4-6] The countries in Europe use different classifications for coding cause of death, and there is not now any consensus about the best way to classify these deaths. However, all classifications include a category for congenital anomalies. Thus, while waiting for a common European cause of death classification, the EURO-PERISTAT project focused on fetal and neonatal deaths due to congenital anomalies.

Definition and presentation of indicators

For this indicator, we present data on the percentage of fetal deaths and early neonatal deaths due to congenital anomalies (that is, for which congenital anomalies were the underlying cause). In the chapter on congenital anomalies contributed by EUROCAT, this indicator is also presented as the fetal mortality rate per 1000 total births and rates derived from birth registers are compared to rates derived from congenital anomaly registers. Caution is necessary in interpreting mortality rates, because the number of deaths is small in some cases.

Data sources and availability of indicator in European countries

These data were provided by 18 countries for early neonatal deaths (some could not provide data for late neonatal deaths) and by 14 for fetal deaths.

Methodological issues in the computation, reporting, and interpretation of the indicator

The main problem is verifying that the cause of death has been attributed in the same way in all cases and that a congenital anomal is not simply present but is the underlying cause of death. Another factor that can influence the detection of an anomaly is whether an autopsy was conducted after death. In general, more deaths are attributed to this category when autopsies are performed.

Results

Figure 7.13 reports the percentage of early neonatal deaths due to congenital anomalies. Overall, about one-quarter of early neonatal deaths are due to congenital anomalies; the figure ranges between countries from 21 to 42%. Variability in fetal deaths is still higher (Figure 7.14). The very low rate for fetal deaths due to congenital anomalies in Germany is due to poor recording of the cause of death for fetal deaths within the data source (see source DE_01 in Appendix C). About 15-20% of fetal deaths were attributed to congenital anomalies in most countries. Some of this variation may be due to differences in policies for antenatal screening and terminations for congenital anomalies. If anomalies are detected and terminated before 22 weeks of pregnancy, this should reduce fetal and neonatal deaths due to congenital anomalies. In countries that allow terminations after 22 weeks of gestation, this policy may increase the percentage of fetal deaths due to congenital anomalies. In Malta and Ireland, for example, where terminations of pregnancy are illegal, higher rates of fetal and neonatal deaths due to congenital anomalies were observed.

KEY POINTS

These statistics are essential for interpreting mortality rates and especially neonatal mortality rates of babies born at term, because congenital anomalies can account for almost half of these deaths. Further work is planned between EURO-PERISTAT and EUROCAT to assess the role of congenital anomalies in perinatal mortality through the use of both birth data systems and congenital anomaly registers.

A survey of policies in European countries for antenatal screening and laws regarding termination of pregnancy was done by EUROCAT [7] and is useful in analysing differences between countries.

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Figure 7.13 Percentage of early neonatal deaths due to congenital anomalies

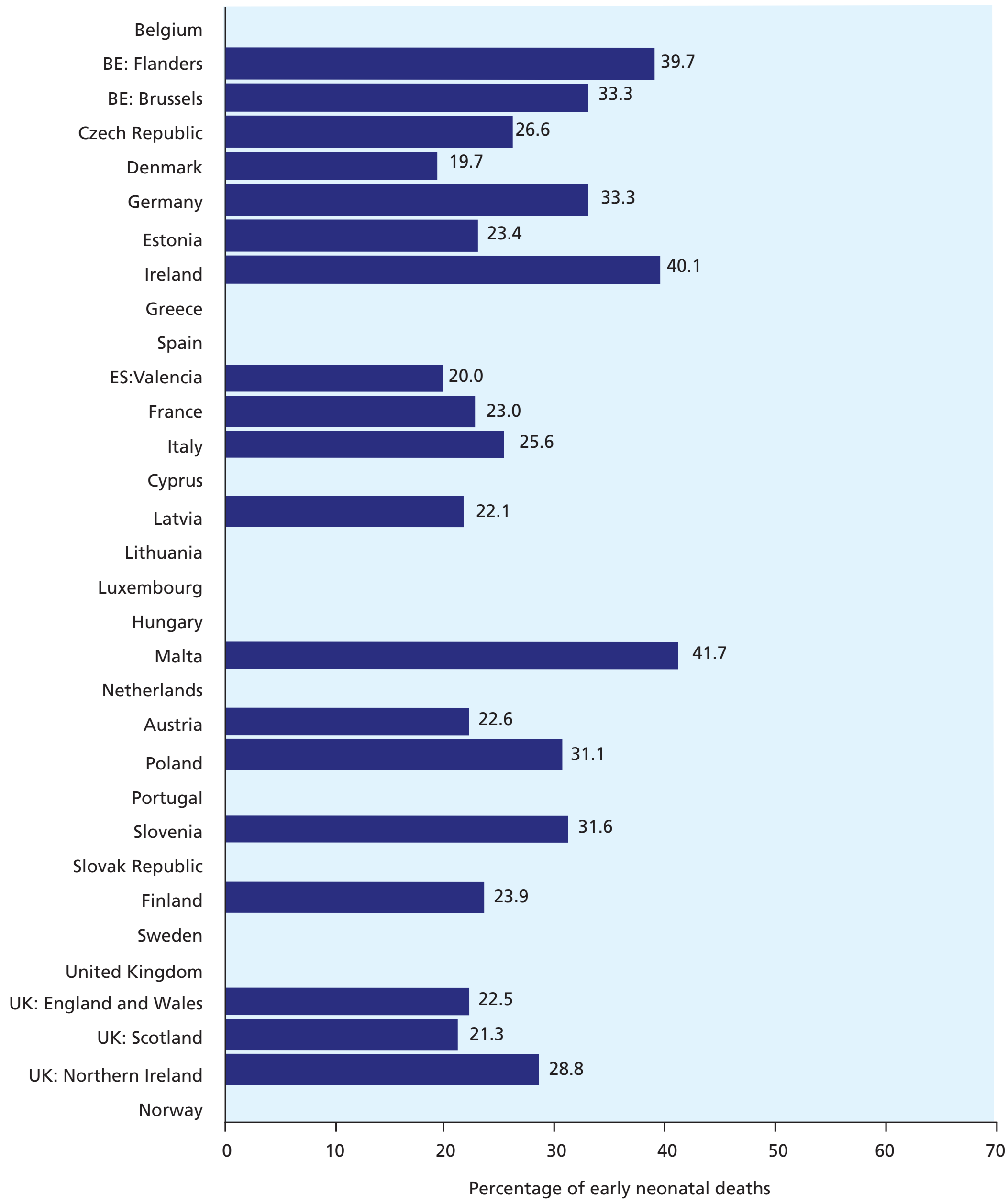
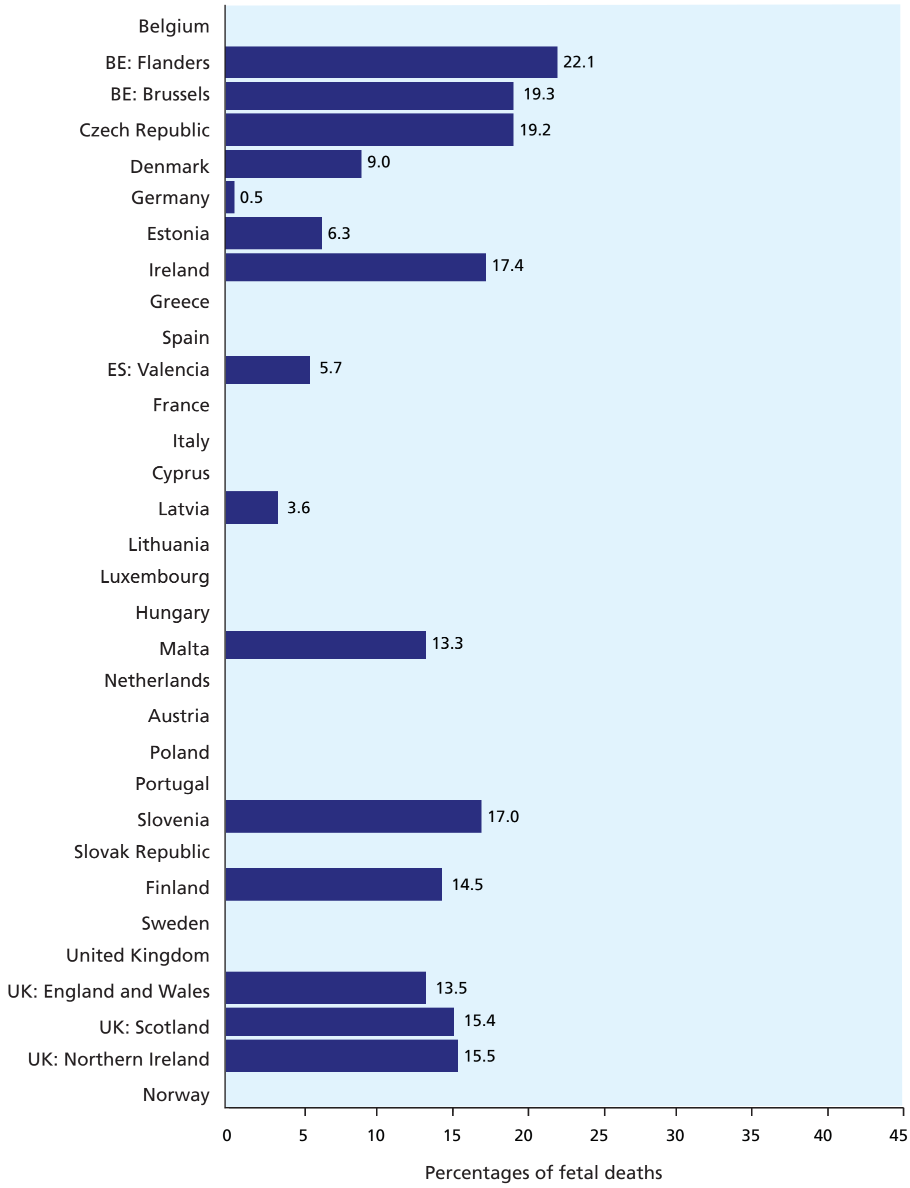


Figure 7.14 Percentage of fetal deaths due to congenital anomalies



8

CEREBRAL PALSY, SCPE NETWORK

8 CEREBRAL PALSY, SCPE NETWORK

Cerebral palsy (CP) is a recommended PERISTAT indicator for long-term child health because of its known association with adverse perinatal events. For many years, perinatal mortality has been used as the main outcome measure in assessing standards of perinatal care. However, with improved survival rates it is now recognised that mortality rates cannot accurately reflect these standards. Studies looking at changes in perinatal practice have not shown a similar decrease in mortality rates.

CP is a group of permanent, but not unchanging, disorders of movement and/or posture and of motor function, due to a non-progressive interference, lesion, or abnormality of the developing/immature brain [SCPE 2000].[1] CP is the most common motor impairment in childhood. Affecting one child in 500, it is responsible for a permanent lifelong activity limitation and participation restriction.

Monitoring CP prevalence rates is important for policy makers, and others, to ensure that the increased survival in very preterm babies is not at the expense of increasing morbidity. The increasing multiple birth rate, associated with an increase in births of tiny babies, should also be monitored.

8.1 METHODS AND ACHIEVEMENTS OF THE SCPE NETWORK

8.1.1 DIAGNOSIS AND DATA COLLECTION

The main aim of SCPE, when it was founded in 1998, was to develop a central database of children with CP in order to monitor trends in birthweight-specific groups, to provide information for service planning, and to provide a framework for collaborative research.

The network included 14 centres in eight countries when first established. Professionals participating were epidemiologists, neuro-paediatricians, orthopaedic surgeons, physiotherapists, occupational therapists, and nutritionists. The data for this report have been provided by 22 centres in 14 countries. At present 16 countries are participating in the network.

In Europe, before 1998, diagnostic criteria for the various CP subtypes varied between countries and between centres. The assessment of the severity of CP in terms of motor and associated impairments also varied. The first important achievement of SCPE was to establish a consensus of standards, definitions, and classification systems for children with CP.[1,2] Since confirmation of CP in a child requires time, too early a diagnosis might lead to overascertainment because of transient anomalies in preterm babies or to underascertainment, ie, in children with mild unilateral spasticity or ataxia. Among the SCPE registries it was therefore agreed that 5 was the optimal age for confirmation of diagnosis and case registration. Although clinical symptoms appear earlier, full assessment should not be carried out before the age of 4 years to enable reliable identification of cases.

The diagnostic criteria and a classification of subtypes, including a decision tree, have been made available on the SCPE home page: http://www-rheop.ujf-grenoble.fr/scpe2/site_scpe/index.php. An important follow up of this classification has been the development of a Reference and Training Manual, including a CD with interactive video illustrations of typical cases. In particular, the manual aims at helping clinicians and researchers to classify cases with overlapping symptoms.[3] The SCPE network also reached agreement about how the severity of gross motor impairment in CP should be graded; this is now done by using the Gross Motor Function Classification Scale.[4] Impairments of fine motor function are assessed with the Bi-manual Fine Motor Function (BFMF) scale. These SCPE standards and criteria have been implemented in a number of European countries, and even on other continents.[5] Most importantly, they have been widely accepted by clinicians as well as scientists and referenced in a number of recent studies.[6-10]

The registries acquire their data from different sources partly due to differences in health care organization. Whereas some centres use questionnaires and forms to be completed by paediatric departments or rehabilitation centres, other have direct access to the patients' health records. Moreover, SCPE registries have put a great effort into ascertainment of cases, using various sources such as summary data from national public health sources, hospital statistics, and health insurance data. Such sources also vary between countries. Finally, SCPE has worked intensively to acquire correct background information (ie, denominators). For a number of countries, these come from national birth data systems.

By the end of 2007, more than 11 000 children with CP were recorded in the SCPE common database. Several studies analysing this database have already been published.

In conclusion, the SCPE network is promoting a broad consensus in Europe on what constitutes CP. It is recognized that children with CP often present associated impairments that may strongly influence their activity, participation, and quality of life. The network has facilitated personal contact between researchers and clinicians. Moreover, SCPE has already provided information that may be useful for service planning in European countries. However, more work likely to contribute even more to health planning is in progress. Much of it addresses the question of equity of access to health services in Europe. This work includes protocols addressing participation, communication, and treatment options, and involves collaboration between researchers in basic sciences, in clinical and social research, and epidemiologists.

8.1.2 SURVEILLANCE OF CP BY DIAGNOSIS RELATED GROUPS

The collection of information for each hospitalisation episode according to diagnosis related groups (DRG) makes it possible to establish databases whose utility for epidemiological surveillance can be examined. Although the information obtained for each hospital stay is very synthetic, it may enable the identification of some CP cases.

Different studies have sought to validate the appropriateness of the use of DRGs for the surveillance of diseases.[11,12] When considering the use of DRGs for surveillance of CP, two aspects have to be considered: i) the identification of all children with CP, and ii) the collection of complete data to describe and explain the trends in the course of the disease.

In Europe and Australia, the surveillance of CP is most often conducted through registries,[13,14] and the identification of children with CP is done actively or passively through paediatricians, rehabilitation physicians or other rehabilitation therapists, or management centres or institutions. The quality of the surveillance depends upon the completeness of case identification and this can only be ensured by using several reporting sources.[15]

From this standpoint, DRGs may be a valuable supplementary reporting source, but they have limitations:

a) although specific ICD-10 codes exist for and identify CP (G80), those responsible for coding hospitalisation summaries may use other codes for motor deficiency without reference to CP;
b) a DRG summary is only produced when a child is hospitalised, but diagnosis and follow-up usually take place during outpatient care;
c) CP might not be the main reason for hospitalisation. A child with CP may be admitted with infection, seizures, gastrointestinal complications, or for orthopaedic surgery for skeletal deformities. Thus children with severe forms of CP may not be identified, unless CP is specifically identified as a diagnosis in the database;
d) the inpatient medical or surgical management of children with CP may be done in specialised referral hospitals that are outside the geographical area covered by the registry. To overcome this problem, registries need to check the DRG data from hospitals located outside their area;
e) finally, access to databases containing personal information depends on data protection regulations in each country.

Collection of data

CP surveillance requires that the motor deficiency for each child be described in a consistent manner, with specific scales to record motor impairment and associated deficiencies, eg, measurement of the intelligence quotient. This information is usually not present in the DRGs and, if present, must be viewed with caution as overdiagnosis of these associated deficiencies may occur because DRG-based payment is based on clinical severity. At the present time, DRG data used in one EU country show that about 40% of cases reported to be CP had more severe motor handicaps or developmental delays than CP cases not reported by DRG summaries.

In contrast, information regarding birth conditions, in particular birth weight, can be easily and accurately found in DRG delivery summaries and are essential for monitoring trends in CP prevalence rates.

Thus, although DRGs do not currently constitute a reliable primary data source for CP surveillance, they may be of interest as a secondary data source for the existing registries in order to improve or validate the completeness of ascertainment and the quality of the data collection. DRGs from specialised rehabilitation services may be particularly useful.

8.1.3 ROUTINE STATISTICS

There are many difficulties with routinely collected data about child health. Amongst the most important challenges are that most systems are neither truly national nor standardised. Systems may be set up by a variety of agencies and for a range of purposes with the result that they do not readily intercommunicate. Data collected from these systems and fed into national statistics, such as the Office for National Statistics in the UK, are limited and, on their own, are insufficient for studies of disability and impairment. Systems in the Nordic countries, by comparison, are able to form databases which are fully linkable and result in a very rich and diverse source of information.[16,17]

In the UK, child health computing systems traditionally come under the auspices of Primary Care Trusts or Health Authorities, and data relate to the relevant population residing within the Authority's boundaries.[18] Difficulties have arisen where alteration of National Health Service administrative boundaries has rendered comparison of data over time problematic. The primary purpose of these systems may be to keep immunisation records, but they may also include data about developmental assessments for preschool children or additional entries for those children identified as having "special needs". A comparison of cases of cerebral palsy identified by the Northern Ireland Cerebral Palsy Register with those on the Child Health Computing System, found only 50% of cases were recorded in both systems.[19] Data stored on each child health system vary, not only by type, but also in quality. Jones et al found that among schoolchildren whose height was measured twice during the same school year, in 20% of cases the second measurement was smaller than the first, a strong indicator of incorrect data entry.[20] Whilst much has been done to address these issues in the UK, there is still work to do.

Follow up studies of groups of infants at risk are an important means of studying outcomes, often following admission to NICU. These are a very useful addition to the body of research on disability but, because the sourcing of the information is narrow, may not be population based and may not include infants whose impairment was identified some time after birth (infants not "at risk"). Assessment of health at age two years, for example, is likely to underestimate the prevalence of disability in the population, whether it uses follow up studies or routinely collected data.[21] Similarly, preschool assessments may not be suitable for predicting all aspects of later, higher functioning.[22]

8.2 CP PREVALENCE RATES AND EURO-PERISTAT PERINATAL INDICATORS

8.2.1 PERINATAL INDICATORS AMONG LIVE BIRTHS IN THE AREAS COVERED BY THE SCPE NETWORK

Each registry provides vital statistics data for the population in the area it covers. Data presented relate to birth years 1990-1998, except when otherwise specified.

Table 8.1 Live births in areas covered by SCPE network registries

			Number of live births
C01	FR - RHEOP	France - RHEOP Isere	124 623
C02	FR - RHE31	France - RHE31 Haute-Garonne	109 410
C03*	UK - CPRS	Scotland CP register	454 312
C04	IE - SICPR	Ireland - Southern Ireland CP Register	66 913
C05	UK - NICPR	UK - NICPR Northern Ireland CP Register	222 624
C06	SE - GCPR	Sweden - Göteborg CP register	196 273
C07	IE - EICPR	Ireland - Eastern Ireland CP register	173 040
C08	UK - NECCPS	UK - Northern England Collaborative CP Survey	290 555
C09	UK - 4Child	UK - 4Child Database of CP, Vision Loss and Hearing Loss in Children	315 956
C10*	GE - BSCP	BSCP survey southern Germany	187 103
C11	UK - MCCPR	Mersey and Cheshire CP register	271 754
C12	DK - DCPR	Denmark - Cerebral Palsy Registry	316 330
C13	IT - CICPR	Italy - Central Italy CP Registry	26 288
C14*	NL - CPS	Population based survey	172 000
C15	NO - CPRN	Norway – Norwegian CP Registry	135 014
C16*	IT - CPSNI	Italy – CP Survey in northern Italy	37 255
C17	IE - WICPR	Ireland - western Ireland CP Registry	66 475
C18	SP - DIMAS	Spain - Madrid CP Registry DIMAS	54 397
C19*	SL - SCPS	Slovenia CP survey	258 585
C20*	LT- KCPS	Kaunas CP survey	60 925
C21*	PT - LCPS	Portugal-Lisboa CP Survey	71 993
C23*	HU - HCPS	Hungary CP survey	176 371

* birth-year period different from 1990-1998

8.2.2 CORE PERISTAT INDICATORS

Birthweight-specific **neonatal mortality** rates vary between countries and between centres within the same country. About 200 of every 1000 babies born weighing less than 1500 g die during the first month of life, compared with 10 per 1000 for babies weighing 1500-2499 g and 1 per 1000 for babies born with a normal birth weight.

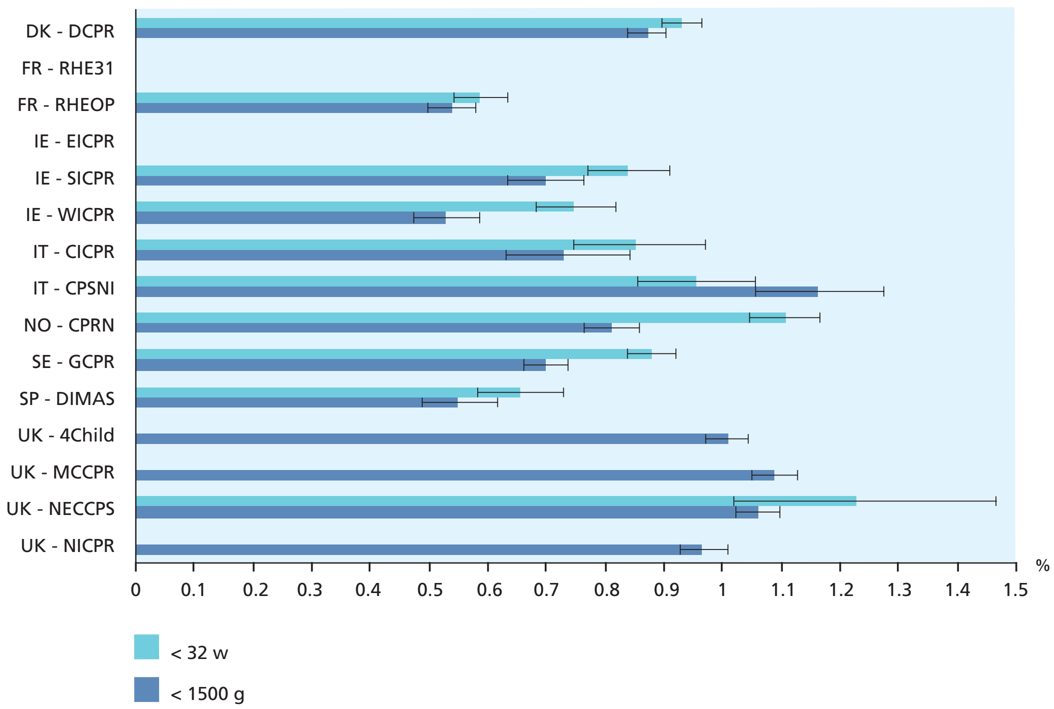
Table 8.2 Specific neonatal mortality rate by BW group per 1000 live births, 1990-1998

	< 1500 g	1500 - < 2500 g	2500 g or more	Number of neonatal deaths	Total number of live births	Total rate
DK – DCPR	187.5*	14.7*	1.3*	1070*	280 530*	3.81
FR - RHE31				364	109 410	3.33
FR – RHEOP	197.2**	14.3**	0.9**	353	124 623	2.83
IE - EICPR				806	173 040	4.66
IE - SICPR				305	66 913	4.56
IE - WICPR				228	66 475	3.43
IT - CICPR						
IT - CPSNI						
NO - CPRN	137.9	10.5	1.0	353	135 014	2.61
SE - GCPR	172.8	14.9	1.0	599	196 273	3.05
SP - DIMAS						
UK – 4Child	181.1	8.9	1.1	1156	315 956	3.66
UK - MCCPR	186.9	8.4	0.9	1044	271 754	3.84
UK - NECCPS	227.2	10.8	1.4	1257	290 555	4.33
UK - NICPR				973	222 624	4.37

* without 1996 birth year ** only 1990-1992 birth years

The lowest **proportion of live births with a VLBW, that is, less than 1500 g**, is 0.53 (Ireland) and the highest proportion of live births before 32 weeks is 1.23 (UK). Despite large variations between countries, nearly one percent of babies are born either VLBW or very preterm or both. For most centres, the proportion of very preterm live births is marginally higher than the proportion of VLBW live births.

Figure 8.1 **Proportion of live births before 32 weeks or with a birth weight under 1500 g**



The rate of **multiple live births** is lowest in Spain and highest in Denmark. Half of these multiple births have a low birth weight (<2500 g), whilst the proportion of singleton live births with low birth weight is only 6 to 7%. During the entire 1990-1998 period, the rate of multiple births increased, but the proportion of VLBW and low birthweight babies among these multiple births was fairly stable over time.

Table 8.3 **Multiple birth rates and percentages of very low and low birth weights among multiple births, 1990-1998**

	Number of live births	Rate of multiple births among live births %	Percentage of very low birthweight babies among multiple births*	Percentage of babies weighing from 1500 to under 2500 g among multiple births
DK - DCPR	316 330	3.31	7.56	37.12
FR - RHE31				
FR - RHEOP	124 623	2.69	5.54	42.92
IE - EICPR	173 040	2.56		
IE - SICPR	66 913	2.73	5.26	32.13
IE - WICPR	66 475	2.47	4.02	36.26
IT - CICPR	26 288	2.14	9.06	37.12
IT - CPSNI				
NO - CPRN	135 014	3.17	7.11	34.97
SE - GCPR	196 273	2.82	6.64	34.32
SP - DIMAS	54 397	2.06	5.08	47.64
UK - 4Child	315 956	2.79	8.79	44.27
UK - MCCPR	271754	2.56	9.38	41.63
UK - NECCPS	290 555	2.47	9.39	45.20
UK - NICPR				

* very low birth weight < 1500 g

The maternal age distribution was unusual in the Irish and Italian centres, with nearly 20% of mothers having babies after 35 years. The proportion of teenage pregnancies was highest in Irish and UK (Oxford region) centres. Otherwise, the maternal age distribution in other countries was very similar.

Table 8.4 Distribution of maternal age in birth years 1997-1998

	< 20 %	20-24 %	25-29 %	30-34 %	35-39 %	40+ %	Total
DK - DCPR	1.3	12.9	33.2	36.2	14.0	2.4	70 548
FR – RHE31	1.6	11.7	36.0	34.7	13.6	2.4	25 372
FR – RHEOP	1.6	13.8	39.0	31.6	11.8	2.2	28 073
IE - EICPR							
IE – SICPR	4.4	12.1	26.8	35.6	17.7	3.3	15 490
IE - WICPR							
IT - CICPR	1.1	8.6	31.6	38.9	16.7	3.2	10 283
IT - CPSNI							
NO - CPRN	2.8	17.3	36.9	29.7	11.5	1.9	118 839
SE - GCPR	1.8	15.1	35.9	32.7	12.1	2.4	35 567
SP - DIMAS							
UK - 4Child	5.5	14.8	30.1	33.1	14.1	2.4	69 111
UK - MCCPR							
UK - NECCPS							
UK - NICPR							

8.2.3 RECOMMENDED PERISTAT INDICATORS

The **size** of maternity units classified according to the number of deliveries per year varied greatly between countries and also between centres within same countries (see UK). French and Italian centres in particular had the most births in small size units and none in maternity units delivering 4000 or more babies per year.

Table 8.5 Distribution of births by size of maternity unit (recommended indicator) in 1997-1998

	Percentage of total births delivered in maternity units of different sizes						
	1 – 499 %	500 – 999 %	1000 – 1499 %	1500 – 1999 %	2000 – 3999 %	4000+ %	Total
DK - DCPR	3.6	4.3	19.1	6.6	60.8	5.7	70 548
FR - RHE31							
FR - RHEOP	1.8	23.2	17.8	40.2	17.0	0.0	22 461
IE - EICPR							
IE - SICPR							
IE - WICPR							
IT - CICPR	30.6	27.3	1.2	10.8	30.1	0.0	10 286
IT - CPSNI							
NO - CPRN	11.2	13.0	12.0	12.3	29.1	22.4	117 799
SE - GCPR	1.9	4.1	14.1	14.7	12.4	52.8	35 207
SP - DIMAS							
UK - 4Child	1.1	0.0	2.1	2.3	46.8	47.6	65 491
UK - MCCPR	0.0	0.0	4.1	6.5	67.0	22.3	54 458
UK - NECCPS	0.9	2.9	4.1	42.6	34.3	15.2	63 468
UK - NICPR							

8.2.4 CP PREVALENCE RATES

All CP cases of post-neonatal origin have been excluded.

a. Overall prevalence rate

Table 8.6 Registries with data from SCPE database for 1990-1998*

	Period	Number of children with CP	Number of live births	Prevalence rate per 1000	95% CI
DK - DCPR	1990-1998	649	316 330	2.05	1.90-2.22
FR - RHE31	1990-1998	114	109 410	1.04	0.86-1.25
FR - RHEOP	1990-1998	230	124 623	1.85	1.61-2.10
IE - EICPR	1990-1998	333	173 040	1.92	1.72-2.14
IE - SICPR	1990-1998	128	66 913	1.91	1.60-2.27
IE - WICPR	1990-1998	98	66 475	1.47	1.20-1.80
IT - CICPR	1990-1998	55	26 288	2.09	1.58-2.72
IT - CPSNI	1991-1996	61	37 255	1.64	1.25-2.10
NO – CPRN	1991-1998	201	132 486	1.52	1.31-1.74
SE - GCPR	1990-1998	377	196 273	1.92	1.73-2.12
SP - DIMAS	1991-1998	80	48 356	1.65	1.31-2.06
UK - 4Child	1990-1998	543	315 956	1.72	1.58-1.87
UK - NECCPS	1990-1998	731	290 555	2.52	2.34-2.70
UK - NICPR	1990-1998	490	222 624	2.20	2.01-2.40

*Most centres require informed consent for inclusion in the registry. These prevalence rates are thus low estimates.

The prevalence of CP varied from just over 1 per 1000 (FR-RHE31) to more than 2.5 per 1000 (UK-NECCPS), although all registries used the same criteria for including CP cases. These differences must be explored. Some centres have no data covering this time period or their data have not yet been included into the SCPE common database. Their prevalence rates are shown in Table 8.7.

Table 8.7 Other registries and population based surveys with data on children with CP

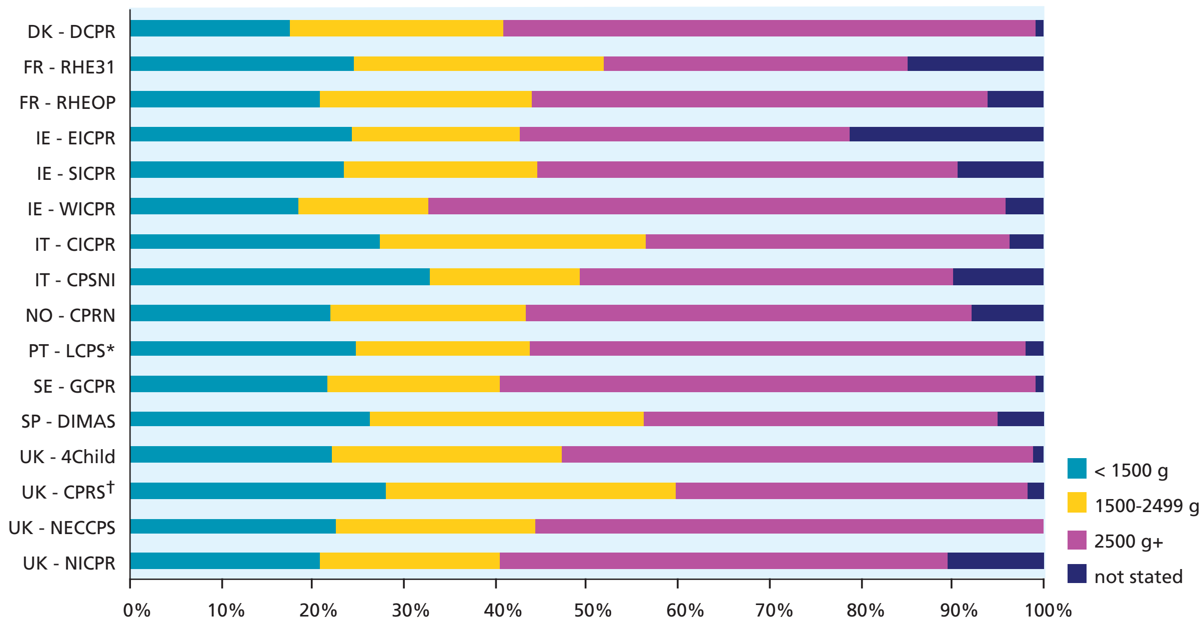
	Period	Number of children with CP	Number of live births	Prevalence rate per 1000	95% CI	Reference
GE – BSCP*	1976-1986	220	187 103	1.18	1.03-1.34	SCPE 2002[23]
HU – HCPS*	1975-1986	140	176 371	0.80	0.67-0.94	Hollody 2007[24]
LT - KCPS	1991-1996	130	60 925	2.13	1.78-2.53	Prasauskiene et al. 2007[25]
NL - CPS	1977-1988	260	172 000	1.51	1.33-1.71	Wichers et al. 2001[26]
PT - LCPS	1996-1997	105	71 993	1.46	1.19-1.77	SCPE 2002[23]
SL - SCPS	1981-1990	768	258 585	2.97	2.76-3.19	Kavcic et al. 1998[27]
UK - CPRS	1984-1990	736	454 312	1.62	1.51-1.74	SCPE 2002[23]
UK - MCCPR	1976-1989	854	412 318	2.07	1.93-2.21	SCPE 2002[23]

* Includes only bilateral spastic CP cases

b. Characteristics and prevalence by birth weight

Children born with a normal birth weight (2500 g or more) account for half of the CP cases in nearly all centres. Overall, 20-25% of children with CP were born with a VLBW.

Figure 8.2 Birthweight distribution in children with CP



* 1996-1997 birth years
† 1990 birth year

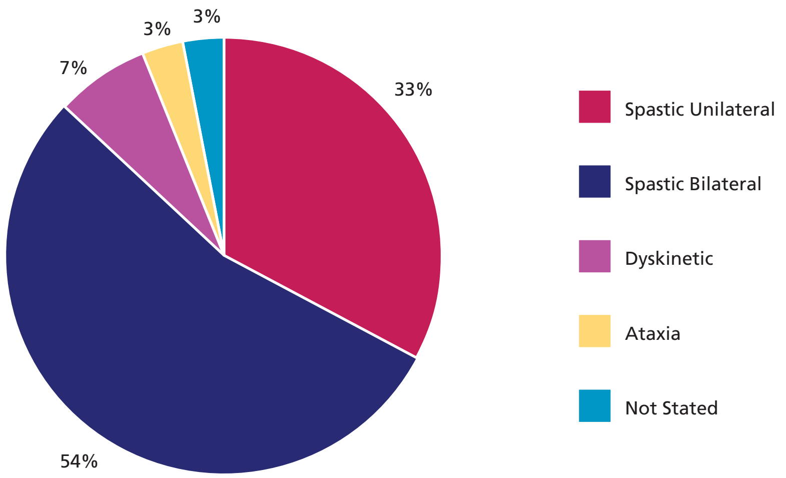
There is a clear relationship between CP and birth weight, with higher CP prevalence rates in lower birthweight groups.

Table 8.8 CP prevalence rates per 1000 live births by birthweight groups

	< 1500 g	1500-2499 g	2500 g+
DK - DCPR	41.7	11.0	1.3
FR - RHE31			
FR - RHEOP	75.1	8.7	1.0
IE - EICPR			
IE - SICPR	64.9	11.5	0.9
IE - WICPR	51.9	6.1	1.0
IT - CICPR	78.1	13.3	0.9
IT - CPSNI	46.2	4.7	0.7
NO - CPRN	41.2	8.5	0.8
PT - LCPS			
SE - GCPR	60.0	10.3	1.2
SP - DIMAS	82.0	8.6	0.7
UK - 4Child	38.5	7.8	1.0
UK - CPRS	27.2	4.8	0.4
UK - NECCPS	53.6	9.2	1.5
UK - NICPR	47.4	9.5	1.1
Rate across all centres	48.4	8.9	1.1

c. Characteristics and prevalence per CP subtype

Figure 8.3 Distribution of children with CP by CP subtype



The bilateral spastic subtype is the most common and the easiest to classify. These children usually present a moderate to severe clinical pattern. Mild cases are less likely to be missing from this group, compared with mild cases of unilateral spastic CP, which might be underascertained by registers. Among the bilateral spastic CP subtype group, differences persist between centres, with very low rates in some centres (FR-RHE31, NO-CPRN)) and higher rates in others (IT-CICPR, UK-NECCPS), but the variation is smaller than for the overall CP prevalence rate.

Table 8.9 Prevalence rate of children with bilateral spastic CP subtype

	Period	Number of bilateral spastic CP cases	Number of live births	Prevalence rate per 1000	95% CI
DK - DCPR	1990-1998	325	316 330	1.03	0.92-1.15
FR - RHE31	1990-1998	78	109 410	0.71	0.56-0.89
FR - RHEOP	1990-1998	138	124 623	1.11	0.93-1.31
IE - EICPR	1990-1998	197	173 040	1.14	0.99-1.31
IE - SICPR	1990-1998	66	66 913	0.99	0.76-1.25
IE - WICPR	1990-1998	56	66 475	0.84	0.64-1.09
IT - CICPR	1990-1998	33	26 288	1.26	0.86-1.76
IT - CPSNI	1991-1996	35	37 255	0.94	0.65-1.31
NO - CPRN	1991-1998	95	132 486	0.72	0.58-0.88
SE - GCPR	1990-1998	187	196 273	0.95	0.82-1.10
SP - DIMAS	1991-1998	47	48 356	0.97	0.71-1.29
UK - 4Child	1990-1998	288	315 956	0.91	0.81-1.02
UK - NECCPS	1990-1998	427	290 555	1.47	1.33-1.62
UK - NICPR	1990-1998	244	222 624	1.10	0.96-1.24

The burden on children with CP is not caused only by their motor impairments. The most frequently associated severe impairments in these children are intellectual and visual impairments and epilepsy, whilst hearing impairment is quite rare among children with CP.

Table 8.10 Associated impairments in children with CP born 1990-1998

Associated impairment	Percentage of children with severe associated impairment	Range [min-max]
Severe intellectual impairment (IQ test level <50)	26.0	[11.5-37.2]
Severe visual impairment Defined as blind or no useful vision (after correction, on the better eye)	10.4	[0.9-28.8]
Severe hearing impairment Defined as 'severe' or 'profound' hearing loss, i.e. loss greater than 70dB (before correction, on the better ear)	2.6	[0.0-4.1]
Active epilepsia Defined by two unprovoked seizures, excluding febrile or neonatal seizures	19.9	[2.7-30.6]

8.3 TRENDS AMONG CHILDREN AT HIGHER RISK OF CP

8.3.1 TRENDS IN VLBW RATES

It is well known that advances in perinatal and neonatal treatments have been associated with increased survival amongst VLBW infants. This increased survival led to a natural concern that there might be an accompanying increase in the rate of impairment and disability. In a paper published in 1997, Vohr and Msall warned that "the medical community must remain vigilant in its surveillance" in the face of increasing survival of those born around the limits of viability.[28]

Data about children with CP from the 16 centres in the SCPE network were analysed for evidence of trends among infants who were either born VLBW or very preterm (< 32 weeks).[29] In all, 26% of the children with CP weighed less than 1000 g at birth; 20% (317/1575) were from multiple births, and 93% (1426/1533) had spastic CP, unilateral in 24% (336/1426).

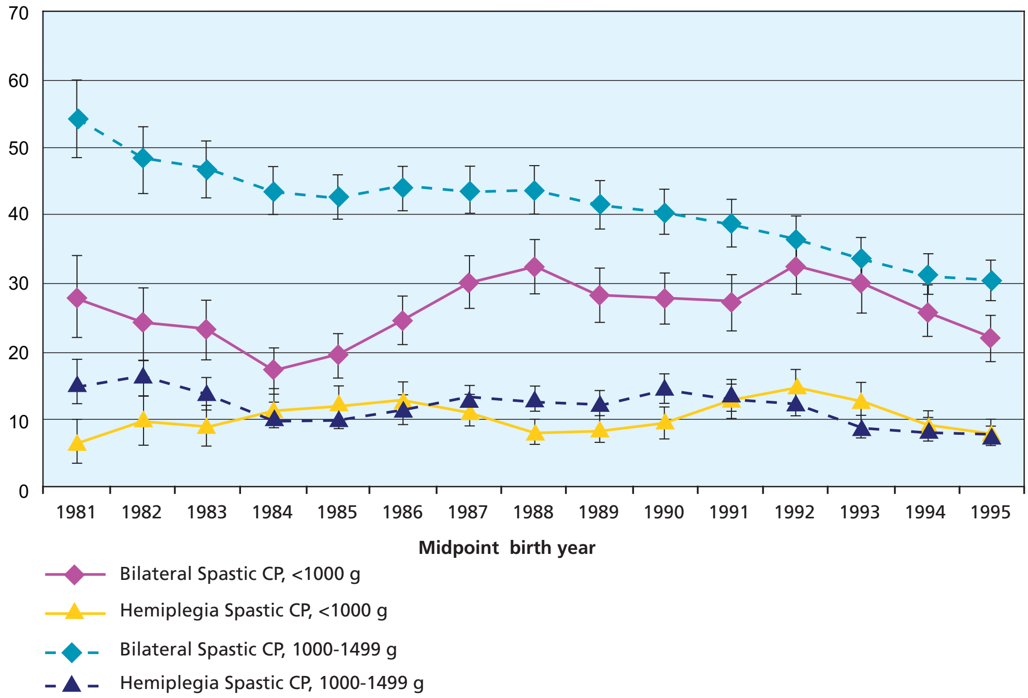
Table 8.11 Description of SCPE data on children with cerebral palsy included in Platt et al.[29]

Location of centre	Centre	Data available	Number of cases < 1000 g	Number of cases 1000-1499 g	Total
FR - RHEOP	C01	1980-96	9	57	66
FR - RHE31	C02	1981-93	0	20	20
UK - CPRS	C03	1984-90	38	117	155
IE - SICPR	C04	1981-95	11	27	38
UK - NICPR	C05	1981-96	74	130	204
SE - GCPR	C06	1980-96	34	101	135
IE - EICPR	C07	1980-93	31	53	84
UK - NECCPS	C08	1980-96	55	98	153
UK - 4Child	C09	1984-96	58	141	199
GE - BSCP	C10	1980-86	14	28	42
UK - MCCPR	C11	1980-89	36	123	159
DK - DCPR	C12	1980-96	49	201	250
IT - CICPR	C13	1981-95	9	19	28
NL - CPS	C14	1981-89	3	14	17
NO - CPRN	C15	1991-96	1	4	5
IT - CPSNI	C16	1991-96	6	14	20
Total			428	1147	1575

Although there was considerable variation between centres, as shown in earlier studies,[30] the harmonisation procedures carried out before pooling all the different data sets into one European database ensure valid and reliable results. The proportion of VLBW infants among all live births has increased in all participating centres since 1980. This increase was most marked in Sweden and the UK – from 0.5% in 1980 to nearly 1% in 1996.

Most of the European centres showed a significant improvement in neonatal survival between 1980 and 1996 in all VLBW infants but especially for the group of children weighing < 1000 g, where survival increased from 50% to 65% (p< 0.0001).

Figure 8.4 CP rates in VLBW children, 1000-1499 g and <1000 g in Platt et al,[29] Post-neonatal cases excluded.



The prevalence of CP among VLBW infants, however, fell from 60.6 per 1000 live births in 1980 to 39.5 per 1000 in 1996 (p<0.0004). The significant decline in CP prevalence was confined to children with a birth weight of 1000-1499 g and was largely related to a decrease in bilateral spastic CP. Prevalence of unilateral spastic CP was similar for both VLBW groups and remained relatively stable from 1980 through 1996.

Over the entire period, the proportion of VLBW infants with CP from multiple births increased significantly, from around 17% to 24%, reflecting the increased frequency of multiple births. There was, however, no significant change in the proportion of male infants or in the proportion of children with severe CP.

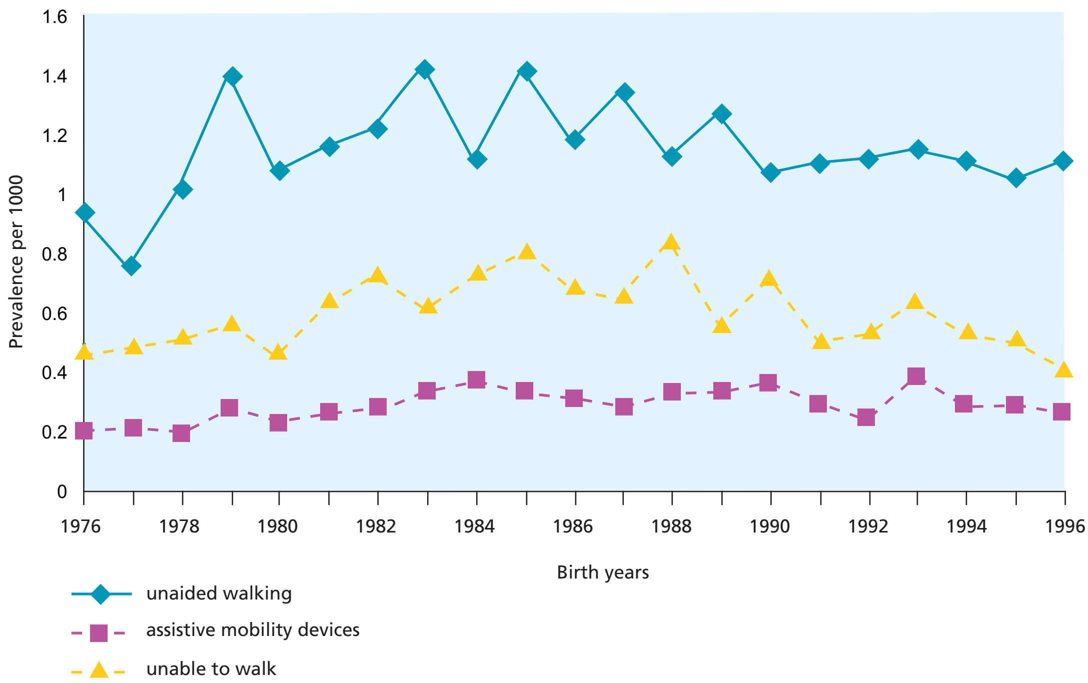
This study of data from European centres showed that the chances of survival have improved for very low birthweight infants and especially for infants born weighing less than 1000 g. Even more encouraging is the increased likelihood of survival without severe neurological impairment for these very small infants.

8.3.2 TRENDS IN CHILDREN UNABLE TO WALK

A descriptive analysis was performed of 9012 CP cases from the SCPE database, born between 1976 and 1996.[31] Walking ability was graded at 5 years of age as follows : 1) unaided walking, 2) walking with aids, and 3) unable to walk. The Gross Motor Function Classification System[4] was not available for children born in these birth years.

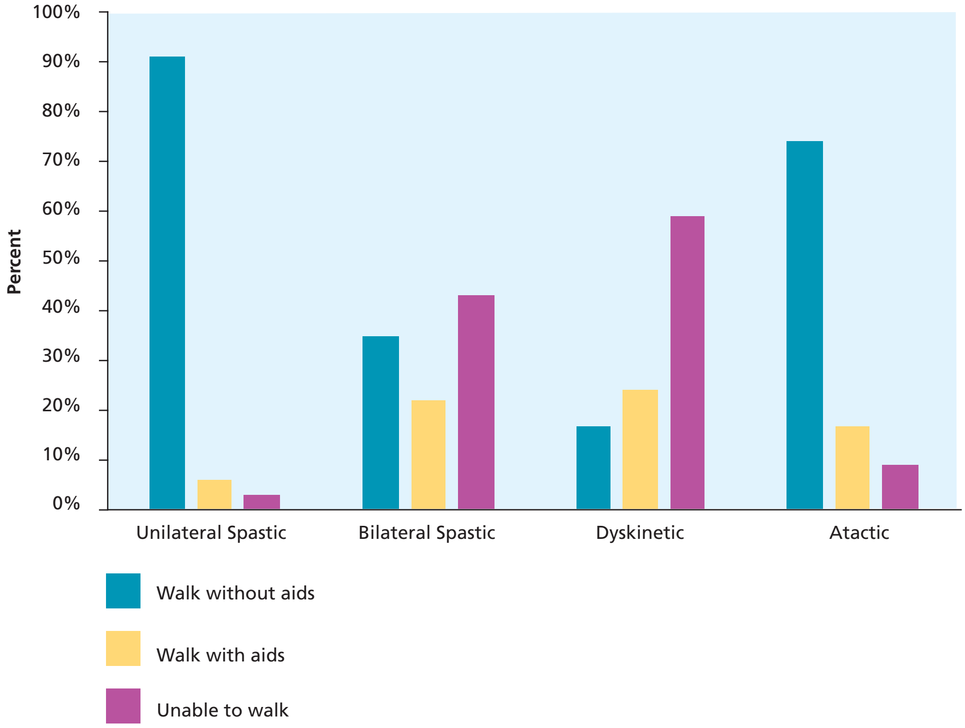
This study found that the mean proportion of children unable to walk at age four was 28%, a proportion that seems to have remained relatively stable over the period despite the changes in neonatal care. The prevalence rate of CP children unable to walk is around 0.6 per 1000 live births, with some evidence of a decrease in recent years.

Figure 8.5 Prevalence of walking in all centers except C02, C03, C09, and C11, children born 1976-1996. Adapted from Beckung et al.[31]



Walking ability is strongly correlated with CP type: in the unilateral spastic group, only 3% of the children do not walk, in the ataxic group 10%, in the bilateral spastic group 43%, and in the dyskinetic group 59%.

Figure 8.6 **Walking ability and CP subtypes – Children born 1976-1996**



Associated disabilities, ie, intellectual, visual, and hearing impairments as well as epilepsy, correlate significantly with inability to walk. Severe intellectual impairment (IQ < 50) is the factor most strongly related to walking ability in all CP subtypes. When present it multiplies the risk of being unable to walk: by 56 for children with unilateral spastic CP and by nine for children with bilateral spastic CP.

Although VLBW and very low gestational age are well known risk factors for CP, the proportion of children with CP unable to walk was not associated with prematurity in this study.

Walking ability may change with age. Some children are able to walk independently at the age of peak motor performance, at around eight years; and for some children, walking ability decreases as they grow. Later on, deterioration in walking ability in adulthood is frequent, due to pain, fatigue, joint contractures, and lack of physical exercise. This adverse trend is not rare: 9% of adults without any learning disability in Sweden have stopped walking.[32] This change in ability also depends on the subtype of CP.

8.3.3 TRENDS AMONG MULTIPLE BIRTHS

Twins and triplets are at increased risk for cerebral palsy and perinatal death compared with singletons,[33] and this higher risk has been related to their lower gestational age. Over the past two decades, the rate of multiple births has increased significantly, from 1.9% of all live births in 1980 to 2.4% in 1990, and the rate, as recorded in the SCPE database, is now around 2.7 – 2.8%. The increase is mainly due to IVF, but also to increasing maternal age.[29] In particular in light of the increasing use of IVF, its possible consequences, including rates of CP, subtypes, severity and panorama of associated impairments, must be thoroughly described to improve health planning and service provision.

In 2004, Topp et al.[35] described the time trends in multiple birth based on data collected by SCPE. Here we summarise the main results. Of 5590 CP cases recorded in the database (born between 1976-1990), 437 were born as multiples. The proportion of multiples among all children with CP increased from 4.6% in 1976 to 10% in 1990. Children born from multiple pregnancies in the time period 1984 to 1990 were at more than four times as much risk for CP as singletons (Relative risk (RR): 4.36; 95% confidence interval (CI): 3.76 – 4.97), and bilateral spastic CP subtype was more common than in singletons, who were more likely to have the unilateral subtype. However, this increased risk could be explained by the associated risk of preterm birth for multiples. There were no differences in the severity of CP as judged by walking ability or by associated impairments, and there was no time trend in the rate of children from multiple births who had CP.

The important message for society and health planners from these data is firstly that the proportion of children born as multiples among children with CP has increased during the past two decades. Although the attributable proportion due to multiple births may be low (10% of children with CP), the increase in multiple births has led to an increase in the total number of children with CP.

The immediate cause of the increased risk for CP can be explained by the increased risk of preterm birth among multiples, and the main cause leading to the increase over time is most likely IVF. Since the increased risk for CP in this group is mainly due to preterm delivery associated with more than one fetus, the findings emphasize the need to reduce the number of fertilized eggs implanted, and even to avoid twin pregnancies. Thus, the results do not suggest that a child born after IVF per se has an increased risk for CP. It may also be reassuring for health planners that the severity of CP and of associated impairments is not increased in this group.

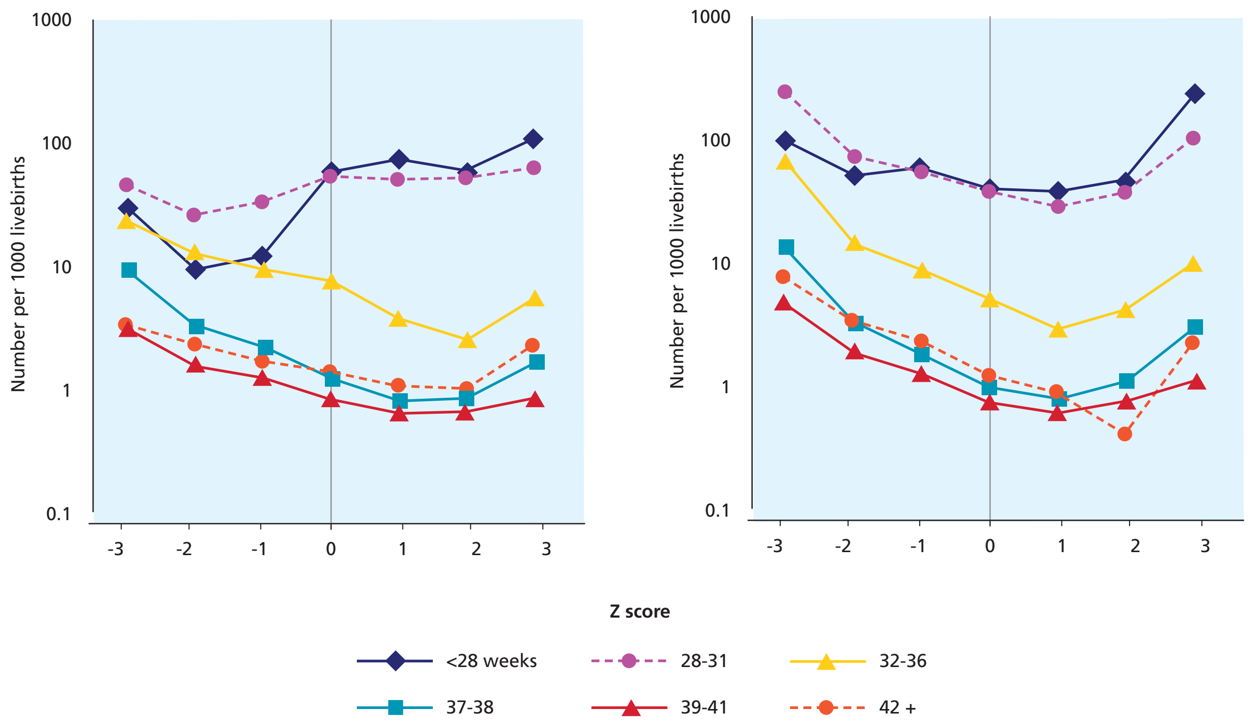
8.3.4 TRENDS ACCORDING TO GROWTH DEVIATION

The risk of CP increases with decreasing birth weight. The 1980s saw a sharp increase in the rate of CP associated with low birth weight. Stanley[36] emphasised the need to study both gestational duration and growth to disentangle the independent effects of each on the risk of CP. The measurement of gestational age and growth is, however, not without difficulty and probably explains why birth weight continues to be the best used perinatal "currency".

The assessment of intrauterine growth relies on an accurate gestational age estimation but also requires an accurate assessment of growth, which is complicated by the growth standards available. These were traditionally based on growth at birth and thus were inherently biased by the fact that babies born preterm tend to have had intrauterine growth restriction.[37] Jarvis[38] used data from the SCPE pooled dataset to assess the impact of deviation from normal growth on the risk of CP, by comparing the results derived from the use of conventional growth standards based on birth weight and those derived from estimates of fetal weight calculated from ultrasonography of fetuses who went on to deliver as healthy babies at term.

The fetal growth standards were calculated from North of England birthweight standards,[39] according to the Gardosi formula,[40] and based on data from two relatively small populations of pregnancies, one with a single ultrasonographic estimation of fetal weight and the second with serial measures in a still smaller population. Jarvis et al.[38] demonstrated in this study that the risk of CP is linked not only to low weight-for-gestation, but also to excessive high weight-for-gestation in a reverse J-shaped relationship. Importantly they demonstrated that conventional growth standards underestimated the impact of both extremes of birth weight on CP risk. The use of the fetal growth standards led to more uniformity in the shape of the J curve for risk of CP across all gestational age groups and placed optimal growth more consistently at about one standard deviation above the mean for all gestational groups, including preterm births (Figure 8.8). These findings are consistent with data for the risk of perinatal mortality and of other non-fatal perinatal outcomes. Jarvis et al[38] suggest that slowed or increased growth is a generic response to intrauterine insult and distress.

Figure 8.7 **Prevalence of cerebral palsy by Z score of weight for gestation: effect of different growth standards. Adapted from Jarvis et al.[38]**



The nature of the relationship between deviant growth and CP is as yet unclear. The causal link may be in either direction, that is, abnormal growth may cause CP or CP may result in abnormal growth. Alternatively the relationship may operate through one or more confounding factor, independently linked to both growth and CP.

More recent analysis of data from just the UK registers that are part of the SCPE network has demonstrated that the infants who are born lighter than average for gestational age are not only at increased risk of CP but are also at increased risk of more severe impairment.[41] However, amongst those infants with multiple severe impairments, those born lighter than average for gestational age had the longest life expectancy, and those born heavier than average had the shortest life expectancy. Hemming[41] hypothesised that this apparently counterintuitive finding might be the result of the higher mortality rates for those who are small for gestational age, resulting in a group of highly selected survivors, albeit with cerebral palsy.

Further development of fetal growth standards is needed as is research into better routine clinical identification of deviant fetal growth at all gestational ages and at both extremes of the growth-for-gestation spectrum.

8.4 CONCLUSION

The SCPE network is promoting a widespread consensus in Europe on what constitutes CP, and it is recognized that children with CP often present associated impairments that may strongly influence their activity, participation, and quality of life. Collaborative efforts, through collection of data from multiple sources, ideally population based registries, are required to monitor CP trends and to evaluate prevention strategies and treatment efficacy properly.

During the past decades CP prevalence rates tended to increase or remain steady. But SCPE network efforts have recently contributed to show that the epidemiology of CP is changing now, with a decreasing trend among VLBW children, very clear in the bilateral spastic subtype.

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9

CONGENITAL ANOMALIES: EUROCAT

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9.1 INTRODUCTION

Collectively, congenital anomalies have an important public health impact in terms of

- effect on the quality of life of affected children and adults and their families
- contribution to fetal and infant mortality, both in terms of loss of potential years of life and emotional costs to the family
- provision, quality, and financial cost of medical, social, and educational services to improve the participation and quality of life of affected individuals and their families
- provision, quality, and financial cost of prenatal screening in the population and its psychological cost to pregnant women.

In the majority of individual cases of congenital anomaly, the cause of the condition is unknown, but is suspected to be an interaction of multiple environmental and genetic factors. For about 15% of cases, there is an identifiable chromosomal abnormality. Under 5% of cases can be attributed to a known single gene mutation, and under 5% to exposure to a single environmental teratogen (such as a drug taken during early pregnancy).[1]

Congenital anomalies straddle different public health agendas – perinatal and child health, rare diseases, environmental health, drug safety surveillance, and major health determinants. Many major "lifestyle" determinants of ill health in the population, such as alcohol, recreational drugs, smoking, and obesity, are also risk factors for congenital anomalies. Any strategy to tackle these health determinants should pay special attention to women of childbearing age, for the harm is often done very early, before the pregnancy is recognised, and the fetus may have special susceptibility. Policies aimed at ensuring "healthy pregnancy" or good perinatal outcomes include congenital anomalies as part of a range of outcomes, including fetal and infant mortality, birth weight, and neurodevelopmental outcomes. However, a system of pre- and peri-conceptional care is needed for congenital anomalies. Much greater investment is needed in postmarketing surveillance of medicinal drugs and assisted reproduction technologies, and in environmental health surveillance, particularly of sources of environmental pollution that may have the potential to harm the fetus.

9.2 EPIDEMIOLOGIC SURVEILLANCE OF CONGENITAL ANOMALIES

Congenital ("present from birth") anomalies which involve structural malformations diagnosed prenatally, at birth, or within the first year of life, are the focus of epidemiological surveillance through congenital anomaly registers. EUROCAT (European Surveillance of Congenital Anomalies) is the principal source of information on the epidemiology of congenital anomalies in Europe. EUROCAT is a network of population-based congenital anomaly registries that use multiple sources of information to collect high quality data (both in terms of case ascertainment and diagnostic detail). Registries cover affected live births, stillbirths, and fetal deaths from 20 weeks of gestation, and terminations of pregnancy for fetal anomaly (TOPFA) following prenatal diagnosis (whether before or after 20 weeks of gestation). Registries may cover only diagnoses made prenatally and in infancy or extend registration to new diagnoses made during childhood.

The main issues for surveillance by EUROCAT are (i) the identification of environmental risk factors and high risk groups leading to opportunities for prevention;[1-5] (ii) the evaluation of preventive strategies (such as periconceptional folic acid supplementation);[6-9] (iii) the estimation of the numbers of children and families requiring specialist health or other services;[10-14] and (iv) evaluation of the impact of prenatal screening and diagnostic services.[10,15-17]

In 2005, approximately 4 million euros was spent on congenital anomaly registers by European Union countries. This equates to approximately 3 euros per birth in a registry area, or 1 euro per birth in the European Union.

Within Europe, there are geographic and socioeconomic inequalities in the prevalence of congenital anomalies. These are now of two main types – variation in the prevalence of risk factors affecting total prevalence, and additional variation in prenatal detection and termination of pregnancy rates affecting prevalence among live births.

9.3 POPULATION COVERAGE BY EUROCAT AND EURO-PERISTAT

EUROCAT started in 1979. There are currently 38 registers in 20 countries (see Table 9.1), covering in total 1.4 million births per year. Annual birth coverage is 23.4% of births of the EU-15 countries, 35.0% of the EU new member states (acceded 2004-2007), and 25.6% of the EU-27. In addition to the latter, Norway, Switzerland, and Croatia participate in EUROCAT (Table 9.1), as has Ukraine since 2007. The only EU countries with established registers of congenital anomalies not participating in EUROCAT are the Czech and Slovak Republics, both of which are working towards full membership in 2009.

Table 9.1 Coverage of the European population by EUROCAT registries and/or EURO-PERISTAT data sources, 2004

Country	Source	Region covered	Year	No of births*	% national coverage†
Belgium					
	EURO-PERISTAT – SPE	Flanders	2004	60 921	52.8
	EURO-PERISTAT – linked birth and death certificates	Brussels	2004	16 288	14.1
	EURO-PERISTAT - Belgium	Total		77 209	66.9
	EUROCAT	Antwerp	2004	18 604	16.1
	EUROCAT	Hainaut	2004	12 301	10.7
	EUROCAT – Belgium	Total		30 905	26.8
Czech Republic‡	EURO-PERISTAT - UZIS CR	Czech Republic	2004	125 503	100.0
Denmark					
	EURO-PERISTAT - Danish perinatal database	Denmark	2004	64 853	100.0
	EUROCAT	Funen County	2004	5297	8.2
Germany					
	EURO-PERISTAT - www.bqs-online.de	Germany	2004	674 524	95.6
	EUROCAT	Mainz	2004	3140	0.4
	EUROCAT	Saxony-Anhalt	2004	17 414	2.5
	EUROCAT – Germany	Total		20 554	2.9
Estonia					
	EURO-PERISTAT - Govt annual report on morbidity incidences	Estonia	2004	26 680	100.0

* Number of annual births provided by EURO-PERISTAT or EUROCAT

† % national coverage was calculated as annual births in region divided by total births in country. Total births were calculated using EUROSTAT total population figures multiplied by EUROSTAT crude birth rate/1000 (year 2004 figures).

‡ National non-EUROCAT congenital anomaly registry

Table 9.1 Coverage of the European population by EUROCAT registries and/or EURO-PERISTAT data sources, 2004 (Continued)

Country	Source	Region covered	Year	No of births*	% national coverage†
Greece					
					0.0
Spain					
	EUROCAT	Asturias	2004	7205	1.6
	EUROCAT	Barcelona	2003	14 659	3.3
	EUROCAT	Basque Country	2004	19 681	4.4
	EUROCAT	Madrid §	2004	104 009	23.1
	EUROCAT - Spain	Total		145 554	32.3
France					
	EURO-PERISTAT - Paris Birth Defects Registry data	Paris	2004	39 857	5.0
	EUROCAT	Central-east France §	2004	91 841	11.5
	EUROCAT	Ile de la Reunion	2004	14 545	1.8
	EUROCAT	Paris	2004	39 532	5.0
	EUROCAT	Strasbourg	2003	12 712	1.6
	EUROCAT - France	Total		158 630	19.9
Ireland					
	EUROCAT	Cork & Kerry	2004	8618	14.0
	EUROCAT	Dublin	2004	23 893	38.9
	EUROCAT	Southeast Ireland	2004	6632	10.8
	EUROCAT - Ireland	Total		39 143	63.8
Italy					
	EUROCAT	Campania	2004	60 906	10.9
	EUROCAT	Emilia Romagna	2004	36 567	6.5
	EUROCAT	Northeast Italy	2003	58 070	10.4
	EUROCAT	Sicily	2004	19 880	3.6
	EUROCAT	Tuscany	2004	28 979	5.2
	EUROCAT - Italy	Total		204 402	36.5
Cyprus					
					0.0
Latvia					
	EURO-PERISTAT - Newborns Register of Latvia	Latvia	2004	20 492	100.0
Lithuania					
	EURO-PERISTAT - Medical Data of Births	Lithuania	2004	29 633	97.1
Luxembourg					
	EURO-PERISTAT - FIMENA Fiche Médicale de Naissance	Luxembourg	2004	5483	100.0
Hungary					
	EURO-PERISTAT – unspecified source	Hungary	unspec.	148 152	100.0
	EUROCAT	Hungary	2002	113 839	100.0
Malta					
	EURO-PERISTAT - Malta EUROCAT Registry data	Malta	2004	3902	100.0
	EUROCAT	Malta	2004	3902	100.0
Netherlands					
	EURO-PERISTAT - The Netherlands Perinatal Registry	Netherlands	2004	177 638	91.7

† % national coverage was calculated as annual births in region divided by total births in country. Total births were calculated using EUROSTAT total population figures multiplied by EUROSTAT crude birth rate/1000 (year 2004 figures).

§ Associate EUROCAT Registries (transmit aggregate data only)

Table 9.1 Coverage of the European population by EUROCAT registries and/or EURO-PERISTAT data sources, 2004 (Continued)

Country	Source	Region covered	Year	No of births*	% national coverage†
	EUROCAT	northern Netherlands	2004	19 133	9.9
Austria					
	EURO-PERISTAT - Birth statistics	Austria	2004	79 268	100.0
	EUROCAT	Styria	2004	10 510	13.4
Poland					
	EURO-PERISTAT - EUROCAT Wielkopolska data		2004	33 738	9.5
	EUROCAT	Wielkopolska	2004	33 738	9.5
	EUROCAT	Rest of Poland §	2004	269 957	75.8
	EUROCAT - Poland	Total		303 695	85.3
Portugal					
	EUROCAT	Southern Portugal	2004	18 134	16.6
Slovenia					
	EURO-PERISTAT - National Perinatal system of Slovenia	Slovenia	2004	17 946	99.9
Slovak Republic					
	EURO-PERISTAT - SOR - report on delivering mother	Slovak Republic	2004	52 522	97.8
Finland					
	EURO-PERISTAT - The Finnish EUROCAT registry	Finland	2004	58 199	100.0
	EUROCAT	Finland §	2004	57 945	100.0
Sweden					
	EURO-PERISTAT - The Swedish EUROCAT registry	Sweden	2004	100 929	100.0
	EUROCAT	Sweden §	2003	99 516	100.0
United Kingdom					
	EURO-PERISTAT – National Congenital Anomaly System/Abortion Notifications	England and Wales		642 511	90.0
	EURO-PERISTAT - Scottish Linked Congenital Anomaly Database	Scotland		48 605	6.8
	EURO-PERISTAT	Total		691 116	96.8
	EUROCAT	England - NW Thames	2004	49 666	7.0
	EUROCAT	England - Northern region	2004	31 202	4.4
	EUROCAT	England - Oxford	2004	6921	1.0
	EUROCAT	England - E Midl/S Yorkshire	2004	66 346	9.3
	EUROCAT	England - Wessex	2004	27 180	3.8
	EUROCAT	Wales	2004	32 504	4.6
	EUROCAT - UK	Total		213 819	30.0
Norway					
	EURO-PERISTAT - Medical birth registry - EUROCAT	Norway	2004	57 616	100.0
	EUROCAT	Norway	2004	57 989	100.0
Croatia	EUROCAT	Zagreb	2004	5444	13.5
Switzerland	EUROCAT	Vaud	2004	7092	9.7
Europe	EURO-PERISTAT	Total	2004	2485 260	51.0
	EURO-PERISTAT from selected EUROCAT sources	Total	2004	294 241	6.0
	EURO-PERISTAT from other sources	Total	2004	2191 019	45.0
Europe	EUROCAT	Total	2004	1502 967	30.8

† % national coverage was calculated as annual births in region divided by total births in country. Total births were calculated using EUROSTAT total population figures multiplied by EUROSTAT crude birth rate/1000 (year 2004 figures).

§ Associate EUROCAT Registries (transmit aggregate data only)

Total population figures (EUROSTAT):
http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1996,39140985&_dad=portal&_schema=PORTAL&screen=detailref&language=en&product=REF_TB_population&root=REF_TB_population/t_popula/t_pop/t_demo_gen/tps00001
Crude birth rate (EUROSTAT):
http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1996,39140985&_dad=portal&_schema=PORTAL&screen=detailref&language=en&product=REF_TB_population&root=REF_TB_population/t_popula/t_pop/t_demo_gen/tps00112

As part of the EURO-PERISTAT II project, participating countries were in addition requested to supply data on selected congenital anomalies for 2004 only [Appendix C]. Table 9.1 shows the EU-25 countries of 2004 as well as Norway, Croatia, and Switzerland. EUROCAT in 2004 covered a population in 19 of these countries, for 1.5 million births, or 30% of the birth population (Table 9.1). EURO-PERISTAT covered an extra 2.2 million births in 14 countries, including seven countries without EUROCAT registries (Czech Republic, Estonia, Latvia, Lithuania, Luxembourg, Slovenia, and Slovak Republic). No source provided any data for Greece and Cyprus.

Maintaining high quality data usually requires a limit to the total size of the population to be covered by a register. Thus, there is a preference in larger nations for regional rather than national registries, networked nationally, and networked at a European level by EUROCAT. The proportion of national births covered by registers in each country is shown in Table 9.1, ranging among participating countries from 3% (Germany) to 100% (Norway, Sweden, Finland, Malta, and Hungary). Although complete coverage of the European population may be an ideal, this should not replace deeper investment of resources in areas already covered – excellent data from one quarter of Europe will give us more meaningful information than poor data from all of Europe.

9.4 PREVALENCE OF CONGENITAL ANOMALIES IN EUROPE

EUROCAT recorded a total prevalence of major congenital anomalies of 24.4 per 1000 births for 2004 (Table 9.2). Extrapolating to the entire EU-25, this represents 120 000 cases. Total prevalence includes live births, stillbirths, and TOPFA following prenatal diagnosis. “Major” congenital anomalies are those associated with high mortality or other serious medical or functional consequences, as defined by EUROCAT guidelines.[18]

Table 9.2 Prevalence per 1000 births of EUROCAT congenital anomaly subgroups* 2004, all EUROCAT full member registries combined†

	LB (rate per 1000 births)	LB+FD+TOPFA (rate per 1000 births)
All Anomalies	19.63	24.39
All Non-chromosomal Anomalies	18.07	20.63
Nervous system	1.01	2.21
Neural Tube Defects	0.28	0.98
Anencephalus and similar	0.03	0.37
Encephalocele	0.04	0.12
Spina Bifida	0.21	0.50
Hydrocephaly	0.22	0.47
Microcephaly	0.18	0.21
Arhinencephaly/holoprosencephaly	0.03	0.11
Eye	0.34	0.36
Congenital cataract	0.10	0.10
Ear, face and neck	0.13	0.15

Table 9.2 **Prevalence per 1000 births of EUROCAT congenital anomaly subgroups* 2004, all EUROCAT full member registries combined† (Continued)**

	LB (rate per 1000 births)	LB+FD+TOPFA (rate per 1,000 births)
Congenital heart disease	5.64	6.14
Transposition of great vessels	0.30	0.32
Ventricular septal defect	2.44	2.54
Atrial septal defect	1.87	1.89
Atrioventricular septal defect	0.10	0.15
Tetralogy of Fallot	0.22	0.24
Pulmonary valve stenosis	0.31	0.32
Pulmonary valve atresia	0.08	0.10
Aortic valve atresia/stenosis	0.09	0.10
Hypoplastic left heart	0.14	0.27
Coarctation of aorta	0.27	0.29
Respiratory	0.38	0.55
Oro-facial clefts	1.24	1.34
Cleft lip with or without palate	0.74	0.82
Cleft palate	0.49	0.52
Digestive system	1.21	1.43
Oesophageal atresia with or without tracheo-oesophagal fistula	0.18	0.20
Ano-rectal atresia and stenosis	0.23	0.29
Hirchspung's disease	0.10	0.10
Diaphragmatic hernia	0.20	0.24
Abdomnal wall defects	0.40	0.54
Gastroschisis	0.27	0.30
Omphalocele	0.13	0.21
Urinary	2.25	2.74
Bilateral renal agenesis including Potter syndrome	0.03	0.12
Renal dysplasia	0.29	0.40
Congenital hydronephrosis	0.90	0.94
Posterior urethral valve and/or prune belly	0.07	0.11
Genital	1.51	1.57
Hypospadias	1.22	1.23
Limb	3.16	3.47
Limb reduction	0.41	0.55
Upper limb reduction	0.31	0.40
Lower limb reduction	0.14	0.21
Club foot - talipes equinovarus	0.76	0.85
Hip dislocation and/or dysplasia	0.54	0.55
Polydactyly	0.64	0.68
Syndactyly	0.43	0.45
Musculo-skeletal	0.53	0.81
Craniosynostosis	0.13	0.14
Other malformations	0.40	0.52
Disorders of skin	0.37	0.38
Teratogenic syndromes with malformations	0.06	0.10
Genetic syndromes + microdeletions	0.42	0.50
Chromosomal	1.57	3.77
Down Syndrome	1.03	2.20
Patau syndrome/trisomy 13	0.04	0.18
Edward syndrome/trisomy 18	0.08	0.50
Turner's syndrome	0.06	0.20
Klinefelters syndrome	0.07	0.11

Footnotes:

LB= live birth; FD= fetal death/stillbirths from 20 weeks of gestation; TOPFA= termination of pregnancy following prenatal diagnosis of congenital anomaly

* Subgroups with total prevalence of at least 0.1 per 1000 births are shown. For the full list of 96 subgroups see http://www.eurocat.ulster.ac.uk/pubdata/tables.html

The prevalence of major congenital anomalies among live births recorded by EUROCAT was 19.6 per 1000 births in 2004 (Table 9.2). Extrapolating to the entire EU-25, this represents 96 000 affected live births.

The prevalence of chromosomal anomalies was 3.8 per 1000 births (Table 9.2). In the data shown in Table 9.2, these cases have been excluded from other subgroups (ie, a child with an abdominal wall defect and a chromosomal anomaly is recorded only under chromosomal anomalies). Congenital heart disease is the most common subgroup, at 6.1 per 1000 births, followed by limb (3.5 per 1000), urinary system (2.7 per 1000), and nervous system defects (2.2 per 1000), including neural tube defects (1.0 per 1000) and cleft lip and/or palate (1.3 per 1000). Each year EUROCAT updates prevalence figures on 95 subgroups of congenital anomalies, available on its website (EUROCAT 2007). Those with a total prevalence above 0.1 per 1000 births are shown in Table 9.2.

The EURO-PERISTAT II project collected data on four specific anomalies only: two types of neural tube defects (anencephaly and spina bifida), cleft lip and/or palate, and Down syndrome (Table 9.3). These anomalies are usually readily recognisable at birth or prenatally. In the absence of a congenital anomaly registry, these anomalies are more likely than other congenital anomalies to be well ascertained in data sources such as birth records and hospital statistics, but ascertainment of TOPFA may pose problems. Some countries had data from both EUROCAT and EURO-PERISTAT. Although there is some variation in the rates from a single year in the smaller countries/regions due to chance variation in very small numbers, differences can be observed between data sources. Substantially higher rates were reported by EUROCAT than EURO-PERISTAT in Belgium, Germany, Austria, and England & Wales. In the Netherlands, the two sources of data reported more similar figures. In four countries rates were nearly identical, as the EURO-PERISTAT data sources were EUROCAT registries (France-Paris, Norway, Sweden, Malta), although small discrepancies were found which may be due to different interpretations of EURO-PERISTAT data extraction rules.

Table 9.3 Comparison of EURO-PERISTAT and EUROCAT livebirth and total prevalence rates per 1000 births for anencephaly, spina bifida, cleft lip and/or palate, and Down Syndrome, 2004

		LB rate per 1000 births EURO-PERISTAT				LB rate per 1000 births EUROCAT				LB + FD + TOP rate per 1000 births EURO-PERISTAT				LB + FD + TOP rate per 1000 births EUROCAT			
Country	Source	Anencephaly	Spina Bifida	Cleft lip and/or cleft palate	Down Syndrome	Anencephaly	Spina Bifida	Cleft lip and/or cleft palate	Down Syndrome	Anencephaly	Spina Bifida	Cleft lip and/or cleft palate	Down Syndrome	Anencephaly	Spina Bifida	Cleft lip and/or cleft palate	Down Syndrome
EUROCAT (All)						0.03	0.20	1.21	0.98					0.36	0.50	1.38	2.08
EURO-PERISTAT (All)		0.02	0.17	1.02	0.65					0.15	0.27	1.07	1.08				
EURO-PERISTAT (All excluding EUROCAT)		0.02	0.16	0.94	0.58					0.12	0.26	0.98	0.89				
Belgium																	
Flanders	EURO-PERISTAT	0.03	0.28	1.17	0.49					0.05	0.38	1.18	0.53				
Brussels	EURO-PERISTAT	0.00	0.25	NA						0.06	0.31	0.74					
	EUROCAT					0.00	0.03	2.11	0.88					0.19	0.45	2.17	1.78
Czech Republic	EURO-PERISTAT	0.02	0.08	1.22	0.41					0.12	0.26	1.38	0.92				
Denmark	EURO-PERISTAT	0.00	0.63	2.37	1.03					0.00	0.66	1.42	1.06				
Funen County	EUROCAT					0.00	0.38	1.90	0.38					0.57	0.38	2.08	1.89
Germany	EURO-PERISTAT	0.02	0.12	0.78	0.37					0.03	0.14	0.79	0.40				
	EUROCAT					0.00	0.64	1.66	1.27					0.24	1.07	1.99	2.38
Estonia	EURO-PERISTAT	0.00	0.00	NA	0.07					0.00	0.04	NA	0.15				
Spain	EUROCAT					0.02	0.02	0.83	0.71					0.51	0.24	0.97	2.64
France	EURO-PERISTAT / EUROCAT Paris	0.00	0.15	0.80	0.50					0.55	0.40	1.25	4.04				
Paris	EUROCAT					0.00	0.15	0.82	0.51					0.61	0.41	1.27	4.10
France (inc Paris)	EUROCAT					0.00	0.17	1.10	0.54					0.63	0.49	1.56	3.02
Ireland	EUROCAT					0.15	0.44	1.21	1.69					0.23	0.46	1.25	1.86
Italy	EUROCAT					0.02	0.12	0.72	0.57					0.18	0.40	0.87	1.58
Latvia	EURO-PERISTAT	0.00	0.39	0.63	0.73					0.00	0.39	0.63	0.73				
Lithuania	EURO-PERISTAT	0.00	0.61	1.21	1.32					0.13	0.64	1.21	1.32				
Luxembourg	EURO-PERISTAT	0.00	0.00	NA	NA					0.00	0.00	1.28	0.36				
Hungary	EURO-PERISTAT	0.01	0.09	0.80	0.50					0.14	0.22	0.82	1.01				
Hungary*	EUROCAT					0.07	0.20	1.17	1.01					0.28	0.40	1.05	1.39
Malta	EURO-PERISTAT / EUROCAT Malta	0.00	0.51	1.54	1.03					0.26	0.51	1.54	1.03				
Malta	EUROCAT					0.00	0.51	1.80	1.03					0.26	0.51	1.79	1.03
Netherlands	EURO-PERISTAT	0.06	0.32	1.37	1.17					0.11	0.43	1.45	1.25				
N Netherlands	EUROCAT					0.00	0.26	1.63	0.89					0.05	0.57	1.78	1.57

Table 9.3 Comparison of EURO-PERISTAT and EUROCAT livebirth and total prevalence rates per 1000 births for anencephaly, spina bifida, cleft lip and/or palate, and Down Syndrome, 2004 (Continued)

		LB rate per 1000 births EURO-PERISTAT				LB rate per 1000 births EUROCAT				LB + FD + TOP rate per 1000 births EURO-PERISTAT				LB + FD + TOP rate per 1000 births EUROCAT			
Country	Source	Anencephaly	Spina Bifida	Cleft lip and/or cleft palate	Down Syndrome	Anencephaly	Spina Bifida	Cleft lip and/or cleft palate	Down Syndrome	Anencephaly	Spina Bifida	Cleft lip and/or cleft palate	Down Syndrome	Anencephaly	Spina Bifida	Cleft lip and/or cleft palate	Down Syndrome
Austria	EURO-PERISTAT	0.00	0.11	0.81	0.13					0.01	0.13	0.82	0.13				
Styria	EUROCAT					0.00	0.67	2.01	0.48					0.19	0.86	2.09	1.62
Poland	EURO-PERISTAT/EUROCAT	0.21	0.33	1.51	1.24					0.24	0.39	1.54	1.24				
	Wielkopolska																
Wielkopolska	EUROCAT					0.21	0.51	1.67	1.76					0.24	0.56	1.69	1.75
Portugal	EUROCAT					0.00	0.17	0.33	0.44					0.06	0.22	0.39	0.66
Slovenia	EURO-PERISTAT	0.00	0.39	1.78	0.84					0.00	0.39	1.84	0.89				
Slovak Republic	EURO-PERISTAT	0.00	0.44	1.45	0.89					0.10	0.48	1.54	0.99				
Finland	EURO-PERISTAT/ EUROCAT																
Finland	Finland	0.02	0.21	2.15	1.15					0.27	0.36	2.42	2.80				
	EUROCAT					0.02	0.21	2.19	1.16					0.28	0.36	2.43	2.81
Sweden	EURO-PERISTAT/ EUROCAT																
	Sweden	0.02	0.16	1.43	1.05					0.34	0.35	1.53	2.43				
Sweden†	EUROCAT					0.00	0.22	1.25	1.53					0.35	0.39	1.40	2.72
United Kingdom																	
England and Wales	EURO-PERISTAT	0.02	0.09	0.75	0.65					0.26	0.26	0.78	1.36				
England and Wales	EUROCAT					0.01	0.14	1.34	1.23					0.52	0.58	1.55	2.46
Scotland	EURO-PERISTAT	0.02	0.19	1.87	1.03					0.27	0.39	1.89	1.85				
Norway	EURO-PERISTAT / EUROCAT																
	Norway	0.05	0.38	1.89	1.56					0.50	0.56	1.98	2.13				
Norway	EUROCAT					0.05	0.37	1.86	1.58					0.53	0.53	1.95	2.14

Footnotes:
LB= live birth; FD= fetal death/stillbirths from 20 weeks gestation; TOPFA= termination of pregnancy following prenatal diagnosis of congenital anomaly
*Based on 2002 data; †Based on 2003 data

9.5 TERMINATION OF PREGNANCY FOR FETAL ANOMALY

Some congenital anomalies in Europe are very commonly prenatally diagnosed. For example EUROCAT data for 2002-2006 show the proportion of cases prenatally diagnosed was 99% for anencephalus, 81% for spina bifida, 42% transposition of great vessels, 79% hypoplastic left heart, 95% gastroschisis, 92% bilateral renal agenesis (including Potter syndrome), and 72% Down syndrome (http://www.bio-medical.co.uk/eurocatlive/results7.cgi).

For some anomalies, including various forms of congenital heart disease, gastroschisis, and diaphragmatic hernia, prenatal diagnosis leads to better preparation of families and health services for an affected baby and can improve treatment success.[19, 20]

For other anomalies, particularly neural tube defects and chromosomal anomalies including Down Syndrome, prenatal diagnosis is commonly followed by TOPFA. The reported TOPFA rate varies from 0 (Ireland and Malta, where TOPFA is illegal) to 10.7 (France) per 1000 births (Table 9.4). Differing prenatal screening policies and practices, differences in uptake of prenatal screening due to cultural and organisational factors, and differences in TOPFA laws and practices all influence the rate of TOPFA in the population.[15,21] Some countries allow TOPFA at any gestational age (Austria, Belgium, Croatia, England & Wales, France, and Germany). Others have an upper gestational age limit (Finland, Italy, Spain, Sweden, and Switzerland), and yet others have an upper gestational age limit but allow TOPFA for lethal anomalies beyond this limit (Netherlands, Norway, Portugal, and Denmark). In Poland, TOPFA tends to be only in case of lethal anomaly.

Of all TOPFA in 2004 (all EUROCAT registries combined), 28% were for neural tube defects (13% anencephaly and 11% spina bifida) and 26% were for Down syndrome.

Table 9.4 shows TOPFA before and after 20 weeks of gestation. The highest TOPFA rates, both before and after 20 weeks, were recorded in France (4.8 and 5.9 per 1000 births respectively). Comparison between countries is complicated by different laws and practices regarding the recording of late terminations.

Table 9.4 **Rate of terminations of pregnancy for fetal anomaly following prenatal diagnosis (TOPFA) and rates of perinatal deaths* per 1000 births by country, 2004, EUROCAT full member registries**

Country†	TOPFA <20 weeks per 1000 births	TOPFA 20+ weeks per 1000 births	Total TOPFA per 1000 births‡	Perinatal mortality per 1000 births*	Perinatal mortality + TOPFA per 1000 births§
Belgium	1.49	1.33	3.27	1.68	4.95
Denmark	2.83	0.94	3.78	1.51	5.29
Germany	2.43	1.56	3.99	0.83	4.82
Spain	3.79	2.75	6.62	0.48	7.10
France	4.75	5.90	10.65	0.94	11.59
Ireland**	-	-	-	2.37	2.37
Italy	2.06	2.48	4.95	0.25	5.20
Malta**	-	-	-	2.56	2.56
Netherlands	0.89	0.63	1.52	1.10	2.61
Austria	2.66	0.67	3.33	0.76	4.09
Poland††	-	-	-	1.48	1.48
Portugal	0.44	0.33	0.77	0.22	0.99
UK	2.69	2.09	4.80	1.10	5.90
Norway	2.55	0.48	3.05	0.48	3.54
Total	2.31	1.97	4.38	0.93	5.31

* Perinatal deaths associated with congenital malformations as reported in EUROCAT database, including fetal deaths/stillbirths from 20 weeks of gestation and early neonatal deaths

† EUROCAT Full Member registries only (excluding Sicily)

‡ Total TOPFA includes cases with gestational age not known

§ Perinatal Mortality + TOPFA includes total TOPFA

** Termination of pregnancy illegal

†† TOPFA known to be underascertained

Differences between countries in the proportion of cases prenatally diagnosed leading to TOPFA lead to wide variation in livebirth rates of certain congenital anomalies. The livebirth rate of spina bifida varies from <0.05 per 1000 in Belgium and Spain (Table 3) to >0.5 per 1000 in Germany, Malta, and Poland. The livebirth rate of Down syndrome, which is in addition influenced by the maternal age profile of the population, varies from <0.5 per 1000 in Denmark, Austria, and Portugal to >1.5 per 1000 in Poland, Sweden, and Norway (Table 9.3).

9.6 FETAL AND NEONATAL MORTALITY ASSOCIATED WITH CONGENITAL ANOMALY

Congenital anomalies are an important contributor to perinatal mortality. The overall recorded rate of late fetal deaths/stillbirths with congenital anomaly is 0.47 per 1000 births for 2004 (EUROCAT data), and of deaths in the first week 0.46 per 1000 births (EUROCAT data), for a total perinatal mortality rate associated with congenital anomaly of 0.93 per 1000 births (Table 9.5). The main congenital anomaly subgroups contributing to perinatal mortality are congenital heart disease (26% of perinatal deaths with anomaly), nervous system anomalies (21%), and chromosomal anomalies (25%) (Table 9.5). Chromosomal anomalies and nervous system defects contribute more to stillbirths than to deaths during the first week, while congenital heart disease is almost equal in both categories (Table 9.5).

Perinatal mortality associated with congenital anomaly varies by country (Table 6). The highest rates of perinatal mortality associated with congenital anomaly are recorded in Ireland (2.4 per 1000, EUROCAT data) and Malta (2.6 per 1000, EUROCAT data). These are both countries where TOPFA is illegal, and thus the perinatal mortality rate includes affected fetuses with a lethal or high mortality anomaly which would in other countries have led to TOPFA and exclusion from mortality statistics.

Table 9.5 Perinatal mortality associated with congenital anomalies in EUROCAT full member registries combined, 2004,* by type of anomaly

Anomaly Subgroup†	% of 1st week LB deaths (all anomalies)	% of FD (all anomalies	Prevalence of 1st week deaths per 1000 births	Prevalence of FD per 1000 births	Perinatal mortality per 1000 births
All Anomalies	100	100	0.46	0.47	0.93
All Anomalies Excluding Chromosomal Anomalies	82	69	0.38	0.32	0.70
Nervous system	18	23	0.08	0.11	0.19
Neural Tube Defects	9	11	0.04	0.05	0.09
Anencephalus and similar	5	6	0.02	0.03	0.05
Hydrocephaly	2	6	0.01	0.03	0.04
Congenital heart disease	25	26	0.12	0.12	0.24
Ventricular septal defect	5	6	0.02	0.03	0.05
Atrial septal defect	5	3	0.02	0.01	0.03
Hypoplastic left heart	5	2	0.02	0.01	0.03
Respiratory	14	11	0.06	0.05	0.12
Oro-facial clefts	4	5	0.02	0.02	0.04
Digestive system	17	11	0.08	0.05	0.13
Diaphragmatic hernia	11	4	0.05	0.02	0.07
Abdominal wall defects	3	6	0.01	0.03	0.04
Omphalocele	2	5	0.01	0.02	0.03
Urinary	15	12	0.07	0.06	0.13
Bilateral renal agenesis including Potter syndrome	5	1	0.02	0.01	0.03
Limb	11	14	0.05	0.07	0.12
Club foot - talipes equinovarus	4	7	0.02	0.03	0.05
Musculo-skeletal	6	8	0.03	0.04	0.07
Other malformations	3	8	0.01	0.04	0.05
Chromosomal	18	31	0.08	0.15	0.23
Down Syndrome	4	11	0.02	0.05	0.07
Edward syndrome/trisomy 18	6	7	0.03	0.03	0.06

LB=Live births, FD=Fetal deaths/stillbirths from 20 weeks gestation

* Perinatal mortality rates associated with congenital malformations as reported in EUROCAT database;

† Subgroups contributing to at least 5% of first week deaths or FD are shown.

Table 9.6 presents both EUROCAT and EURO-PERISTAT data on fetal deaths (from 20 weeks for EUROCAT, for 22 weeks and/or 500 g for EURO-PERISTAT) and neonatal mortality. The EUROCAT data come from the registries, which record the type of birth (live, still- or termination) and whether the baby survived the first week for live births. The EURO-PERISTAT data come from death certificates for stillbirths and infant deaths from most countries, and from stillbirth and infant death enquiries, and may concentrate on underlying cause of death, rather than on whether a major congenital malformation was present. This is the first time that these various sources of data have been compared. Death certificates may under-record or imprecisely record or code congenital anomalies as a cause of death, especially if the autopsy rate is low. Depending on the information systems in place, deaths may be incompletely notified to some congenital anomaly registries. In the EUROCAT data, late TOPFA are excluded from perinatal mortality statistics but may in some countries nevertheless be registered as stillbirths and be included in the EURO-PERISTAT statistics. Much work therefore remains to be done in interpreting the statistics shown in Table 9.6.

TOPFA in most countries far outnumber stillbirths and neonatal deaths with congenital anomaly (Table 9.4). Up to 1.2% (France) of fetuses result in a TOPFA, stillbirth, or early neonatal death associated with a congenital anomaly, and 5 countries report a rate above 0.5% (Table 9.4). The differences in total mortality (TOPFA + perinatal) between countries probably mainly reflects the frequency with which TOPFA is carried out for non-lethal anomalies, but is also influenced by differences between countries in the prevalence of anomalies such as neural tube defects and Down syndrome and in the completeness of ascertainment of stillbirths, neonatal deaths, and TOPFA.

Table 9.6 Fetal death, early neonatal, perinatal and neonatal mortality associated with congenital anomalies per country, 2004, EUROCAT and EURO-PERISTAT data

	EUROCAT*			EURO-PERISTAT*		
All Anomalies	Prevalence of FD per 1000 births	Prevalence of early neonatal†‡ deaths per 1000 births	Perinatal mortality per 1000 births‡	Fetal mortality due to CA per 1000 births§	Neonatal mortality due to CA per 1000 live births	Ratio early: late neonatal† deaths with CA
Belgium	0.78	0.91	1.68	0.9	1.0	4:1
Czech Republic**	-	-	-	0.8	NA	NA
Denmark	0.38	1.13	1.51	0.5	0.8	2:1
Germany	0.63	0.19	0.83	0.0	NA	NA
Estonia††	-	-	-	0.3	0.9	6:1
Spain‡‡	0.15	0.33	0.48	0.3	0.4	3:1
France§§	0.35	0.59	0.94	NA	0.6	NA
Ireland***	0.95	1.41	2.37	0.9	NA	NA
Italy	0.15	0.10	0.25	NA	0.8	NA
Latvia	-	-	-	0.2	1.3	2:1
Lithuania	-	-	-	0.6	1.8	2:1
Malta†††	0.77	1.79	2.56	0.5	2.3	1:1
Netherlands	0.31	0.78	1.10	-	-	-
Austria‡‡‡	0.48	0.29	0.76	NA	0.7	NA
Poland§§§	0.30	1.19	1.48	NA	1.5	NA
Portugal	0.06	0.17	0.22	-	-	-
Slovenia	-	-	-	0.9	0.7	12:1
Finland****	-	-	-	1.2	0.6	4:1
UK	0.66	0.44	1.10	-	-	-
Scotland††††	-	-	-	1.0	0.7	2:1
Northern Ireland‡‡‡‡	-	-	-	1.0	0.8	9:1
Norway	0.48	0.00	0.48	-	-	-
Total	0.47	0.46	0.93	0.6	0.9	2:1

* Please refer to text for difficulties in interpretation of a direct comparison of these sources of statistics
† Early neonatal mortality = 1 week, late neonatal mortality= >1 week to < 1 month
‡ Perinatal mortality rates associated with congenital malformations as reported in EUROCAT database
§ Fetal deaths with gestational age >= 22 weeks and/or birth weight >= 500 g
** Source: EURO-PERISTAT: Database of aggregated data of the Czech Society of Perinatal Medicine
†† Source: EURO-PERISTAT: Statistics Estonia
‡‡ Source: EURO-PERISTAT: Registro de Mortalidad Perinatal
§§ Source: EURO-PERISTAT: National statistics of causes of death, CepiDC, INSERM
*** Source: EURO-PERISTAT: National Perinatal Reporting System (NPRS)
††† Source: EURO-PERISTAT: National Mortality Register
‡‡‡ Source: EURO-PERISTAT: birth + cause of death statistics for infant deaths
§§§ Source: EURO-PERISTAT: CSO
**** Source: EURO-PERISTAT: Cause-of-Death Register, fetal death not defined
†††† Source: EURO-PERISTAT: Scottish Stillbirth & Infant Death Enquiry
‡‡‡‡ Source: EURO-PERISTAT: CEMACH, fetal death not defined

9.7 INFANT SURVIVORS

Of the total prevalence of major congenital anomalies in 2004 (24.4 per 1000 births), a little over one fifth (5.3 per 1000) resulted in a fetal or early neonatal death. Preliminary EUROCAT data analyses show that 97% of live births affected by a major congenital anomaly survive to one week, and of these babies less than 5% die in the first year. Thus, despite the important mortality consequences of congenital anomaly, the vast majority of cases of congenital anomaly across Europe are liveborn children who survive infancy, but who may have important medical, social, or educational needs.

9.8 DATA DEVELOPMENTS

Registries provide syntheses across a variety of data sources generated by the health system. There are many areas where improvement in underlying health information systems across Europe will improve the quality or efficiency of registries, most of which rely at least in part on manual trawling through medical records or specific notifications from clinicians. These improvements could include, depending on country: a) full coding of cause of death on stillbirth and infant death certificates, backed by specialised fetal pathology services; b) systematic recording of TOPFA with diagnostic information, clearly distinguished from spontaneous fetal deaths/stillbirths; c) the potential to link registry cases to death notifications in order to ascertain survival; d) improved accuracy and accessibility of hospital episode data; e) linkage between different health information systems using unique patient identifiers; and f) use of a core set of descriptors of SES for all births. EUROCAT is working with EURO-PERISTAT towards better perinatal information across Europe.

9.9 THE FUTURE

The last few decades have not seen any real progress in primary prevention of congenital anomalies, as evidenced by the lack of decline in prevalence. Implementation of current knowledge with effective policies and research into causes of congenital anomalies have the potential to change this situation, with political will.

"Clusters" of congenital anomalies and their potential relationship to environmental pollution or to newly marketed drugs are the most prominent public health concern about congenital anomalies, whether detected by the community or by statistical monitoring. They require epidemiological preparedness (see the EUROCAT Cluster Advisory Service http://www.eurocat.ulster.ac.uk/clusteradservice.html) and further investment and co-operation between countries in cluster response, with effective dialogue with communities. However, primary prevention of congenital anomalies needs to be proactive as well as reactive.

Prenatal screening and diagnosis have seen rapid development. The near future will bring less invasive technologies for the detection of chromosomal anomalies and greater sensitivity and specificity of diagnosis of anomalies. Variations in the quality of screening services within Europe need examination. Another challenge for European countries is to reduce the number of women who may need to consider termination of pregnancy as an option by achieving effective primary prevention and improving the outcome of affected children and their families in terms of health, quality of life, and participation. It is vital to invest in the epidemiological surveillance of congenital anomalies across Europe in order to direct and track our progress in these areas.

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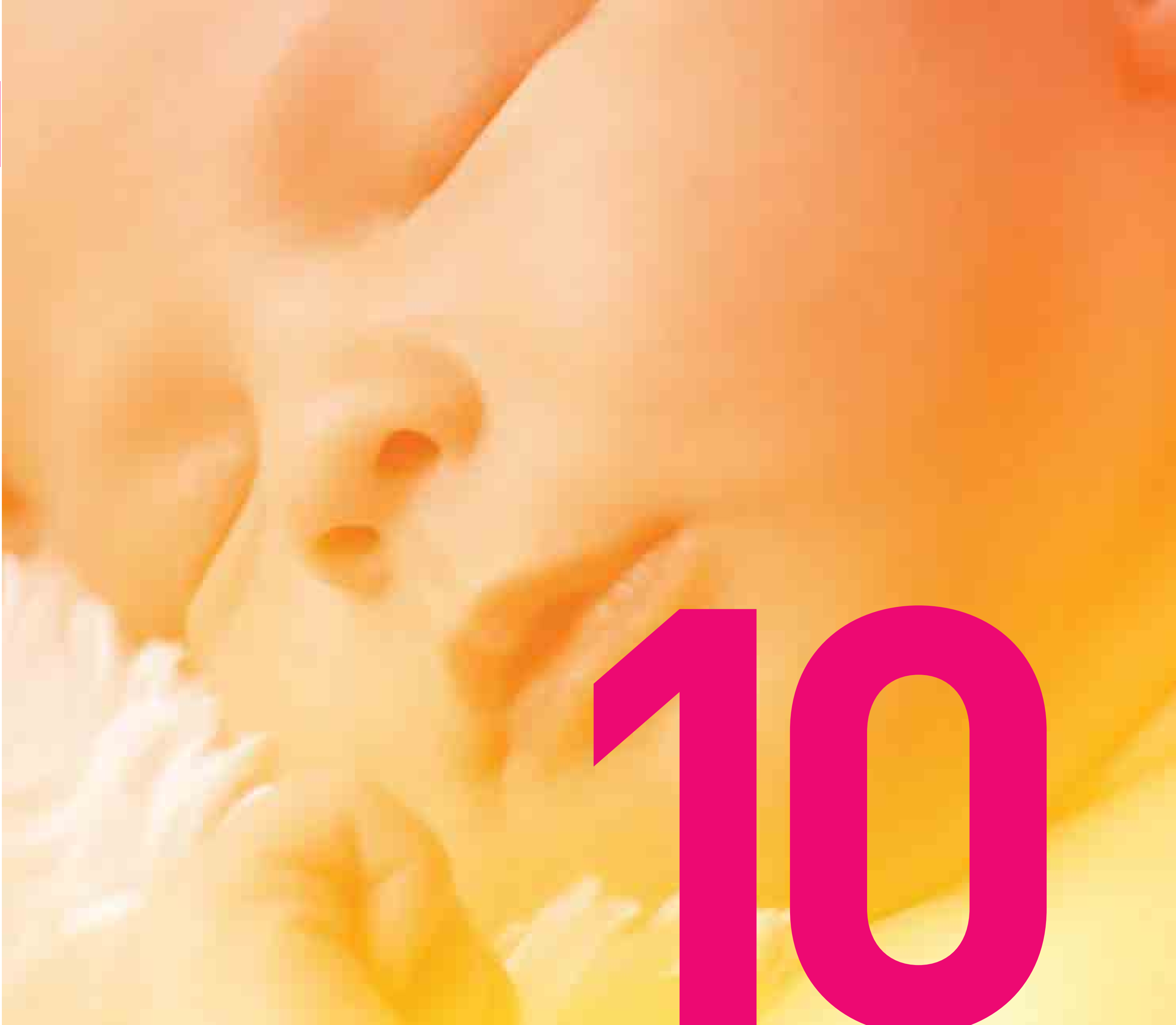

10

VERY LOW BIRTHWEIGHT AND GESTATIONAL AGE INFANTS IN EUROPE: EURONEOSTAT

10 VERY LOW BIRTHWEIGHT AND GESTATIONAL AGE BABIES IN EUROPE: EURONEOSTAT

10.1 INTRODUCTION

This chapter considers the health implications in Europe of **"being born too soon, too small"**. It reviews the neonatal care processes for infants of very low gestational age (VLGA, less than 32 weeks) and of very low birth weight (VLBW, below 1501 g) and presents weight-specific neonatal mortality rates (NMR), perinatal risks and preventive factors, frequent therapeutic interventions, and selected short-term morbidity. Finally, long-term consequences for postnatal wellbeing and neurodevelopment in terms of disabilities and quality of life are also discussed.

VLBW infants account for less than 2% (0.04-1.24%)[1] of all live births, but their outcomes nonetheless have a major impact on perinatal, neonatal, and infant mortality.[2] Moreover, the long-term consequences of extreme prematurity might compromise their wellbeing as children and adults,[3] cause stress to families,[4] and economic burden to health systems.[5] The weight-adjusted NMR for VLBW infants (~150/1000 live births) is more than 50 times higher than the overall NMR (2.4-6.8/1000).[6] Furthermore, disabilities of perinatal origin are more frequent in preterm than in term infants.

It is estimated that over 2 million VLBW infants are born every year worldwide, and the prevalence of prematurity is rising in most European countries despite efforts to prevent it.[7] This may be related to the increased number of twin pregnancies, due perhaps to the increase in both maternal age and use of assisted reproduction.[8]

European health care systems are not uniform, but all member states offer government-paid access to NICUs and perinatal centres.[9] Birth of these babies at such centres diminishes the need for postnatal transfers.[10] A further advantage of regionalisation to facilitate access of VLBW infants to intensive care is that it makes it easier to keep track of every such baby born within a given area.

Neonatal mortality reporting systems from civil and birth registers are well established but have traditionally only reported weight-specific data for the whole category of low birthweight infants (ie, <2500 g).[11] Years ago data about more immature infants were often under-reported because mortality was extremely high at those low gestational ages and birth weights. In the last few decades, improvements in perinatal and neonatal care have pushed back the limits of viability. Collecting data about these immature infants has thus become extremely important, but these data are not widely available. Data from survey and hospital discharges are becoming available, but are not systematically aggregated by central registers or by EUROSTAT. Currently, some European countries report data on gestational age and weight-specific neonatal mortality to evaluate perinatal and neonatal health care of VLBW/VLGA infants, as recommended by the EURO-PERISTAT project.[12]

With the implementation of new internet-based communication technologies, networking has been very successful in gathering data and disseminating health information. Existing neonatal networks collect standardised patient data to promote excellence in clinical practice by benchmarking and comparing outcomes, and in research, continued education, and quality improvement projects. Networks maintain databases that can keep patient and unit identities anonymous. For many reasons (Table 10.1), neonatal networks have focused on outcomes for VLBW/VLGA infants, a group for which the development of an epidemiological information system is fully justified.

Table 10.1 Advantages of a European information system for VLBW/VLGA infants

- Prematurity rates are increasing in Europe and throughout the world (8-12% of live births).
- Outcomes of VLGA/VLBW infants contribute significantly to neonatal and infant mortality rates (up to 60-70%).
- These infants have even higher rates of short and long-term morbidity associated with later developmental disabilities.
- The total number of VLGA/VLBW infants is relatively small (1-2% of live births).
- All infants are immediately and easily identified at hospitals.
- Many initial risk factors are known and can be used to standardise outcomes.
- To some extent outcome is related to the quality of care received, which paves the way to the implementation and assessment of quality improvement strategies.
- Larger and increasing amounts of resources are consumed for their short and long-term care.
- Several evidence-based interventions have been shown to improve outcome (eg, antenatal steroids and postnatal surfactant).
- Nosocomial infection is prevalent and increases risk for poor outcomes but is potentially preventable.
- Surviving infants often have neurological and respiratory disabilities requiring follow up, multiple therapeutic interventions, prolonged care, and rehospitalisations.
- Overall, perinatal, neonatal, and long-term care of VLBW infants is a demanding health problem involving increasingly more health resources.

Modified from JP Diaz Rosello, CLAP, Montevideo, Uruguay. Personal communication

There are several neonatal networks in other areas of the world[17-20] and in some European countries (including Belgium,[21] Ireland,[22] Portugal,[23] and Spain[24]) and regions (eg, the Basque Country and Navarre,[25] Lazio,[26] and England's Regional Networks[27]). However, there was no Europe-wide network to allow comparisons of outcomes for VLGA/VLBW infants, specifically designed to identify differences in perinatal care in the different European countries. A neonatal network for data collection on the short- and long-term health consequences of VLBW and VLGA birth in Europe was much needed. In 2006, such a network – EuroNeoNet – was financed by the European Commission's Directorate General of Public Health and Consumer Protection (DG-SANCO)[15,16] and one of its components, the EuroNeoStat project (www.euroneostat.org) began collecting data about VLBW/VLGA babies born in several European countries in 2006.

EuroNeoStat has developed a consensus set of standardised perinatal indicators with uniform definitions, composed of perinatal risk and protective factors, selected neonatal interventions, and short-term outcomes. These have been modified from those developed by the Vermont-Oxford Network, with their approval. Furthermore, a minimal follow-up set of indicators to assess health status and neurodevelopment status at 24 months of postnatal age corrected for prematurity have been proposed and are currently being evaluated (Table 10.2).

Table 10.2 Health status and developmental follow-up at 24 months of age (corrected for prematurity)

- Died after discharge from Neonatal Unit Corrected age at assessment
- Weight, height/length and head circumference at assessment - Congenital malformations/anomalies - Able to walk without support? - Able to sit? - Able to use hands to feed self? - Able to control head movement without support or no head control? - Total hearing impaired, uncorrected even with aids? - Total blindness or sees light only? - Assessment with objective test: - If performed (normal or not) - If not performed indicate:
Communicating by speech or other method? YES/NO
Able to produce more than 5 recognisable sounds? YES/NO Able to understand words/signs? YES/NO Shows interest in known people or objects? YES/NO
- Convulsions (more than one seizure monthly even with treatment) - Gastrointestinal function: Normal, requires tube feeding or parental nutrition - Respiratory function: normal or requires continual or respiratory support? - Renal function: requires dialysis? - Cerebral palsy: absent, permanent disability or considered temporary

Full health and neurodevelopment follow-up items in the dataset and definitions can be downloaded at: www.euroneostat.org

These indicators can be used for many purposes, for example: 1) to compare outcomes from individual NICUs with those of other institutions, to identify areas with opportunities for improvement, and to assess the success of the initiatives undertaken; 2) to evaluate health programmes and develop priorities for planning, promotion, and evaluation of short- and long-term care of these infants by health organisations; 3) to document clinical variability of the care process and its outcomes with the aim of developing the optimal application of health care; and 4) to promote consensus in health policies and strategies to improve the care of these high-risk premature infants.

10.2 DATA COLLECTION AND ANALYSIS

The 2006 infant cohort included a total of 2875 VLGA/VLBW infants, who received care at 60 NICUs in 13 countries. Of these infants, 73 were not admitted to a NICU because they died in the delivery room and were excluded from this study.

The following items were included in the 2006 EuroNeoStat perinatal dataset and collected for each baby: gestational age, birth weight, length and head circumference, gender, prenatal care, steroid use, mode of delivery, multiple birth, Apgar scores at 1 and 5 min, resuscitation at birth, death in the delivery room, age at admission, surfactant administration, supplemental oxygen on day 28 and at 36 weeks, steroid use for bronchopulmonary dysplasia, indomethacin/ibuprofen treatment, ductus arteriosus surgical closure, retinopathy of prematurity (ROP), necrotising enterocolitis (NEC) or focal gastrointestinal perforation and surgery for NEC, other major surgery, respiratory distress syndrome, pneumothorax, cranial imaging, presence and grade of intraventricular haemorrhage (IVH), periventricular leukomalacia, early and late bacterial sepsis and/or meningitis and the responsible bacterial pathogen, major congenital anomalies, the provision of an oxygen and/or cardiorespiratory monitor at discharge, age, weight, length, and head circumference at initial disposition from the hospital, transfer to another neonatal unit and the reason for transfer, limitation of intensive support, age at death, autopsy, and cause of death. The full perinatal dataset and definitions can be downloaded at www.euroneostat.org.

Non-categorical data were described with parametric and non-parametric statistics (mean, SD, median, P25, P75, Min, Max). Rates were calculated for categorical data. For Apgar scores, rates for values below 5 and 7 points were determined for 1- and 5-min scores. A global rate of surfactant administration was calculated (surfactant at any time) and within this group of surfactant-treated babies, a first hour of life rate was also calculated.

Units with 5 or fewer babies admitted were excluded from the analysis of the variability of outcomes within NICUs. Lowest and highest rates were calculated for each item within each unit. Unit variability graphs were drawn as crude rates for each NICU and item.

Standard mortality rates adjusted for both birth weight and gestational age groups and their 95% CI intervals were calculated for NICUs with more than 5 babies admitted.

10.3 RESULTS

This report is based on morbidity and mortality data from the 2006 EuroNeoStat cohort of immature infants of VLGA and VLBW and emphasises the influence of gestational age, birth weight, and sex on the outcomes. Clinical variability and possible health inequalities are also discussed.

10.3.1 PRINCIPAL RISK FACTORS AND DETERMINANTS

One of the most important determinants for intact survival is accessibility to a NICU in the same hospital where the infant was born.[30] Rates for babies born before 32 weeks of gestation in hospitals with NICUs varied from 33.5% in Greece to 97.7% in the Valencia region in Spain.[6]

The major biological risk factor for mortality in VLBW infants is immaturity. The lower limit for viability is now around 23-24 weeks of gestation. However, there are other risk factors related to maternal health, SES, aspects of pregnancy (eg, antenatal care, infection, multiple pregnancy, and assisted conception, infant characteristics (eg, birth weight and congenital anomalies), and condition at birth (eg, Apgar scores and need for resuscitation).[13]

The 2006 EuroNeoNet cohort included babies with a birth weight <1501 g or a gestational age <32 weeks from 60 NICUs from 12 member states (Austria, Czech Republic, Finland, France, Germany, Greece, Italy, Poland, Spain, Sweden, Switzerland, and the UK) as well as Russia. The sample size of the cohort was too small to be considered representative of all member states or to allow valid comparisons between regions or countries. Table 10.3 shows the infant characteristics of the cohort, which had a mean (±SD) birth weight of 1157 (269) g and a mean and gestational age of 28.6 (2.8) weeks.

Table 10.3 Infant characteristics

Variables (*)	Value
Birth Weight (g)	**Mean (SD or range)**
Mean (SD)	1157 (269)
95% CI (Mean)	1143.6 - 1170.6
Median (P25, P75)	1167 (877 - 1410)
Gestational Age (weeks)	
Mean (SD)	28.6 (2.8)
95% CI (Mean)	28.5 - 28.7
Median (P25, P75)	29 (27;31)
Age at Admission (days)	
Mean (SD)	0.8 (3.1)
Median (P25, P75)	0 (0 - 0)
Min - Max	0 - 27

(*) Babies not dead in delivery room *Data from the EuroNeoStat project 2006 cohort of VLBW/VLGA infants.*

In the 2006 cohort, 26.2% of babies had a 1-min Apgar score below 5 and 18.8% a 5-min score below 7. The most important protective factor was prenatal corticosteroid administration, received by 77.9% of all babies, 63.5% of whom had a full course (Table 10.4). Prenatal infection was present in 3.8% of infants.

10.3.2 MORBIDITY

Clinical management and therapies.

As shown in Table 10.4, caesarean section was the mode of delivery for 67.4% of babies. It should be noted that 63.5% of the infants received a full course of two doses of prenatal steroids and an additional 14.4% one dose. That means that 22.1% did not receive prenatal steroids (Table 10.4). The reason for this was unclear, but imminent delivery is likely to be a major contributing factor.

Table 10.4 Perinatal risk factors

Variables (*)	Value
Prenatal Corticoids	**Mean (SD or range)**
Complete, %	63.5
Incomplete, %	14.4
Any, Unit Variability (lowest - highest, %)	(3.2 - 100)
Caesarean Section	
%, Unit Variability (lowest - highest, %)	67.4 (30.4 - 87.6)
1-Minute Apgar Score	
Mean (SD)	6.1 (2.7)
Median (P25, P75)	7 (4 - 8)
< 5 points (%)	26.2
5- Minutes Apgar Score	
Mean (SD)	7.9 (2.1)
Median (P25, P75)	8 (7 - 9)
< 7 points (%)	18.8
Perinatal Infection	
%, Unit Variability (lowest - highest, %)	3.8 (0 - 14)
Congenital Malformations	
%, Unit Variability (lowest - highest, %)	7.6 (0 26.4)

(*) Babies not dead in delivery room
For Unit Variability, NICUs with 5 or less babies admitted have been excluded
Data from the EuroNeoStat project 2006 cohort of VLBW/VLGA infants.

Neonatal care at the delivery area.

A significant number of babies required some resuscitation at birth (Table 10.5). Oxygen was given to 74.6%, bag and mask ventilation to 57.2%, tracheal intubation to 33.2%, cardiac compression to 3.1%, and epinephrine administration to 1.8%. Early surfactant administration was given to 56.9% of the infants (Table 10.6).

Table 10.5 Early clinical management and interventions.

Variables (*)	Value
Resuscitation Maneuvers (Delivery Room)	**Mean (SD or range)**
Oxygen, %, Unit Variability (lowest - highest, %)	74.6 (25 - 100)
Bag/Mask, %, Unit Variability (lowest - highest, %)	57.2 (1.1 - 100)
Intubation, %, Unit Variability (lowest - highest, %)	33.2 (0 - 87.1)
Cardiac Compression, %, Unit Variability (lowest - highest, %)	3.1 (0 - 21.4)
Epinephrine/Adrenaline, %, Unit Variability (lowest - highest, %)	1.8 (0 - 10)

(*) Babies not dead in delivery room
For Unit Variability, NICU's with 5 or less babies admitted have been excluded
Data from the EuroNeoStat project 2006 cohort of VLBW/VLGA infants.

Table 10.6 Clinical management at the NICU

Variables (*)	Value
Exogenous Surfactant	**Mean (SD or range)**
%, Unit Variability (lowest - highest, %)	44.7 (4.3 - 87.5)
First dose within first hour of life, %	56.9 (2.8 - 100)
Respiratory Assistance	
Oxygen, %, Unit Variability (lowest - highest, %)	78.1 (44 - 100)
NCPAP, %, Unit Variability (lowest - highest, %)	67.4 (17.9 - 100)
Conventional Ventilation, %, Unit Variability (lowest - highest, %)	44.1 (0 - 93.5)
HIFI, %, Unit Variability (lowest - highest, %)	12 (0 - 65.6)
Surgery	
Any Surgery, %, Unit Variability (lowest - highest,%)	13.1 (0 - 58.1)
One	10.4
≥ Two	2.6
PDA Ligation,%, Unit Variability (lowest - highest, %)	5.5 (0 - 32.3)
ROP Surgery, %, Unit Variability (lowest - highest, %)	2.3 (0 - 11.2)
NEC Surgery, %, Unit Variability (lowest - highest, %)	2.2 (0 - 14.3)
Other Major Surgery, %, Unit Variability (lowest - highest, %)	6.6 (0 - 35.5)
Nosocomial Infection	
%, Unit Variability (lowest - highest, %)	22.6 (0 - 52.7)
Periventricular - Intraventricular Haemorrhage	
Cranial Imaging done, %	87.6
Grades III or IV, %	7.9
Unit Variability (lowest - highest, %)	0 - 36.7
Cystic Periventricular Leukomalacia	
%, Unit Variability (lowest - highest, %)	3.3 (0 - 12.5)
Pneumothorax	
%, Unit Variability (lowest - highest, %)	3.7 (0 - 16.3)
Bronchopulmonar Dysplasia	
%, Unit Variability (lowest - highest, %)	19.6 (0 - 79.2)
Necrotising Enterocholitis	
%, Unit Variability (lowest - highest, %)	4.6 (0 - 27.5)
Retinopathy of Prematurity	
Retinal Exam done, %	67.8
Grades > 0, %, Unit Variability (lowest - highest, %)	24.5 (0 - 100)
Grades III, IV or V, %, Unit Variability (lowest - highest, %)	5.5 (0 - 50)

(*) For Unit Variability, NICU's with 5 or less babies admitted have been excluded
Data from the EuroNeoStat project 2006 cohort of VLBW/VLGA infants.
CPAP: Constant positive airway pressure; HFV : High frequency ventilation; PDA: Patent ductus arteriosus; ROP: Retinopathy of prematurity; NEC: Necrotising enterocolitis.

In this high-risk population of VLBW/VLGA infants, stabilisation and resuscitation practices at birth may vary from hospital to hospital, even within the same country,[33] perhaps due to different case-mixes and to the lack of evidence to guide practice. For example, oxygen use at birth varied from 25 to 100% and bag and mask resuscitation from 1.1 to 100% (Table 10.5).

Congenital anomalies

It is noteworthy that 7.8% of these babies had at least one major congenital malformation (Table 10.4), a factor known to be associated with increased mortality and risk of neurodevelopmental impairment.[31] This rate was more than four times greater than that reported by EUROCAT for all births (live births and stillbirths).[31]

Neonatal care at the NICU

After admission to the NICU, 78.1% of babies received oxygen therapy at some point during their stay, and 67.4% received nasal continuous positive airway pressure (N-CPAP), delivered either before or after conventional mechanical ventilation (CMV). CMV was applied to 44.1% and high frequency ventilation to 12% of infants (Table 10.6). Overall, exogenous surfactant instillation was given to 44.7% of babies, about half of them within the first hour of life (Table 10.6).

Neonatal surgery

13.1% of babies had major surgery, 5.5% for patent symptomatic ductus arteriosus, 2.2% for NEC, 2.3% for severe ROP, and an additional 6.6% for other reasons (Table 10.6). Moreover, 2.6% received two or more interventions.

Major short-term morbidity

Infection. The nosocomial infection rate was 22.6% and varied widely, from 0 to 52.7% (Table 10.6). This rate was almost six times higher than that of prenatal infection, which was diagnosed in 3.8% (0-14%) (Table 10.4).

Respiratory problems. Pneumothorax was diagnosed in 3.7% (0-16.3%) and bronchopulmonary dysplasia (defined as a need for oxygen at 36 weeks) in 19.6% of infants (Table 10.6).

Other major morbidities. Rates of IVH grades 3-4 and cystic periventricular leukomalacia were 7.9% and 3.3%, respectively (Table 10.6). Table 10.6 reports the data on other major morbidities. The rate of NEC was 4.6% and that of ROP stages III to V was 5.5%.

Neurodevelopmental follow-up

The measurement of specific impairments makes it possible to assess the major effects of new interventions. A broader approach to health measurement in follow up studies should include the assessment of both long-term disability assessed objectively by a third-party[34,35] and subjective self-reported quality of life,[36] since neonatal interventions which appear to have minimal effect on mortality and neurodevelopment at an early age may profoundly influence the quality of life in later childhood and adulthood.[37]

In the past 15 years, several follow up studies of VLBW/VLGA babies in different member states (the EPIPAGE group in France,[38] the Leiden study in the Netherlands,[39] and several studies in the UK[34,35]) have found that most survivors are in mainstream schools and coping well as they enter adult life, although some will continue to need additional health, educational, and social services. Overall, parents of these teenagers reported a higher incidence of problems in physical functioning and family life than parents of their term peers. In a similar comparison, teachers rated the ability of the VLBW teenagers lower in all areas of learning.[7]

Although the published follow up studies have not used comparable outcome measures, developmental disabilities resulting from cognitive, motor, or sensorial impairments appear more likely for children born at lower gestational ages. Overall, severe disability is considered to affect 20% of children born before 26 weeks. Such disability, assessed at 24-30 months, was a strong predictor of moderate-severe disability at school age.[34]

CP is a major clinical marker of brain injury. Its frequency increased during the early years of neonatal intensive care, as mortality of VLBW infants decreased. Thus there was concern that the frequency of CP would continue to increase. Data provided by the SCPE study shows that frequency of CP in VLBW infants has decreased significantly — from 6% of live births in 1980 to 4% in 1996.[40] This improvement occurred despite an increase in VLBW live births, a decrease in the NMR, and an increase in multiple births. The decline in CP occurred mainly in the 1000-1499 g birth weight group. The prevalence of CP for those below 1000 g at birth has not changed.[41]

Despite this encouraging decrease in the prevalence of CP, the increase in the number of live births of VLBW/VLGA infants might lead to an increase in the number of children with CP (Table 10.1). It should be pointed out that not all children with CP are severely disabled, and that VLBW children, with or without CP, may have other disabilities (sensorial, cognitive, and behavioural).

The EuroNeoStat project has developed a consensus set of indicators to assess health and neurodevelopment status at 24 months (Table 10.2), based on those proposed in 1997 by Anne Johnson (full definitions available at: www.euroneostat.org).[42,43]

10.3.3 MORTALITY

EURO-PERISTAT recommended collecting data on neonatal mortality and post-neonatal specific mortality rates by gestational age, birth weight and plurality.[1] Not all member states provide such a breakdown of neonatal mortality data yet, but without this information perinatal health cannot be assessed in detail, since the neonatal mortality of infants born before 32 weeks of gestation accounts for 48% of all neonatal deaths.[13]

The 28-day NMR of VLBW/VLGA infants admitted to NICUs in 2006 was 10%, while another 1.4% died after 28 days but before discharge. Babies who died in the delivery suite accounted for 2.5% of all babies born. Table 10.7 lists the NMRs specific for gestational age and birth weight groups. There was an inverse relationship between NMR and both birth weight and gestational age.

Table 10.7 Neonatal mortality rates, overall and by birthweight and gestational age groups

	Deaths in DR	< 28 days	At Discharge
All live births	2.5	12.2	13.6
Admitted babies	---	10	11.4

Mortality rate by Birth weight subgroups							
Birth Weight (g)	< 501	501-750	751-1000	1001-1250	1251-1500	> 1500	Total
Survivors	52.1	63	83.8	64.1	97.3	97	88.6
Non-survivors	47.9	37	16.2	5.9	2.7	3	11.4
Total	1.7	12.6	20.7	22.8	26.9	15.3	

Mortality rate by gestational age subgroups							
Gestation (wks)	< 24	24-25	26-27	28-29	30-31	> 31	Total
Survivors	36.1	70.2	83.1	92.4	97.4	95.3	88.6
Non-survivors	63.9	29.8	16.9	7.6	2.6	4.7	11.4
Total	2.6	12.1	17.1	25.2	33.1	9.9	

P-value was <0.001 for the NMR distribution for both gestational age and birth weight.

10.4 HEALTH SERVICES PROVIDED TO VLBW/VLGA NEWBORN INFANTS.

10.4.1 MEASURING QUALITY OF CARE AND HEALTH SERVICE PROVISION FOR VLBW INFANTS.

To measure the quality of the health care provided to VLBW/VLGA infants in NICUs, clinical variability in the application of evidence-based preventive and therapeutic strategies and standardised outcome comparisons can be used. These data were not available for European NICUs until the EuroNeoStat project started. With this methodology, outcome variability and possible inequalities can be detected, thereby allowing units to perform their own benchmarking to discover areas with opportunities to improve the care process and to measure the effectiveness of the quality improvement initiatives implemented.

Figure 1 shows SMR by gestational age and birth weight. However, since the number of babies in these subgroups is small, point estimates of specific NMRs are less precise. It is noteworthy that rates for caesarean sections (Fig. 2) and tracheal intubation at birth (Fig 3) varied over a wide range among EuroNeoNet units. There was also a wide range in the use of exogenous surfactant (Fig 3), n-CPAP (Fig. 4), and CMV (Fig. 4).

These data were also used to assess the quality of care, by measuring the degree of use of evidence-based interventions, that is, those proven to be effective. Two units had unusually low rates of prenatal steroid use (Fig. 2). Some NICUs had high rates of pneumothorax (Fig. 5), bronchopulmonary dysplasia (Fig. 6), IVH (Fig. 7), cystic periventricular leukomalacia (Fig. 7), and ROP (Fig. 6).

10.4.2 PATIENT SAFETY

Patient safety data for VLBW infants are not currently being systematically collected. Several countries have developed reporting systems on adverse events and incidents that can be used in NICUs (eg, the Nordic countries and the UK). NEOSAFE (www.neosafe.nl) is a specific system for neonates developed in the Netherlands by a EuroNeoStat partner (H. Molendijk). However, no specific data have been reported so far for these immature newborn infants.

Outcomes that could be explored for patient safety include rates of nosocomial infection and pneumothorax during CMV. These rates vary widely among EuroNeoStat units: from 0 to 52.7% for nosocomial infection (Table VI and Fig. 5) and from 0 to 16.3% for pneumothorax (Table 6 and Fig. 5). These are areas where there is room for improvement in many NICUs.

The EuroNeoStat project includes the EuroNeoSafe initiative, the mission of which is to develop a culture that places the safety for these tiny patients first, by minimising medication errors and other mistakes which might have a significant impact on neonatal morbidity and mortality. Free software for voluntary communication of adverse events and near-misses has been specifically developed to be used in NICUs and is available at the EuroNeoStat website (www.euroneostat.org). The purpose of this tool is not to find or blame a guilty party, but to help units to analyse and clarify the causes of incidents, to learn from them, and to adopt corrective mechanisms that can reduce the frequency and consequences of this kind of error.

10.5 COMMENTS

Health determinants and risk factors. As mentioned above, the health determinants and risk factors for VLBW infants are not currently systematically collected at the European level. However, a few regions collect data on a quasi-population based basis[25,26] and member states21-24 have undertaken studies about the variability of mortality rates of VLBW infants related to, for example, regional factors28 or hospital volume29 within the same country.

Prematurity is a major health problem, which has an extensive public health impact: it affects neonatal and infant mortality and has long-term consequences on childhood wellbeing, family stress, and prolonged need for health resources. Prevention of very premature delivery, although much sought after, has been elusive. In this context, prenatal pharmacological induction of fetal maturity by prenatal steroids is an effective and efficient intervention. Ready access to intensive care for these high risk infants is mandatory to improve their short- and long-term outcomes.

To enable monitoring of the health care process and outcomes of these tiny infants, DG SANCO funded the EuroNeoStat project to establish an information system at a European level. This initiative is proposed as a standard for quality assessment and development of patient safety among all European NICUs.

Since the number of neonatal units, member states, and thus cases analysed in the 2006 EuroNeoStat VLBW/VLGA infant cohort is still small, its results should be interpreted with caution. Nevertheless, the network is growing fast and with it, the number of cases collected. The aim is that in the future most, if not all, European NICUs collaborate in the project via EuroNeoNet (www.euroneonet.org), a neonatal network affiliated with the European Society for Neonatology/European Society for Paediatric Research (ESPR). The development of population-based national or regional networks[44] in all member states, which would send data to EuroNeoStat/EuroNeoNet, could further contribute to establish a truly pan-European information system on the consequences of **"being born too soon, too small".**

VLBW/VLGA-specific NMR, like overall neonatal mortality, is an excellent indicator of the quality of perinatal care. Weight-specific mortality rates account for about three quarters of the mortality variance observed among countries and regions. For these reasons, we suggest that WHO should consider including gestational age specific mortality and morbidity among the indicators used to monitor infant health and should recommend that member states collect and report such data.

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Figure 10.1 Standardised neonatal mortality rates (SNMR) by gestational age and birth weight. SNMR: was calculated by the indirect method as the observed number of cases per NICU and subgroup divided by the expected number in each NICU and subgroup

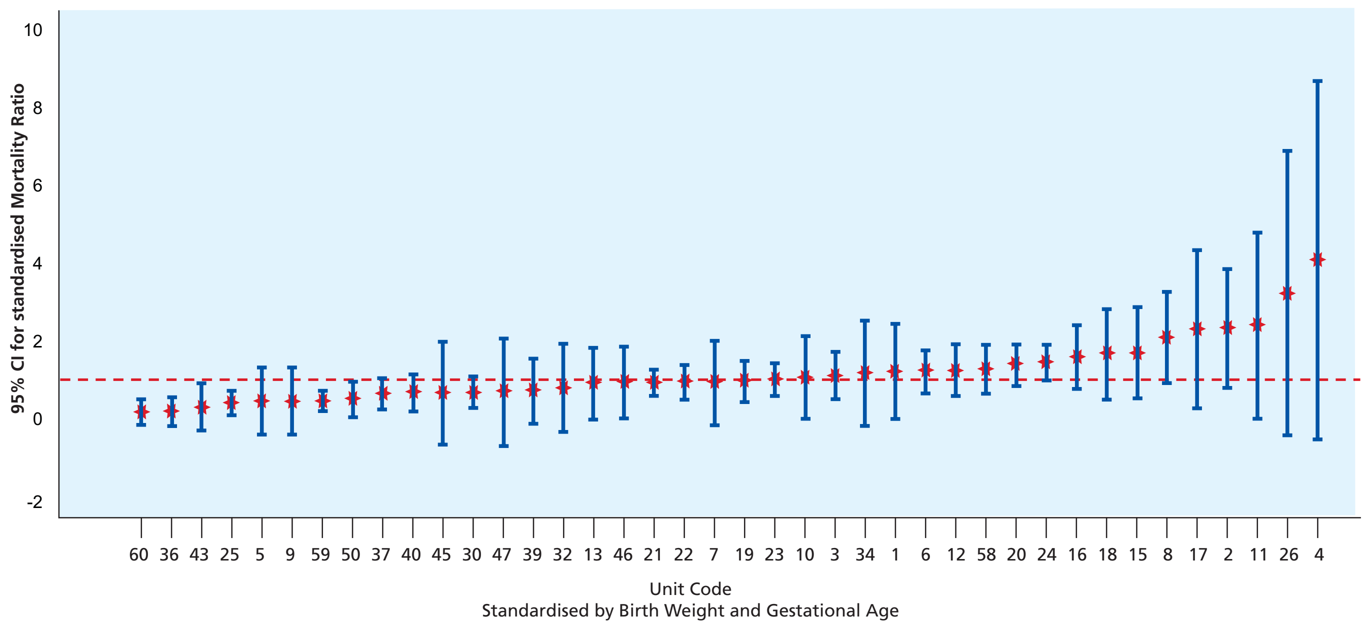


Figure 10.2 Variability of the rates of caesarean sections (◀) and prenatal corticosteroid administration (complete and partial) (×)

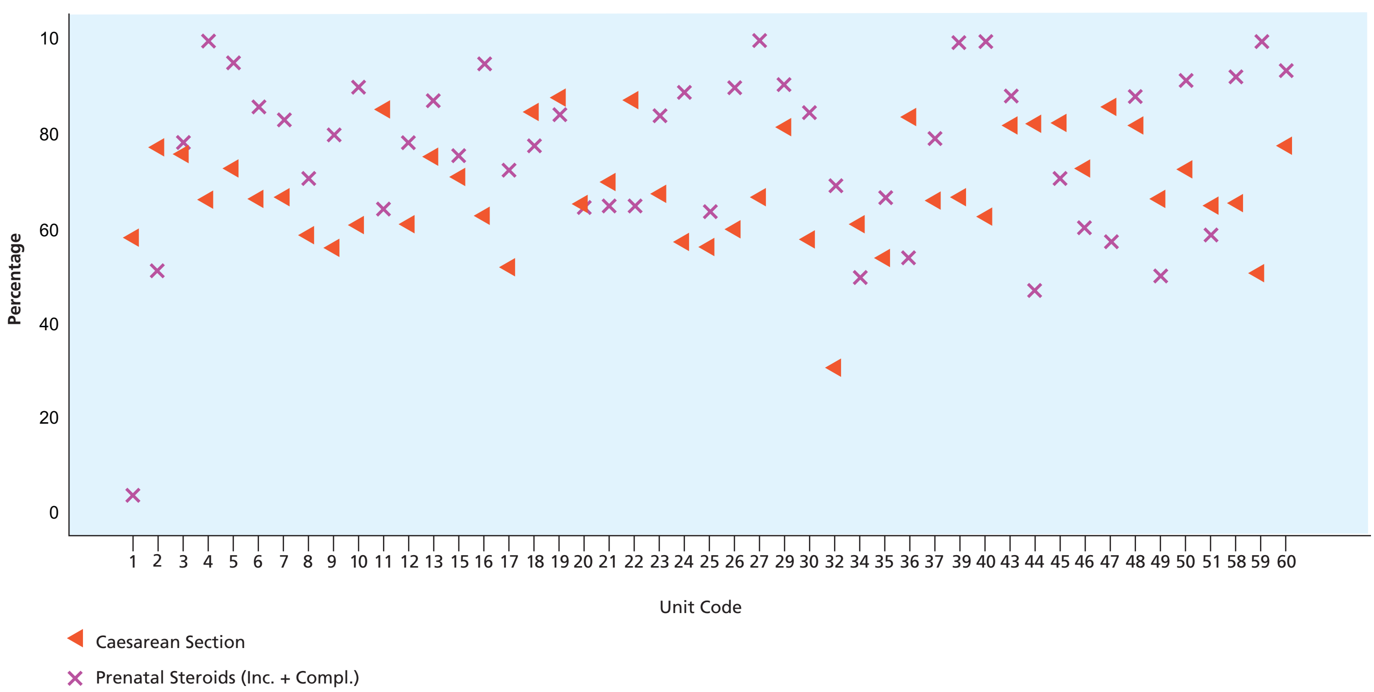
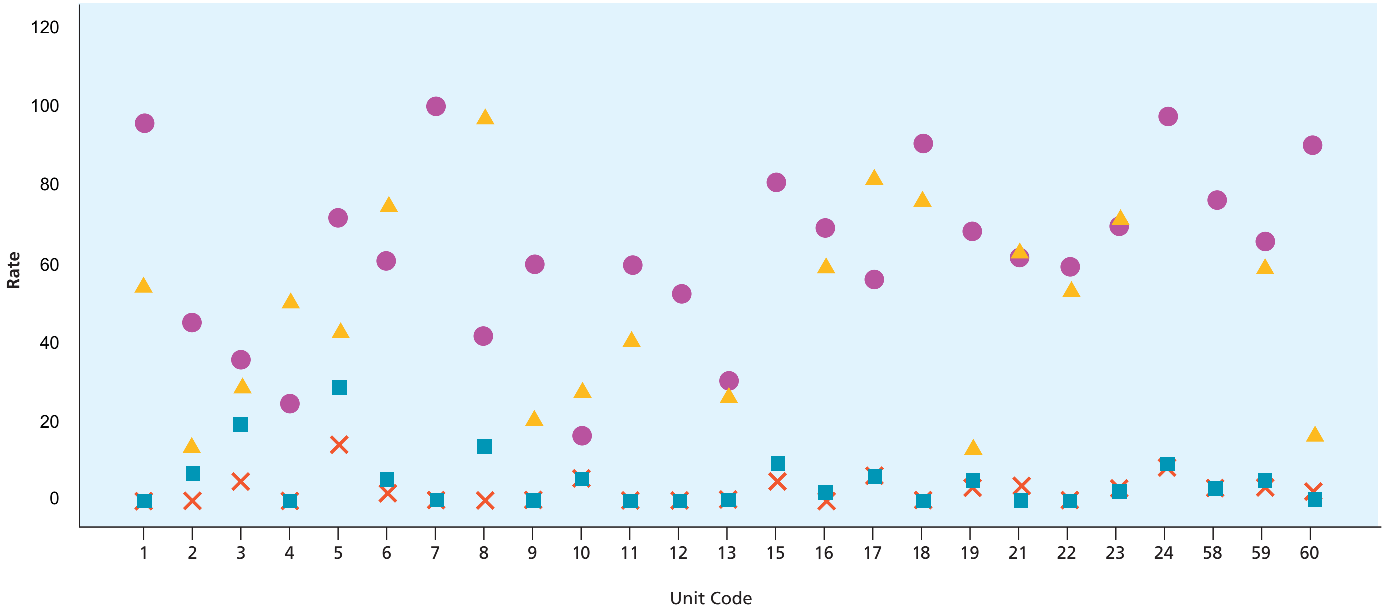


Figure 10.3 Variability of the rates of endotracheal intubation (●), cardiac compression (■), epinephrine administration (×) during resuscitation at birth and of surfactant administration during the first hour of life (▲).



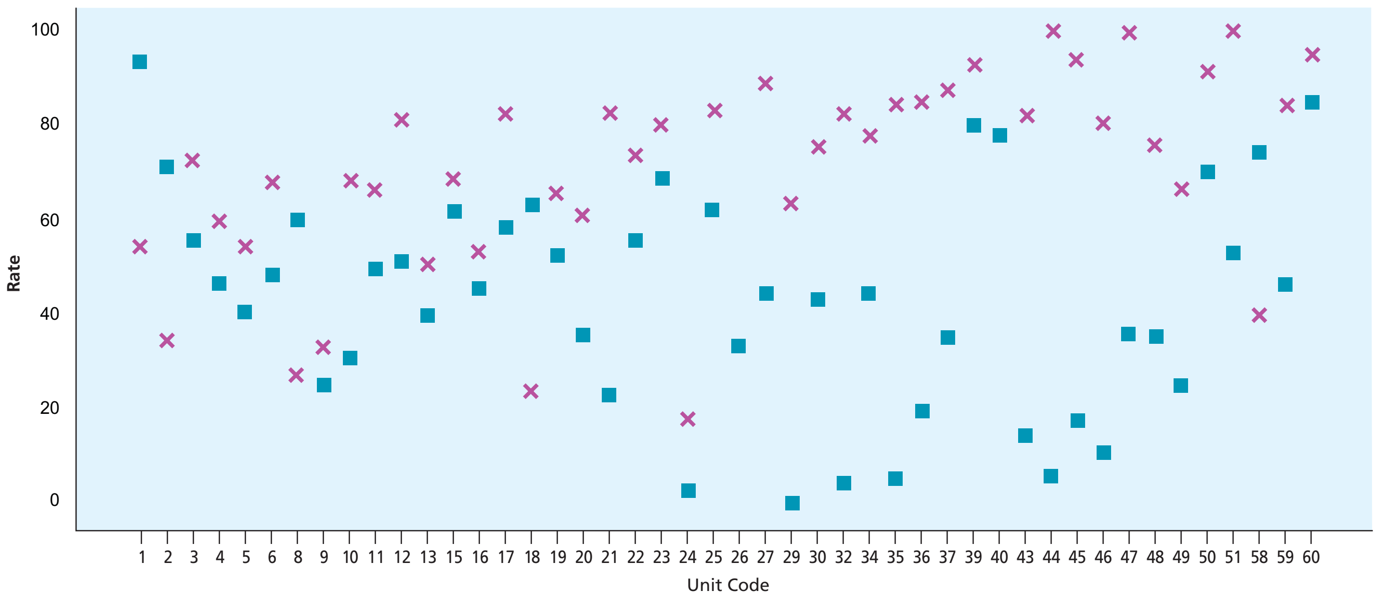
● Endotrachael intubation in the delivery room

■ Cardiac Compression in the delivery room

× Epinephrinel/Adrenaline in the ddelivery room

▲ Surfactant within the first hour of life

Figure 10.4 Variability of the rates of conventional ventilation (■) and n-CPAP (×) after leaving the delivery room



■ Conventional Ventilation

× Nasal CPAP

Figure 10.5 **Variability of the rates of pneumothorax (■) and nosocomial infection (×).**

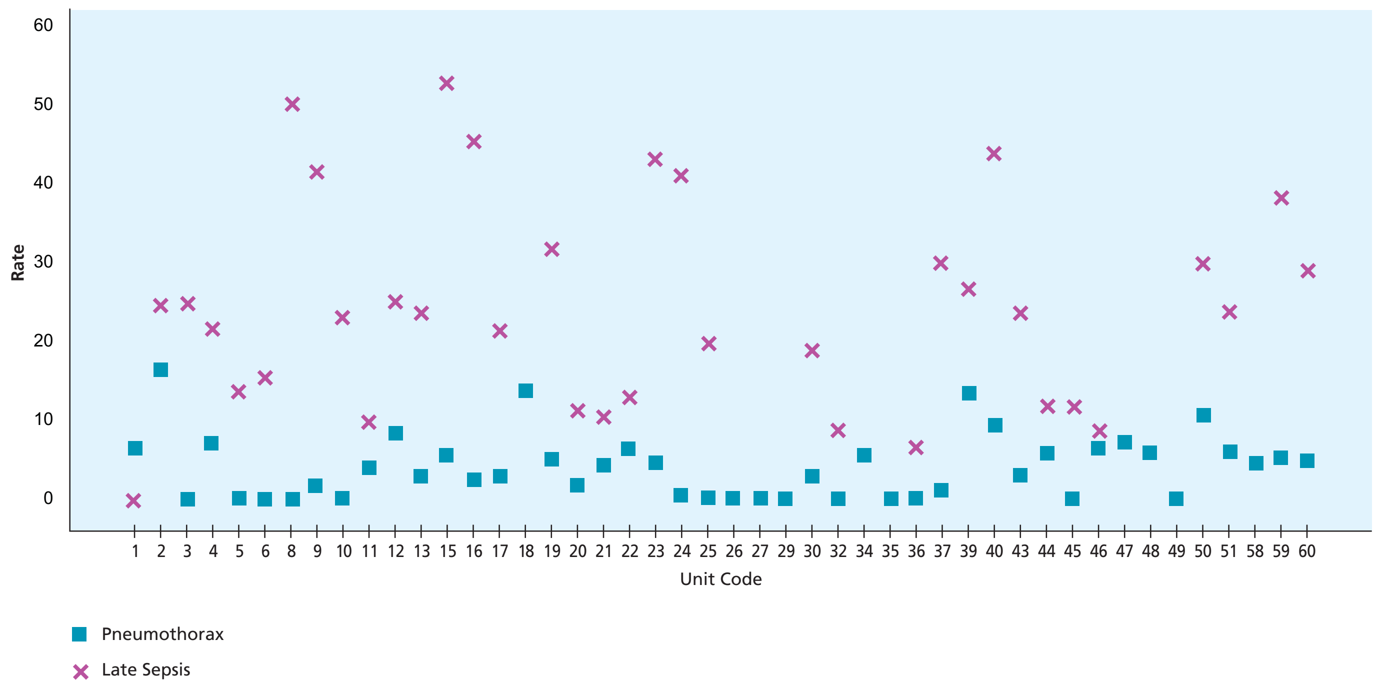


Figure 10.6 **Variability of the rates of bronchopulmonary dysplasia (■) and retinopathy of prematurity (×).**

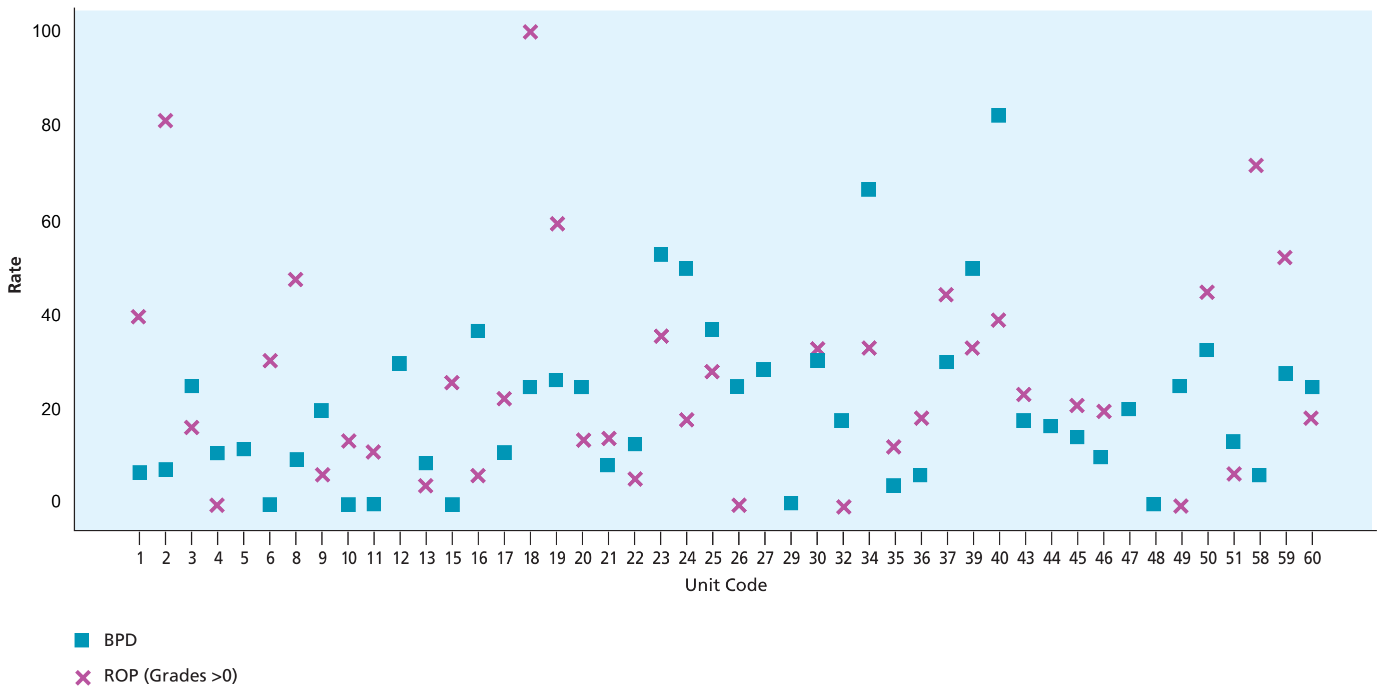
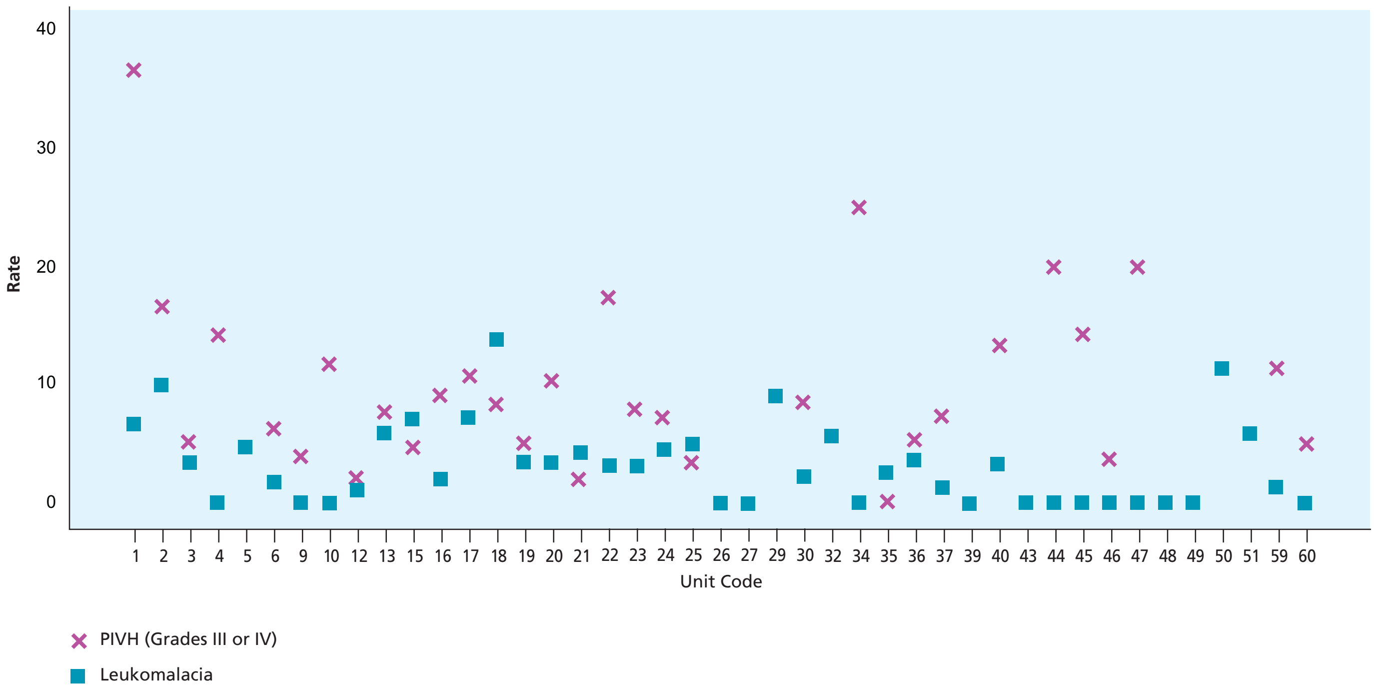


Figure 10.7 **Variability of the rates of intraventricular haemorrhage (×) and cystic periventricular leukomalacia of prematurity (■).**



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APPENDIX B:
DATA TABLES ON EURO-PERISTAT CORE AND RECOMMENDED INDICATORS

C1: Fetal Mortality Rate (numbers and rates per 1000 total births)

Country/coverage	Source	Lower limit for registration of fetal deaths	Number of total births			Number of fetal deaths			Fetal Mortality Rate per 1000 total births		
			All	≥ 1000 grams	≥ 28 weeks	All	≥ 1000 grams	≥ 28 weeks	All	≥ 1000 grams	≥ 28 weeks
Belgium											
Flanders	BE_01	≥ 500g	60 921	60 642	60 679	249	162	173	4.1	2.7	2.9
Brussels	BE_03	≥ 22 wks or ≥ 500g	16 288	15 752	15 176	88	40	51	5.4	2.5	3.4
Czech Republic	CZ_01	≥ 22 wks	98 051	97 544	97 480	387	250	234	3.9	2.6	2.4
Denmark	DK_01	≥ 22 wks	64 853	64 293	64 521	332	151	239	5.1	2.3	3.7
Germany	DE_01	≥ 500g	648 860	644 654	645 401	2 261	1 542	1 648	3.5	2.4	2.6
Estonia	EE_01	≥ 22 wks or ≥ 500g	14 053	13 945	13 939	63	47	44	4.5	3.4	3.2
Ireland	IE_01	≥ 24 wks or ≥ 500g	62 400	62 077	62 097	334	237	266	5.4	3.8	4.3
Greece	GR_01	≥ 28 wks	104 858	NA	104 546	503	NA	416	4.8	NA	4.0
Spain	ES_02	no limit	456 029	434 485	402 777	1 438	990	1 097	3.2	2.3	2.7
Valencia	ES_01	> 22 wks	51 267	49 505	48 279	220	146	150	4.3	2.9	3.1
France	FR_04	≥ 22 wks or ≥ 500g	774 870	NA	NA	7 054	NA	NA	9.1	NA	NA
France	FR_01	≥ 22 wks or ≥ 500g	14 737	14 551	14 540	157	60	71	10.7	4.1	4.9
Italy	IT_02/04	≥ 22 wks	542 003	539 680	539 698	2 937	1 952	2 011	5.4	3.6	3.7
Cyprus[1]											
Latvia	LV_01/02	≥ 22 wks	20 492	20 393	20 382	137	96	99	6.7	4.7	4.9
Lithuania	LT_01	≥ 22 wks	29 633	29 510	29 502	153	113	116	5.2	3.8	3.9
Luxembourg	LU_01	no limit	5 486	5 296	5 384	17	13	15	3.1	2.5	2.8
Hungary	HU_01	≥ 24 wks	95 594	94 801	94 900	476	337	354	5.0	3.6	3.7
Malta	MT_02	≥ 22 wks or ≥ 500g	3 902	3 889	3 894	15	15	15	3.8	3.9	3.9
Netherlands	NL_02	≥ 22 wks or ≥ 500g	182 279	181 014	178 710	1 273	682	763	7.0	3.8	4.3
Austria	AT_02	≥ 500g	79 229	78 820	78 794	295	184	196	3.7	2.3	2.5
Poland	PL_01	≥ 500g	358 440	356 571	356 734	1 743	1 264	1 345	4.9	3.5	3.8
Portugal	PT_02	≥ 24 wks	109 778	108 948	109 192	422	288	294	3.8	2.6	2.7
Slovenia	SI_01	≥ 500g	17 946	17 840	17 849	100	62	63	5.6	3.5	3.5
Slovak Republic	SK_01	≥ 22 wks	52 522	52 301	52 332	134	85	87	2.6	1.6	1.7
Finland	FI_01	≥ 22 wks or ≥ 500g	57 759	57 482	57 407	190	113	117	3.3	2.0	2.0
Sweden	SE_01	≥ 28 wks	100 474	99 928	100 111	316	287	316	3.1	2.9	3.2
United Kingdom[2]											
England and Wales[3]	UK_01	≥ 24 wks	643 407	637 653	NA	3 686	2 346	2 630	5.7	3.7	NA
Scotland	UK_09	≥ 22 wks	53 269	52 907	52 860	358	215	242	6.7	4.1	4.6
Northern Ireland	UK_08	≥ 22 wks	22 504	22 351	22 355	142	81	84	6.3	3.6	3.8
Norway	NO_01	≥ 12 wks	57 368	57 123	57 092	257	212	167	4.5	3.7	2.9

Fetal Mortality Rate per 1000 total births = ((number of fetal death)/(number of total births))*1000. [1] Cyprus provided no data on fetal death. [2] In the UK, fetal deaths <24 weeks of gestation are not registered but there is voluntary notification of late fetal deaths at 22 and 23 weeks. Notifications from Scotland and Northern Ireland are included in totals. [3] In England and Wales, 1067 late fetal deaths at 22 or 23 weeks of gestation in 2004 were notified to the Confidential Enquiry into Maternal and Child Health.

C1_A: Fetal Mortality by gestational age (numbers and percentages)

Country/coverage	Source	Number of total births	Number of fetal deaths, Gestational age in weeks: < 24	24-27	28-31	32-36	≥ 37	All stated	Not stated	All	Percentage of fetal deaths, Gestational age in weeks: < 24	24-27	28-31	32-36	≥ 37	All stated	Not stated
Belgium																	
Flanders	BE_01	60 921	29	47	41	73	59	249	0	249	11.6	18.9	16.5	29.3	23.7	100.0	0.0
Brussels	BE_02	16 288	3	19	12	23	16	73	15	88	4.1	26.0	16.4	31.5	21.9	100.0	17.0
Czech Republic	CZ_01	98 051	47	106	45	80	109	387	0	387	12.1	27.4	11.6	20.7	28.2	100.0	0.0
Denmark	DK_01	64 853	37	42	38	58	143	318	14	332	11.6	13.2	11.9	18.2	45.0	100.0	4.2
Germany	DE_01	648 887	224	362	412	577	659	2 234	27	2 261	10.0	16.2	18.4	25.8	29.5	100.0	1.2
Estonia	EE_01	14 053	4	15	8	9	27	63	0	63	6.3	23.8	12.7	14.3	42.9	100.0	0.0
Ireland	IE_01	62 400	20	48	65	86	115	334	0	334	6.0	14.4	19.5	25.7	34.4	100.0	0.0
Greece	GR_01	104 858	10	77	101	151	164	503	0	503	2.0	15.3	20.1	30.0	32.6	100.0	0.0
Spain	ES_02	456 029	33	140	256	404	437	1 270	168	1 438	2.6	11.0	20.2	31.8	34.4	100.0	11.7
Valencia	ES_01	51 267	24	40	35	56	59	214	6	220	11.2	18.7	16.4	26.2	27.6	100.0	2.7
France	FR_06	14 737	41	44	19	28	24	156	1	157	26.3	28.2	12.2	17.9	15.4	100.0	0.6
Italy	IT_04	542 003	531	395	398	557	1 056	2 937	0	2 937	18.1	13.4	13.6	19.0	36.0	100.0	0.0
Cyprus[1]																	
Latvia	LV_01/02	20 492	9	29	22	31	46	137	0	137	6.6	21.2	16.1	22.6	33.6	100.0	0.0
Lithuania	LT_01	29 633	14	23	27	35	54	153	0	153	9.2	15.0	17.6	22.9	35.3	100.0	0.0
Luxembourg	LU_01	5 486	0	2	8	4	3	17	0	17	0.0	11.8	47.1	23.5	17.6	100.0	0.0
Hungary[2]	HU_01	95 594	NA	116	88	155	111	470	6	476	NA	24.7	18.7	33.0	23.6	NA	1.3
Malta	MT_02	3 902	0	0	3	5	7	15	0	15	0.0	0.0	20.0	33.3	46.7	100.0	0.0
Netherlands	NL_02	182 279	249	243	175	239	349	1 255	18	1 273	19.8	19.4	13.9	19.0	27.8	100.0	1.4
Austria	AT_02	79 229	49	50	47	77	72	295	0	295	16.6	16.9	15.9	26.1	24.4	100.0	0.0
Poland	PL_01	358 440	112	280	285	508	552	1 737	6	1 743	6.4	16.1	16.4	29.2	31.8	100.0	0.3
Portugal	PT_02	109 778	16	72	75	117	102	382	40	422	4.2	18.8	19.6	30.6	26.7	100.0	9.5
Slovenia	SI_01	17 946	8	29	17	23	23	100	0	100	8.0	29.0	17.0	23.0	23.0	100.0	0.0
Slovak Republic	SK_01	52 522	11	36	28	33	26	134	0	134	8.2	26.9	20.9	24.6	19.4	100.0	0.0
Finland	FI_01	57 759	30	38	21	52	44	185	5	190	16.2	20.5	11.4	28.1	23.8	100.0	2.6
Sweden[2]	SE_01	100 474	NA	NA	44	92	180	316	0	316	NA	NA	13.9	29.1	57.0	NA	0.0
United Kingdom[3]																	
England and Wales[4]	UK_01	643 407	NA	988	594	853	1 183	3 618	68	3 686	NA	27.3	16.4	23.6	32.7	NA	1.8
Scotland	UK_09	53 269	41	75	52	88	102	358	0	358	11.5	20.9	14.5	24.6	28.5	100.0	0.0
Northern Ireland	UK_08	22 504	25	33	23	30	31	142	0	142	17.6	23.2	16.2	21.1	21.8	100.0	0.0
Norway	NO_01	57 368	45	45	22	52	93	257	0	257	17.5	17.5	8.6	20.2	36.2	100.0	0.0

[1] Cyprus provided no data on fetal death. [2] For Hungary and Sweden the inclusion criteria for fetal death is 24 and 28 of gestation, respectively. [3] In the UK, fetal deaths before 24 weeks of gestation are not registered but there is voluntary notification of late fetal deaths at 22 and 23 weeks. Notifications from Scotland and Northern Ireland are included in totals. [4]In England and Wales, 1067 late fetal deaths at 22 or 23 weeks of gestation in 2004 were notified to the Confidential Enquiry into Maternal and Child Health.

C1_B: Fetal Mortality by birthweight (numbers and percentages)

Country/coverage	Source	Number of total births	Number of fetal deaths birthweight in grams < 500	500-999	1000-1499	1500-2499	≥ 2500	All stated	Not stated	All	Percentage of fetal deaths birthweight in grams < 500	500-999	1000-1499	1500-2499	≥ 2500	All stated	Not stated
Belgium																	
Flanders	BE_01	60 921	0	87	39	68	55	249	0	249	0.0	34.9	15.7	27.3	22.1	100.0	0.0
Brussels	BE_02	16 288	8	20	4	18	18	68	20	88	11.8	29.4	5.9	26.5	26.5	100.0	0.1
Czech Republic	CZ_01	98 056	60	75	55	91	104	385	0	385	15.6	19.5	14.3	23.6	27.0	100.0	0.0
Denmark	DK_01	64 853	30	49	21	34	96	230	102	332	13.0	21.3	9.1	14.8	41.7	100.0	0.2
Germany	DE_01	648 887	0	715	318	526	698	2 257	4	2 261	0.0	31.7	14.1	23.3	30.9	100.0	0.0
Estonia	EE_01	14 053	0	16	14	6	27	63	0	63	0.0	25.4	22.2	9.5	42.9	100.0	0.0
Ireland[3]	IE_01	62 400	0	95	48	85	104	332	2	334	0.0	28.6	14.5	25.6	31.3	100.0	0.0
Greece[2]																	
Spain	ES_02	456 029	13	235	187	341	462	1 238	200	1 438	1.1	19.0	15.1	27.5	37.3	100.0	13.9
Valencia	ES_01	51 267	18	45	32	53	61	209	11	220	8.6	21.5	15.3	25.4	29.2	100.0	0.0
France	FR_06	14 737	22	67	9	24	27	149	8	157	14.8	45.0	6.0	16.1	18.1	100.0	0.1
Italy	IT_04	542 003	15	237	228	544	1 180	2 204	733	2 937	0.7	10.8	10.3	24.7	53.5	100.0	0.1
Cyprus[1]																	
Latvia	LV_01/02	20 492	4	37	17	36	43	137	0	137	2.9	27.0	12.4	26.3	31.4	100.0	0.0
Lithuania	LT_01	29 633	1	39	23	40	50	153	0	153	0.7	25.5	15.0	26.1	32.7	100.0	0.0
Luxembourg	LU_02	5 486	0	3	3	6	4	16	1	17	0.0	18.8	18.8	37.5	25.0	100.0	0.0
Hungary	HU_01	95 613	13	124	73	130	134	474	2	476	2.7	26.2	15.4	27.4	28.3	100.0	0.0
Malta	MT_02	3 902	0	0	3	5	7	15	0	15	0.0	0.0	20.0	33.3	46.7	100.0	0.0
Netherlands	NL_02	182 279	264	319	103	250	329	1 265	8	1 273	20.9	25.2	8.1	19.8	26.0	100.0	0.0
Austria	AT_02	79 229	0	111	42	63	79	295	0	295	0.0	37.6	14.2	21.4	26.8	100.0	0.0
Poland	PL_01	358 388	0	470	261	487	516	1 734	3	1 737	0.0	27.1	15.1	28.1	29.8	100.0	0.0
Portugal	PT_02	109 778	15	92	75	113	100	395	27	422	3.8	23.3	19.0	28.6	25.3	100.0	0.0
Slovenia	SI_01	17 946	2	36	16	26	20	100	0	100	2.0	36.0	16.0	26.0	20.0	100.0	0.0
Slovak Republic	SK_01	52 522	2	47	30	34	21	134	0	134	1.5	35.1	22.4	25.4	15.7	100.0	0.0
Finland	FI_01	57 759	38	39	13	43	57	190	0	190	20.0	20.5	6.8	22.6	30.0	100.0	0.0
Sweden	SE_01	100 474	1	16	29	72	186	304	12	316	0.3	5.3	9.5	23.7	61.2	100.0	0.0
United Kingdom																	
England and Wales[4]	UK_01	643 407	385	855	421	790	1 135	3 586	100	3 686	10.7	23.8	11.7	22.0	31.7	100.0	0.0
Scotland	UK_09	53 269	39	100	36	72	107	354	4	358	11.0	28.2	10.2	20.3	30.2	100.0	0.0
Northern Ireland	UK_08	22 504	36	25	22	20	39	142	0	142	25.4	17.6	15.5	14.1	27.5	100.0	0.0
Norway	NO_01	57 368	18	24	23	57	132	254	3	257	7.1	9.4	9.1	22.4	52.0	100.0	0.0

[1] Cyprus provided no data on fetal death. [2] Greece provided no data on fetal death by birthweight. [3] In Ireland births weighing <500 grams are excluded regardless of gestational age. [4] In England and Wales, 1067 late fetal deaths at 22 or 23 weeks of gestation in 2004 were notified to the Confidential Enquiry into Maternal and Child Health. Of these, 557 weighed under 500g, 421 weighed 500-999g, 12 weighed 1000g or over and 77 were of unknown birthweight.

C1_C: Fetal Mortality Rate by plurality (numbers and rates per 1000 total singleton and multiple births)

		Number of total births		Number of fetal deaths		Fetal Mortality Rate per 1000 total births	
Country/coverage	Source	Singletons	Multiples	Singletons	Multiples	Singletons	Multiples
Belgium							
Flanders	BE_01	58 997	1 924	229	20	3.9	10.4
Brussels	BE_02	15 738	550	81	7	5.1	12.7
Czech Republic	CZ_01	94 280	3 633	227	22	2.4	6.1
Denmark	DK_01	61 934	2 919	247	85	4.0	29.1
Germany	DE_01	625 408	23 452	2 049	185	3.3	7.9
Estonia	EE_01	13 683	337	60	3	4.4	8.9
Ireland	IE_01	60 493	1 907	308	26	5.1	13.6
Greece[2]							
Spain	ES_02	439 806	16 223	1 307	131	3.0	8.1
Valencia	ES_01	49 474	1 791	193	25	3.9	14.0
France	FR_04	750 104	24 766	6 351	703	8.5	28.4
Italy	IT_04	528 160	13 110	2 029	175	3.8	13.3
Cyprus[1]							
Latvia	LV_01/02	20 022	470	132	5	6.6	10.6
Lithuania	LT_01	28 984	649	145	8	5.0	12.3
Luxembourg	LU_01	5 332	153	15	1	2.8	6.5
Hungary[2]							
Malta	MT_02	3 782	120	15	0	4.0	0.0
Netherlands	NL_02	175 117	7 162	1 161	112	6.6	15.6
Austria	AT_02	76 754	2 475	271	24	3.5	9.7
Poland	PL_01	350 474	7 966	1 604	139	4.6	17.4
Portugal	PT_02	106 771	3 007	395	27	3.7	9.0
Slovenia	SI_01	17 315	631	86	14	5.0	22.2
Slovak Republic	SK_01	51 362	1 294	117	17	2.3	13.1
Finland	FI_01	56 013	1 746	164	26	2.9	14.9
Sweden	SE_01	97 689	2 781	293	23	3.0	8.3
United Kingdom							
England and Wales[3]	UK_01	624 207	19 200	3 383	303	5.4	15.8
Scotland	UK_09	51 738	1 529	326	32	6.3	20.9
Northern Ireland	UK_08	21 823	679	122	18	5.6	26.5
Norway	NO_01	55 178	2 140	221	36	4.0	16.8

[1] Cyprus provided no data on fetal death. [2] Greece and Hungary provided no data on fetal death by plurality. [3] In England and Wales, 1067 late fetal deaths at 22 or 23 weeks of gestation in 2004 were notified to the Confidential Enquiry into Maternal and Child Health. Of these, 970 were from singleton births, 96 were from multiple births and 1 was of unknown plurality.

EURO-PERISTAT indicators for the year 2004

C2: Neonatal Mortality Rate (numbers and rates per 1000 live births)

Country/coverage	Source	Lower limit for registration of live births	Number of live births	Number of neonatal deaths: All (day 0-27)	Number of neonatal deaths: Early (day 0-6)	Number of neonatal deaths: Late (day 7-27)	Neonatal Mortality Rate per 1000 live births: All (day 0-27)	Neonatal Mortality Rate per 1000 live births: Early (day 0-6)	Neonatal Mortality Rate per 1000 live births: Late (day 7-27)
Belgium									
Flanders	BE_01	no limit	60 672	146	121	25	2.4	2.0	0.4
Brussels	BE_02	no limit	16 200	51	36	15	3.1	2.2	0.9
Czech Republic	CZ_02	≥ 500g or any bw surviving first 24 hours	97 664	224	130	94	2.3	1.3	1.0
Denmark	DK_01	no limit	64 521	230	193	37	3.6	3.0	0.6
Germany	DE_02	no limit	705 622	1 892	1 446	446	2.7	2.0	0.6
Estonia	EE_01	no limit	13 990	59	47	12	4.2	3.4	0.9
Ireland[2]	IE_01	no limit	62 066	NA	167	NA	NA	2.7	NA
Greece	GR_01	no limit	104 355	282	186	96	2.7	1.8	0.9
Spain	ES_02	no limit	454 591	1 199	399	417	2.6	0.9	0.9
Valencia	ES_01	no limit	51 047	103	68	35	2.0	1.3	0.7
France	FR_04	≥ 22 wks or ≥ 500g	767 816	1 968	1 370	598	2.6	1.8	0.8
Italy	IT_01	no limit	539 066	1 526	1 077	449	2.8	2.0	0.8
Cyprus[1]	CY_03	no limit	8 309	13	NA	NA	1.6	NA	NA
Latvia	LV_01/02	ga or bw criterion, present heartbeat	20 355	116	77	39	5.7	3.8	1.9
Lithuania	LT_01	≥ 22 wks	29 480	136	96	40	4.6	3.3	1.4
Luxembourg	LU_02	no limit	5 469	11	9	2	2.0	1.6	0.4
Hungary	HU_01	no limit	95 137	423	322	101	4.4	3.4	1.1
Malta	MT_02	no limit	3 887	17	12	5	4.4	3.1	1.3
Netherlands	NL_02	≥ 22 wks or ≥ 500g, if ga is unknown	181 006	631	544	87	3.5	3.0	0.5
Austria	AT_03	no limit	78 934	215	133	82	2.7	1.7	1.0
Poland	PL_01	≥ 500g	356 697	1 731	1 272	459	4.9	3.6	1.3
Portugal	PT_02	no limit	109 356	280	183	97	2.6	1.7	0.9
Slovenia	SI_01	no limit	17 846	47	38	9	2.6	2.1	0.5
Slovak Republic	SK_01	no limit	52 388	134	113	21	2.6	2.2	0.4
Finland	FI_01	no limit	57 569	141	113	28	2.4	2.0	0.5
Sweden	SE_01	no limit	100 158	210	160	50	2.1	1.6	0.5
United Kingdom									
England and Wales	UK_01	no limit	639 721	2 185	1 685	500	3.4	2.6	0.8
Scotland	UK_09	no limit	52 911	161	117	44	3.0	2.2	0.8
Northern Ireland	UK_08	no limit	22 362	66	59	7	3.0	2.6	0.3
Norway	NO_01	≥ 12 wks	57 111	118	83	35	2.1	1.5	0.6

Neonatal Mortality Rate per 1000 live births =((number of neonatal deaths)/(number of live births))*1000. Early Neonatal Mortality Rate per 1000 live births =((number of early neonatal deaths)/(number of early live births))*1000. Late Neonatal Mortality Rate per 1000 live births =((number of late neonatal deaths)/(number of late live births))*1000.

[1] Cyprus provided data on total neonatal death. [2] Ireland provided data on early neonatal deaths.

C2_A: Neonatal Mortality by gestational age (numbers and percentages)

Country/coverage	Source	Number of live births	Number of neonatal deaths Gestational age in weeks								Percentage of neonatal death Gestational age in weeks						
			< 24	24-27	28-31	32-36	≥ 37	All stated	Not stated	All	< 24	24-27	28-31	32-36	≥ 37	All stated	Not stated
Belgium																	
Flanders	BE_01	60 672	15	47	20	31	33	146	0	146	10.3	32.2	13.7	21.2	22.6	100.0	0.0
Brussels	BE_02	16 200	2	16	9	6	18	51	0	51	3.9	31.4	17.6	11.8	35.3	100.0	0.0
Czech Republic	CZ_01	97 671	12	62	39	34	49	196	0	196	6.1	31.6	19.9	17.3	25.0	100.0	0.0
Denmark	DK_01	64 521	18	48	19	31	98	214	16	230	8.4	22.4	8.9	14.5	45.8	100.0	0.0
Germany[3]	DE_01	646 626	191	196	85	115	143	730	3	733	26.2	26.8	11.6	15.8	19.6	100.0	0.0
Estonia	EE_01	13 990	4	17	4	6	27	58	1	59	6.9	29.3	6.9	10.3	46.6	100.0	0.0
Ireland[3]	IE_01	62 066	21	45	24	28	49	167	0	167	12.6	26.9	14.4	16.8	29.3	100.0	0.0
Greece[1]																	
Spain																	
Valencia	ES_01	51 047	4	32	24	14	22	96	7	103	4.2	33.3	25.0	14.6	22.9	100.0	0.0
France[1]																	
Italy[1]																	
Cyprus[1]																	
Latvia	LV_01/02	20 355	2	31	15	14	52	114	2	116	1.8	27.2	13.2	12.3	45.6	100.0	0.0
Lithuania	LT_01	29 480	11	39	17	17	52	136	0	136	8.1	28.7	12.5	12.5	38.2	100.0	0.0
Luxembourg	LU_02	5 469	0	3	1	3	3	10	1	11	0.0	30.0	10.0	30.0	30.0	100.0	0.0
Hungary[1]																	
Malta	MT_02	3 887	0	3	5	4	5	17	0	17	0.0	17.6	29.4	23.5	29.4	100.0	0.0
Netherlands	NL_02	181 006	124	149	72	85	186	616	15	631	20.1	24.2	11.7	13.8	30.2	100.0	0.0
Austria	AT_03	78 934	39	67	29	32	48	215	0	215	18.1	31.2	13.5	14.9	22.3	100.0	0.0
Poland	PL_01	356 697	133	507	326	331	410	1 707	24	1 731	7.8	29.7	19.1	19.4	24.0	100.0	0.0
Portugal	PT_02	109 356	14	89	39	43	76	261	19	280	5.4	34.1	14.9	16.5	29.1	100.0	0.0
Slovenia	SI_01	17 846	7	16	5	8	11	47	0	47	14.9	34.0	10.6	17.0	23.4	100.0	0.0
Slovak Republic	SK_01	52 388	9	36	30	33	26	134	0	134	6.7	26.9	22.4	24.6	19.4	100.0	0.0
Finland	FI_01	57 569	26	39	18	16	40	139	2	141	18.7	28.1	12.9	11.5	28.8	100.0	0.0
Sweden	SE_01	100 158	16	43	21	48	82	210	0	210	7.6	20.5	10.0	22.9	39.0	100.0	0.0
United Kingdom																	
England and Wales[2]	UK_01	645 887	584	576	213	241	562	2 176	63	2 239	26.8	26.5	9.8	11.1	25.8	100.0	0.0
Scotland	UK_09	52 911	20	55	21	16	41	153	8	161	13.1	35.9	13.7	10.5	26.8	100.0	0.0
Northern Ireland	UK_08	22 362	14	20	5	11	16	66	0	66	21.2	30.3	7.6	16.7	24.2	100.0	0.0
Norway	NO_01	57 111	10	31	19	15	43	118	0	118	8.5	26.3	16.1	12.7	36.4	100.0	0.0

[1] Greece, France, Italy, Cyprus, and Hungary provided no data on neonatal death by gestational age. [2] England and Wales provided data on neonatal death and live births by gestational age for the year 2005. [3] Data from Germany and Ireland refers to early neonatal deaths.

C2_B: Neonatal mortality by birthweight (numbers and percentages)

			Number of neonatal deaths birthweight in grams								Percentage of neonatal death birthweight in grams						
Country/coverage	Source	Number of live births	< 500	500-999	1000-1499	1500-2499	≥ 2500	All stated	Not stated	All	< 500	500-999	1000-1499	1500-2499	≥ 2500	All stated	Not stated
Belgium																	
Flanders	BE_01	60 672	0	63	22	31	30	146	0	146	0.0	43.2	15.1	21.2	20.5	100.0	0.0
Brussels	BE_02	16 200	3	17	7	8	15	50	1	51	6.0	34.0	14.0	16.0	30.0	100.0	2.0
Czech Republic	CZ_01	97 671	7	80	28	39	42	196	0	196	3.6	40.8	14.3	19.9	21.4	100.0	0.0
Denmark	DK_01	64 521	22	73	25	17	59	196	34	230	11.2	37.2	12.8	8.7	30.1	100.0	14.8
Germany	DE_02	705 622	272	659	160	245	368	1 704	188	1 892	16.0	38.7	9.4	14.4	21.6	100.0	9.9
Estonia	EE_01	13 990	3	21	6	9	20	59	0	59	5.1	35.6	10.2	15.3	33.9	100.0	0.0
Ireland[2]	IE_01	62 066	0	66	18	36	46	166	1	167	0.0	39.8	10.8	21.7	27.7	100.0	0.6
Greece[1]																	
Spain																	
Valencia	ES_01	51 047	6	31	21	17	22	97	6	103	6.2	32.0	21.6	17.5	22.7	100.0	5.8
France[1]																	
Italy[1]																	
Cyprus[1]																	
Latvia	LV_01/02	20 355	0	28	15	16	57	116	0	116	0.0	24.1	12.9	13.8	49.1	100.0	0.0
Lithuania	LT_01	29 480	3	48	17	23	45	136	0	136	2.2	35.3	12.5	16.9	33.1	100.0	0.0
Luxembourg	LU_02	5 469	0	2	2	2	4	10	1	11	0.0	20.0	20.0	20.0	40.0	100.0	9.1
Hungary	HU_01	95 137	47	191	43	51	86	418	5	423	11.2	45.7	10.3	12.2	20.6	100.0	1.2
Malta	MT_02	3 887	0	4	5	5	3	17	0	17	0.0	23.5	29.4	29.4	17.6	100.0	0.0
Netherlands	NL_02	181 006	43	233	70	88	196	630	1	631	6.8	37.0	11.1	14.0	31.1	100.0	0.2
Austria	AT_03	78 934	18	84	25	32	56	215	0	215	8.4	39.1	11.6	14.9	26.0	100.0	0.0
Poland	PL_01	356 651	0	688	263	370	405	1 726	5	1 731	0.0	39.9	15.2	21.4	23.5	100.0	0.3
Portugal	PT_02	109 356	7	101	37	53	74	272	8	280	2.6	37.1	13.6	19.5	27.2	100.0	2.9
Slovenia	SI_01	17 846	5	19	5	5	13	47	0	47	10.6	40.4	10.6	10.6	27.7	100.0	0.0
Slovak Republic	SK_01	52 388	2	47	30	34	21	134	0	134	1.5	35.1	22.4	25.4	15.7	100.0	0.0
Finland	FI_01	57 569	18	48	11	19	39	135	6	141	13.3	35.6	8.1	14.1	28.9	100.0	4.3
Sweden	SE_01	100 158	10	44	24	33	84	195	15	210	5.1	22.6	12.3	16.9	43.1	100.0	7.1
United Kingdom																	
England and Wales	UK_01	639 721	319	739	211	287	560	2 116	69	2 185	15.1	34.9	10.0	13.6	26.5	100.0	3.2
Scotland	UK_09	52 911	7	62	18	20	43	150	11	161	4.7	41.3	12.0	13.3	28.7	100.0	6.8
Northern Ireland	UK_08	22 362	11	21	7	12	15	66	0	66	16.7	31.8	10.6	18.2	22.7	100.0	0.0
Norway	NO_01	57 111	4	36	20	10	45	115	1	116	3.5	31.3	17.4	8.7	39.1	100.0	0.9

[1] Greece, France, Italy, and Cyprus provided no data on neonatal death by birthweight. [2] Data from Ireland refers to early neonatal deaths.

C2_C: Neonatal Mortality Rate by plurality (numbers and rates per 1000 live singleton and multiple births)

Country/coverage	Source	Number of live births		Number of neonatal deaths		Neonatal Mortality Rate per 1000 live births	
		Singletons	Multiples	Singletons	Multiples	Singletons	Multiples
Belgium							
Flanders	BE_01	58 768	1 904	112	34	1.9	17.9
Brussels	BE_02	15 657	543	45	6	2.9	11.0
Czech Republic[1]							
Denmark	DK_01	61 687	2 834	158	72	2.6	25.4
Germany[2]	DE_01	623 359	23 267	694	197	1.1	8.5
Estonia	EE_01	13 623	334	48	11	3.5	32.9
Ireland[2]	IE_01	60 185	1 881	139	28	2.3	14.9
Greece[1]							
Spain							
Valencia	ES_01	49 281	1 766	76	19	1.5	10.8
France[1]							
Italy	IT_01	526 131	12 935	1 308	218	2.5	16.9
Cyprus[1]							
Latvia	LV_01/02	19 890	465	101	15	5.1	32.3
Lithuania	LT_01	28 839	641	125	11	4.3	17.2
Luxembourg	LU_02	5 317	152	9	1	1.7	6.6
Hungary[1]							
Malta	MT_02	3 767	120	15	2	4.0	16.7
Netherlands	NL_02	173 956	7 050	512	119	2.9	16.9
Austria	AT_03	76 483	2 451	171	44	2.2	18.0
Poland	PL_01	348 870	7 827	1 477	247	4.2	31.6
Portugal	PT_02	106 376	2 980	229	51	2.2	17.1
Slovenia	SI_01	17 229	617	35	12	2.0	19.4
Slovak Republic	SK_01	51 128	1 620	117	17	2.3	10.5
Finland	FI_01	55 849	1 720	115	26	2.1	15.1
Sweden	SE_01	97 396	2 758	181	29	1.9	10.5
United Kingdom							
England and Wales	UK_01	620 824	18 897	1 851	334	3.0	17.7
Scotland	UK_09	51 412	1 497	130	31	2.5	20.7
Northern Ireland	UK_08	21 701	661	57	9	2.6	13.6
Norway	NO_01	54 957	2 104	89	29	1.6	13.8

[1] Czech Republic, Greece, France, Cyprus, and Hungary provided no data on neonatal death by plurality. [2] Data from Germany and Ireland refers to early neonatal deaths.

C2_D: Neonatal Mortality Rates per 1000 live births for specific gestational age and birthweight subgroups

Country/coverage	Source	Neonatal Mortality Rate per 1000 live births in gestational age subgroup Gestational age in weeks					Neonatal Mortality Rate per 1000 live births in birthweight subgroup birthweight in grams				
		< 24	24-27	28-31	32-36	≥ 37	< 500	500-999	1000-1499	1500-2499	≥ 2500
Belgium											
Flanders[3]	BE_01	1000.0	311.3	51.5	7.2	0.6	NA	328.1	72.4	9.0	0.5
Brussels	BE_02	1000.0	320.0	84.9	6.6	1.3	1000.0	288.1	71.4	9.3	1.0
Czech Republic	CZ_01	545.5	218.3	52.1	5.9	0.5	500.0	220.4	42.4	7.0	0.5
Denmark	DK_01	947.4	289.2	38.2	8.2	1.6	**1000.0**	366.8	65.1	6.0	1.0
Germany	DE_01	616.5	107.3	17.6	2.5	0.3	877.4	222.8	35.1	6.5	0.6
Estonia	EE_01	800.0	320.8	47.1	8.8	2.1	1000.0	396.2	76.9	19.5	1.5
Ireland[3]	IE_01	777.8	247.3	58.0	10.0	0.8	NA	326.7	52.9	14.1	0.8
Greece[1]											
Spain											
Valencia	ES_01	**1000.0**	301.9	67.4	3.5	0.5	**1000.0**	240.3	73.4	4.5	0.5
France[1,2]											
Italy[1,2]											
Cyprus[1,2]											
Latvia[3]	LV_01/02	333.3	476.9	82.9	15.3	2.7	NA	482.8	119.0	19.2	2.9
Lithuania	LT_01	785.7	487.5	90.9	13.2	1.9	1000.0	600.0	130.8	19.4	1.6
Luxembourg[3,4]	LU_02	NA	**1000.0**	76.9	9.7	0.6	NA	**1000.0**	333.3	8.6	0.8
Hungary[1]	HU_01						810.3	353.0	59.8	7.7	1.0
Malta[4]	MT_02	NA	375.0	238.1	15.9	1.4	NA	400.0	200.0	18.8	0.8
Netherlands	NL_02	976.4	324.6	54.5	7.5	1.1	877.6	377.6	63.0	9.0	1.2
Austria	AT_03	866.7	230.2	37.4	4.1	0.7	818.2	304.3	48.2	7.1	0.8
Poland[3]	PL_01	875.0	456.8	124.7	16.2	1.2	NA	513.4	130.1	20.1	1.2
Portugal[6]	PT_02	337.7		54.9	6.7	0.7	**1000.0**	263.7	58.5	7.3	0.7
Slovenia	SI_01	875.0	307.7	36.5	7.6	0.7	833.3	306.5	52.6	5.7	0.8
Slovak Republic		600.0	281.3	86.0	11.8	0.5	500.0	279.8	101.0	10.0	0.4
Finland	FI_01	866.7	293.2	52.6	6.0	0.7	818.2	313.7	40.9	9.8	0.7
Sweden	SE_01	484.8	166.7	33.4	8.9	0.9	666.7	169.9	50.6	9.5	0.9
United Kingdom											
England and Wales[5]	UK_01	902.6	236.9	36.6	6.1	0.9	822.2	266.9	44.5	7.1	0.9
Scotland	UK_09	**1000.0**	300.5	47.3	4.7	0.8	318.2	331.6	47.1	6.2	0.9
Northern Ireland	UK_08	**1000.0**	243.9	30.3	9.0	0.8	**1000.0**	241.4	52.6	11.2	0.7
Norway	NO_01	555.6	184.5	46.6	4.3	0.8	363.6	200.0	60.8	4.4	0.8

[1] Greece, France, Italy, Cyprus and Hungary provided no data on neonatal death by gestational age. [2] Greece, France, Italy, and Cyprus provide no data on neonatal death by birthweight. [3] Flanders, Ireland, Latvia, Luxembourg, and Poland had no neonatal deaths and no live births <500 grams. [4] Luxembourg and Malta had no infant deaths and no live births <24 weeks of gestation. [5] England and Wales provided data on neonatal death and live births by gestational age for the year 2005. [6] Portugal has no data on live births by gestational age for < 24 weeks and 24-27 weeks. The neonatal mortality rate of 337.7 refers to ≤ 27 weeks of gestation. NOTE: corresponding numbers for these rates are presented in tables C2_A, C2_B, C4, and C5.

C3: Infant Mortality Rate (number and rate per 1000 live births)

Country/coverage	Source	Lower limit for registration of live births	Numbers: Live births	Numbers: Infant deaths	Infant Mortality Rate per 1000 live births
Belgium					
Flanders	BE_01	no limit	60 672	231	3.8
Brussels	BE_02	no limit	16 200	72	4.4
Czech Republic	CZ_02	≥ 500g or any bw surviving first 24 hours	97 664	366	3.7
Denmark	DK_01	no limit	64 521	286	4.4
Germany	DE_02	no limit	705 622	2 918	4.1
Estonia	EE_01	no limit	13 990	88	6.3
Ireland[2]	IE_02	no limit	61 972	287	4.6
Greece[2]	GR_01	no limit	104 355	420	4.0
Spain[2]	ES_02	no limit	454 591	1 813	4.0
Valencia[2]	ES_02	no limit	51 047	189	3.7
France[2]	FR_04	≥ 22 wks or ≥ 500g	767 816	2 988	3.9
Italy	IT_01	no limit	539 066	2 134	4.0
Cyprus[2]	CY_03	no limit	8 309	29	3.5
Latvia	LV_02	ga or bw criterion, present heartbeat	20 355	191	9.4
Lithuania[2]	LT_02	≥ 22 wks	29 480	240	8.1
Luxembourg[2]	LU_02	no limit	5 469	19	3.5
Hungary	HU_01	no limit	95 118	628	6.6
Malta	MT_02	no limit	3 887	23	5.9
Netherlands[2]	NL_07	≥ 22 wks or ≥ 500g, if ga is unknown	194 007	891	4.6
Austria	AT_03	no limit	78 934	320	4.1
Poland	PL_01	≥ 500g	356 697	2 414	6.8
Portugal[2]	PT_02	no limit	109 356	426	3.9
Slovenia[1]					
Slovak Republic[2]	SK_01	no limit	52 388	365	7.0
Finland	FI_01	no limit	57 569	195	3.4
Sweden	SE_01	no limit	100 158	299	3.0
United Kingdom					
England and Wales	UK_01	no limit	639 721	3 157	4.9
Scotland	UK_09	no limit	52 911	261	4.9
Northern Ireland	UK_07	no limit	22 362	90	4.0
Norway	NO_01	≥ 12 wks	57 111	172	3.0

Infant Mortality Rate per 1000 live births = ((number of infant deaths)/(number of live births))*1000. [1] Slovenia provided no data on infant death. [2] Ireland, Greece, Spain, France, Cyprus, Lithuania, Luxembourg, the Netherlands, Portugal, and Slovak Republic provided data on total infant death.

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C3_A: Infant Mortality by gestational age (numbers and percentages)

			Number of infant deaths Gestational age in weeks								Percentage of infant death Gestational age in weeks						
Country/coverage	Source	Number of live births	< 24	24-27	28-31	32-36	≥ 37	All stated	Not stated	All	< 24	24-27	28-31	32-36	≥ 37	All stated	Not stated
Belgium																	
Flanders	BE_01	60 672	15	51	23	43	99	231	0	231	6.5	22.1	10.0	18.6	42.9	100.0	0.0
Brussels	BE_02	16 200	2	16	12	9	33	72	0	72	2.8	22.2	16.7	12.5	45.8	100.0	0.0
Czech Republic[2]																	
Denmark	DK_01	64 521	18	50	21	39	141	269	17	286	6.7	18.6	7.8	14.5	52.4	100.0	5.9
Germany[2]																	
Estonia	EE_01	13 990	4	22	11	10	40	87	1	88	4.6	25.3	12.6	11.5	46.0	100.0	1.1
Ireland[2]																	
Greece[2]																	
Spain[2]																	
France[2]																	
Italy[2]																	
Cyprus[2]																	
Latvia	LV_02	20 355	5	31	19	31	104	190	1	191	2.6	16.3	10.0	16.3	54.7	100.0	0.5
Lithuania[2]																	
Luxembourg[2]																	
Hungary[2]																	
Malta	MT_02	3 887	0	5	5	6	7	23	0	23	0.0	21.7	21.7	26.1	30.4	100.0	0.0
Netherlands[2]																	
Austria	AT_03	78 934	40	93	34	46	107	320	0	320	12.5	29.1	10.6	14.4	33.4	100.0	0.0
Poland	PL_01	356 697	140	589	386	473	780	2 368	46	2 414	5.9	24.9	16.3	20.0	32.9	100.0	1.9
Portugal[2]																	
Slovenia[1]																	
Slovak Republic[2]																	
Finland	FI_01	57 569	27	42	20	26	78	193	2	195	14.0	21.8	10.4	13.5	40.4	100.0	1.0
Sweden	SE_01	100 158	17	51	26	69	136	299	0	299	5.7	17.1	8.7	23.1	45.5	100.0	0.0
United Kingdom																	
England and Wales[3]	UK_01	645 675	383	725	304	420	1 086	2 918	282	3 200	13.1	24.8	10.4	14.4	37.2	100.0	8.8
Scotland	UK_09	52 911	20	69	27	30	84	230	31	261	8.7	30.0	11.7	13.0	36.5	100.0	11.9
Northern Ireland	UK_07	22 362	10	22	9	16	33	90	0	90	11.1	24.4	10.0	17.8	36.7	100.0	0.0
Norway	NO_01	57 111	10	37	23	25	77	172	0	172	5.8	21.5	13.4	14.5	44.8	100.0	0.0

[1] Slovenia provided no data on infant death. [2] Czech Republic, Germany, Ireland, Greece, Spain, France, Italy, Cyprus, Lithuania, Luxembourg, Hungary, the Netherlands, Portugal, and Slovak Republic provided no data on infant death by gestational age. [3] England and Wales provided data on infant death and live births by gestational age for year 2005.

C3_B: Infant Mortality by birthweight (numbers and percentages)

Country/coverage	Source	Number of live births	Number of infant deaths birthweight in grams: < 500	500-999	1000-1499	1500-2499	≥ 2500	All stated	Not stated	All	Percentage of infant death birthweight in grams: < 500	500-999	1000-1499	1500-2499	≥ 2500	All stated	Not stated
Belgium																	
Flanders	BE_01	60 672	0	68	22	44	97	231	0	231	0.0	29.4	9.5	19.0	42.0	100.0	0.0
Brussels	BE_02	16 200	3	18	9	13	27	70	2	72	4.3	25.7	12.9	18.6	38.6	100.0	2.8
Czech Republic	CZ_02	97 664	10	150	80	124	2	366	0	366	2.7	41.0	21.9	33.9	0.5	100.0	0.0
Denmark	DK_01	64 521	22	79	28	25	96	250	36	286	8.8	31.6	11.2	10.0	38.4	100.0	12.6
Germany	DE_02	705 622	292	764	209	420	814	2 499	419	2 918	11.7	30.6	8.4	16.8	32.6	100.0	14.4
Estonia	EE_01	13 990	3	24	8	16	37	88	0	88	3.4	27.3	9.1	18.2	42.0	100.0	0.0
Ireland[2]																	
Greece[2]																	
Spain[2]																	
France[2]																	
Italy[2]																	
Cyprus[2]																	
Latvia	LV_02	20 355	0	34	19	29	108	190	1	191	0.0	17.9	10.0	15.3	56.8	100.0	0.5
Lithuania[2]																	
Luxembourg[2]																	
Hungary	HU_01	95 137	48	233	57	92	190	620	8	628	7.7	37.6	9.2	14.8	30.6	100.0	1.3
Malta	MT_02	3 887	0	5	6	8	4	23	0	23	0.0	21.7	26.1	34.8	17.4	100.0	0.0
Netherlands[2]																	
Austria	AT_03	78 934	20	105	34	42	119	320	0	320	6.3	32.8	10.6	13.1	37.2	100.0	0.0
Poland	PL_01	356 651	0	779	325	533	763	2 400	14	2 414	0.0	32.5	13.5	22.2	31.8	100.0	0.6
Portugal[2]																	
Slovenia[1]																	
Slovak Republic[2]																	
Finland	FI_01	57 569	19	52	13	30	75	189	6	195	10.1	27.5	6.9	15.9	39.7	100.0	3.1
Sweden	SE_01	100 158	11	51	29	58	135	284	15	299	3.9	18.0	10.2	20.4	47.5	100.0	5.0
United Kingdom																	
England and Wales	UK_01	639 721	329	916	287	491	1 062	3 085	72	3 157	10.7	29.7	9.3	15.9	34.4	100.0	2.3
Scotland	UK_09	52 911	7	76	23	34	85	225	36	261	3.1	33.8	10.2	15.1	37.8	100.0	13.8
Northern Ireland	UK_07	22 362	6	26	7	16	34	89	1	90	6.7	29.2	7.9	18.0	38.2	100.0	1.1
Norway	NO_01	57 111	5	41	24	18	83	171	1	172	2.9	24.0	14.0	10.5	48.5	100.0	0.6

[1] Slovenia provided no data on infant death. [2] Ireland, Greece, Spain, France, Italy, Cyprus, Lithuania, Luxembourg, the Netherlands, and Portugal provided no data on infant death by birthweight.

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C3_C: Infant Mortality Rate by plurality (numbers and rates per 1000 live singleton and multiple births)

Country/coverage	Source	Number of live births		Number of infant deaths		Infant Mortality Rate per 1000 live births	
		Singletons	Multiples	Singletons	Multiples	Singletons	Multiples
Belgium							
Flanders	BE_01	58 768	1 904	192	39	3.3	20.5
Brussels	BE_02	15 657	543	63	9	4.0	16.6
Czech Republic[2]							
Denmark	DK_01	61 687	2 834	207	79	3.4	27.9
Germany[2]							
Estonia	EE_01	13 623	334	74	14	5.4	41.9
Ireland[2]							
Greece[2]							
Spain[2]							
France[2]							
Italy	IT_01	526 131	12 935	1 886	248	3.6	19.2
Cyprus[2]							
Latvia	LV_02	19 890	465	173	18	8.7	38.7
Lithuania[2]							
Luxembourg[2]							
Hungary[2]							
Malta	MT_02	3 767	120	20	3	5.3	25.0
Netherlands[2]							
Austria	AT_03	76 483	2 451	264	56	3.5	22.8
Poland	PL_01	348 870	7 827	2 094	306	6.0	39.1
Portugal[2]							
Slovenia[1]							
Slovak Republic[2]							
Finland	FI_01	55 849	1 720	166	29	3.0	16.9
Sweden	SE_01	97 396	2 758	262	37	2.7	13.4
United Kingdom							
England and Wales	UK_01	620 824	18 897	2 730	427	4.4	22.6
Scotland	UK_09	51 412	1 497	220	41	4.3	27.4
Northern Ireland	UK_07	21 701	661	80	10	3.7	15.1
Norway	NO_01	54 957	2 104	138	34	2.5	16.2

[1] Slovenia provided no data on infant death. [2] Czech Republic, Germany, Ireland, Greece, Spain, France, Cyprus, Lithuania, Luxembourg, Hungary, the Netherlands, Portugal, and Slovak Republic provided no data on infant death by plurality.

C3_D: Specific Infant Mortality Rates per 1000 live births for gestational age and birthweight subgroups

		Infant Mortality Rate per 1000 live births for gestational age subgroups Gestational age in weeks					Infant Mortality Rate per 1000 live births in birthweight subgroups birthweight in grams				
Country/coverage	Source	< 24	24-27	28-31	32-36	≥ 37	< 500	500-999	1000-1499	1500-2499	≥ 2500
Belgium											
Flanders[4]	BE_01	1000.0	337.7	59.3	10.0	1.8	NA	354.2	72.4	12.8	1.7
Brussels	BE_02	1000.0	320.0	113.2	9.9	2.3	1000.0	305.1	91.8	15.1	1.8
Czech Republic[3]	CZ_02	NA	NA	NA	NA	NA	714.3	259.1	73.3	14.3	3.7
Denmark	DK_01	947.4	301.2	42.2	10.3	2.3	**1000.0**	397.0	72.9	8.9	1.6
Germany[3]	DE_02	NA	NA	NA	NA	NA	772.5	244.0	43.3	10.3	1.2
Estonia	EE_01	800.0	415.1	129.4	14.7	3.0	1000.0	452.8	102.6	34.6	2.8
Ireland[2]											
Greece[2]											
Spain[2]											
France[2]											
Italy[3]											
Cyprus[2]											
Latvia[4]	LV_02	833.3	476.9	105.0	33.8	5.4	NA	586.2	150.8	34.8	5.6
Lithuania[2]											
Luxembourg[2]											
Hungary[3]		NA	NA	NA	NA	NA	827.6	430.7	79.3	14.0	2.2
Malta[4,5]	MT_02	NA	625.0	238.1	23.8	1.9	NA	500.0	240.0	30.1	1.1
Netherlands[2]											
Austria	AT_03	888.9	319.6	43.8	5.8	1.5	909.1	380.4	65.5	9.3	1.6
Poland[4]	PL_01	921.1	530.6	147.7	23.1	2.3	NA	581.3	160.7	28.9	2.3
Portugal[2]											
Slovenia[1]											
Slovak Republic[2]											
Finland	FI_01	900.0	315.8	58.5	9.7	1.4	863.6	339.9	48.3	15.4	1.4
Sweden	SE_01	515.2	197.7	41.3	12.8	1.5	733.3	196.9	61.2	16.8	1.4
United Kingdom											
England and Wales[6]	UK_01	880.5	298.2	52.2	10.6	1.8	847.9	330.8	60.5	12.2	1.8
Scotland	UK_09	**1000.0**	377.0	60.8	8.8	1.7	318.2	406.4	60.2	10.5	1.7
Northern Ireland	UK_07	**1000.0**	268.3	54.5	13.1	1.6	**1000.0**	298.9	52.6	14.9	1.6
Norway	NO_01	555.6	220.2	56.4	7.2	1.5	454.5	227.8	72.9	8.0	1.5

[1] Slovenia provided no data on infant death. [2] Greece, Spain, France, Ireland, Cyprus, Lithuania, Luxembourg, the Netherlands, Portugal, and Slovak Republic provided data on total infant death. [3] Czech Republic, Germany, Italy, and Hungary provided no data on infant death by gestational age, and Italy provided no data on infant death by birthweight. [4] Flanders, Latvia, Malta, and Poland had no infant deaths and no live births <500 grams. [5] Malta had no infant deaths and no live births <24 weeks of gestation. [6] England and Wales provided data on infant death and live births by gestational age for the year 2005. NOTE: corresponding numbers for these rates are presented in tables C3_A, C3_B, C4, and C5.

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C4: Distribution of birthweight - rate of low birthweight

Country/coverage	Source	total births % <2500 g	live births % <2500 g	live term singleton births % <2500 g	live singleton births % <2500 g	live multiple births % <2500 g
Belgium						
Flanders	BE_01	6.8	6.5	2.1	4.8	57.1
Brussels	BE_02	6.8	6.5	2.3	4.8	55.3
Czech Republic[3]	CZ_01	7.0	6.7	2.9	NA	NA
Denmark	DK_01	5.5	5.3	1.3	3.5	45.3
Germany	DE_01	7.3	7.1	1.9	5.2	57.6
Estonia	EE_01	4.5	4.3	0.9	3.3	42.8
Ireland	IE_01	5.3	5.0	1.4	3.7	45.6
Greece[4]	GR_01	NA	8.5	4.1	5.9	67.3
Spain	ES_02	7.6	7.4	3.3	5.5	61.2
Valencia	ES_05	8.7	8.4	3.5	6.4	65.3
France	FR_01	7.2	7.2	2.8	5.5	56.2
Italy	IT_04	6.8	6.7	2.7	5.4	59.3
Cyprus[1]						
Latvia	LV_01	5.4	5.0	1.2	4.0	47.7
Lithuania	LT_01	5.1	4.7	1.4	3.9	43.4
Luxembourg	LU_01	4.8	4.5	2.5	3.5	48.1
Hungary[2]	HU_01	8.6	8.3	3.3	NA	NA
Malta	MT_01	8.0	7.7	3.5	6.1	60.0
Netherlands	NL_02	6.9	6.4	1.8	4.7	48.2
Austria	AT_02	7.0	6.8	1.5	5.0	62.3
Poland	PL_01	6.4	6.1	2.2	5.0	54.1
Portugal	PT_02	7.9	7.6	3.2	6.0	64.0
Slovenia	SI_01	6.2	5.8	1.4	4.0	57.5
Slovak Republic[4,5]	SK_01	NA	7.4	NA	6.2	53.6
Finland	FI_01	4.4	4.2	1.2	3.0	40.7
Sweden	SE_01	4.3	4.2	0.9	3.1	41.6
United Kingdom						
England and Wales[4]	UK_01	7.9	7.6	NA	6.1	55.4
Scotland	UK_06	7.6	7.2	2.7	5.8	55.0
Northern Ireland	UK_07	6.2	5.8	1.9	4.5	46.7
Norway	NO_01	5.0	4.8	0.9	3.3	44.2

Live term singleton births are defined as singleton births of 37 completed weeks of gestation and over. [1] Cyprus provided no data on birthweight. [2] Hungary provided no data on birthweight by plurality. [3] Czech Republic has no data on distribution of birthweight by plurality for birthweight ≥ 2500 grams. [4] Greece and Slovak Republic provided no data on birthweight for fetal deaths (for live births only). [5] Slovak Republic and England and Wales provided no data on birthweight by gestational age. Note: numbers of births and detailed birthweight distributions follow in tables C4_A-C4_D.

C4_A: Distribution of birthweight for total births

Country/coverage	Source	All	Number of total births birthweight in grams < 500	500-1499	1500-2499	2500-4499	≥ 4500	All stated	Not stated	Percentage of total births birthweight in grams < 500	500-1499	1500-2499	2500-4499	≥ 4500	All stated	Not stated
Belgium																
Flanders	BE_01	60 921	0	622	3 510	56 172	617	60 921	0	0.0	1.0	5.8	92.2	1.0	100.0	0.0
Brussels	BE_02	16 288	11	181	879	14 648	123	15 842	446	0.1	1.1	5.5	92.5	0.8	100.0	2.7
Czech Republic	CZ_01	98 056	74	1 153	5 640	90 094	1 095	98 056	0	0.1	1.2	5.8	91.9	1.1	100.0	0.0
Denmark	DK_01	64 853	44	653	2 850	58 655	2 383	64 585	268	0.1	1.0	4.4	90.8	3.7	100.0	0.4
Germany	DE_01	648 860	310	8 580	38 491	591 970	9 259	648 667	250	0.0	1.3	5.9	91.3	1.4	100.0	0.0
Estonia	EE_01	14 053	3	161	468	12 926	459	14 017	36	0.0	1.1	3.3	92.2	3.3	100.0	0.3
Ireland	IE_01	62 400	0	685	2 630	57 293	1 766	62 374	26	0.0	1.1	4.2	91.9	2.8	100.0	0.0
Greece[2]																
Spain	ES_02	456 029	15	3 811	29 315	399 795	2 812	435 748	20 281	0.0	0.9	6.7	91.7	0.6	100.0	4.4
Valencia	ES_05	51 267	20	492	3 801	45 090	296	49 699	1 568	0.0	1.0	7.6	90.7	0.6	100.0	3.1
France	FR_01	14 572	0	124	925	13 362	123	14 534	38	0.0	0.9	6.4	91.9	0.8	100.0	0.3
Italy	IT_04	542 003	76	4 774	32 097	501 311	3 012	541 270	733	0.0	0.9	5.9	92.6	0.6	100.0	0.1
Cyprus[1]																
Latvia	LV_01	20 492	4	238	870	18 967	413	20 492	0	0.0	1.2	4.2	92.6	2.0	100.0	0.0
Lithuania	LT_01	29 633	4	272	1 226	27 587	544	29 633	0	0.0	0.9	4.1	93.1	1.8	100.0	0.0
Luxembourg	LU_01	5 486	0	13	239	5 008	40	5 300	186	0.0	0.2	4.5	94.5	0.8	100.0	3.4
Hungary	HU_01	95 613	71	1 457	6 717	86 173	1 119	95 537	76	0.1	1.5	7.0	90.2	1.2	100.0	0.1
Malta	MT_01	3 902	0	38	272	3 571	18	3 899	3	0.0	1.0	7.0	91.6	0.5	100.0	0.1
Netherlands	NL_02	182 279	313	2 150	10 079	164 455	5 266	182 263	16	0.2	1.2	5.5	90.2	2.9	100.0	0.0
Austria	AT_02	79 229	22	948	4 593	72 818	848	79 229	0	0.0	1.2	5.8	91.9	1.1	100.0	0.0
Poland	PL_01	358 388	0	4 093	18 928	330 150	5 210	358 381	7	0.0	1.1	5.3	92.1	1.5	100.0	0.0
Portugal	PT_02	109 778	21	1 182	7 390	100 360	491	109 444	334	0.0	1.1	6.8	91.7	0.4	100.0	0.3
Slovenia	SI_01	17 946	8	209	903	16 630	196	17 946	0	0.0	1.2	5.0	92.7	1.1	100.0	0.0
Slovak Republic[2]																
Finland	FI_01	57 759	60	474	1 991	53 486	1 723	57 734	25	0.1	0.8	3.4	92.6	3.0	100.0	0.0
Sweden	SE_01	100 474	16	778	3 528	91 874	4 023	100 219	255	0.0	0.8	3.5	91.7	4.0	100.0	0.3
United Kingdom																
England and Wales	UK_01	643 407	773	8 790	41 134	580 558	10 795	642 050	1 357	0.1	1.4	6.4	90.4	1.7	100.0	0.2
Scotland	UK_06	53 269	61	705	3 305	48 079	1 105	53 255	14	0.1	1.3	6.2	90.3	2.1	100.0	0.0
Northern Ireland	UK_07	22 504	40	267	1 092	20 550	554	22 503	1	0.2	1.2	4.9	91.3	2.5	100.0	0.0
Norway	NO_01	57 368	29	556	2 305	52 051	2 415	57 356	12	0.1	1.0	4.0	90.8	4.2	100.0	0.0

[1] Cyprus provided no data on birthweight. [2] Greece and Slovak Republic provided no data on birthweight for fetal deaths (for live births only).

C4_B: Distribution of birthweight for live births

Country/coverage	Source	All	Number of live births, birthweight in grams: < 500	500-1499	1500-2499	2500-4499	≥ 4500	All stated	Not stated	Percentage of live births, birthweight in grams: < 500	500-1499	1500-2499	2500-4499	≥ 4500	All stated	Not stated
Belgium																
Flanders	BE_01	60 672	0	496	3 442	56 117	617	60 672	0	0.0	0.8	5.7	92.5	1.0	100.0	0.0
Brussels	BE_02	16 200	3	157	861	14 631	122	15 774	426	0.0	1.0	5.5	92.8	0.8	100.0	2.6
Czech Republic	CZ_01	97 671	14	1 023	5 549	89 993	1 092	97 671	0	0.0	1.0	5.7	92.1	1.1	100.0	0.0
Denmark	DK_01	64 521	14	583	2 816	58 560	2 382	64 355	166	0.0	0.9	4.4	91.0	3.7	100.0	0.3
Germany	DE_01	646 626	310	7 517	37 965	591 347	9 241	646 380	246	0.0	1.2	5.9	91.5	1.4	100.0	0.0
Estonia	EE_01	13 990	3	131	462	12 901	457	13 954	36	0.0	0.9	3.3	92.5	3.3	100.0	0.3
Ireland	IE_01	62 066	0	542	2 545	57 192	1 763	62 042	24	0.0	0.9	4.1	92.2	2.8	100.0	0.0
Greece	GR_01	104 355	9	1 048	7 857	95 013	428	104 355	0	0.0	1.0	7.5	91.0	0.4	100.0	0.0
Spain	ES_02	454 591	2	3 389	28 974	399 342	2 803	434 510	20 081	0.0	0.8	6.7	91.9	0.6	100.0	4.4
Valencia	ES_05	51 047	2	415	3 748	45 029	296	49 490	1 557	0.0	0.8	7.6	91.0	0.6	100.0	3.1
France	FR_01	14 572	0	124	925	13 362	123	14 534	38	0.0	0.9	6.4	91.9	0.8	100.0	0.3
Italy	IT_04	539 066	61	4 309	31 553	500 147	2 996	539 066	0	0.0	0.8	5.9	92.8	0.6	100.0	0.0
Cyprus[1]																
Latvia	LV_01	20 355	0	184	834	18 926	411	20 355	0	0.0	0.9	4.1	93.0	2.0	100.0	0.0
Lithuania	LT_01	29 480	3	210	1 186	27 538	543	29 480	0	0.0	0.7	4.0	93.4	1.8	100.0	0.0
Luxembourg	LU_01	5 469	0	7	233	5 005	39	5 284	185	0.0	0.1	4.4	94.7	0.7	100.0	3.4
Hungary	HU_01	95 137	58	1 260	6 587	86 044	1 114	95 063	74	0.1	1.3	6.9	90.5	1.2	100.0	0.1
Malta	MT_01	3 887	0	35	266	3 565	18	3 884	3	0.0	0.9	6.8	91.8	0.5	100.0	0.1
Netherlands	NL_02	181 006	49	1 728	9 829	164 135	5 257	180 998	8	0.0	1.0	5.4	90.7	2.9	100.0	0.0
Austria	AT_02	78 934	22	795	4 530	72 744	843	78 934	0	0.0	1.0	5.7	92.2	1.1	100.0	0.0
Poland	PL_01	356 651	0	3 362	18 441	329 651	5 193	356 647	4	0.0	0.9	5.2	92.4	1.5	100.0	0.0
Portugal	PT_02	109 356	6	1 015	7 277	100 261	490	109 049	307	0.0	0.9	6.7	91.9	0.4	100.0	0.3
Slovenia	SI_01	17 846	6	157	877	16 610	196	17 846	0	0.0	0.9	4.9	93.1	1.1	100.0	0.0
Slovak Republic	SK_01	52 388	4	465	3 395	48 075	449	52 388	0	0.0	0.9	6.5	91.8	0.9	100.0	0.0
Finland	FI_01	57 569	22	422	1 948	53 431	1 721	57 544	25	0.0	0.7	3.4	92.9	3.0	100.0	0.0
Sweden	SE_01	100 158	15	733	3 456	91 691	4 020	99 915	243	0.0	0.7	3.5	91.8	4.0	100.0	0.2
United Kingdom																
England and Wales	UK_01	639 721	388	7 514	40 344	579 455	10 763	638 464	1 257	0.1	1.2	6.3	90.8	1.7	100.0	0.2
Scotland	UK_06	52 911	22	569	3 233	47 976	1 101	52 901	10	0.0	1.1	6.1	90.7	2.1	100.0	0.0
Northern Ireland	UK_07	22 362	4	220	1 072	20 513	552	22 361	1	0.0	1.0	4.8	91.7	2.5	100.0	0.0
Norway	NO_01	57 111	11	509	2 248	51 923	2 411	57 102	9	0.0	0.9	3.9	90.9	4.2	100.0	0.0

[1] Cyprus provided no data on birthweight. Note: birthweight distribution of stillbirths can be found in table C1_B.

C4_C: Distribution of birthweight for live term singleton births

Country/coverage	Source	All	Number of live births 37 weeks and over birthweight in grams: < 500	500-1499	1500-2499	2500-4499	≥ 4500	All stated	Not stated	Percentage of live births 37 weeks and over birthweight in grams: < 500	500-1499	1500-2499	2500-4499	≥ 4500	All stated	Not stated
Belgium																
Flanders	BE_01	55 079	0	3	1 166	53 297	613	55 079	0	0.0	0.0	2.1	96.8	1.1	100.0	0.0
Brussels	BE_02	13 879	0	3	312	13 210	115	13 640	239	0.0	0.0	2.3	96.8	0.8	100.0	1.7
Czech Republic	CZ_01	88 192	2	23	2 492	84 669	1 006	88 192	0	0.0	0.0	2.8	96.0	1.1	100.0	0.0
Denmark	DK_01	58 483	6	18	706	55 274	2 368	58 372	111	0.0	0.0	1.2	94.7	4.1	100.0	0.2
Germany	DE_01	579 778	54	58	10 707	559 640	9 193	579 652	126	0.0	0.0	1.8	96.5	1.6	100.0	0.0
Estonia	EE_01	12 952	0	0	117	12 380	455	12 952	0	0.0	0.0	0.9	95.6	3.5	100.0	0.0
Ireland	IE_01	57 527	0	7	814	54 944	1 754	57 519	8	0.0	0.0	1.4	95.5	3.0	100.0	0.0
Greece	GR_01	95 382	2	147	3 799	91 015	419	95 382	0	0.0	0.2	4.0	95.4	0.4	100.0	0.0
Spain	ES_02	370 221	0	39	12 099	349 184	2 476	363 798	6 423	0.0	0.0	3.3	96.0	0.7	100.0	1.7
Valencia	ES_05	43 805	0	14	1 491	41 469	264	43 238	567	0.0	0.0	3.4	95.9	0.6	100.0	1.3
France	FR_01	13 311	0	0	368	12 797	122	13 287	24	0.0	0.0	2.8	96.3	0.9	100.0	0.2
Italy	IT_04	496 158	0	304	13 317	479 579	2 958	496 158	0	0.0	0.1	2.7	96.7	0.6	100.0	0.0
Cyprus[1]																
Latvia	LV_01	18 926	0	2	216	18 297	411	18 926	0	0.0	0.0	1.1	96.7	2.2	100.0	0.0
Lithuania	LT_01	27 540	0	4	390	26 607	539	27 540	0	0.0	0.0	1.4	96.6	2.0	100.0	0.0
Luxembourg	LU_01	5 048	0	0	123	4 762	37	4 922	126	0.0	0.0	2.5	96.7	0.8	100.0	2.5
Hungary	HU_01	86 881	0	23	2 876	82 830	1 114	86 843	38	0.0	0.0	3.3	95.4	1.3	100.0	0.0
Malta	MT_01	3 548	0	4	120	3 404	17	3 545	3	0.0	0.1	3.4	96.0	0.5	100.0	0.1
Netherlands	NL_02	161 712	0	8	2 923	153 645	5 136	161 712	0	0.0	0.0	1.8	95.0	3.2	100.0	0.0
Austria	AT_02	69 323	0	6	1 049	67 430	838	69 323	0	0.0	0.0	1.5	97.3	1.2	100.0	0.0
Poland	PL_01	328 425	0	47	7 146	316 064	5 166	328 423	2	0.0	0.0	2.2	96.2	1.6	100.0	0.0
Portugal	PT_02	100 415	0	33	3 181	96 431	487	100 132	283	0.0	0.0	3.2	96.3	0.5	100.0	0.3
Slovenia	SI_01	16 325	0	0	226	15 904	195	16 325	0	0.0	0.0	1.4	97.4	1.2	100.0	0.0
Slovak Republic[2]																
Finland	FI_01	54 259	0	1	634	51 895	1 711	54 241	18	0.0	0.0	1.2	95.7	3.2	100.0	0.0
Sweden	SE_01	92 260	0	4	819	87 234	4 004	92 061	199	0.0	0.0	0.9	94.8	4.3	100.0	0.2
United Kingdom																
England and Wales[2]																
Scotland	UK_06	48 777	5	12	1 319	46 340	1 095	48 771	6	0.0	0.0	2.7	95.0	2.2	100.0	0.0
Northern Ireland	UK_07	20 729	0	2	395	19 784	548	20 729	0	0.0	0.0	1.9	95.4	2.6	100.0	0.0
Norway	NO_01	51 947	0	3	465	49 067	2 404	51 939	8	0.0	0.0	0.9	94.5	4.6	100.0	0.0

Live term singleton births are defined as singleton births of 37 completed weeks of gestation and over. [1] Cyprus provided no data on birthweight. [2] Slovak Republic, England and Wales provided no data on birthweight by gestational age.

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C4_D: Distribution of birthweight by plurality for live births

Country/coverage	Source	Number of live singleton births	Percentage of live singleton births by birthweight group birthweight in grams							Number of live multiple births	Percentage of live born multiples by birthweight group birthweight in grams						
			< 500	500-1499	1500-2499	2500-4499	≥ 4500	All stated	Not stated		< 500	500-1499	1500-2499	2500-4499	≥ 4500	All stated	Not stated
Belgium																	
Flanders	BE_01	58 768	0.0	0.6	4.3	94.1	1.0	100.0	0.0	1 904	0.0	8.1	49.1	42.9	0.0	100.0	0.0
Brussels	BE_02	15 657	0.0	0.8	4.1	94.4	0.8	100.0	2.5	543	0.2	8.0	47.1	44.7	0.0	100.0	5.7
Czech Republic[3]																	
Denmark	DK_01	61 687	0.0	0.6	2.9	92.6	3.9	100.0	0.2	2 834	0.1	8.2	37.0	54.7	0.0	100.0	1.1
Germany	DE_01	623 359	0.0	0.8	4.3	93.3	1.5	100.0	0.0	23 267	0.3	9.8	47.4	42.4	0.0	100.0	0.1
Estonia	EE_01	13 623	0.0	0.7	2.6	93.3	3.4	100.0	0.0	334	0.9	9.3	32.6	57.2	0.0	100.0	0.0
Ireland	IE_01	60 185	0.0	0.6	3.1	93.4	2.9	100.0	0.0	1 881	0.0	8.7	36.9	54.3	0.1	100.0	0.1
Greece	GR_01	99 861	0.0	0.6	5.3	93.7	0.4	100.0	0.0	4 495	0.1	9.5	57.7	32.7	0.0	100.0	0.0
Spain	ES_02	438 499	0.0	0.5	5.0	93.8	0.7	100.0	4.4	16 092	0.0	8.3	52.9	38.8	0.0	100.0	4.9
Valencia	ES_05	49 281	0.0	0.6	5.8	93.0	0.6	100.0	3.0	1 766	0.0	8.5	56.8	34.7	0.1	100.0	4.9
France	FR_01	14 073	0.0	0.7	4.8	93.6	0.9	100.0	0.2	499	0.0	4.4	51.7	43.8	0.0	100.0	0.8
Italy	IT_04	526 131	0.0	0.6	4.7	94.1	0.6	100.0	0.0	12 935	0.1	7.5	51.7	40.7	0.0	100.0	0.0
Cyprus[1]																	
Latvia	LV_01	19 890	0.0	0.7	3.3	93.9	2.1	100.0	0.0	465	0.0	7.7	40.0	52.3	0.0	100.0	0.0
Lithuania	LT_01	28 839	0.0	0.6	3.3	94.2	1.9	100.0	0.0	641	0.0	5.3	38.1	56.6	0.0	100.0	0.0
Luxembourg	LU_01	5 317	0.0	0.1	3.3	95.8	0.8	100.0	3.0	152	0.0	0.0	48.1	51.9	0.0	100.0	15.1
Hungary[2]																	
Malta	MT_01	3 767	0.0	0.6	5.5	93.4	0.5	100.0	0.1	120	0.0	10.8	49.2	40.0	0.0	100.0	0.0
Netherlands	NL_02	173 956	0.0	0.7	4.0	92.3	3.0	100.0	0.0	7 050	0.2	7.3	40.6	51.8	0.0	100.0	0.0
Austria	AT_02	76 483	0.0	0.7	4.3	93.9	1.1	100.0	0.0	2 451	0.1	10.6	51.7	37.7	0.0	100.0	0.0
Poland	PL_01	348 826	0.0	0.8	4.3	93.5	1.5	100.0	0.0	7 825	0.0	9.1	45.0	45.9	0.0	100.0	0.0
Portugal	PT_02	106 376	0.0	0.7	5.3	93.5	0.5	100.0	0.3	2 980	0.1	10.0	53.9	36.0	0.0	100.0	0.0
Slovenia	SI_01	17 229	0.0	0.6	3.4	94.9	1.1	100.0	0.0	617	0.8	8.8	48.0	42.5	0.0	100.0	0.0
Slovak Republic	SK_01	51 128	0.0	0.7	5.6	92.9	0.9	100.0	0.0	1 260	0.1	9.4	44.0	46.4	0.0	100.0	0.0
Finland	FI_01	55 849	0.0	0.6	2.4	93.9	3.1	100.0	0.0	1 720	0.4	6.4	33.9	59.3	0.0	100.0	0.1
Sweden	SE_01	97 396	0.0	0.6	2.6	92.7	4.1	100.0	0.2	2 758	0.1	7.0	34.4	58.4	0.1	100.0	0.2
United Kingdom																	
England and Wales	UK_01	620 824	0.1	0.9	5.1	92.2	1.7	100.0	0.2	18 897	0.4	9.4	45.6	44.6	0.0	100.0	0.3
Scotland	UK_06	51 409	0.0	0.8	5.0	92.0	2.1	100.0	0.0	1 500	0.4	9.2	45.4	45.0	0.0	100.0	0.0
Northern Ireland	UK_07	21 701	0.0	0.7	3.8	92.9	2.5	100.0	0.0	661	0.2	9.2	37.4	53.3	0.0	100.0	0.0
Norway	NO_01	54 957	0.0	0.6	2.7	92.3	4.4	100.0	0.0	2 104	0.3	8.2	35.6	55.8	0.0	100.0	0.0

[1] Cyprus provided no data on birthweight. [2] Hungary provided no data on birthweight by plurality. [3] Czech Republic has data on distribution of birthweight by plurality for birthweight less than 2500 grams only. Note: birthweight distribution of fetal deaths can be found in tables for indicator C1.

C5: Distribution of gestational age - preterm birth rates

Country/coverage	Source	Total births % <37 weeks	Live births % <37 weeks	Live singleton births % <37 weeks	Live multiple births % <37 weeks
Belgium					
Flanders	BE_01	8.2	8.0	6.3	60.2
Brussels	BE_02	7.4	7.1	5.4	55.1
Czech Republic	CZ_01	7.3	7.0	5.4	49.7
Denmark	DK_01	7.2	6.9	5.1	46.2
Germany	DE_01	9.1	8.9	7.0	59.0
Estonia	EE_01	6.1	5.9	4.9	47.6
Ireland	IE_01	5.8	5.5	4.4	42.2
Greece	GR_01	6.3	6.0	4.5	40.3
Spain	ES_02	8.2	8.0	6.4	50.7
Valencia	ES_05	9.5	9.2	7.2	63.6
France	FR_01	7.2	6.3	5.0	44.3
Italy	IT_04	7.2	6.8	5.7	53.5
Cyprus[1]					
Latvia	LV_01	6.2	5.7	4.8	44.5
Lithuania	LT_01	5.6	5.3	4.5	42.7
Luxembourg	LU_01	6.2	6.0	4.7	52.0
Hungary[2]	HU_01	8.9	8.6	NA	NA
Malta	MT_01	7.4	7.2	5.8	51.7
Netherlands	NL_02	7.8	7.4	5.7	48.2
Austria	AT_02	11.6	11.4	9.4	74.6
Poland	PL_01	7.1	6.8	5.8	50.2
Portugal	PT_02	7.0	6.8	5.4	55.0
Slovenia	SI_01	7.4	7.0	5.2	55.4
Slovak Republic[3]	SK_01	NA	6.3	5.2	49.8
Finland	FI_01	5.8	5.6	4.4	44.5
Sweden	SE_01	6.4	6.3	5.2	45.4
United Kingdom					
England and Wales[3]	UK_01	NA	7.5	6.1	53.3
Scotland	UK_07	8.1	7.6	6.3	55.2
Northern Ireland	UK_06	7.0	6.6	5.4	46.9
Norway	NO_01	7.3	7.1	5.5	49.2

[1] Cyprus provided no data on gestational age distribution. [2] Hungary provided no data on gestational age distribution by plurality. [3] Slovak Republic and England and Wales provided no data on gestational age distribution for total births. Note: numbers of births and detailed gestational age distributions follow in tables C5_A-C5_C.

C5_A: Distribution of gestational age for total births

			Number of total births Gestational age in weeks								Percentage of total births Gestational age in weeks							
Country/coverage	Source	All	< 24	24-27	28-31	32-36	37-41	≥ 42	All stated	Not stated	< 24	24-27	28-31	32-36	37-41	≥ 42	All stated	Not stated
Belgium																		
Flanders	BE_01	60 921	44	198	429	4 354	55 546	350	60 921	0	0.1	0.3	0.7	7.1	91.2	0.6	100.0	0.0
Brussels	BE_02	16 288	5	69	118	935	13 877	246	15 250	1 038	0.0	0.4	0.8	6.1	91.0	1.6	100.0	6.4
Czech Republic	CZ_01	98 058	69	390	794	5 860	86 933	4 012	98 058	0	0.1	0.5	0.8	6.0	88.7	4.1	100.0	0.0
Denmark	DK_01	64 853	56	208	536	3 840	56 186	3 959	64 785	68	0.1	0.3	0.8	5.9	86.7	6.1	100.0	0.1
Germany	DE_01	648 860	636	2 823	6 087	49 336	581 665	8 313	648 860	0	0.1	0.4	0.9	7.6	89.6	1.3	100.0	0.0
Estonia	EE_01	14 053	9	68	93	690	12 858	298	14 016	37	0.1	0.5	0.7	4.9	91.7	2.1	100.0	0.3
Ireland	IE_01	62 400	47	230	479	2 889	55 915	2 814	62 374	26	0.1	0.4	0.8	4.6	89.6	4.5	100.0	0.0
Greece	GR_01	104 852	25	281	769	5 549	98 228		104 852	0	0.0	0.3	0.7	5.3	93.7		100.0	0.0
Spain	ES_02	456 029	87	996	2 711	29 408	356 064	14 594	403 860	52 169	0.0	0.2	0.7	7.3	88.2	3.6	100.0	11.4
Valencia	ES_05	51 267	27	146	391	4 024	42 636	1 228	48 452	2 815	0.1	0.3	0.8	8.3	88.0	2.5	100.0	5.5
France	FR_01	14 737	42	83	110	817	13 465	152	14 669	68	0.3	0.6	0.7	5.6	91.8	1.0	100.0	0.5
Italy	IT_04	542 003	716	1 589	4 256	32 217	492 796	10 429	542 003	0	0.1	0.3	0.8	5.9	90.9	1.9	100.0	0.0
Cyprus[1]																		
Latvia	LV_01	20 492	15	94	203	949	19 090	140	20 491	1	0.1	0.5	1.0	4.6	93.2	0.7	100.0	0.0
Lithuania	LT_01	29 633	28	103	214	1 327	27 749	212	29 633	0	0.1	0.3	0.7	4.5	93.6	0.7	100.0	0.0
Luxembourg	LU_01	5 486	0	3	21	312	5 038	13	5 387	99	0.0	0.1	0.4	5.8	93.5	0.2	100.0	1.8
Hungary	HU_01	95 594	0	588	979	6 929	86 380	612	95 488	106	0.0	0.6	1.0	7.3	90.5	0.6	100.0	0.1
Malta	MT_01	3 902	0	8	24	257	3 572	41	3 902	0	0.0	0.2	0.6	6.6	91.5	1.1	100.0	0.0
Netherlands	NL_02	182 279	376	702	1 497	11 506	156 104	9 603	179 788	2 491	0.2	0.4	0.8	6.4	86.8	5.3	100.0	1.4
Austria	AT_02	79 229	94	341	823	7 953	69 854	164	79 229	0	0.1	0.4	1.0	10.0	88.2	0.2	100.0	0.0
Poland	PL_01	358 440	264	1 390	2 899	20 960	321 278	11 597	358 388	52	0.1	0.4	0.8	5.8	89.6	3.2	100.0	0.0
Portugal[2]	PT_02	109 778	393		785	6 492	95 367	6 492	109 529	249	0.4		0.7	5.9	87.1	5.9	100.0	0.2
Slovenia	SI_01	17 946	16	81	154	1 072	16 455	168	17 946	0	0.1	0.5	0.9	6.0	91.7	0.9	100.0	0.0
Slovak Republic[3]																		
Finland	FI_01	57 759	60	171	363	2 741	51 552	2 751	57 638	121	0.1	0.3	0.6	4.8	89.4	4.8	100.0	0.2
Sweden	SE_01	100 402	33	258	673	5 490	86 843	7 105	100 402	0	0.0	0.3	0.7	5.5	86.5	7.1	100.0	0.0
United Kingdom[3]																		
Scotland	UK_07	53 269	57	258	496	3 485	47 508	1 371	53 175	94	0.1	0.5	0.9	6.6	89.3	2.6	100.0	0.2
Northern Ireland	UK_06	22 504	34	115	188	1 248	20 617	302	22 504	0	0.2	0.5	0.8	5.5	91.6	1.3	100.0	0.0
Norway	NO_01	57 368	63	213	430	3 507	49 368	3 787	57 368	0	0.1	0.4	0.7	6.1	86.1	6.6	100.0	0.0

[1] Cyprus provided no data on gestational age distribution. [2] Portugal has no data on live births by gestational age for <24 weeks and 24-27 weeks (the percentage refers to ≤ 27 weeks of gestation). [3] Slovak Republic and England and Wales provided no data on gestational age distribution for total births. Note: Gestational age distribution of fetal deaths can be found in table C1_A.

C5_B: Distribution of gestational age for live births

Country/coverage	Source	Number of live births: All	Number of live births, gestational age in weeks: < 24	24-27	28-31	32-36	37-41	≥ 42	All stated	Not stated	Percentage of live births, gestational age in weeks: < 24	24-27	28-31	32-36	37-41	≥ 42	All stated	Not stated
Belgium																		
Flanders	BE_01	60 672	15	151	388	4 281	55 487	350	60 672	0	0.0	0.2	0.6	7.1	91.5	0.6	100.0	0.0
Brussels	BE_02	16 200	2	50	106	912	13 861	246	15 177	1 023	0.0	0.3	0.7	6.0	91.3	1.6	100.0	6.3
Czech Republic	CZ_01	97 671	22	284	749	5 780	86 825	4 011	97 671	0	0.1	0.3	0.8	5.9	88.9	4.1	100.0	0.0
Denmark	DK_01	64 521	19	166	498	3 782	56 045	3 957	64 467	54	0.0	0.3	0.8	5.9	86.9	6.1	100.0	0.1
Germany	DE_01	646 626	412	2 461	5 675	48 759	581 017	8 302	646 626	0	0.1	0.4	0.9	7.5	89.9	1.3	100.0	0.0
Estonia	EE_01	13 990	5	53	85	681	12 832	297	13 953	37	0.0	0.4	0.6	4.9	92.0	2.1	100.0	0.3
Ireland	IE_01	62 066	27	182	414	2 803	55 803	2 811	62 040	26	0.0	0.3	0.7	4.5	89.9	4.5	100.0	0.0
Greece	GR_01	104 349	15	204	668	5 398	98 064		104 349	0	0.0	0.2	0.6	5.2	94.0		100.0	0.0
Spain	ES_02	454 591	54	856	2 455	29 004	355 633	14 588	402 590	52 001	0.0	0.2	0.6	7.2	88.3	3.6	100.0	11.4
Valencia	ES_05	51 047	3	106	356	3 968	42 580	1 225	48 238	2 809	0.0	0.2	0.7	8.2	88.3	2.5	100.0	5.5
France	FR_01	14 572	1	38	91	789	13 437	152	14 508	64	0.0	0.3	0.6	5.4	92.6	1.0	100.0	0.4
Italy	IT_04	539 066	185	1 194	3 858	31 660	491 760	10 409	539 066	0	0.0	0.2	0.7	5.9	91.2	1.9	100.0	0.0
Cyprus[1]																		
Latvia	LV_01	20 355	6	65	181	918	19 047	137	20 354	1	0.0	0.3	0.9	4.5	93.6	0.7	100.0	0.0
Lithuania	LT_01	29 480	14	80	187	1 292	27 696	211	29 480	0	0.0	0.3	0.6	4.4	93.9	0.7	100.0	0.0
Luxembourg	LU_01	5 469	0	1	13	308	5 035	13	5 370	99	0.0	0.0	0.2	5.7	93.8	0.2	100.0	1.8
Hungary	HU_01	95 118	0	472	891	6 774	86 270	611	95 018	100	0.0	0.5	0.9	7.1	90.8	0.6	100.0	0.1
Malta	MT_01	3 887	0	8	21	252	3 565	41	3 887	0	0.0	0.2	0.5	6.5	91.7	1.1	100.0	0.0
Netherlands	NL_02	181 006	127	459	1 322	11 267	155 771	9 587	178 533	2 473	0.1	0.3	0.7	6.3	87.3	5.4	100.0	1.4
Austria	AT_02	78 934	45	291	776	7 876	69 782	164	78 934	0	0.1	0.4	1.0	10.0	88.4	0.2	100.0	0.0
Poland	PL_01	356 697	152	1 110	2 614	20 452	320 739	11 584	356 651	46	0.0	0.3	0.7	5.7	89.9	3.2	100.0	0.0
Portugal[2]	PT_02	109 356	305		710	6 375	95 265	6 492	109 147	209	0.3		0.7	5.8	87.3	5.9	100.0	0.2
Slovenia	SI_01	17 846	8	52	137	1 049	16 432	168	17 846	0	0.0	0.3	0.8	5.9	92.1	0.9	100.0	0.0
Slovak Republic	SK_01	52 388	15	128	349	2 802	48 133	961	52 388	0	0.0	0.2	0.7	5.3	91.9	1.8	100.0	0.0
Finland	FI_01	57 569	30	133	342	2 689	51 509	2 750	57 453	116	0.1	0.2	0.6	4.7	89.7	4.8	100.0	0.2
Sweden	SE_01	100 158	33	258	629	5 398	86 677	7 091	100 086	72	0.0	0.3	0.6	5.4	86.6	7.1	100.0	0.1
United Kingdom																		
England and Wales[3]	UK_01	645 675	435	2 431	5 825	39 538	564 403	27 755	640 387	5 288	0.1	0.4	0.9	6.2	88.1	4.3	100.0	0.8
Scotland	UK_07	52 911	16	183	444	3 397	47 407	1 370	52 817	94	0.0	0.3	0.8	6.4	89.8	2.6	100.0	0.2
Northern Ireland	UK_06	22 362	9	82	165	1 218	20 586	302	22 362	0	0.0	0.4	0.7	5.4	92.1	1.4	100.0	0.0
Norway	NO_01	57 111	18	168	408	3 455	49 281	3 781	57 111	0	0.0	0.3	0.7	6.0	86.3	6.6	100.0	0.0

[1] Cyprus provided no data on gestational age distribution. [2] Portugal has no data on live births by gestational age for <24 weeks and 24-27 weeks (the percentage refers to ≤ 27 weeks of gestation). [3] England and Wales provided data on gestational age distribution for the year 2005. Note: Gestational age distribution of fetal deaths can be found in table C1_A.

EURO-PERISTAT indicators for the year 2004

C5_C: Distribution of gestational age by plurality for live births

			Percentage of live singleton births by gestational age group Gestational age in weeks									Percentage of live multiple births by gestational age group Gestational age in weeks							
Country/coverage	Source	Number of live singleton births	< 24	24-27	28-31	32-36	37-41	≥ 42	All stated	Not stated	Number of live multiple births	< 24	24-27	28-31	32-36	37-41	≥ 42	All stated	Not stated
Belgium																			
Flanders	BE_01	58 768	0.0	0.2	0.5	5.6	93.1	0.6	100.0	0.0	1 904	0.2	2.5	5.3	52.3	39.8	0.0	100.0	0.0
Brussels	BE_02	15 657	0.0	0.2	0.6	4.6	92.9	1.7	100.0	6.3	543	0.0	3.1	4.3	47.6	44.9	0.0	100.0	6.4
Czech Republic	CZ_01	94 056	0.0	0.2	0.5	4.6	90.4	4.2	100.0	0.0	3 615	0.1	1.8	7.4	40.4	49.8	0.4	100.0	0.0
Denmark	DK_01	61 687	0.0	0.2	0.5	4.4	88.5	6.4	100.0	0.1	2 834	0.2	2.0	6.6	37.5	53.7	0.1	100.0	0.3
Germany	DE_01	623 359	0.0	0.3	0.6	6.0	91.7	1.3	100.0	0.0	23 267	0.5	2.7	7.6	48.2	40.9	0.1	100.0	0.0
Estonia	EE_01	13 623	0.0	0.3	0.5	4.1	92.9	2.2	100.0	0.0	334	0.6	3.9	4.5	38.6	52.4	0.0	100.0	0.0
Ireland	IE_01	60 185	0.0	0.2	0.5	3.7	91.0	4.7	100.0	0.0	1 881	0.4	2.8	7.0	32.1	57.7	0.1	100.0	0.0
Greece	GR_01	99 855	0.0	0.1	0.5	3.8	95.5		100.0	0.0	4 494	0.0	1.2	4.0	35.1	59.7		100.0	0.0
Spain	ES_02	438 499	0.0	0.2	0.4	5.8	89.9	3.7	100.0	11.5	16 092	0.1	1.5	5.1	44.0	48.9	0.4	100.0	10.3
Valencia	ES_05	49 281	0.0	0.2	0.5	6.5	90.2	2.6	100.0	5.6	1 766	0.0	1.8	6.3	55.5	36.4	0.0	100.0	2.8
France	FR_01	14 073	0.0	0.2	0.5	4.2	93.9	1.1	100.0	0.5	499	0.0	1.8	3.6	38.9	55.7	0.0	100.0	0.0
Italy	IT_04	526 131	0.0	0.2	0.6	4.9	92.3	2.0	100.0	0.0	12 935	0.2	1.8	5.4	46.1	46.3	0.1	100.0	0.0
Cyprus[1]																			
Latvia	LV_01	19 890	0.0	0.3	0.7	3.8	94.5	0.7	100.0	0.0	465	0.4	2.4	6.9	34.8	55.5	0.0	100.0	0.0
Lithuania	LT_01	28 839	0.0	0.2	0.6	3.7	94.8	0.7	100.0	0.0	641	0.3	2.0	3.4	37.0	57.3	0.0	100.0	0.0
Luxembourg	LU_01	5 317	0.0	0.0	0.2	4.4	95.1	0.2	100.0	1.8	152	0.0	0.0	1.3	50.7	48.0	0.0	100.0	1.3
Hungary[2]																			
Malta	MT_01	3 767	0.0	0.1	0.5	5.2	93.1	1.1	100.0	0.0	120	0.0	3.3	2.5	45.8	48.3	0.0	100.0	0.0
Netherlands	NL_02	173 956	0.1	0.2	0.5	4.9	88.7	5.6	100.0	1.4	7 050	0.6	1.8	6.0	39.8	51.7	0.1	100.0	0.1
Austria	AT_02	76 483	0.1	0.3	0.7	8.4	90.4	0.2	100.0	0.0	2 451	0.2	3.1	10.8	60.5	25.4	0.0	100.0	0.0
Poland	PL_01	348 870	0.0	0.3	0.6	4.9	90.8	3.3	100.0	0.0	7 827	0.4	2.3	6.7	40.8	49.7	0.2	100.0	0.0
Portugal[3]	PT_02	106 375	0.2		0.5	4.7	88.5	6.1	100.0	0.2	2 981	2.9		7.3	44.9	45.0	0.1	100.0	0.0
Slovenia	SI_01	17 229	0.0	0.2	0.5	4.5	93.8	1.0	100.0	0.0	617	0.6	2.3	8.1	44.4	44.6	0.0	100.0	0.0
Slovak Republic	SK_01	51 128	0.0	0.2	0.5	4.5	92.9	1.9	100.0	0.0	1 260	0.4	2.2	6.9	40.3	50.2	0.0	100.0	0.0
Finland	FI_01	55 849	0.0	0.2	0.4	3.7	90.7	4.9	100.0	0.2	1 720	0.5	1.8	5.5	36.7	55.5	0.0	100.0	0.0
Sweden	SE_01	97 396	0.0	0.2	0.5	4.5	87.5	7.3	100.0	0.1	2 758	0.2	2.0	6.1	37.1	54.4	0.2	100.0	0.1
United Kingdom																			
England and Wales[4]	UK_01	626 734	0.1	0.3	0.7	5.1	89.4	4.5	100.0	0.8	18 941	0.5	2.8	7.6	42.3	46.6	0.2	100.0	0.9
Scotland	UK_07	51 412	0.0	0.2	0.7	5.3	91.1	2.7	100.0	0.2	1 497	0.0	3.7	5.5	46.0	44.8	0.0	100.0	0.0
Northern Ireland	UK_06	21 701	0.0	0.3	0.5	4.5	93.3	1.4	100.0	0.0	661	0.5	2.3	8.3	35.9	52.8	0.3	100.0	0.0
Norway	NO_01	54 957	0.0	0.2	0.5	4.8	87.6	6.9	100.0	0.0	2 104	0.2	2.9	6.3	39.8	50.8	0.0	100.0	0.0

[1] Cyprus provided no data on gestational age distribution. [2] Hungary provided no data on gestational age distribution by plurality. [3] Portugal has no data on live births by gestational age for <24 weeks and 24-27 weeks (the percentage refers to ≤ 27 weeks of gestation). [4] England and Wales provided data on gestational age distribution for the year 2005.

C6: Maternal Mortality Ratio (number and ratio per 100 000 live births)

Country/coverage	Source	Number of live births	Number of maternal deaths			Maternal Mortality Ratio per 100 000 live births
			All	Year 2003	Year 2004	
Belgium						
Flanders	BE_01	119 167	5	4	1	4.2
Brussels[2]	BE_02	32 400	2	1	1	6.2
Czech Republic	CZ_02	191 349	19	11	8	9.9
Denmark	DK_03	129 466	12	7	5	9.3
Germany[3,6]	DE_01/02	692 802	37	NA	37	5.3
Estonia	EE_01	27 028	8	4	4	29.6
Ireland[1]						
Greece	GR_01	104 355	2	2	NA	1.9
Spain	ES_02	896 472	41	20	21	4.6
Valencia	ES_02	95 847	4	3	1	4.2
France	FR_02	1 529 280	107	55	52	7.0
Italy[2,3]	IT_01	539 066	17	17	NA	3.2
Cyprus[1]						
Latvia	LV_02	41 340	5	3	2	12.1
Lithuania	LT_02	61 017	6	1	5	9.8
Luxembourg[3]	LU_02	27 252	2	total for five years		7.3
Hungary[5]	HU_03	190 274	14	7	7	7.4
Malta	MT_02	7 923	0	0	0	0.0
Netherlands	NL_06	362 012	32	18	14	8.8
Austria	AT_01	155 912	10	2	8	6.4
Poland	PL_01	707 203	31	14	17	4.4
Portugal	PT_02	221 945	17	8	9	7.7
Slovenia[4]	SI_02	34 907	4	4	0	11.5
Slovak Republic[1]						
Finland	FI_02	114 018	9	2	7	7.9
Sweden[2]	SE_02	200 316	4	2	2	2.0
United Kingdom	UK_01/02/03	1 411 545	108	55	53	7.7
England and Wales	UK_01	1 261 190	91	45	46	7.2
Scotland	UK_02	106 389	13	7	6	12.2
Northern Ireland	UK_03	43 786	4	3	1	9.1
Norway	NO_01	113 409	4	4	0	3.5

[1] Ireland, Cyprus, Slovak Republic and Norway provided no data on maternal death. [2] Brussels, Italy and Sweden provided data on maternal death without the number of live births. The number of live births was estimated by the number of live births from 2004, which is 16 200 for Brussels, 539 066 for Italy and 100 158 for Sweden. [3] Data on maternal death was provided for one year only by Germany (2004) and Italy (2002), and for five years by Luxembourg (2000-2004). [4] Slovenia provided data on maternal death for the years 2001 and 2002. [5] Hungary provided data on maternal death for the years 2003 and 2004, but did not provide the number of live births for year 2003. The number of live births for 2003 was estimated by the number of live births for 2004. [6] Germany provided data on maternal death by number of women (pregnancies) instead of the number of live births.

C6_A: Maternal Mortality ratio by maternal age (numbers and rates per 100 000 live births)

		Numbers										Maternal Mortality Ratio per 100 000 live births Age in years		
		Live births Age in years					Maternal deaths Age in years							
Country/coverage	Source	<25	25-34	≥35	All stated	Not stated	<25	25-34	≥35	All stated	Not stated	<25	25-34	≥35
Belgium														
Flanders	BE_01	20 594	83 894	14 679	119 167	0	1	2	2	5	0	4.9	2.4	13.6
Czech Republic	CZ_02	45 231	131 118	15 000	191 349	0	2	15	2	19	0	4.4	11.4	13.3
Denmark	DK_03	14 612	91 917	22 937	129 466	0	2	5	5	12	0	13.7	5.4	21.8
Germany[4]	DE_01	129 696	404 263	152 180	686 139	6 663	5	20	12	37	0	3.9	4.9	7.9
Estonia	EE_01	9 588	14 408	3 031	27 027	1	2	4	2	8	0	20.9	27.8	66.0
Ireland[1]														
Greece[2]														
Spain	ES_02	113 867	579 564	203 041	896 472	0	2	16	23	41	0	1.8	2.8	11.3
Valencia	ES_02	12 751	64 380	18 716	95 847	0	0	2	2	4	0	0.0	3.1	10.7
France	FR_02	245 988	996 140	287 152	1 529 280	0	13	55	39	107	0	5.3	5.5	13.6
Italy[3]														
Cyprus[1]														
Latvia	LV_02	16 227	20 760	4 346	41 333	7	1	1	3	5	0	6.2	4.8	69.0
Lithuania	LT_02	23 278	31 477	6 246	61 001	16	1	2	3	6	0	4.3	6.4	48.0
Luxembourg[2]														
Hungary[5]	HU_03	48 672	122 050	19 552	190 274	0	3	7	2	12	2	6.2	5.7	10.2
Malta	MT_02	1 981	5 004	917	7 902	21	0	0	0	0	0	0.0	0.0	0.0
Netherlands	NL_06	42 734	244 998	74 244	361 976	36	4	14	14	32	0	9.4	5.7	18.9
Austria	AT_01	35 386	94 586	25 940	155 912	0	1	6	3	10	0	2.8	6.3	11.6
Poland	PL_01	243 323	399 948	63 932	707 203	0	5	17	9	31	0	2.1	4.3	14.1
Portugal[2]														
Slovenia	SI_02	7 981	23 251	3 675	34 907	0	0	3	1	4	0	0.0	12.9	27.2
Slovak Republic[1]														
Finland	FI_02	21 937	69 876	22 205	114 018	0	2	4	3	9	0	9.1	5.7	13.5
Sweden[3]														
United Kingdom	UK_01/02/03	365 104	778 216	268 139	1 411 459	86	14	63	31	108	0	3.8	8.1	11.6
England and Wales	UK_01	327 024	694 679	239 487	1 261 190	0	10	53	28	91	0	3.1	7.6	11.7
Scotland	UK_02	27 903	58 026	20 374	106 303	86	3	8	2	13	0	10.8	13.8	9.8
Northern Ireland	UK_03	10 177	25 511	8 278	43 966	0	1	2	1	4	0	9.8	7.8	12.1
Norway[1]														

[1] Ireland, Cyprus, Slovak Republic and Norway provided no data on maternal death. [2] Greece, Luxembourg and Portugal provided no data on maternal death by maternal age. [3] Italy and Sweden provided data on maternal death by maternal age without the number of live births by maternal age. [4] Germany provided data on maternal death by maternal age for one year only (2004); their data is based on number of women and includes births <22 weeks of gestation. [5] Hungary provided data on maternal death by maternal age for the years 2003 and 2004, but did not provide the number of live births by maternal for year 2003. These were estimated by the numbers from 2004.

C6_B: Maternal Mortality Ratio by mode of delivery (numbers and rates per 100 000 live births)

		Numbers														Maternal Mortality Ratio per 100 000 live births				
		Live births Mode of delivery							Maternal deaths Mode of delivery							Mode of delivery				
Country/coverage	Source	Vag - spon	Vag - instr	CS - no lab	CS - lab	CS - total	All stated	Not stated	Vag - spon	Vag - instr	CS - no lab	CS - lab	CS - total	All stated	Not stated	Vag - spon	Vag - instr	CS - no lab	CS - lab	CS - total
Belgium																				
Flanders	BE_01	83 670	12 895	13 365	9 238	22 603	119 168	0	2	2	1	0	1	5	0	2.4	15.5	7.5	0.0	4.4
Czech Republic	CZ_01	155 477	3 050	14 167	15 791	29 958	188 485	0	6	1	0	2	2	9	10	3.9	32.8	0.0	12.7	6.7
Denmark	DK_01	91 621	9 841	15 152	12 173	27 325	128 787	0	2	2	3	0	3	7	5	2.2	20.3	19.8	0.0	11.0
Germany[6]	DE_01	443 135	37 136	86 429	82 347	168 776	649 047	11 363	16	2	13	11	24	42	1	3.6	5.4	15.0	13.4	14.2
Estonia[8]	EE_01	10 926	652	926	1 553	2 479	14 057	33	1	0	0	2	2	3	1	9.2	0.0	0.0	128.8	80.7
Ireland[1]																				
Greece[1]																				
Spain[3]																				
France[7]	FR_06	1 071 189	182 396	NA	NA	292 142	1 545 727	NA	26	10	10	50	60	96	4	2.4	5.5	NA	NA	20.5
Italy[2]																				
Cyprus[1]																				
Latvia	LV01/02	12 371	3 898	1 991	2 095	4 086	20 355	0	2	0	1	0	1	3	1	16.2	0.0	50.2	0.0	24.5
Lithuania[1]																				
Luxembourg[2]																				
Hungary[4,5]	HU_03	134 772	3 492	NA	NA	48 880	187 144	3 130	7	0	NA	NA	6	13	1	5.2	0.0	NA	NA	12.3
Malta	MT_02	5 423	310	1 154	1 035	2 189	7 922	1	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Netherlands[4]	NL_06	268 512	38 372	NA	NA	54 844	361 728	284	11	1	NA	NA	0	12	9	4.1	2.6	NA	NA	0.0
Austria[2]																				
Poland[2]																				
Portugal[2]																				
Slovenia	SI_02	29 456	870	1 561	3 017	4 578	34 904	3	1	0	1	2	3	4	0	3.4	0.0	64.1	66.3	65.5
Slovak Republic[1]																				
Finland	FI_02	87 199	7 410	8 799	10 582	19 381	113 990	28	3	1	1	1	2	6	3	3.4	13.5	11.4	9.5	10.3
Sweden[2]																				
United Kingdom[2]																				
Norway[1]																				

ABBREVIATIONS: Vag - spon (vaginal spontaneous); Vag - instr (vaginal instrumental); CS - no lab (caesarean section - no labour/elective); CS - lab (caesarean section - during labour/emergency).
[1] Ireland, Cyprus, Slovak Republic and Norway provided no data on maternal death. [2] Greece Italy, Lithuania, Luxembourg, Austria, Poland, Portugal, Sweden, and United Kingdom provided no data on maternal death by mode of delivery. [3] Spain provided data on maternal death by mode of delivery for the Valencia region without the number of live births by mode of delivery. [4] Hungary and the Netherlands provided data on maternal death and live births for caesarean total. [5] Hungary provided data on maternal death by mode of delivery for the years 2003 and 2004, but did not provide the number of live births by mode of delivery for year 2003. These were estimated by the numbers from 2004. [6] Data from Germany is based on number of women (pregnancies) and includes births <22 weeks of gestation; not stated includes "caesarean-other". [7] France, Hungary and the Netherlands provided data on maternal death and live births for caesarean total. [8] Estonia provided data on maternal mortality by mode of delivery for the year 2004 only (4 maternal deaths).

EURO-PERISTAT indicators for the year 2004

C7: Multiple Birth Rate (numbers and rates per 1000 women)

		Number of women						Multiple Birth Rate per 1000 women	
		Plurality							
Country/coverage	Source	Singletons	Twins	Triplets or more	All stated	Not stated	All	Twins	Triplets or more
Belgium									
Flanders	BE_01	58 997	945	14	59 956	0	59 956	15.8	0.2
Brussels	BE_02	15 738	262	9	16 009	0	16 009	16.4	0.6
Czech Republic	CZ_01	94 288	1 791	19	96 098	0	96 098	18.6	0.2
Denmark	DK_01	61 922	1 425	36	63 383	0	63 383	22.5	0.6
Germany	DE_01	625 275	11 246	323	636 844	0	636 844	17.7	0.5
Estonia	EE_01	13 711	167	1	13 879	0	13 879	12.0	0.1
Ireland	IE_01	60 493	925	19	61 437	0	61 437	15.1	0.3
Greece[1]									
Spain	ES_08	439 806	7 712	266	447 784	0	447 784	17.2	0.6
France	FR_04	750 104	12 058	216	762 378	0	762 378	15.8	0.3
Italy	IT_04	528 160	6 147	261	534 568	0	534 568	11.5	0.5
Cyprus	CY_01	7 849	189	12	8 050	69	8 119	23.5	1.5
Latvia	LV_01	20 022	232	2	20 256	0	20 256	11.5	0.1
Lithuania	LT_01	28 984	317	5	29 306	0	29 306	10.8	0.2
Luxembourg	LU_02	5 330	73	2	5 405	0	5 405	13.5	0.4
Hungary	HU_03	92 278	1 570	65	93 913	0	93 913	16.7	0.7
Malta	MT_01	3 782	50	6	3 838	0	3 838	13.0	1.6
Netherlands	NL_02	175 117	3 581	76	178 774	0	178 774	20.0	0.4
Austria	AT_02	76 754	1 200	25	77 979	0	77 979	15.4	0.3
Poland	PL_01	350 424	3 894	67	354 385	0	354 385	11.0	0.2
Portugal	PT_01	106 773	1 444	41	108 258	0	108 258	13.3	0.4
Slovenia	SI_01	17 315	311	3	17 629	0	17 629	17.6	0.2
Slovak Republic	SK_01	51 334	629	5	51 968	0	51 968	12.1	0.1
Finland	FI_01	56 013	849	16	56 878	0	56 878	14.9	0.3
Sweden	SE_01	97 697	1 361	15	99 073	0	99 073	13.7	0.2
United Kingdom	UK_01/02/03	698 694	10 455	168	709 317	0	709 317	14.7	0.2
England and Wales	UK_01	624 207	9 368	153	633 728	0	633 728	14.8	0.2
Scotland	UK_02	52 737	757	8	53 502	2	53 504	14.1	0.1
Northern Ireland	UK_03	21 750	330	7	22 087	0	22 087	14.9	0.3
Norway	NO_01	55 178	1 050	15	56 243	45	56 288	18.7	0.3

[1] Greece provided no data on multiple births.

C8: Distribution of maternal age

Country/coverage	Source	Number of women	Percentage of women delivering live or still births — Age in years: 10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	≥ 50	All stated	Not stated
Belgium													
Flanders	BE_01	59 956	0.0	2.1	15.1	37.5	32.6	10.9	1.7	0.1	0.0	100.0	0.0
Brussels	BE_02	16 009	0.0	2.9	17.7	29.9	30.4	15.1	3.7	0.2	0.0	100.0	0.0
Czech Republic	CZ_02	97 929	0.0	3.7	18.4	44.0	25.7	7.0	1.1	0.0	0.0	100.0	0.0
Denmark	DK_01	63 383	0.0	1.3	10.3	34.2	36.9	14.9	2.3	0.1	0.0	100.0	0.0
Germany	DE_01	636 844	0.0	2.9	16.0	27.9	31.0	18.5	3.5	0.1	0.0	100.0	1.0
Estonia	EE_01	13 879	0.0	8.1	26.9	31.5	22.1	9.5	1.8	0.1	0.0	100.0	0.0
Ireland	IE_01	61 437	0.0	4.1	13.5	23.5	34.6	20.4	3.8	0.1	0.0	100.0	0.2
Greece[1]													
Spain	ES_02	447 784	0.0	2.6	9.7	25.5	39.0	19.6	3.2	0.1	0.0	100.0	0.0
Valencia	ES_03	45 578	0.0	3.3	10.8	26.9	38.1	18.1	2.7	0.1	0.0	100.0	0.1
France	FR_01	14 482	0.0	2.6	16.1	33.3	32.1	13.2	2.6	0.1	0.0	100.0	1.8
Italy	IT_04	534 568	0.0	2.1	10.2	27.5	36.3	20.0	3.7	0.1	0.0	100.0	0.0
Cyprus	CY_01	8 119	0.0	2.7	19.2	37.0	27.5	11.1	2.3	0.1	0.0	100.0	1.2
Latvia	LV_01	20 256	0.0	9.3	29.9	29.7	20.0	8.8	2.2	0.1	0.0	100.0	0.0
Lithuania	LT_01	29 306	0.0	6.7	27.3	33.0	21.3	9.2	2.4	0.1	0.0	100.0	0.0
Luxembourg	LU_01	5 483	0.0	2.6	13.5	29.6	34.9	16.5	2.7	0.1	0.0	100.0	0.1
Hungary[2]	HU_01	95 613	0.1	6.8	18.7	38.8	25.3	8.8	1.5	0.0	0.0	100.0	0.0
Malta	MT_01	3 838	0.1	5.7	18.8	37.0	26.8	9.4	2.2	0.1	0.0	100.0	0.0
Netherlands	NL_02	178 774	0.0	1.6	10.3	27.6	40.1	17.8	2.6	0.1	0.0	100.0	0.0
Austria	AT_02	77 979	0.0	4.2	18.9	30.6	29.5	14.2	2.5	0.1	0.0	100.0	0.0
Poland	PL_01	354 385	0.0	5.8	27.7	37.3	20.1	7.2	1.8	0.1	0.0	100.0	0.0
Portugal	PT_01	108 258	0.0	4.2	15.1	30.6	32.2	14.3	3.3	0.2	0.0	100.0	0.0
Slovenia	SI_01	17 629	0.0	1.9	17.1	39.8	29.3	9.9	1.8	0.1	0.0	100.0	0.0
Slovak Republic	SK_01	51 968	0.1	8.0	27.2	37.2	19.9	6.2	1.3	0.0	0.0	100.0	0.0
Finland	FI_01	56 878	0.0	2.9	16.5	32.3	28.8	15.6	3.6	0.2	0.0	100.0	0.0
Sweden	SE_01	99 073	0.0	1.7	12.1	30.2	36.2	16.7	3.1	0.1	0.0	100.0	0.1
United Kingdom	UK_01/02/03	709 317	0.0	7.1	18.9	25.0	29.7	15.9	3.1	0.1	0.0	100.0	0.0
England and Wales	UK_01	633 728	0.0	7.1	19.0	25.0	29.7	15.9	3.1	0.1	0.0	100.0	0.0
Scotland	UK_02	52 438	0.0	7.8	18.6	24.5	29.7	16.3	3.0	0.1	0.0	100.0	0.0
Northern Ireland	UK_03	22 087	0.0	6.7	16.2	26.7	31.2	16.5	2.7	0.1	0.0	100.0	0.0
Norway	NO_01	56 288	0.0	2.0	14.3	31.9	34.7	14.8	2.2	0.1	0.0	100.0	0.0

[1] Greece provided no data on maternal age. [2] Hungary provided data on child level (95 613 live and still births) instead of maternal level (93 913 women delivering live or still births).

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C9: Distribution of parity

Country/coverage	Source	Number of women	Percentage of women delivering live or stillbirths Parity 0	1	2	3	≥4	All stated	Not stated
Belgium									
Flanders	BE_01	59 956	47.8	33.4	12.5	3.9	2.4	100.0	0.0
Czech Republic	CZ_01	96 098	51.9	33.6	9.8	2.8	1.9	100.0	0.0
Denmark	DK_01	63 383	43.3	36.9	14.4	3.7	1.7	100.0	1.4
Germany	DE_01	636 844	49.8	33.8	11.1	3.3	1.9	100.0	0.0
Estonia	EE_01	13 879	49.6	32.3	12.1	3.5	2.5	100.0	0.2
Ireland	IE_01	61 437	40.1	32.3	17.1	6.7	3.8	100.0	0.1
Greece[1]									
Spain	ES_02	447 784	55.6	34.8	7.3	1.5	0.8	100.0	0.0
Valencia	ES_04	8 650	45.3	35.2	12.6	4.1	2.8	100.0	1.8
France	FR_01	14 482	43.3	35.0	14.2	4.7	2.9	100.0	1.5
Italy[1]									
Cyprus	CY_01	8 119	44.5	34.7	14.9	4.2	1.7	100.0	1.3
Latvia	LV_01	20 256	53.1	30.2	10.1	3.5	3.1	100.0	0.0
Lithuania	LT_01	29 306	50.1	32.7	10.2	3.4	3.5	100.0	0.0
Luxembourg	LU_01	5 483	45.1	34.9	14.6	5.3	0.1	100.0	0.0
Hungary[2]	HU_01	95 613	46.7	31.7	13.2	4.5	4.0	100.0	0.0
Malta	MT_01	3 838	51.6	32.9	10.8	3.3	1.4	100.0	0.0
Netherlands	NL_02	178 774	46.2	35.9	12.6	3.4	1.9	100.0	0.0
Austria	AT_02	77 979	46.6	34.7	12.8	4.0	1.8	100.0	0.0
Poland	PL_01	354 385	51.3	31.2	10.4	3.8	3.4	100.0	0.0
Portugal	PT_01	108 258	54.2	33.6	8.5	2.4	1.3	100.0	0.0
Slovenia	SI_01	17 629	49.9	36.0	10.9	2.1	1.2	100.0	0.0
Slovak Republic	SK_01	51 968	44.8	31.1	12.8	5.2	6.1	100.0	0.0
Finland	FI_01	56 878	42.3	32.5	15.1	5.5	4.5	100.0	0.1
Sweden	SE_01	99 073	44.6	36.1	13.4	3.8	2.1	100.0	0.0
United Kingdom[1]									
England	UK_04	584 100	39.4	30.9	15.9	7.3	6.5	100.0	0.0
Scotland	UK_06	52 437	44.3	34.8	14.1	4.5	2.3	100.0	0.2
Northern Ireland	UK_03	22 087	41.2	33.0	16.3	6.0	3.5	100.0	0.0
Norway	NO_01	56 288	41.3	35.6	16.4	4.6	2.1	100.0	0.0

[1] Greece, Italy and Wales provided no data on parity. [2] Hungary provided data on child level (95 613 live and still births) instead of maternal level (93 913 women delivering live or still births).
[3] Data for England grossed up to allow for 25% of data missing.

C10: Mode of delivery (numbers and percentages of total births)

		Number of total births	Number of total births - Mode of delivery								Percentage of total births - Mode of delivery							
Country/coverage	Source		Vag - spon	Vag - instr	Vag - total	CS - no lab	CS - lab	CS - total	All stated	Not stated	Vag - spon	Vag - instr	Vag - total	CS - no lab	CS - lab	CS - total	All stated	Not stated
Belgium																		
Flanders	BE_01	60 921	42 886	6 519	49 405	6 845	4 671	11 516	60 921	0	70.4	10.7	81.1	11.2	7.7	18.9	100.0	0.0
Brussels[2]	BE_02	16 288	11 380	1 500	12 880	NA	NA	2 681	15 561	727	73.1	9.6	82.8	NA	NA	17.2	100.0	4.7
Czech Republic[4]	CZ_01	96 098	78 969	1 495	80 464	7 438	8 196	15 634	96 098	0	82.2	1.6	83.7	7.7	8.5	16.3	100.0	0.0
Denmark	DK_01	63 767	45 920	4 806	50 726	7 278	5 763	13 041	63 767	0	72.0	7.5	79.5	11.4	9.0	20.5	100.0	0.0
Germany	DE_01	648 860	434 589	36 415	471 004	92 375	84 306	176 681	647 685	1 175	67.1	5.6	72.7	14.3	13.0	27.3	100.0	0.2
Estonia	EE_01	14 053	10 979	553	11 532	926	1 562	2 488	14 020	33	78.3	3.9	82.3	6.6	11.1	17.7	100.0	0.2
Ireland[2]	IE_01	62 400	37 188	9 513	46 701	NA	NA	15 679	62 380	20	59.6	15.3	74.9	NA	NA	25.1	100.0	0.0
Greece[1]																		
Spain																		
Valencia[2]	ES_03	38 290	23 651	5 237	28 888	NA	NA	9 402	38 290	0	61.8	13.7	75.4	NA	NA	24.6	100.0	0.0
France	FR_01	14 737	10 100	1 631	11 731	1 897	1 068	2 965	14 696	41	68.7	11.1	79.8	12.9	7.3	20.2	100.0	0.3
Italy	IT_04	542 003	326 689	8 889	335 578	134 317	69 340	203 657	539 235	2 768	60.6	1.6	62.2	24.9	12.9	37.8	100.0	0.5
Cyprus[1]																		
Latvia[4]	LV_01	20 256	15 975	308	16 283	1 933	2 040	3 973	20 256	0	78.9	1.5	80.4	9.5	10.1	19.6	100.0	0.0
Lithuania[2]	LT_01	29 633	24 151	304	24 455	NA	NA	5 140	29 595	38	81.6	1.0	82.6	NA	NA	17.4	100.0	0.1
Luxembourg[2]	LU_01	5 483	3 799	250	4 049	NA	NA	1 373	5 422	61	70.1	4.6	74.7	NA	NA	25.3	100.0	1.1
Hungary[2]	HU_03	95 613	69 427	1 746	71 173	NA	NA	24 440	95 613	0	72.6	1.8	74.4	NA	NA	25.6	100.0	0.0
Malta	MT_01	3 902	2 647	150	2 797	593	512	1 105	3 902	0	67.8	3.8	71.7	15.2	13.1	28.3	100.0	0.0
Netherlands	NL_02	182 279	135 418	19 226	154 644	12 830	14 661	27 491	182 135	144	74.4	10.6	84.9	7.0	8.0	15.1	100.0	0.1
Austria[2]	AT_02	79 229	56 431	4 157	60 588	NA	NA	18 641	79 229	0	71.2	5.2	76.5	NA	NA	23.5	100.0	0.0
Poland[3,4]	PL_02	350 048	NA	NA	257 927	NA	NA	92 121	350 048	0	NA	NA	73.7	NA	NA	26.3	100.0	0.0
Portugal[2,5]	PT_01	108 258	57 692	14 036	71 728	NA	NA	35 467	107 195	1 063	53.8	13.1	66.9	NA	NA	33.1	100.0	1.0
Slovenia	SI_01	17 946	14 846	517	15 363	958	1 616	2 574	17 937	9	82.8	2.9	85.6	5.3	9.0	14.4	100.0	0.1
Slovak Republic[2,4]	SK_01	51 968	40 638	1 017	41 655	NA	NA	9 896	51 551	417	78.8	2.0	80.8	NA	NA	19.2	100.0	0.8
Finland	FI_01	57 759	44 101	3 762	47 863	4 455	5 434	9 889	57 752	7	76.4	6.5	82.9	7.7	9.4	17.1	100.0	0.0
Sweden	SE_01	100 474	74 884	7 799	82 683	8 794	8 604	17 398	100 081	393	74.8	7.8	82.6	8.8	8.6	17.4	100.0	0.4
United Kingdom																		
England	UK_04	583 500	386 100	63 100	449 200	54 900	79 400	134 300	583 500	0	66.2	10.8	77.0	9.4	13.6	23.0	100.0	0.0
Wales	UK_10	29 632	19 168	2 834	22 002	3 078	4 308	7 386	29 388	244	65.2	9.6	74.9	10.5	14.7	25.1	100.0	0.8
Scotland	UK_06	52 911	33 584	6 223	39 807	4 939	8 147	13 086	52 893	18	63.5	11.8	75.3	9.3	15.4	24.7	100.0	0.0
Northern Ireland	UK_07	22 434	13 536	2 670	16 206	3 467	2 705	6 172	22 378	56	60.5	11.9	72.4	15.5	12.1	27.6	100.0	0.3
Norway	NO_01	57 368	43 580	4 811	48 391	2 893	6 084	8 977	57 368	0	76.0	8.4	84.4	5.0	10.6	15.6	100.0	0.0

ABBREVIATIONS: Vag - spon (vaginal spontaneous); Vag - instr (vaginal instrumental); CS - no lab (caesarean section - no labour/elective); CS - lab (caesarean section - during labour/emergency). [1] Greece and Cyprus provided no data on mode of delivery. [2] Brussels, Valencia, Ireland, Lithuania, Luxembourg, Hungary, Austria, Portugal and Slovak Republic provided the total number of caesarean sections. [3] Poland provided the total number of vaginal deliveries and the total number of caesarean sections. [4] Czech Republic, Latvia, Poland and Slovak Republic provided data on maternal level (number of women delivering live or still births) instead of child level (number of live and still births). [5] Data from Portugal is based on live and still births at or after 24 weeks of gestation.

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C10_A: Mode of delivery by parity

		Nullipara									Multipara								
			Percentage of births by mode of delivery									Percentage of births by mode of delivery							
Country/coverage	Source	Number of births	Vag - spon	Vag - instr	Vag - total	CS - no lab	CS - lab	CS - total	All stated	Not stated	Number of births	Vag - spon	Vag - instr	Vag - total	CS - no lab	CS - lab	CS - total	All stated	Not stated
Belgium																			
Flanders	BE_01	29 143	61.6	18.0	79.6	9.3	11.1	20.4	100.0	0.0	31 778	78.5	4.0	82.5	13.0	4.5	17.5	100.0	0.0
Czech Republic[6]	CZ_01	49 834	78.7	2.4	81.1	8.0	10.9	18.9	100.0	0.0	46 264	85.9	0.6	86.6	7.4	6.0	13.4	100.0	0.0
Denmark	DK_01	27 099	63.6	13.8	77.3	9.2	13.5	22.7	100.0	0.0	35 434	78.4	2.7	81.1	13.2	5.6	18.9	100.0	0.0
Germany[4]	DE_01	323 989	58.6	9.1	67.7	14.5	17.8	32.3	100.0	0.3	324 871	75.8	2.0	77.9	14.0	8.1	22.1	100.0	3.2
Estonia	EE_01	6 921	74.0	6.7	80.6	5.2	14.1	19.4	100.0	0.2	7 104	82.5	1.3	83.8	8.0	8.2	16.2	100.0	0.3
Ireland	IE_01	24 999	44.9	26.8	71.7	NA	NA	28.3	100.0	0.0	37 370	69.5	7.6	77.0	NA	NA	23.0	100.0	0.0
Greece[1]																			
Spain																			
Valencia[3]	ES_04	3 850	57.1	15.7	72.9	NA	NA	27.1	100.0	6.9	4 644	65.1	12.5	77.6	NA	NA	22.4	100.0	5.6
France	FR_01	6 286	57.7	19.3	77.0	11.9	11.0	23.0	100.0	0.3	8 221	77.4	4.7	82.1	13.6	4.3	17.9	100.0	0.2
Italy[2]																			
Cyprus[1]																			
Latvia[6]	LV_01	10 765	76.5	2.5	79.0	8.3	12.7	21.0	100.0	0.0	9 491	81.6	0.4	82.0	10.9	7.1	18.0	100.0	0.0
Lithuania	LT_01	14 830	78.9	1.7	80.5	NA	NA	19.5	100.0	0.1	14 803	84.3	0.4	84.7	NA	NA	15.3	100.0	0.1
Luxembourg	LU_01	2 473	64.1	7.3	71.4	NA	NA	28.6	100.0	1.2	3 008	75.0	2.4	77.3	NA	NA	22.7	100.0	1.0
Hungary[2]																			
Malta	MT_01	2 019	64.5	5.8	70.3	12.6	17.1	29.7	100.0	0.0	1 883	71.4	1.8	73.1	18.0	8.9	26.9	100.0	0.0
Netherlands	NL_02	84 296	63.3	18.6	81.9	6.5	11.6	18.1	100.0	0.1	97 928	83.8	3.7	87.5	7.5	5.0	12.5	100.0	0.1
Austria	AT_02	36 373	64.5	9.2	73.6	NA	NA	26.4	100.0	0.0	42 856	77.0	1.9	78.9	NA	NA	21.1	100.0	0.0
Poland[2]																			
Portugal[2]																			
Slovenia	SI_01	8 968	78.1	4.8	83.0	4.7	12.3	17.0	100.0	0.0	8 978	87.4	0.9	88.3	6.0	5.7	11.7	100.0	0.1
Slovak Republic[6]	SK_01	23 297	74.5	3.2	77.7	NA	NA	22.3	100.0	0.8	28 671	82.3	1.0	83.3	NA	NA	16.7	100.0	0.8
Finland	FI_01	24 454	67.1	11.9	79.0	7.1	13.8	21.0	100.0	0.0	33 305	83.1	2.6	85.7	8.1	6.2	14.3	100.0	0.0
Sweden	SE_01	44 773	67.2	13.7	80.9	7.0	12.0	19.1	100.0	0.3	55 701	81.0	3.0	84.0	10.2	5.8	16.0	100.0	0.4
United Kingdom[2]																			
England[5]	UK_04	179 500	58.5	17.4	75.9	6.1	18.0	24.1	100.0	0.0	298 800	71.4	6.2	77.6	11.3	11.0	22.4	100.0	0.0
Scotland	UK_06	23 401	53.2	20.3	73.5	4.8	21.7	26.5	100.0	0.1	29 423	71.7	5.0	76.7	12.9	10.4	23.3	100.0	0.0
Northern Ireland	UK_07	7 746	47.7	21.4	69.1	11.5	19.4	30.9	100.0	0.2	10 828	67.9	5.2	73.1	19.9	7.0	26.9	100.0	0.3
Norway	NO_01	23 698	67.1	15.2	82.3	3.4	14.3	17.7	100.0	0.0	33 670	82.2	3.6	85.8	6.2	8.0	14.2	100.0	0.0

ABBREVIATIONS: Vag - spon (vaginal spontaneous); Vag - instr (vaginal instrumental); CS - no lab (caesarean section - no labour/elective); CS - lab (caesarean section - during labour/emergency).
[1] Greece and Cyprus provided no data on mode of delivery. [2] Italy, Hungary, Poland, Portugal and Wales provided no data on mode of delivery by parity. [3] Valencia provided data on mode of delivery by parity for the year 2005.
[4] For Germany "not stated" includes caesarean section other than "labour/no labour". [5] Data for England was grossed up to allow 25% of data missing. A total of 1,200 births by 'other' methods of delivery were excluded from "All stated". [6] Czech Republic, Latvia and Slovak Republic provided data on maternal level (number of women delivering live or still births) instead of child level (number of live and still births).

C10_B: Mode of delivery by previous caesarean section

		Previous caesarean section									No previous caesarean section								
		Number of births	Percentage of births by mode of delivery								Number of births	Percentage of births by mode of delivery							
Country/coverage	Source		Vag - spon	Vag - instr	Vag - total	CS - no lab	CS - lab	CS - total	All stated	Not stated		Vag - spon	Vag - instr	Vag - total	CS - no lab	CS - lab	CS - total	All stated	Not stated
Belgium																			
Flanders	BE_01	4 979	26.9	5.5	32.4	55.9	11.7	67.6	100.0	0.0	30 901	83.5	6.1	89.7	5.6	4.7	10.3	100.0	0.0
Czech Republic[5]	CZ_01	4 518	40.1	1.1	41.2	36.9	21.9	58.8	100.0	0.0	91 580	84.3	1.6	85.8	6.3	7.9	14.2	100.0	0.0
Denmark	DK_01	6 761	34.2	5.1	39.3	43.6	17.1	60.7	100.0	0.0	57 006	76.5	7.8	84.3	7.6	8.1	15.7	100.0	0.0
Germany[3]	DE_01	74 554	37.0	4.3	41.4	40.2	18.4	58.6	100.0	12.9	574 306	71.4	5.8	77.2	10.6	12.1	22.8	100.0	0.3
Estonia	EE_01	682	21.8	1.8	23.6	50.7	25.7	76.4	100.0	0.0	13 371	81.2	4.1	85.3	4.3	10.4	14.7	100.0	0.2
Ireland[2]																			
Greece[1]																			
Spain																			
Valencia	ES_03	2 279	15.0	10.3	25.3	NA	NA	74.7	100.0	0.0	36 011	64.7	13.9	78.6	NA	NA	21.4	100.0	0.0
France	FR_01	1 352	27.7	7.7	35.4	55.0	9.6	64.6	100.0	0.0	13 041	73.0	11.4	84.4	8.7	7.0	15.6	100.0	0.3
Italy[2]																			
Cyprus[1]																			
Latvia	LV_01	1 007	8.9	0.2	9.1	67.5	23.3	90.9	100.0	0.0	19 249	82.5	1.6	84.1	6.5	9.4	15.9	100.0	0.0
Lithuania	LT_01	1 183	18.3	0.3	18.7	NA	NA	81.3	100.0	0.0	28 450	84.2	1.1	85.3	NA	NA	14.7	100.0	0.1
Luxembourg[2]																			
Hungary[2]																			
Malta	MT_01	400	22.3	2.8	25.0	56.8	18.3	75.0	100.0	0.0	3 502	73.0	4.0	77.0	10.5	12.5	23.0	100.0	0.0
Netherlands[4]	NL_01	10 033	44.3	10.3	54.6	28.3	17.2	45.4	100.0	0.0	87 895	88.4	2.9	91.3	5.1	3.6	8.7	100.0	0.1
Austria[2]																			
Poland[2]																			
Portugal[2]																			
Slovenia	SI_01	585	23.9	1.2	25.1	47.0	27.9	74.9	100.0	0.0	17 360	84.8	2.9	87.7	3.9	8.4	12.3	100.0	0.1
Slovak Republic[2]																			
Finland	FI_01	4 719	45.5	5.3	50.8	33.4	15.9	49.2	100.0	0.0	53 040	79.1	6.6	85.7	5.4	8.8	14.3	100.0	0.0
Sweden	SE_01	7 043	38.0	6.9	44.9	38.0	17.1	55.1	100.0	0.8	64 908	79.5	8.0	87.5	5.7	6.9	12.5	100.0	0.2
United Kingdom[2]																			
Scotland	UK_06	6 156	20.6	6.1	26.7	46.9	26.4	73.3	100.0	0.0	46 755	69.1	12.5	81.7	4.4	14.0	18.3	100.0	0.0
Norway	NO_01	4 682	43.5	7.6	51.1	25.5	23.4	48.9	100.0	0.0	52 686	78.9	8.5	87.3	3.2	9.5	12.7	100.0	0.0

ABBREVIATIONS: Vag - spon (vaginal spontaneous); Vag - instr (vaginal instrumental); CS - no lab (caesarean section - no labour/elective); CS - lab (caesarean section - during labour/emergency). [1] Greece and Cyprus provided no data on mode of delivery. [2] Ireland, Italy, Luxembourg, Hungary, Austria, Poland, Portugal, Slovak Republic, England, Wales and Northern Ireland provided no data on mode of delivery by previous caesarean section. [3] For Germany "not stated" includes caesarean section other than "labour/no labour". [4] Data from the Netherlands is based on mothers who had parity > 0. [5] Czech Republic provided data on maternal level (number of women delivering live or still births) instead of child level (number of live and still births).

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C10_C: Mode of delivery by presentation of fetus

		Breech presentation									Vertex presentation								
		Number of births	Percentage of births by mode of delivery								Number of births	Percentage of births by mode of delivery							
Country/coverage	Source		Vag - spon	Vag - instr	Vag - total	CS - no lab	CS - lab	CS - total	All stated	Not stated		Vag - spon	Vag - instr	Vag - total	CS - no lab	CS - lab	CS - total	All stated	Not stated
Belgium																			
Flanders	BE_01	3 190	11.4	0.3	11.7	69.5	18.8	88.3	100.0	0.0	57 458	74.0	11.3	85.3	7.7	7.0	14.7	100.0	0.0
Brussels	BE_02	704	20.6	0.3	20.9	NA	NA	79.1	100.0	0.9	14 329	76.9	10.1	87.0	NA	NA	13.0	100.0	2.8
Czech Republic[3]	CZ_01	4 214	20.0	0.0	20.0	NA	NA	80.0	100.0	0.0	93 707	84.2	1.5	85.7	NA	NA	14.3	100.0	0.0
Denmark	DK_01	3 012	8.4	0.3	8.7	63.6	27.7	91.3	100.0	0.0	60 238	75.1	7.9	83.0	8.8	8.1	17.0	100.0	0.0
Germany	DE_01	36 227	8.4	0.0	8.4	70.5	21.1	91.6	100.0	3.5	560 593	72.9	5.5	78.5	10.9	10.6	21.5	100.0	1.6
Estonia	EE_01	418	17.2	0.0	17.2	43.8	39.0	82.8	100.0	0.0	13 449	80.9	4.0	84.9	5.4	9.7	15.1	100.0	0.0
Ireland[2]																			
Greece[1]																			
Spain[2]																			
France	FR_01	790	23.2	1.3	24.5	64.7	10.8	75.5	100.0	0.3	13 774	71.8	11.8	83.6	9.4	7.0	16.4	100.0	0.2
Italy	IT_04	953	39.1	6.0	45.1	15.6	39.4	54.9	100.0	0.3	512 675	63.6	1.7	65.3	22.4	12.3	34.7	100.0	0.4
Cyprus[1]																			
Latvia	LV_01	626	25.6	0.0	25.6	42.3	32.1	74.4	100.0	0.0	19 352	81.5	1.6	83.1	8.1	8.8	16.9	100.0	0.0
Lithuania	LT_01	222	65.3	0.0	65.3	NA	NA	34.7	100.0	0.0	29 411	81.7	1.0	82.8	NA	NA	17.2	100.0	0.1
Luxembourg	LU_01	251	4.8	0.0	4.8	NA	NA	95.2	100.0	0.8	5 153	73.9	4.8	78.7	NA	NA	21.3	100.0	0.7
Hungary[2]																			
Malta	MT_01	132	0.0	0.0	0.0	81.8	18.2	100.0	100.0	0.0	3 767	70.3	4.0	74.3	12.8	13.0	25.7	100.0	0.0
Netherlands	NL_02	10 184	25.4	2.1	27.5	52.8	19.7	72.5	100.0	0.1	167 821	77.4	11.3	88.7	4.1	7.2	11.3	100.0	0.1
Austria[2]																			
Poland[2]																			
Portugal[2]																			
Slovenia	SI_01	807	35.0	0.1	35.1	34.7	30.2	64.9	100.0	1.1	17 057	85.4	3.0	88.4	3.8	7.8	11.6	100.0	0.0
Slovak Republic[3]	SK_01	2 045	17.9	4.8	22.7	NA	NA	77.3	100.0	0.4	49 061	82.4	1.8	84.2	NA	NA	15.8	100.0	0.8
Finland	FI_01	2 292	21.0	0.5	21.6	52.1	26.4	78.4	100.0	0.0	55 467	78.6	6.8	85.4	5.9	8.7	14.6	100.0	0.0
Sweden	SE_01	3 983	10.7	0.4	11.0	59.7	29.3	89.0	100.0	0.1	91 901	80.1	8.3	88.4	5.6	6.0	11.6	100.0	0.2
United Kingdom[2]																			
Scotland	UK_06	2 084	0.1	0.0	0.1	56.8	43.1	99.9	100.0	0.0	49 426	66.7	12.3	79.0	7.2	13.9	21.0	100.0	0.0
Norway	NO_01	2 605	29.8	4.6	34.4	29.8	35.8	65.6	100.0	0.0	51 206	80.7	7.9	88.5	3.6	7.8	11.5	100.0	0.0

ABBREVIATIONS: Vag - spon (vaginal spontaneous); Vag - instr (vaginal instrumental); CS - no lab (caesarean section - no labour/elective); CS - lab (caesarean section - during labour/emergency). [1] Greece and Cyprus provided no data on mode of delivery. [2] Ireland, Spain, Hungary, Austria, Poland, Portugal, England, Wales and Northern Ireland provided no data on mode of delivery by presentation of fetus. [3] Czech Republic and Slovak Republic provided data on maternal level (number of women delivering live or still births) instead of child level (number of live and still births).

C10_D: Mode of delivery by plurality

		Singletons									Twins								
			Percentage by mode of delivery									Percentage by mode of delivery							
Country/coverage	Source	Number of births	Vag - spon	Vag - instr	Vag - total	CS - no lab	CS - lab	CS - total	All stated	Not stated	Number of births	Vag - spon	Vag - instr	Vag - total	CS - no lab	CS - lab	CS - total	All stated	Not stated
Belgium																			
Flanders	BE_01	58 997	71.4	10.8	82.2	10.5	7.3	17.8	100.0	0.0	1 886	40.7	6.3	47.0	33.1	19.9	53.0	100.0	0.0
Brussels	BE_02	15 738	74.3	9.8	84.0	NA	NA	16.0	100.0	4.5	523	42.0	6.4	48.4	NA	NA	51.6	100.0	4.0
Czech Republic[3]	CZ_01	94 288	83.2	1.6	84.7	7.1	8.2	15.3	100.0	0.0	1 791	30.5	1.1	31.7	42.2	26.2	68.3	100.0	0.0
Denmark	DK_01	62 292	72.9	7.6	80.5	10.8	8.8	19.5	100.0	0.0	1 439	35.2	7.0	42.2	36.8	21.1	57.8	100.0	0.0
Germany	DE_01	625 413	68.7	5.7	74.4	13.1	12.5	25.6	100.0	1.7	22 476	25.6	2.4	28.0	45.2	26.8	72.0	100.0	2.8
Estonia	EE_01	13 716	79.1	4.0	83.1	6.2	10.7	16.9	100.0	0.2	334	45.8	2.7	48.5	21.6	29.9	51.5	100.0	0.0
Ireland	IE_01	60 493	60.6	15.2	75.8	NA	NA	24.2	100.0	0.0	1 849	28.8	16.2	45.0	NA	NA	55.0	100.0	0.0
Greece[1]																			
Spain																			
Valencia	ES_03	33 144	63.7	13.5	77.2	NA	NA	22.8	100.0	0.0	622	19.9	7.9	27.8	NA	NA	72.2	100.0	0.0
France	FR_01	14 228	69.7	11.2	80.9	12.1	7.0	19.1	100.0	0.3	506	40.9	8.9	49.8	36.1	14.1	50.2	100.0	0.4
Italy	IT_04	528 160	61.6	1.7	63.3	24.1	12.6	36.7	100.0	0.4	13 110	17.3	0.6	17.9	58.4	23.6	82.1	100.0	1.1
Cyprus[1]																			
Latvia[3]	LV_01	20 022	79.3	1.5	80.8	9.4	9.8	19.2	100.0	0.0	232	41.4	0.4	41.8	24.1	34.1	58.2	100.0	0.0
Lithuania	LT_01	28 984	82.2	1.0	83.2	NA	NA	16.8	100.0	0.1	634	56.7	0.5	57.2	NA	NA	42.8	100.0	0.2
Luxembourg	LU_01	5 330	71.3	4.7	76.0	NA	NA	24.0	100.0	1.0	147	25.5	2.8	28.4	NA	NA	71.6	100.0	4.1
Hungary[2]																			
Malta	MT_01	3 782	69.7	3.9	73.6	13.9	12.6	26.4	100.0	0.0	100	12.0	2.0	14.0	60.0	26.0	86.0	100.0	0.0
Netherlands	NL_02	175 117	75.2	10.6	85.8	6.5	7.7	14.2	100.0	0.1	6 959	54.1	9.9	64.0	19.0	17.1	36.0	100.0	0.1
Austria	AT_02	76 754	72.9	5.4	78.3	NA	NA	21.7	100.0	0.0	2 400	19.3	2.0	21.2	NA	NA	78.8	100.0	0.0
Poland[2]																			
Portugal[2]																			
Slovenia	SI_01	17 315	83.8	2.9	86.7	4.9	8.4	13.3	100.0	0.0	622	55.2	1.9	57.1	16.8	26.1	42.9	100.0	0.3
Slovak Republic[3]	SK_01	51 334	79.5	1.9	81.4	NA	NA	18.6	100.0	0.8	629	28.1	4.8	32.9	NA	NA	67.1	100.0	1.0
Finland	FI_01	56 013	77.3	6.5	83.8	7.3	8.9	16.2	100.0	0.0	1 698	48.2	6.2	54.4	21.8	23.8	45.6	100.0	0.0
Sweden	SE_01	97 697	75.8	7.9	83.7	8.2	8.1	16.3	100.0	0.4	2 733	39.5	4.9	44.4	29.4	26.2	55.6	100.0	1.6
United Kingdom[2]																			
Wales	UK_10	28 891	66.2	9.7	75.9	10.0	14.1	24.1	100.0	0.8	726	26.6	8.0	34.6	30.5	34.9	65.4	100.0	0.6
Scotland	UK_06	51 480	64.5	11.8	76.3	8.8	14.9	23.7	100.0	0.0	1 431	26.6	10.6	37.2	28.2	34.6	62.8	100.0	0.3
Northern Ireland	UK_07	21 745	61.7	11.8	73.5	14.7	11.8	26.5	100.0	0.3	654	22.2	15.4	37.6	40.4	22.0	62.4	100.0	0.0
Norway	NO_01	55 178	77.0	8.4	85.4	4.7	9.9	14.6	100.0	0.0	2 093	49.7	9.1	58.8	13.6	27.6	41.2	100.0	0.0

ABBREVIATIONS: Vag - spon (vaginal spontaneous); Vag - instr (vaginal instrumental); CS - no lab (caesarean section - no labour/elective); CS - lab (caesarean section - during labour/emergency). [1] Greece and Cyprus provided no data on mode of delivery. [2] Hungary, Poland, Portugal and England provided no data on mode of delivery by plurality. [3] Czech Republic, Latvia and Slovak Republic provided data on maternal level (number of women delivering live or still births) instead of child level (number of live and still births).

EURO-PERISTAT indicators for the year 2004

R1: Selected congenital anomalies (fetal deaths and terminations of pregnancies ≥ 20 weeks of gestation and live births, numbers and rates per 10 000 total births)

Country/coverage	Source	Number of births	Number of cases				Rate per 10 000 total births			
			Anencephaly[A]	Spina Bifida[B]	Down's syndrome[C]	Cleft lip and/or cleft palate[D]	Anencephaly[A]	Spina Bifida[B]	Down's syndrome[C]	Cleft lip and/or cleft palate[D]
Belgium										
Flanders[2,3]	BE_01	60 921	3	23	32	72	0.5	3.8	5.3	11.8
Brussels[2,3]	BE_02	16 288	1	5	NA	12	0.6	3.1	NA	7.4
Czech Republic	CZ_01	97 929	15	33	115	173	1.5	3.4	11.7	17.7
Denmark[2,3]	DK_01	64 853	0	43	69	157	0.0	6.6	10.6	24.2
Germany[3]	DE_01	674 524	18	95	269	534	0.3	1.4	4.0	7.9
Estonia[2]	EE_04	14 055	0	1	4	NA	0.0	0.7	2.8	NA
Ireland[1]										
Greece[1]										
Spain[1]										
Valencia										
France[7]	FR_05	39 532	22	16	161	50	5.6	4.0	40.7	12.6
Italy[1]										
Cyprus[1]										
Latvia[3,4]	*LV_01*	*20 492*	*0*	*8*	*15*	*13*	*0.0*	*3.9*	*7.3*	*6.3*
Lithuania[3]	LT_01	29 633	4	19	39	36	1.3	6.4	13.2	12.1
Luxembourg[3,5]	*LU_01*	*5 483*	*0*	*0*	*2*	*7*	*0.0*	*0.0*	*3.6*	*12.8*
Hungary	HU_02	95 613	21	33	150	121	2.2	3.5	15.7	12.7
Malta[3,7,8]	*MT_03*	*3 902*	*1*	*2*	*4*	*6*	*2.6*	*5.1*	*10.3*	*15.4*
Netherlands[6]	NL_01	177 638	20	77	222	258	1.1	4.3	12.5	14.5
Austria[3]	AT_02	79 268	1	10	10	65	0.1	1.3	1.3	8.2
Poland[3]	PL_03	33 738	8	13	42	52	2.4	3.9	12.4	15.4
Portugal[1]										
Slovenia[3]	SI_01	17 946	0	7	16	33	0.0	3.9	8.9	18.4
Slovak Republic	SK_01	52 522	5	25	52	81	1.0	4.8	9.9	15.4
Finland[2]	FI_03	58 199	16	21	163	141	2.7	3.6	28.0	24.2
Sweden[7]	*SE_04*	*100 929*	*34*	*35*	*245*	*154*	*3.4*	*3.5*	*24.3*	*15.3*
United Kingdom[1]										
England and Wales[9]	UK_13/17	642 511	167	165	873	499	2.6	2.6	13.6	7.8
Scotland	UK_14/17	48 383	13	19	90	92	2.7	3.9	18.6	19.0
Norway	NO_01	57 616	29	32	123	114	5.0	5.6	21.3	19.8

NOTE: Children with multiple congenital anomalies can be counted several times. EUROCAT member registry; detail data available at http://www.eurocat.ulster.ac.uk/. [A]Anencephaly and similar malformations (ICD10: Q00); [B] Spina Bifida (ICD10: Q05); [C] Down Syndrome (ICD10: Q90); [D] Cleft lip and/or cleft palate (ICD10: Q35-37). [1] Ireland, Greece, Spain, Italy, Cyprus, Portugal and Northern Ireland provided no data on congenital anomalies. [2] Belgium, Denmark, Estonia and Finland provided data on congenital anomalies at or after 22 weeks of gestation instead of the asked 20 weeks of gestation. [3] Belgium, Denmark, Germany, Latvia, Lithuania, Luxembourg, Malta, Austria, Poland, and Slovenia have no data on congenital anomalies by induced abortions, all data is based on fetal deaths and live births. [4] Latvia provided total number of congenital anomalies and their data about congenital anomalies are about live birth cases (including before 20 weeks of gestation). [5] Luxembourg data on congenital anomalies are under registered; the database only includes the congenital anomalies diagnosed and obvious at clinical examination at or within 3-4 days after birth. [6] In the Netherlands induced abortions are not separately coded in the database, but are registered as fetal deaths. [7] For France, Malta and Sweden the number of births comes from another data source. [8] In Malta induced abortions are illegal; therefore there are no induced abortions. [9] In England and Wales, terminations on the grounds of fetal anomaly after 24 weeks of gestation should also be registered as stillbirths. There were only 124 such terminations in 2004, of which 11 were for Down's syndrome.

R1_A: Anencephaly[A] (number of cases and rates per 10 000 total births)

Country/coverage	Source	Number of births	Number of cases				Rate per 10 000 total births	
			Live births	Fetal deaths[B]	Termination of pregnancy	All	All cases	Live births cases
Belgium								
Flanders[2,3]	BE_01	60 921	2	1	NA	3	0.5	0.3
Brussels[2,3]	BE_02	16 288	0	1	NA	1	0.6	0.0
Czech Republic	CZ_01	97 929	3	0	12	15	1.5	0.3
Denmark[2,3]	DK_01	64 853	0	0	NA	0	0.0	0.0
Germany[3]	DE_01	674 524	13	5	NA	18	0.3	0.2
Estonia[2]	EE_04	14 055	0	0	0	0	0.0	0.0
Ireland[1]								
Greece[1]								
Spain[1]								
Valencia								
France	FR_05	39 532	0	0	22	22	5.6	0.0
Italy[1]								
Cyprus[1]								
Latvia[4]	*LV_01*	*20 492*	*0*	*NA*	*NA*	*0*	*0.0*	*0.0*
Lithuania[3]	LT_01	29 633	0	4	NA	4	1.3	0.0
Luxembourg[5]	LU_01	5 483	0	0	NA	0	0.0	0.0
Hungary	HU_02	95 613	2	0	19	21	2.2	0.2
Malta[7]	*MT_03*	*3 902*	*0*	*1*	*0*	*1*	*2.6*	*0.0*
Netherlands[6]	*NL_01*	177 638	*10*	*10*	NA	*20*	*1.1*	*0.6*
Austria[3]	AT_02	79 268	0	1	NA	1	0.1	0.0
Poland[3]	PL_03	33 738	7	1	NA	8	2.4	2.1
Portugal[1]								
Slovenia[3]	SI_01	17 946	0	0	NA	0	0.0	0.0
Slovak Republic	SK_01	52 522	0	0	5	5	1.0	0.0
Finland[2]	FI_03	58 199	1	0	15	16	2.7	0.2
Sweden[7]	*SE_04*	*100 929*	*2*	*0*	*32*	*34*	*3.4*	*0.2*
United Kingdom[1]								
England and Wales	UK_13/17	642 511	12	10	145	167	2.6	0.2
Scotland	UK_14/17	48 383	1	0	12	13	2.7	0.2
Norway	NO_01	57 616	3	4	22	*29*	*5.0*	*0.5*

[A]Anencephaly and similar malformations (ICD10: Q00). [B]Fetal deaths at or after 20 weeks of gestation. EUROCAT member registry; detail data available at http://www.eurocat.ulster.ac.uk/.
[1] Ireland, Greece, Spain, Italy, Cyprus, Portugal and Northern Ireland provided no data on congenital anomalies. [2] Belgium, Denmark, Estonia and Finland provided data on congenital anomalies at or after 22 weeks of gestation instead of the asked 20 weeks of gestation. [3] Belgium, Denmark, Germany, Latvia, Lithuania, Luxembourg, Malta, Austria, Poland, and Slovenia have no data on congenital anomalies by induced abortions, all data is based on fetal deaths and live births. [4] Latvia provided total number of congenital anomalies and their data about congenital anomalies are about live birth cases (including before 20 weeks of gestation). [5] Luxembourg data on congenital anomalies are under registered; the database only includes the congenital anomalies diagnosed and obvious at clinical examination at or within 3-4 days after birth. [6] In the Netherlands induced abortions are not separately coded in the database, but are registered as fetal deaths. [7] For France, Malta and Sweden the number of births comes from another data source. [8] In Malta induced abortions are illegal; therefore there are no induced abortions.

R1_B: Spina bifida[A] (number of cases and rates per 10 000 total births)

			Number of cases				Rate per 10 000 total births	
Country/coverage	Source	Number of births	Live births	Fetal deaths[B]	Termination of pregnancy	All	All cases	Live births cases
Belgium								
Flanders[2,3]	BE_01	60 921	17	6	NA	23	3.8	2.8
Brussels[2,3]	BE_02	16 288	4	1	NA	5	3.1	2.5
Czech Republic	CZ_01	97 929	10	2	21	33	3.4	1.0
Denmark[2,3]	DK_01	64 853	41	2	NA	43	6.6	6.3
Germany[3]	DE_01	674 524	78	17	NA	95	1.4	1.2
Estonia[2]	EE_04	14 055	0	1	0	1	0.7	0.0
Ireland[1]								
Greece[1]								
Spain[1]								
Valencia								
France	FR_05	39 532	6	0	10	16	4.0	1.5
Italy[1]								
Cyprus[1]								
Latvia[4]	*LV_01*	*20 492*	*8*	*NA*	*NA*	*8*	*3.9*	*3.9*
Lithuania[3]	LT_01	29 633	18	1	NA	19	6.4	6.1
Luxembourg[5]	*LU_01*	*5 483*	*0*	*0*	NA	*0*	*0.0*	*0.0*
Hungary	HU_02	95 613	14	1	18	33	3.5	1.5
Malta[7]	*MT_03*	*3 902*	*2*	*0*	*0*	*2*	*5.1*	*5.1*
Netherlands[6]	*NL_01*	177 638	*56*	*21*	NA	*77*	*4.3*	*3.2*
Austria[3]	AT_02	79 268	9	1	NA	10	1.3	1.1
Poland[3]	PL_03	33 738	11	2	NA	13	3.9	3.3
Portugal[1]								
Slovenia[3]	SI_01	17 946	7	0	NA	7	3.9	3.9
Slovak Republic	SK_01	52 522	23	0	2	25	4.8	4.4
Finland[2]	FI_03	58 199	12	1	8	21	3.6	2.1
Sweden[7]	*SE_04*	*100 929*	*16*	*0*	*19*	*35*	*3.5*	*1.6*
United Kingdom[1]								
England and Wales	UK_13/17	642 511	58	17	90	165	2.6	0.9
Scotland	UK_14/17	48 383	9	0	10	19	3.9	1.9
Norway	NO_01	57 616	22	1	9	*32*	*5.6*	*3.8*

[A] Spina Bifida (ICD10: Q05); can be associated with other malformations. [B]Fetal deaths at or after 20 weeks of gestation. EUROCAT member registry; detail data available at http://www.eurocat.ulster.ac.uk/. [1] Ireland, Greece, Spain, Italy, Cyprus, Portugal and Northern Ireland provided no data on congenital anomalies. [2] Belgium, Denmark, Estonia and Finland provided data on congenital anomalies at or after 22 weeks of gestation instead of the asked 20 weeks of gestation. [3] Belgium, Denmark, Germany, Latvia, Lithuania, Luxembourg, Malta, Austria, Poland, and Slovenia have no data on congenital anomalies by induced abortions, all data is based on fetal deaths and live births. [4] Latvia provided total number of congenital anomalies and their data about congenital anomalies are about live birth cases (including before 20 weeks of gestation). [5] Luxembourg data on congenital anomalies are under registered; the database only includes the congenital anomalies diagnosed and obvious at clinical examination at or within 3-4 days after birth. [6] In the Netherlands induced abortions are not separately coded in the database, but are registered as fetal deaths. [7] For France, Malta and Sweden the number of births comes from another data source. [8] In Malta induced abortions are illegal; therefore there are no induced abortions.

R1_C: Down's syndrome[A] (number of cases and rates per 10 000 total births)

Country/coverage	Source	Number of births	Number of cases: Live births	Number of cases: Fetal deaths[B]	Number of cases: Termination of pregnancy	Number of cases: All	Rate per 10 000 total births: All cases	Rate per 10 000 total births: Live births cases
Belgium								
Flanders[2,3]	BE_01	60 921	30	2	NA	32	5.3	4.9
Brussels[2,3]	BE_02	16 288						
Czech Republic	CZ_01	97 929	52	1	62	115	11.7	5.3
Denmark[2,3]	DK_01	64 853	67	2	NA	69	10.6	10.3
Germany[3]	DE_01	674 524	250	19	NA	269	4.0	3.7
Estonia[2]	EE_04	14 055	2	0	2	4	2.8	1.4
Ireland[1]								
Greece[1]								
Spain[1]								
Valencia								
France	FR_05	39 532	20	1	140	161	40.7	5.1
Italy[1]								
Cyprus[1]								
Latvia[4]	*LV_01*	*20 492*	*15*	*NA*	*NA*	*15*	*7.3*	*7.3*
Lithuania[3]	LT_01	29 633	39	0	NA	39	13.2	13.2
Luxembourg[5]	*LU_01*	*5 483*				*2*	*3.6*	*NA*
Hungary	HU_02	95 613	74	2	74	150	15.7	7.7
Malta[7]	*MT_03*	*3 902*	*4*	*0*	*0*	*4*	*10.3*	*10.3*
Netherlands[6]	*NL_01*	177 638	*207*	*15*	NA	*222*	*12.5*	*11.7*
Austria[3]	AT_02	79 268	10	0	NA	10	1.3	1.3
Poland[3]	PL_03	33 738	42	0	NA	42	12.4	12.4
Portugal[1]								
Slovenia[3]	SI_01	17 946	15	1		16	8.9	8.4
Slovak Republic	SK_01	52 522	47	0	5	52	9.9	8.9
Finland[2]	FI_03	58 199	67	4	92	163	28.0	11.5
Sweden[7]	*SE_04*	*100 929*	*106*	*1*	*138*	*245*	*24.3*	*10.5*
United Kingdom[1]								
England and Wales[9]	UK_13/17	642 511	420	34	419	873	13.6	6.5
Scotland	UK_14/17	48 383	50	5	35	90	18.6	10.3
Norway	NO_01	57 616	90	4	29	*123*	*21.3*	*15.6*

A Down Syndrome (ICD10: Q90); can be associated with other malformations. [B]Fetal deaths at or after 20 weeks of gestation. EUROCAT member registry; detail data available at http://www.eurocat.ulster.ac.uk/. [1] Ireland, Greece, Spain, Italy, Cyprus, Portugal and Northern Ireland provided no data on congenital anomalies. [2] Belgium, Denmark, Estonia and Finland provided data on congenital anomalies at or after 22 weeks of gestation instead of the asked 20 weeks of gestation. [3] Belgium, Denmark, Germany, Latvia, Lithuania, Luxembourg, Malta, Austria, Poland, and Slovenia have no data on congenital anomalies by induced abortions, all data is based on fetal deaths and live births. [4] Latvia provided total number of congenital anomalies and their data about congenital anomalies are about live birth cases (including before 20 weeks of gestation). [5] Luxembourg data on congenital anomalies are under registered; the database only includes the congenital anomalies diagnosed and obvious at clinical examination at or within 3-4 days after birth. [6] In the Netherlands induced abortions are not separately coded in the database, but are registered as fetal deaths. [7] For France, Malta and Sweden the number of births comes from another data source. [8] In Malta induced abortions are illegal; therefore there are no induced abortions. [9] In England and Wales, terminations on the grounds of fetal anomaly after 24 weeks of gestation should also be registered as stillbirths. There were only 124 such terminations in 2004, of which 11 were for Down's syndrome.

EURO-PERISTAT indicators for the year 2004

R1_D: Cleft lip and/or cleft palate[A] (number of cases and rates per 10 000 total births)

Country/coverage	Source	Number of births	Number of cases: Live births	Fetal deaths[B]	Termination of pregnancy	All	Rate per 10 000 total births: All cases	Live births cases
Belgium								
Flanders[2,3]	BE_01	60 921	71	1	NA	72	11.8	11.7
Brussels[2,3]	BE_02	16 288				12	7.4	NA
Czech Republic	CZ_01	97 929	153	0	20	173	17.7	15.6
Denmark[2,3]	DK_01	64 853	154	3	NA	157	24.2	23.7
Germany[3]	DE_01	674 524	523	11	NA	534	7.9	7.8
Estonia[2]	EE_04	14 055	NA	NA	NA	NA	NA	NA
Ireland[1]								
Greece[1]								
Spain[1]								
Valencia								
France	FR_05	39 532	32	1	17	50	12.6	8.1
Italy[1]								
Cyprus[1]								
Latvia[4]	*LV_01*	*20 492*	*13*	*NA*	*NA*	*13*	*6.3*	*6.3*
Lithuania[3]	LT_01	29 633	36	0	NA	36	12.1	12.1
Luxembourg[5]	*LU_01*	*5 483*				*7*	*12.8*	*NA*
Hungary	HU_02	95 613	118	1	2	121	12.7	12.3
Malta[7]	*MT_03*	*3 902*	*6*	*0*	*0*	*6*	*15.4*	*15.4*
Netherlands[6]	*NL_01*	177 638	*243*	*15*	NA	*258*	*14.5*	*13.7*
Austria[3]	AT_02	79 268	64	1	NA	65	8.2	8.1
Poland[3]	PL_03	33 738	51	1	NA	52	15.4	15.1
Portugal[1]								
Slovenia[3]	SI_01	17 946	32	1	NA	33	18.4	17.8
Slovak Republic	SK_01	52 522	76	3	2	81	15.4	14.5
Finland[2]	FI_03	58 199	125	2	14	141	24.2	21.5
Sweden[7]	*SE_04*	*100 929*	*144*	*1*	*9*	*154*	*15.3*	*14.3*
United Kingdom[1]								
England and Wales[9]	UK_13/17	642 511	483	16	0	499	7.8	7.5
Scotland	UK_14/17	48 383	91	1	0	92	19.0	18.8
Norway	NO_01	57 616	109	1	4	114	19.8	18.9

[A] Cleft lip and/or cleft palate (ICD10: Q35-37); can be associated with other malformations. [B]Fetal deaths at or after 20 weeks of gestation. EUROCAT member registry; detail data available at http://www.eurocat.ulster.ac.uk/. [1] Ireland, Greece, Spain, Italy, Cyprus, Portugal and Northern Ireland provided no data on congenital anomalies. [2] Belgium, Denmark, Estonia and Finland provided data on congenital anomalies at or after 22 weeks of gestation instead of the asked 20 weeks of gestation. [3] Belgium, Denmark, Germany, Latvia, Lithuania, Luxembourg, Malta, Austria, Poland, and Slovenia have no data on congenital anomalies by induced abortions, all data is based on fetal deaths and live births. [4] Latvia provided total number of congenital anomalies and their data about congenital anomalies are about live birth cases (including before 20 weeks of gestation). [5] Luxembourg data on congenital anomalies are under registered; the database only includes the congenital anomalies diagnosed and obvious at clinical examination at or within 3-4 days after birth. [6] In the Netherlands induced abortions are not separately coded in the database, but are registered as fetal deaths. [7] For France, Malta and Sweden the number of births comes from another data source. [8] In Malta induced abortions are illegal; therefore there are no induced abortions. [9] In England and Wales, the numbers of terminations were not published as there were fewer than 10, because of disclosure control procedures. The number has therefore been set to zero.

R2: Apgar score at five minutes (numbers and percentages of live births)

Country/coverage	Source	Number of live births Apgar score						Percentage of live births Apgar score	
		All	< 4	4-6	≥ 7	All stated	Not stated	< 4	< 7
Belgium									
Flanders	BE_01	60 672	139	916	59 560	60 615	57	0.2	1.7
Brussels	BE_02	16 200	39	172	15 504	15 715	485	0.2	1.3
Czech Republic	CZ_01	97 671	332	772	96 567	97 671	0	0.3	1.1
Denmark	DK_01	64 901	146	326	63 766	64 238	663	0.2	0.7
Germany	DE_01	646 626	1 848	4 627	625 552	632 027	14 599	0.3	1.0
Estonia	EE_01	13 990	28	163	13 743	13 934	56	0.2	1.4
Ireland[1]									
Greece[1]									
Spain[1]									
France	FR_01	14 572	27	76	14 368	14 471	101	0.2	0.7
Italy[1]									
Cyprus[1]									
Latvia	LV_01	20 355	46	294	19 896	20 236	119	0.2	1.7
Lithuania	LT_01	29 480	43	133	29 183	29 359	121	0.1	0.6
Luxembourg	LU_01	5 469	4	37	5 333	5 374	95	0.1	0.8
Hungary[1]									
Malta	MT_01	3 887	6	17	3 860	3 883	4	0.2	0.6
Netherlands	NL_02	181 006	550	1 781	178 542	180 873	133	0.3	1.3
Austria	AT_02	78 934	137	532	78 203	78 872	62	0.2	0.8
Poland[1]									
Portugal[1]									
Slovenia	SI_01	17 846	29	130	17 685	17 844	2	0.2	0.9
Slovak Republic	SK_01	52 388	156	399	51 673	52 228	160	0.3	1.1
Finland	FI_01	57 759	338	579	46 116	47 033	10 726	0.7	1.9
Sweden	SE_01	100 158	216	917	98 388	99 521	637	0.2	1.1
United Kingdom[1]									
Wales	UK_05	32 351	75	209	25 032	25 316	7 035	0.3	1.1
Scotland	UK_06	52 817	362	563	49 210	50 135	2 682	0.7	1.8
Norway	NO_01	57 111	138	558	56 333	57 029	82	0.2	1.2

[1] Ireland, Greece, Spain, Italy, Cyprus, Hungary, Poland, Portugal, England and Northern Ireland provided no data on Apgar score.

R3: Maternal death by cause of death (numbers)

		Numbers in 2003 and 2004		Number of maternal deaths by cause of death										
Country/region	Source	Live births	Maternal deaths	I	II	III	IV	V	VI	VII	VIII	IX	X	XI
Belgium														
Flanders	BE_01	119 167	5	0	0	1	0	1	0	0	0	0	1	2
Brussels	BE_02	32 400	2	1	0	0	1	0	0	0	0	0	0	0
Czech Republic	CZ_01	191 349	19	3	4	0	2	1	0	0	1	3	4	1
Denmark[1]														
Germany[2]	DE_01	646 626	43	2	3	1	3	0	0	0	0	7	7	20
Estonia	EE_01	27 028	8	1	1	0	2	1	0	0	0	3	0	0
Ireland[1]														
Greece[1]														
Spain														
Valencia	ES_02	95 847	4	0	0	1	0	2	0	0	0	1	0	0
France	FR_02	1 529 280	107	15	15	15	19	3	9	1	1	16	9	4
Italy[2,4]	IT_01	539 066	17	1	1	1	3	2	1	1	4	1	1	1
Cyprus[1]														
Latvia	LV_02	41 340	5	1	1	0	0	0	0	0	0	0	3	0
Lithuania	LT_02	61 017	6	0	1	1	0	0	0	0	1	3	0	0
Luxembourg[6,7]	LU_02	10 793	1	0	0	0	0	0	0	0	0	1	0	0
Hungary	HU_03	95 137	14	0	2	0	2	5	0	0	0	0	4	1
Malta	MT_02	7 923	0	0	0	0	0	0	0	0	0	0	0	0
Netherlands	NL_06	362 012	32	0	4	4	3	3	0	0	0	1	11	6
Austria[5]	AT_01	155 912	10	1	1	2	0	0	0	0	0	1	5	0
Poland	PL_01	707 203	31	4	1	2	12	3	4	0	0	5	NA	0
Portugal[1]														
Slovenia[3]	SI_02	34 907	4	0	1	0	2	0	0	0	0	1	0	0
Slovak Republic[1]														
Finland	FI_02	114 018	9	1	0	1	1	0	0	1	1	2	2	0
Sweden[1]														
United Kingdom	UK_01/02/03	1 411 591	108	15	9	10	6	6	10	1	0	27	24	0
England and Wales	UK_01	1 261 190	91	15	6	9	6	6	8	1	0	24	16	0
Scotland	UK_02	106 389	13	0	2	1	0	0	2	0	0	1	7	0
Northern Ireland	UK_03	43 967	4	0	1	0	0	0	0	0	0	2	1	0
Norway[1]														

NOTE: I Amniotic fluid embolism; II Other thromboembolic causes; III Hypertension; IV Hemorrhage; V Chorioamnionitis/Sepsis; VI Abortion/ectopic; VII Anaesthetic; VIII Uterine rupture; IX Other direct causes; X Indirect causes; XI Cause of death unknown. [1] Denmark, Ireland, Greece, Cyprus, Portugal, Slovak Republic, Sweden and Norway provided no data on maternal mortality by cause of death. [2] Germany and Italy provided data on maternal mortality by cause of death for one year only, 2004 and 2002 respectively. [3] Slovenia provided data for the years 2001 and 2002. [4] Italy provided data on maternal mortality by cause of death based on ICD-9 codes. [5] In Austria indirect causes of maternal death are only registered since 2004. [6] In Luxembourg there were no cases of maternal death notificated in 2001 (5 503 live births), 2002 (5 401 live births), and 2003 (5 324 live births). [7] In Luxembourg the notification is probably under registered due to the fact that the link to the birth of a child might not be registered if the death occurred some time after the birth.

R4: Smoking at the beginning and/or during pregnancy

Country/coverage	Source	Definition of period: Period 1	Definition of period: Period 2	Number of women	Period 1: Yes	Period 1: No	Period 1: All stated	Period 1: Not stated	Period 2: Yes	Period 2: No	Period 2: All stated	Period 2: Not stated
Belgium[1]												
Czech Republic	CZ_01		During (entire) pregnancy	96 459					6.1	93.9	100.0	0.0
Denmark	DK_01		During (entire) pregnancy	63 781					16.0	84.0	100.0	2.6
Germany	DE_01		During (entire) pregnancy	636 844					10.9	89.1	100.0	0.0
Estonia	EE_01	First trimester	After first trimester	13 879	11.9	88.1	100.0	6.8	9.9	90.1	100.0	6.8
Ireland[1]												
Greece[1]												
Spain												
Valencia	ES_04	First trimester		8 650	19.6	80.4	100.0	0.0				
France	FR_01	Before pregnancy	Third trimester	14 482	35.9	64.1	100.0	9.0	21.8	78.2	100.0	13.5
Italy[1]												
Cyprus[1]												
Latvia	LV_01		During (entire) pregnancy	20 256					11.3	88.7	100.0	0.0
Lithuania	LT_01	Before pregnancy	During (entire) pregnancy	29 306	7.9	92.1	100.0	0.0	4.8	95.2	100.0	0.0
Luxembourg[1]												
Hungary[1]												
Malta	MT_01		During (entire) pregnancy	3 838					7.2	92.8	100.0	0.3
Netherlands	NL_04		During (entire) pregnancy	2 913					13.4	86.6	100.0	0.9
Austria[1]												
Poland[1]												
Portugal[1]												
Slovenia	SI_01	First trimester		17 629	10.9	89.1	100.0	0.0				
Slovak Republic[1]												
Finland	FI_01	First trimester	After first trimester	56 878	15.4	84.6	100.0	2.4	12.4	87.6	100.0	2.4
Sweden	SE_01	First trimester	Third trimester	99 073	8.9	91.1	100.0	9.0	6.3	93.7	100.0	9.9
United Kingdom	UK_15	Before or during pregnancy	During (entire) pregnancy	11 933	33.0	67.0	100.0	NA	17.0	83.0	100.0	NA
England	UK_15	Before or during pregnancy	During (entire) pregnancy	5 896	32.0	68.0	100.0	NA	17.0	83.0	100.0	NA
Wales	UK_15	Before or during pregnancy	During (entire) pregnancy	2 076	37.0	63.0	100.0	NA	22.0	88.0	100.0	NA
Scotland	UK_06	First trimester		52 342	24.9	75.1	100.0	6.9				
Northern Ireland	UK_15	Before or during pregnancy	During (entire) pregnancy	1 830	32.0	68.0	100.0	NA	18.0	82	100.0	NA
Norway	NO_01	At the start of pregnancy	At time of delivery	56 288	17.7	82.3	100.0	17.7	10.7	89.3	100.0	20.4

[1] Belgium, Ireland, Greece, Italy, Cyprus, Luxembourg, Hungary, Austria, Poland, Portugal and Slovak Republic provided no data on maternal smoking.

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R5: Maternal education by total births

Country/coverage	Source	Number of total births	Percentage distribution of maternal education for total births: Primary not complete or none	Primary complete	Primary or none	Secondary inferior	Secondary (3-6 years)	Secondary (any)	Post-secondary non tertiary	Tertiary education (Bachelor or higher)	Post-secondary (any)	All stated	Not stated
Belgium													
Flanders	BE_01	60 921	1.7	2.5	4.1	9.1	41.5	50.6	NA	45.2	45.2	100.0	5.8
Brussels[2]	BE_02	16 288	1.8	4.7	6.5	14.7	47.6	62.3	NA	NA	31.2	100.0	10.7
Czech Republic[2]	CZ_01	97 921	NA	NA	12.9	31.8	42.2	74.1	NA	13.0	13.0	100.0	4.0
Denmark[1]													
Germany[2,4]													
Estonia[2]	EE_01	14 053	1.4	17.1	18.4	39.2	18.1	57.3	NA	24.2	24.2	100.0	0.0
Ireland[1]													
Greece[1]													
Spain													
Valencia	ES_04	8 650	3.3	25.3	28.6	28.6	24.8	53.4	9.8	8.2	18.0	100.0	3.1
France[2]	FR_01	14 737	NA	NA	3.7	32.2	21.5	53.7	NA	NA	42.6	100.0	5.1
Italy[2]	IT_02/04	542 003	NA	NA	5.3	36.2	43.9	80.1	NA	14.7	14.7	100.0	4.7
Cyprus[2,3]													
Latvia[2]	LV_01	20 492	1.4	20.3	21.7	NA	NA	33.2	21.6	23.5	45.1	100.0	0.2
Lithuania[2]	LT_01	29 633	NA	NA	3.1	17.4	38.7	56.1	19.9	20.9	40.7	100.0	0.1
Luxembourg[1]													
Hungary[2]	HU_01	95 613	3.6	20.8	24.3	20.9	33.1	54.0	NA	NA	21.7	100.0	0.3
Malta[1]													
Netherlands[1]													
Austria[2,5]	AT_02	79 229	NA	NA	NA	20.2	66.4	86.7	NA	NA	13.3	100.0	4.6
Poland[2]	PL_01	358 388	0.2	11.3	11.5	26.0	37.1	63.1	1.8	23.7	25.5	100.0	0.4
Portugal[2]	PT_02	109 779	10.7	21.3	32.0	20.3	24.4	44.7	NA	NA	23.3	100.0	0.0
Slovenia	SI_01	17 946	3.9	6.1	10.1	15.5	42.0	57.5	8.4	24.1	32.5	100.0	17.3
Slovak Republic[2]	SK_01	51 968	NA	NA	21.3	23.7	41.7	65.4	NA	13.3	13.3	100.0	0.0
Finland[2]	FI_05	57 945	NA	NA	15.0	NA	NA	40.1	16.8	28.1	44.9	100.0	0.0
Sweden[1]													
United Kingdom[1]													
Norway[1]													

[1] Denmark, Ireland, Greece, Luxembourg, Malta, the Netherlands, Sweden, United Kingdom and Norway provided no data on maternal education. [2] Brussels, Czech Republic, Germany, Estonia, France, Italy, Cyprus, Latvia, Lithuania, Hungary, Malta, Austria, Poland, Portugal, Slovak Republic and Finland provided data on maternal education by their own subgroup division. [3] Cyprus provided data for maternal education by live births only. [4] Germany provided data on maternal education using the following categories: housewife (231 405), in professional training or in tertiary training (21 449), unskilled labour (23 067), skilled labour (203 436), white collar worker/self employed (69 954), unknown (99 549). [5] Austria provided data on maternal education using the ISCED classification: ISCED 2 (15293), ISCED 3+4 (50210), ISCED 5+6 (10087), unknown (3639).

R5_A: Fetal Mortality Rate by maternal education

Country/coverage	Source	Number of total births	Fetal mortality rate per 1000 total births — Maternal education: Primary not complete or none	Primary complete	Primary complete or not	Secondary inferior	Secondary (3 6 years)	Secondary any	Post-secondary non tertiary	Tertiary education (Bachelor or higher)	Post-secondary (any)	All stated	Not stated
Belgium													
Flanders	BE_01	60 921	5.3	8.5	7.2	3.8	2.8	3.0	NA	2.0	2.0	2.7	2.7
Brussels[2]	BE_02	16 288	0.0	2.9	2.1	1.4	0.7	0.9	NA	NA	0.4	0.8	4.4
Czech Republic[2]	CZ_01	97 921	NA	NA	4.4	2.8	1.9	2.3	NA	1.8	1.8	2.5	0.5
Denmark[1]													
Germany[3]													
Estonia[2]	EE_01	14 053	0.0	5.8	5.4	4.2	4.7	4.3	NA	4.1	4.1	4.5	0.0
Ireland[1]													
Greece[1]													
Spain[3]													
France[2]	FR_01	14 737	NA	NA	13.7	4.7	2.3	3.7	NA	NA	3.2	3.9	13.6
Italy[2]	IT_02/04	542 003	NA	NA	7.8	5.4	4.7	5.0	NA	3.7	3.7	5.0	1.5
Cyprus[3]													
Latvia[2]	LV_01	20 492	20.9	8.9	9.7	NA	NA	6.9	6.8	3.1	4.9	6.6	3.9
Lithuania[2]	LT_01	29 633	NA	NA	11.9	4.3	6.1	5.5	4.3	4.0	4.1	5.2	0.0
Luxembourg[1]													
Hungary[3]	HU_01	95 613	8.2	9.7	9.4	4.0	4.2	4.1	NA	NA	2.2	5.0	0.4
Malta[1]													
Netherlands[1]													
Austria[2]	AT_02	79 229	NA	NA	NA	5.1	2.6	3.2	NA	NA	2.7	3.1	1.6
Poland[2]	PL_01	358 388	8.2	7.4	7.4	6.3	4.1	5.0	3.8	3.1	3.1	4.8	2.5
Portugal[2]	PT_02	109 779	5.9	4.7	5.1	4.9	3.0	3.9	NA	NA	1.7	3.8	78.6
Slovenia	SI_01	17 946	10.3	5.5	7.4	7.4	5.0	5.6	7.3	4.2	5.0	5.6	0.5
Slovak Republic[2]	SK_01	51 968	NA	NA	9.4	2.9	2.9	2.9	NA	1.3	1.3	4.1	0.0
Finland[2]	FI_05	57 945	NA	NA	3.7	NA	NA	3.3	3.2	3.0	3.0	3.2	NA
Sweden[1]													
United Kingdom[1]													
Norway[1]													

[1] Denmark, Ireland, Greece, Luxembourg, Malta, the Netherlands, Sweden, United Kingdom and Norway provided no data on maternal education. [2] Brussels, Czech Republic, Estonia, France, Italy, Latvia, Lithuania, Austria, Poland, Portugal, Slovak Republic and Finland provided data on maternal education by their own subgroup division. [3] Germany, Spain, Cyprus and Hungary provided no data on fetal mortality by maternal education.

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R5_B: Neonatal Mortality Rate by maternal education

Country/coverage	Source	Number of live births	Neonatal mortality rate per 1000 live births — Maternal education: Primary not complete or none	Primary complete	Primary complete or not	Secondary inferior	Secondary (3 6 years)	Secondary any	Post-secondary non tertiary	Tertiary education (Bachelor or higher)	Post-secondary (any)	All stated	Not stated
Belgium													
Flanders	BE_01	60 672	1.1	2.8	2.1	1.7	1.9	1.9	NA	1.6	1.6	1.7	0.6
Brussels[2]	BE_02	16 200	0.0	2.9	2.1	1.9	2.6	2.4	NA	NA	0.9	1.9	0.5
Czech Republic[2]	CZ_01	97 671	NA	NA	2.9	1.2	0.9	1.0	NA	0.7	0.7	1.2	0.1
Denmark[1]													
Germany[3]													
Estonia[2]	EE_01	13 990	5.3	4.2	4.3	4.6	3.2	4.1	NA	0.9	0.9	3.4	0.0
Ireland[1]													
Greece[1]													
Spain[3]													
France[3]													
Italy[2,4]	IT_01/04	539 066	NA	NA	1.8	1.3	0.7	1.0	NA	0.7	0.7	1.0	2.3
Cyprus[3]													
Latvia[3]													
Lithuania[2]	LT_01	29 480	NA	NA	6.6	3.7	3.6	3.6	2.6	2.4	2.5	3.3	0.0
Luxembourg[1]													
Hungary[3]													
Malta[1]													
Netherlands[1]													
Austria[2]	AT_02	78 934	NA	NA	NA	1.8	1.6	1.6	NA	NA	1.4	1.6	0.4
Poland[2]	PL_01	356 651	5.5	5.4	5.4	3.9	3.4	3.6	3.6	2.6	2.7	3.6	0.7
Portugal[2]	PT_02	109 356	2.2	2.3	2.3	2.0	1.3	1.6	NA	NA	1.0	1.7	33.3
Slovenia	SI_01	17 846	10.4	5.5	7.4	7.5	5.0	5.7	7.3	4.2	5.0	5.6	0.5
Slovak Republic[2]	SK_01	51 757	NA	NA	3.5	2.3	1.8	2.0	NA	0.7	0.7	2.1	0.0
Finland[3]													
Sweden[1]													
United Kingdom[1]													
Norway[1]													

[1] Denmark, Ireland, Greece, Luxembourg, Malta, the Netherlands, Sweden, United Kingdom and Norway provided no data on maternal education. [2] Brussels, Czech Republic, Estonia, Italy, Lithuania, Austria, Poland, Portugal and Slovak Republic provided data on maternal education by their own subgroup division. [3] Germany, Spain, France, Cyprus, Latvia, Hungary and Finland provided no data on neonatal mortality by maternal education. [4] Data from Italy is based on early neonatal deaths.

R6: Women delivering live and stillbirths after subfertility management

Country/coverage	Source	Number of women	Number of women delivering live and stillbirths — Type of fertility treatment					Percentage of women delivering live and stillbirths — Type of fertility treatment				
			OI	IUI +/- OI	IVF, ICSI, IVM, FET	All treatments	Not stated	OI	IUI +/- OI	IVF, ICSI, IVM, FET	All treatments	Not stated
Belgium												
Flanders	BE_01	59 956	877	361	1 305	2 543	2 823	1.5	0.6	2.3	4.5	4.7
Czech Republic[2]	CZ_01	96 098	NA	NA	707	NA	NA	NA	NA	0.7	NA	NA
Denmark[2,3]	DK_02	63 383	NA	NA	1 001	NA	NA	NA	NA	1.6	NA	NA
Germany[4]	DE_01	636 844	NA	NA	NA	17 420	0	NA	NA	NA	2.7	0.0
Estonia[2]	EE_01	13 879	NA	NA	75	NA	NA	NA	NA	0.5	NA	NA
Ireland[1]												
Greece[1]												
Spain[1]												
France	FR_01	14 482	330	104	235	669	952	2.4	0.8	1.7	4.9	6.6
Italy	IT_04	534 568	2 990	2 629	2 983	8 602	1 096	0.6	0.5	0.6	1.6	0.2
Cyprus[1]												
Latvia[1]												
Lithuania[1]												
Luxembourg[1]												
Hungary[1]												
Malta[4]	MT_01	3 838	NA	NA	NA	44	1	NA	NA	NA	1.1	0.0
Netherlands	NL_01	179 457	1 307	1 211	2 163	4 681	713	0.7	0.7	1.2	2.6	0.4
Austria[1]												
Poland[1]												
Portugal[1]												
Slovenia	SI_01	17 629	86	14	339	439	0	0.5	0.1	1.9	2.5	0.0
Slovak Republic[1]												
Finland	FI_01	56 878	186	250	769	1 205	0	0.3	0.4	1.4	2.1	0.0
Sweden[1]												
United Kingdom[5]	UK_16	709 317	NA	NA	8 280	NA	NA	NA	NA	1.2	NA	NA
Norway	NO_01	56 288	NA	NA	1 072	NA	NA	NA	NA	1.9	NA	NA

Abbreviations: OI (Ovulation Induction); IUI (Intrauterine Insemination); IVF (InVitro Fertilisation); ICSI (IntraCytoplasmatic Sperm Injection); IVM (InVitro Maturation); FET (Frozen Embryo Transfer). [1] Ireland, Greece, Spain, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Austria, Poland, Portugal, Slovak Republic and Sweden provided no data on births after fertility procedures. [2] Czech Republic, Denmark and Estonia provided data on IVF or ICSI. [3] For Denmark the number of women delivering live and stillbirths comes from another data source. [4] Germany and Malta provided the number of all fertility treatments, not by type of treatment. [5] For United Kingdom the number of women was calculated from data sources UK_01/02/03.

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R7: Timing of first antenatal visit

Country/coverage	Source	Number of women	Percentage of pregnant women by timing of first antenatal visit: 1st trimester	2nd trimester	3rd trimester	No care recorded	All stated	Not stated
Belgium[1]								
Czech Republic	CZ_01	96 098	92.5	6.7	0.8	0.0	100.0	1.4
Denmark[1]								
Germany	DE_01	636 844	93.9	5.0	1.1	0.0	100.0	5.0
Estonia[2]	EE_01	13 879	86.0	11.4	1.6	1.0	100.0	0.4
Ireland	IE_01	61 437	71.3	23.2	5.0	0.5	100.0	4.2
Greece[1]								
Spain								
Valencia	ES_04	8 650	91.7	6.1	2.2	0.0	100.0	1.8
France[3]	FR_01	14 482	95.0	4.3	0.5	0.1	100.0	6.9
Italy	IT_04	534 568	94.5	3.6	0.9	1.0	100.0	8.1
Cyprus[1]								
Latvia[2,4]	*LV_01*	*20 261*	*91.8*	*5.1*		*3.1*	*100.0*	*0.0*
Lithuania	LT_01	29 306	74.5	21.2	4.3	0.0	100.0	9.9
Luxembourg[1]								
Hungary[1]								
Malta[5]	MT_01	3 838	66.3	30.5	3.2	0.0	100.0	2.7
Netherlands[1]								
Austria[1]								
Poland[1]								
Portugal	PT_03	5 274	91.2	7.7	1.1	0.0	100.0	10.3
Slovenia	SI_01	17 628	91.1	7.5	0.9	0.5	100.0	0.1
Slovak Republic	SK_01	51 968	79.5	14.9	2.5	3.1	100.0	0.0
Finland	FI_01	56 878	95.9	3.2	0.7	0.2	100.0	1.1
Sweden	SE_01	99 073	91.5	6.5	2.0	0.0	100.0	9.7
United Kingdom[1]								
England	UK_04	584 000	65.4	24.8	9.8	0.0	100.0	58.6
Scotland	UK_06	50 796	78.3	17.3	4.4	0.0	100.0	6.8
Norway[1]								

NOTE: First trimester: Less than 15 completed weeks of gestation; Second trimester: 15-27 completed weeks of gestation; Third trimester: 28 completed weeks of gestation or more.
[1] Belgium, Denmark, Greece, Cyprus, Luxembourg, Hungary, the Netherlands, Austria, Wales, Northern Ireland and Norway provided no data on timing of first antenatal visit. [2] In Estonia and Latvia first antenatal visit is within 12 weeks of gestation. [3] In France, timing of the registration visit corresponds to the first or second visit. [4] Latvia provided data on timing of first antenatal visit as follows: 18606 women with sufficient antenatal care (within 12 weeks of gestation), 1036 with insufficient antenatal care and 619 women without antenatal care. [5] Data from Malta is based on first antenatal visit to hospital. Pregnant women often start antenatal care in the private sector and come for antenatal visit in the hospital later on.

R8: Mode of onset of labour (numbers and percentages of total births).

		Numbers						Percentage of total births				
			Mode of onset of labour					Mode of onset of labour				
Country/coverage	Source	Total births	Spontaneous	Caesarean	Induced	All stated	Not stated	Spontaneous	Caesarean	Induced	All stated	Not stated
Belgium												
Flanders	BE_01	59 956	36 868	6 521	16 567	59 956	0	61.5	10.9	27.6	100.0	0.0
Brussels[3]	*BE_02*	*16 288*			*4 125*					*25.3*		
Czech Republic	CZ_01	87 902	75 311	7 438	5 153	87 902	0	85.7	8.5	5.9	100.0	0.0
Denmark	DK_01	63 781	48 646	7 280	7 855	63 781	0	76.3	11.4	12.3	100.0	0.0
Germany	DE_01	648 860	449 417	87 201	112 242	648 860	0	69.3	13.4	17.3	100.0	0.0
Estonia[4]	EE_01	13 879	11 735	890	1 221	13 846	33	84.8	6.4	8.8	100.0	0.0
Ireland[1]												
Greece[1]												
Spain[2]												
Valencia	*ES_04*	*8 650*	*5 821*		*2 140*	*7 961*	*689*	*73.1*	*NA*	*26.9*	*NA*	*8.0*
France	FR_01	14 737	9 888	1 897	2 915	14 700	37	67.3	12.9	19.8	100.0	0.3
Italy[2]	*IT_04*	*534 568*	*346 542*		*80 484*	*427 026*	*107 542*	*81.2*	*NA*	*18.8*	*100.0*	*20.1*
Cyprus[1]												
Latvia	LV_01	20 492	17 296	1 933	1 263	20 492	0	84.4	9.4	6.2	100.0	0.0
Lithuania[4]	LT_01	29 306	22 689	4 679	1 808	29 176	130	77.8	16.0	6.2	100.0	0.4
Luxembourg[1]												
Hungary[3]												
Malta	MT_01	3 838	1 825	557	1 456	3 838	0	47.6	14.5	37.9	100.0	0.0
Netherlands[4]	NL_01	182 279	143 347	12 802	25 768	181 917	362	78.8	7.0	14.2	100.0	0.2
Austria[1]												
Poland[1]												
Portugal[1]												
Slovenia	SI_01	17 629	13 164	904	3 561	17 629	0	74.7	5.1	20.2	100.0	0.0
Slovak Republic[2]	*SK_01*	*51 968*	*39 128*	*12 840*		*51 968*	*0*	*75.3*	*24.7*	*NA*	*100.0*	*0.0*
Finland	FI_01	56 878	43 147	4 262	9 469	56 878	0	75.9	7.5	16.6	100.0	0.0
Sweden	SE_01	96 699	79 634	6 645	10 420	96 699	0	82.4	6.9	10.8	100.0	0.0
United Kingdom[1]												
England[5]	UK_04	584 100	407 100	62 500	114 500	584 100	0	69.7	10.7	19.6	100.0	0.0
Scotland	UK_06	53 113	35 443	4 893	12 623	52 959	154	66.9	9.2	23.8	100.0	0.3
Northern Ireland	UK_07	22 184	12 044	3 297	6 803	22 144	40	54.4	14.9	30.7	100.0	0.2
Norway	NO_01	57 370	44 608	4 955	7 807	57 370	0	77.8	8.6	13.6	100.0	0.0

[1] Ireland, Greece, Cyprus, Luxembourg, Austria, Poland, Portugal and Wales provided no data on mode of onset of labour. [2] Spain and Italy could only distinguish between spontaneous and induced labour; Slovak Republic provided no data on induced labour. [3] Brussels could only provide the number of induced labour (n=4,125) and Hungary could only provide the number of elective caesarean (n=7,672). [4] Estonia, Lithuania and the Netherlands provided data on maternal level (number of women delivering live and still births) instead of the asked child level (number of live and still births). [5] For England data were missing for 25% of births in 2004-2005, but were grossed up.

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R9: Place of birth and number of deliveries in maternity units

Country/coverage	Source	Number of total births	Percentage of total births: Number of births in unit in year: <300	300 - 499	500 - 999	1000 - 1499	1500 - 1999	2000 - 2999	3000 - 3999	4000 - 4999	≥5000	Home birth	Other place	All stated	Not stated
Belgium															
Flanders	BE_01	60 922	0.5	4.7	47.5	22.7	8.4	15.6	0.0	0.0	0.0	0.6	0.0	100.0	0.0
Czech Republic	CZ_03	96 936	1.0	8.3	42.4	15.2	5.5	13.6	3.9	4.2	5.6	0.0	0.2	100.0	0.0
Denmark	DK_01	54 597	0.5	1.3	4.8	13.7	22.8	29.2	0.0	26.6	0.0	1.1	0.0	100.0	0.4
Germany	DE_01	648 860	4.1	14.4	39.2	24.6	10.9	6.2	0.5	0.0	0.0	0.0	0.0	100.0	0.8
Estonia	EE_02	14 037	10.7	8.4	19.8	0.0	0.0	15.8	44.9	0.0	0.0	0.2	0.1	100.0	0.0
Ireland	IE_01	62 400	0.0	0.0	1.5	8.8	19.0	10.5	15.5	7.1	37.1	0.4	0.2	100.0	0.0
Greece[1]															
Spain															
Valencia	ES_05	51 047	1.1	3.0	8.5	11.6	17.0	28.4	6.3	0.0	24.0	0.0	0.0	100.0	1.2
France[4]	FR_01	14 737	1.2	3.4	20.6	22.6	16.3	27.9	6.1	1.9	0.0	0.0	0.0	100.0	0.1
Italy	IT_04	541 272	2.6	6.9	26.0	22.6	14.3	14.1	6.4	3.3	3.8	0.1	0.0	100.0	0.4
Cyprus	CY_01	8 309	42.4	25.6	32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	4.3
Latvia	LV_01	20 492	15.1	17.2	22.2	5.8	8.2	0.0	0.0	0.0	31.1	0.4	0.1	100.0	0.0
Lithuania	LT_01	29 633	14.3	14.0	9.5	11.8	11.7	38.1	0.0	0.0	0.0	0.2	0.4	100.0	0.0
Luxembourg	LU_01	5 483	1.3	6.5	29.4	0.0	62.8	0.0	0.0	0.0	0.0	0.1	0.0	100.0	0.0
Hungary[1]															
Malta	MT_01	3 902	14.5	0.0	0.0	0.0	0.0	0.0	85.4	0.0	0.0	0.1	0.1	100.0	0.0
Netherlands	NL_01	182 279	NA									30.0	NA		
Austria	AT_02	79 229	3.3	11.5	35.9	20.7	9.0	18.2	0.0	0.0	0.0	1.2	0.3	100.0	0.0
Poland[3]	PL_02	363 785	12.7		31.7	24.9	15.0	15.7				0.0	0.0	100.0	0.0
Portugal[5]	PT_04	108 258	0.2	2.0	5.3	14.4	11.1	33.1	15.4	4.0	5.3	0.5	8.6	100.0	0.4
Slovenia	SI_01	17 946	0.0	4.5	24.8	19.7	20.6	0.0	0.0	0.0	30.2	0.1	0.0	100.0	0.0
Slovak Republic	SK_01	51 968	2.8	9.7	34.6	34.4	9.7	8.8	0.0	0.0	0.0	NA	NA	100.0	0.0
Finland	FI_01	57 759	0.8	3.7	10.2	7.8	11.1	20.3	19.5	8.5	18.0	0.0	0.0	100.0	0.0
Sweden	SE_01	100 474	0.3	1.3	6.7	7.6	18.9	19.3	13.7	4.5	27.5	0.0	0.0	100.0	0.2
United Kingdom															
England	UK_01	601 467	NA									2.2	0.1	NA	
Wales	UK_01	32 040	NA									3.1	0.2	NA	
Scotland[6]	UK_06/02	53 113	2.9	0.0	2.9	4.4	3.6	10.6	37.8	17.3	21.5	1.2	0.0	NA	
Northern Ireland	UK_08	22 846	0.0	0.0	2.8	20.2	8.6	32.3	13.2	0.0	22.5	0.1	0.2	100.0	0.0
Norway[2]	NO_01	57 370	35.2				25.4		38.4			0.5	0.4	100.0	0.0

[1] Greece and Hungary provided no data on place of birth. [2] Norway provided data on place of birth using different categories: 1-49 (233); 50-499 (5 216); 500-1499 (14 749; 1500-2999 (14 593); ≥3000 (22 040); home birth (300); during transport (183); other place (14); unknown (14). [3] Poland provided data on place of birth in 2005 using different categories:<500 (46 205 births; 12.7%), 500-999 (115 406 births; 31.7%), 1000-1499 (90 449 births; 24.9%), 1500-1999 (54 442 births; 15.0%), ≥2000 (57 283 births; 15.7%). These data relate to hospital births which constituted 99,3% of all births in 2004. [4] In France home births and other places are not recorded in the national perinatal survey. In France 0.9% of births were at home and in other places (vital statistics 2003). [5] In Portugal "other place" refers to private maternity units. [6] In Scotland, the number of births by unit size are expressed as a percentage of the 53,113 births reported to UK_06, while the home births are expressed as a percentage of all 52,274 births registered with GRO (Scotland: UK_02).

R10: Breastfeeding in the first 48 hours after birth (numbers and percentages).

		Number of newborns breastfed throughout first 48 hours							Percentage of newborns breastfed throughout first 48 hours					
Country/coverage	Source	All	Yes, exclusively	Yes, mixed	Yes, all	No	All stated	Not stated	Yes, exclusively	Yes, mixed	Yes, all	No	All stated	Not stated
Belgium[1]														
Czech Republic[3]	CZ_01								90.7	4.9	95.6	0.4	NA	NA
Denmark[1]														
Germany[1]														
Estonia[1]														
Ireland	IE_01	62 066	26 151	2 040	28 191	33 699	61 890	176	42.3	3.3	45.6	54.4	100.0	0.3
Greece[1]														
Spain														
Valencia[4]	ES_05	51 054	38 257	1 730	39 987	8 229	48 216	2 838	79.3	3.6	82.9	17.1	100.0	5.6
France	FR_01	14 572	7 662	954	8 616	5 205	13 821	751	55.4	6.9	62.3	37.7	100.0	5.2
Italy[4]	IT_05	539 066	391 050	70 799	461 849	77 200	539 049	17	72.5	13.1	85.7	14.3	100.0	0.0
Cyprus[1]														
Latvia	LV_01	19 843	18 240	1 103	19 343	500	19 843	0	91.9	5.6	97.5	2.5	100.0	0.0
Lithuania[1]														
Luxembourg[1]														
Hungary[1]														
Malta	MT_01	3 902	2 130	501	2 631	1 218	3 849	53	55.3	13.0	68.4	31.6	100.0	1.4
Netherlands[2]	NL_04	2 913	NA	NA	2 326	572	2 898	15	NA	NA	80.3	19.7	100.0	0.5
Austria[1]														
Poland[2]	PL_05	2 056	NA	NA	1 857	197	2 054	2	NA	NA	90.4	9.6	100.0	0.1
Portugal[1]														
Slovenia	SI_01	17 846	15 757	1 690	17 447	399	17 846	0	88.3	9.5	97.8	2.2	100.0	0.0
Slovak Republic[2]	SK_01	52 607	NA	NA	47 024	5 583	52 607	0	NA	NA	89.4	10.6	100.0	0.0
Finland[1]														
Sweden	SE_03	101 810	89 588	8 582	98 170	2 088	100 258	1 552	89.4	8.6	97.9	2.1	100.0	1.5
United Kingdom[5]	UK_15								65.0	11.0	76.0	24.0	NA	NA
England[5]	UK_15								66.0	12.0	78.0	22.0	NA	NA
Wales[5]	UK_15								58.0	9.0	67.0	33.0	NA	NA
Scotland[5]	UK_15								61.0	9.0	70.0	30.0	NA	NA
Northern Ireland[5]	UK_15								55.0	8.0	63.0	37.0	NA	NA
Norway[1]														

[1] Belgium, Denmark, Germany, Estonia, Greece, Cyprus, Lithuania, Luxembourg, Hungary, Austria, Portugal, Finland and Norway provided no data on breastfeeding at birth. [2] The Netherlands, Poland and Slovak Republic could not distinguish between exclusive and mixed breastfeeding. [3] Czech Republic provided data on breastfeeding based on hospital stay after delivery for the years 2000-2005. Breastfeeding was defined as (i) exclusively breastfeeding at discharge (90.7%), (ii) mixed breastfeeding at discharge (4.9%), or (iii) no breastfeeding at discharge (0.4%). [4] Valenci and Italy provided data on breastfeeding from 2005 and 2003, respectively. [5] Incidence of feeding at birth in 2005, derived from five yearly Infant Feeding Survey.

R11: Very preterm births by the presence of neonatal intensive care in maternity of birth

Country/coverage		Source	Classifications of maternity units: Lowest level	Intermediate I	Intermediate II	Highest level	Number of births 22-31 weeks of GA	Percentage of very preterm births by classification of maternity unit of birth: Lower level	Intermediate I	Intermediate II	Highest level	All stated	Not stated
Belgium													
	Flanders	BE_01		Level II	--	Level III	671		32.0		68.0	100.0	
Czech Republic		CZ_01	Other hospital	intermediate care perinatal center	--	regional perinatal center	1 047	8.1	6.1		85.8	100.0	
Denmark		DK_01	without a neonatal or paediatric unit (Code 80)	--	--	with a neonatal or paediatric unit (Code 80)	800	6.0			94.0	100.0	
Germany[1]													
Estonia		EE_02	Lower level	--	--	Higher level	169	10.7			89.3	100.0	
Ireland[1]													
Greece[1]													
Spain													
	Valencia	ES_06	Without NICU			With NICU	3 274	62.0			38.0	100.0	5.8
France		FR_01	Level 1	Level 2A	Level 2B	Level 3	235	11.9	13.6	12.8	61.7	100.0	
Italy[1]													
Cyprus[1]													
Latvia		LV_01	Level I	Level II		Level III	309	24.9	42.1		33.0	100.0	
Lithuania		LT_01	Level I	Level IIA	Level IIB	Level III	345	0.0	14.2	18.0	67.8	100.0	
Luxembourg		LU_01	300-499 births/year, obstetrical service without neonatology	500-999 births/year, obstetrical service without neonatology		1999 births/year, obstetrical unit with neonatology unit	19	5.3	31.6		63.2	100.0	
Hungary[1]													
Malta		MT_01	Basic level			Maximum level	32	3.1			96.9	100.0	
Netherlands[1]													
Austria[1]													
Poland[1]													
Portugal		PT_05	Level II			Level III	1 015	6.8			93.2	100.0	19.0
Slovenia		SI_01		Level 2 no NICU, all other facilities		Level 3 with NICU	251		12.0		88.0	100.0	
Slovak Republic[1]													
Finland		FI_01	Other hospital	Regional hospital	Central Hospital	University Hospital	594	0.3	1.0	17.2	81.5	100.0	
Sweden[1]													
United Kingdom[1]													
Norway[1]													

[1] Germany, Ireland, Greece, Italy, Cyprus, Hungary, the Netherlands, Austria, Poland, Slovak Republic, Sweden, United Kingdom and Norway provided no data on very preterm births by level of care.

F1: Congenital anomalies (CA) as cause of fetal and neonatal death (numbers and percentages).

		Numbers					Percentages of deaths due to CA		Rates per 1000 births	
				Deaths with CA as cause						
Country/coverage	Source	Total births	Live births	Fetal deaths	Early neonatal deaths	Late neonatal deaths	Fetal deaths	Neonatal deaths	Fetal mortality rate due to CA for total births	Neonatal mortality rate due to CA for live births
Belgium										
Flanders	BE_01	60 921	60 672	55	48	9	22.1	39.0	0.9	0.9
Brussels	BE_02	16 288	16 200	17	12	6	19.3	35.3	1.0	1.1
Czech Republic[3]	CZ_03	98 078	97 671	78	34	NA	19.2	NA	0.8	NA
Denmark	DK_01	64 853	64 521	30	37	16	9.0	23.7	0.5	0.8
Germany[3]	DE_01	648 860	646 626	11	2	NA	0.5	NA	0.0	NA
Estonia	EE_01	14 053	13 990	4	11	2	6.3	22.4	0.3	0.9
Ireland[3]	IE_01	62 400	62 066	58	67	NA	17.4	NA	0.9	NA
Greece[1]										
Spain										
Valencia	ES_01	51 293	51 047	14	16	6	5.7	18.3	0.3	0.4
France[2]	FR_02	761 464	761 464	NA	321	170	NA	24.4	NA	0.6
Italy[2]		539 066	539 066	NA	276	148	NA	27.8	NA	0.8
Cyprus[1]										
Latvia	LV_01	20 492	20 355	5	17	9	3.6	22.4	0.2	1.3
Lithuania	LT_01	29 633	29 480	18	38	16	11.8	39.7	0.6	1.8
Luxembourg[1]										
Hungary[1]										
Malta	MT_02	3 902	3 887	2	5	4	13.3	52.9	0.5	2.3
Netherlands[1]										
Austria[2]	AT_03	79 229	78 934	NA	30	27	NA	26.5	NA	0.7
Poland[2]	PL_01	356 651	356 651	NA	396	138	NA	30.8	NA	1.5
Portugal[1]										
Slovenia	SI_01	17 946	17 846	17	12	1	17.0	27.7	0.9	0.7
Slovak Republic[1]										
Finland	FI_02	58 045	57 569	69	27	7	14.5	23.9	1.2	0.6
Sweden[1]										
United Kingdom										
England and Wales[4]	UK_01	643 407	639 721	496	379	144	13.5	23.9	0.8	0.8
Scotland	UK_09	53 269	52 911	55	26	11	15.4	22.3	1.0	0.7
Northern Ireland	UK_08	22 504	22 362	22	17	2	15.5	28.8	1.0	0.8
Norway[1]										

NOTE: Congenital anomalies as underlying cause of death according to WHO definitions: ICD10 codes Q00-Q99. [1] Greece, Cyprus, Luxembourg, Hungary, the Netherlands, Portugal, Slovak Republic, Sweden and Norway provided no data on congenital anomalies as cause of fetal and neonatal death. [2] Cause of fetal death is not provided by France, Italy, Austria, and Poland. [3] Cause of late neonatal death is not provided by Czech Republic, Germany, and Ireland. [4] In England and Wales, cause of death is recorded using a format derived from WHO certificate of perinatal death and classified using a hierarchical classification based on the Wigglesworth Classification.

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F2: Severe Maternal Morbidity (rates per 1000 women delivering one or more live or stillbirths).

Country/coverage	Source	Number of women	Rates per 1000 women							
			Eclampsia	ICU admission	Blood transfusion				Hysterectomy	Embolisation
					3 units or more	5 units or more	other amount	no units specified		
Belgium										
Flanders	BE_01	59 956	NA	NA	NA	NA	NA	11.5	NA	NA
Czech Republic	CZ_03	96 771	0.2	NA	NA	NA	NA	NA	0.8	NA
Denmark	DK_01	63 781	0.3	NA	0.2	0.2	5.9	5.1	0.3	0.0
Germany	DE_01	636 844	3.9	2.8	NA	NA	10.7	NA	0.9	0.0
Estonia	EE_01	13 879	0.6	NA	NA	NA	NA	NA	0.9	NA
Ireland[1]										
Greece[1]										
Spain										
Valencia	ES_03	38 389	0.3	NA	NA	NA	NA	6.5	0.3	NA
France	FR_03	774 870	1.0	0.5	NA	NA	NA	2.1	0.3	0.3
Italy	IT_06	534 568	1.6	NA	NA	NA	NA	4.6	0.9	0.0
Cyprus[1]										
Latvia	LV_01	20 256	0.4	NA	NA	NA	NA	NA	0.8	NA
Lithuania[1]										
Luxembourg[1]										
Hungary	HU_03	93 913	0.5	NA	NA	NA	NA	NA	1.0	0.0
Malta	MT_01	3 838	1.3	NA	1.8	1.8	3.4	0.0	0.5	NA
Netherlands	NL_05	187 910	0.7	2.2	NA	NA	4.4	NA	0.3	0.3
Austria[1]										
Poland	PL_04	213 190	0.2	NA	NA	NA	NA	NA	NA	NA
Portugal[1]										
Slovenia	SI_01	17 629	1.1	NA	NA	NA	NA	10.6	0.6	NA
Slovak Republic[1]										
Finland	FI_04	56 878	0.2	NA	NA	NA	NA	0.1	0.2	0.2
Sweden[1]										
United Kingdom[1]										
Wales	UK_10	29 569	0.8	NA	NA	NA	NA	NA	0.0	NA
Scotland	UK_02	53 342	0.6	NA	NA	NA	NA	NA	0.2	NA
Norway[1]										

[1] Ireland, Greece, Cyprus, Lithuania, Luxembourg, Austria, Portugal, Slovak Republic, Sweden, England, Wales, Northern Ireland, and Norway provided no data on severe maternal morbidity.

F3_A: Trauma to perineum: episiotomy (numbers and percentages of women delivering vaginally)

Country/coverage	Source	Number of women with vaginal delivery	Numbers Episiotomy				Percentages Episiotomy			
			Yes	No	All stated	Not stated	Yes	No	All stated	Not stated
Belgium										
Flanders	BE_01	48 971	30 907	18 064	48 971	0	63.1	36.9	100.0	0.0
Czech Republic	CZ_01	80 464	47 844	32 620	80 464	0	59.5	40.5	100.0	0.0
Denmark	DK_01	51 303	4 966	46 337	51 303	0	9.7	90.3	100.0	0.0
Germany	DE_01	73 534	22 657	50 877	73 534	0	30.8	69.2	100.0	0.0
Estonia[2]	EE_01	11 447	2 514	8 900	11 414	33	22.0	78.0	100.0	0.3
Ireland[1]										
Greece[1]										
Spain										
Valencia	ES_04	6 183	4 991	1 074	6 065	118	82.3	17.7	100.0	1.9
France[1]										
Italy[3]	*IT_06*	*314 726*	*163 521*	*151 205*	*314 726*	*0*	*52.0*	*48.0*	*100.0*	*0.0*
Cyprus[1]										
Latvia	LV_01	16 283	3 361	12 922	16 283	0	20.6	79.4	100.0	0.0
Lithuania[1]										
Luxembourg[1]										
Hungary[1]										
Malta	MT_01	2 790	1 011	1 767	2 778	12	36.4	63.6	100.0	0.4
Netherlands	NL_01	133 618	31 789	98 974	130 763	2 855	24.3	75.7	100.0	2.1
Austria[1]										
Poland[1]										
Portugal[1]										
Slovenia	SI_01	15 203	7 752	7 451	15 203	0	51.0	49.0	100.0	0.0
Slovak Republic[1]										
Finland	FI_01	47 410	15 206	32 204	47 410	0	32.1	67.9	100.0	0.0
Sweden[1]										
United Kingdom[1]										
England[4]	UK_04	449 200	73 600	375 600	449 200	0	16.4	83.6	100.0	0.0
Wales	UK_10	22 394	3 179	19 215	22 394	0	14.2	85.8	100.0	0.0
Scotland	UK_06	40 123	6 306	23 626	29 932	10 191	21.1	78.9	100.0	25.4
Norway[1]										

[1] Ireland, Greece, France, Cyprus, Lithuania, Luxembourg, Hungary, Austria, Poland, Portugal, Slovak Republic, Sweden, Northern Ireland and Norway provided no data on trauma to perineum.
[2] Estonia has provided data on episioperineotomy. [3] Data from Italy is includes all live and still births from 180 days of gestation. [4] Data for England and Wales were grossed up to allow for missing values.

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F3_B: Trauma to perineum: vaginal tears (numbers and percentages of women with vaginal delivery)

		Number of women with	Numbers							Percentages						
			Vaginal tears by severity							Vaginal tears by severity						
Country/coverage	Source	vaginal delivery	No	1st degree	2nd degree	3rd degree	4th degree	All stated	Not stated	No	1st degree	2nd degree	3rd degree	4th degree	All stated	Not stated
Belgium[1]																
Czech Republic[1,2]																
Denmark	DK_01	51 303	32 367	9 945	7 211	1 575	205	51 303	0	63.1	19.4	14.1	3.1	0.4	100.0	0.0
Germany	DE_01	73 584	49 942	10 723	11 264	1 506	149	73 584	0	67.9	14.6	15.3	2.0	0.2	100.0	0.0
Estonia[3]	EE_01	11 447		11 329		85		11 414	33		99.3		0.7		100.0	0.3
Ireland[1]																
Greece[1]																
Spain																
Valencia[5]	ES_04	6 183	4 828	852				5 680	503	85.0	15.0				100.0	8.1
France[1]																
Italy[4]	IT_06	314 726	289 579	14328	9445	524	82	313 958	768	92.2	4.6	3.0	0.2	0.0	100.0	0.2
Cyprus[1]																
Latvia[1]																
Lithuania[1]																
Luxembourg[1]																
Hungary[1]																
Malta[1]																
Netherlands[1]																
Austria[1]																
Poland[1]																
Portugal[1]																
Slovenia	SI_01	12 628	11 084	586	922	29	7	12 628	0	87.8	4.6	7.3	0.2	0.1	100.0	0.0
Slovak Republic[5]	SK_01	41 655	35 912	5 743				41 655	0	86.2	13.8				100.0	0.0
Finland	FI_04	47 410	46 193	286	646	253	29	47 407	3	97.4	0.6	1.4	0.5	0.1	100.0	0.0
Sweden[1]																
United Kingdom[1]																
England	UK_04	446 500	237 400	87 200	114 000	7 400	500	446 500	0	53.2	19.5	25.5	1.7	0.1	100.0	0.0
Wales	UK_10	22 394	11 544	5 030	4 993	362	37	21 966	428	52.6	22.9	22.7	1.6	0.2	100.0	1.9
Scotland	UK_06	40 123	14 671	6001	8308	712	63	29 755	10 368	49.3	20.2	27.9	2.4	0.2	100.0	25.8
Norway[1]																

[1] Belgium, Czech Republic, Ireland, Greece, France, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, the Netherlands, Austria, Poland, Portugal, Sweden, Northern Ireland and Norway provided no data on vaginal tears. [2] Czech Republic cannot provide data on vaginal tears because they collect data on any perineal or cervical tear. [3] In Estonia no information on first and second degree vaginal tears is collected. [4] Data from Italy includes all live and stillbirths from 180 days of gestation. [5] Valencia and Slovak Republic have no data on severity of vaginal tears.

APPENDIX C: DATA SOURCES FOR EURO-PERISTAT CORE AND RECOMMENDED INDICATORS

Table: Data sources general information

Country	Source No	Source name	Start date	Data from	Type of data	Coverage	Completeness	Participation	Other comments on data source
					P=population H=hospital O=other	*N=national R=regional S=sample O=other*	*U=unknown*	*C=compulsory V=voluntary U=unknown*	
Belgium/Flanders	BE_01	SPE	1987	2004	H	R	100%	V	
Belgium/Brussels	BE_02	Linked birth and death certificates	1998	2004	P	R	± 100%	C	± 100% for residents, also includes asylum seekers and illegal residents (for whom birth is usually declared).
Belgium/Brussels	BE_03	Death certificates (vital records)	1998	2004	P	R	U	C	
Czech Republic	CZ_01	UZIS CR	1999	2004	H	N	± 100%	C	No home deliveries - only about 1 per thousand deliveries does not make it to hospital prior delivery and those are also registered.
Czech Republic	CZ_02	Central Statistics Office	NA	2004	P	N	100%	C	
Czech Republic	CZ_03	Database of aggregated data of the Czech Society of Perinatal Medicine	1990	2004	H	N	± 100%	V	
Denmark	DK_01	Danish perinatal database	1973	2004	P	N	> 97%	C	
Denmark	DK_02	Danish Fertility Register	NA	2004	P	N	100%	V	All fertility clinics in Denmark report individualised data that might be followed up in The Danish Perinatal Database
Denmark	DK_03	National patient register	1977	2004	P	N	± 100%	C	
Germany	DE_01	www.bqs-online.de	2002	2004	H	N	99%	C	
Germany	DE_02	www.destatis.de	1900	2004	P	N	± 100%	C	
Germany/Bavaria	DE_03	www.baq-bayern.de	1975	2004	H	R	99%	C	
Estonia	EE_01	Statistics Estonia	1945	2004	P	N	U	U	
Estonia	EE_02	Estonian Medical Birth Registry	1992	2004	O	N	U	C	All delivering on Estonian territory; It overestimates around 1,5% of births (those who deliver on Estonian territory, but are not Estonian residents and underestimates similar amount, who are Estonian residents, but have delivered outside Estonia and for whom the data on delivery items is missing)
Estonia	EE_03	Estonian Abortion Registry	1994	2004	O	N	U	C	All abortions made on Estonian territory in health care institutions
Estonia	EE_04	Ministry of Social Affairs annual report on morbidity incidences	1945	2004	O	N	± 95%	C	health care provider-based data source
Ireland	IE_01	National Perinatal Reporting System (NPRS)	1985	2004	P	N	100%	C	Coverage is 100% when linked to the birth registration system
Ireland	IE_02	Central Statistics Office, Vital Statistics	1864	2004	P	N	100%	C	Coverage is 100% when linked to the birth registration system
Greece	GR_01	National database	1960	2003	P	N	98%	C	Highly suitable in terms of coverage. No linkage of infant deaths to births yet.
Spain	ES_01	Registro de Mortalidad Perinatal	2004	2004	H	R	± 100%	C	Valencia Region
Spain	ES_02	National Institute for Statistics (INE). Movimiento Natural	1941	2004	P	N	± 100%	C	
Spain	ES_03	CMBD (Hospital Registers including private hospitals)	1993	2005	H	N	U	C	
Spain	ES_04	Pregnancy Summary Sheet	NA	2005	P	S	U	C	10% sample of all pregnancies
Spain	ES_05	Metabolopathies (Metabolic Diseases) Register	2004	2004	H	R	98%	C	Valencia Region
Spain	ES_06	ESCRI (Health Survey in internship regime)	NA	2005	H	N	U	C	
France	FR_01	National Perinatal Survey	1995	2003	P	N	99%	V	in 2003 (last survey); data are completed with another data source if missing
France	FR_02	National statistics of causes of death, CepiDC, INSERM	1968	2003-2004	P	N	100%	C	
France	FR_03	National hospital discharge database, ATIH	1998	2004	O	N	100%	C	hospital-based data from all hospitals; All hospitalizations (private and public sector) in France, overseas territories excluded
France	FR_04	Vital Statistics, INSEE	1900	2004	P	N	100%	C	
France	FR_05	Paris Registry of Congenital Anomalies, INSERM	1981	2004	P	R	± 95%	V	
France	FR_06	Enquete confidentielle sur les morts maternalles 2000-2001	1996	2000-2001	P	N	80%	C	
Italy	IT_01	National Register of Deaths - Istat National Institute of Statistics	1980	2003	P	N	95-99%	C	
Italy	IT_02	National Register of hospital discharges after miscarriage - Istat National Institute of Statistics	1978	2003	P	N	100%	C	
Italy	IT_03	National Register of induced abortions (voluntary terminations of pregnancy)- Istat National Institute of Statistics	1978	2003	P	N	U	C	
Italy	IT_04	National Birth Certificates Register	2002	2003	P	N	84%	C	84% in 2003. For the analyses presented in this data set, an extrapolation to 100% coverage was made on the basis of the actual total number of births in the same year.
Italy	IT_05	National survey on births - Istat National Institute of Statistics	2000-2001	2003	P	S	10%	C	This is a representative sample survey on 10% of total live births on register of population.
Italy	IT_06	National hospital discharge database	1995	2003	H	N	100%	C	This database is used for administrative purposes and for reimbursement. Coverage is fairly complete.
Cyprus	CY_01	Live births	1980	2004	P	O	99%	C	Government Controlled Area
Cyprus	CY_02	Public Hospital Discharges	1976	2004	H	O	U	U	Public hospitals only
Cyprus	CY_03	Death Register	2004	2004	P	O	95%	C	Government Controlled Area
Latvia	LV_01	Newborns Register of Latvia	1999	2004	P	N	± 100%	C	

Table: Data sources general information

Country	Source No	Source name	Start date	Data from	Type of data	Coverage	Completeness	Participation	Other comments on data source
Latvia	LV_02	Death Cause Data Base	1996	2004	P	N	± 100%	C	
Lithuania	LT_01	Medical Data of Births	1993	2004	H	N	U	U	This data sourse is from hospital from Lithuania
Lithuania	LT_02	Database of the Demographic Statistics	1994	2004	U	N	U	C	
Luxembourg	LU_01	FIMENA Fiche Médicale de Naissance	1980	2004	O	N	excellent	V	Hospital in general. But for the very few ambulant births the in charge midwife will also fill out a document. No legal necessity yet. For each birth the obstetrician/midwife assisting is asked to fill out a document for each child. The coverage is excellent. The problem in Luxembourg is due to our reduced size of the country and the transnational use of the medical services. This database register the data of the births in Luxembourg, resident population and non resident population. In the FIMENA database fo
Luxembourg	LU_02	Mortality statistics / Ministry of health	NA	2004	P	N	nearly complete	C	nearly complete coverage
Hungary	HU_01	Hungarian Central Statistics Office	NA	2004	P	N	100%	U	Government controlled
Hungary	HU_02	National Registry of Congenital Anomalies	NA	2004	P	N	quite good	U	Revised, controlled and published yearly by the National Institution of Epidemiology.
Hungary	HU_03	National Institution of Obstetrics and Gynaecology	NA	2004	P	N	100%	U	Based on monthly reports of all maternity departments
Malta	MT_01	National Obstetrics Information System (NOIS)	1999	2004	P	N	± 100%	V	All hospitals send data but so far they are not legally bound to.
Malta	MT_02	National Mortality Register	1991	2004	P	N	100%	C	1991 on computer
Malta	MT_03	Malta Congenital Anomalies Register	1993	2004	P	N	± 100%	V	Active data collection is done but there is no statutory requirement for this data collection
Netherlands	NL_01	*The Netherlands* Perinatal Registry	2003	2004	P	N	± 95-99%	V	Data from GP's are not included, further the data source is population based. Midwifes, gynaecologists, obstetricians and paediatricians register voluntarily
Netherlands	NL_02	*The Netherlands* Perinatal Registry	2003	2004	P	N	0-7 days (± 95-99%), 7 27 days (± 70%).	V	Data from GP's are not registered. Midwifes, gynaecologists, obstetricians and paediatricians register voluntarily. 0-6 days completeness is good (± 95-99%), 7-27 days not complete (± 70%).
Netherlands	NL_03	*The Netherlands* Perinatal Registry	2003	2004	P	O	NA	V	Hospital based data, but not each hospital registers. For all NICUs participation is obligatory, for other paediatric departments participation is voluntary.
Netherlands	NL_04	Infant Feeding Questionnaire Survey	1996	2003	P	N	60%	V	60% of questionnaires are send back. The data are not representative for the total Dutch population as more white and high educated people respond.
Netherlands	NL_05	LEMMoN Study	2004	2005	P	N	98%	V	Nationwide Confidential Enquiry in which all hospitals participated; 98% of all monthly communication cards have been returned by all participating hospitals for the year 2005.
Netherlands	NL_06	Commission on maternal mortality	NA	2003-2004	P	N	U	V	Notification by caregivers.
Netherlands	NL_07	Central Statistics Office	NA	2004	P	N	U	C	
Austria	AT_01	Causes of death statistics	1970	2004	P	N	100%	C	
Austria	AT_02	Birth statistics	1970	2004	P	N	100%	C	
Austria	AT_03	Birth and cause of death statistics for infant deaths	1984	2004	P	N	100%	C	
Austria	AT_04	hospital discharges	1989	2004	P	N	100%	C	
Poland	PL_01	Birth and death certificates	1789	2004	P	N	100%	C	
Poland	PL_02	Health statistics	± 1965	2004	H	N	99%	C	This source does not include events outside hospitals and provides aggregated data.
Poland	PL_03	EUROCAT	1999	2004	HO	R	U	V	Wielkopolska region; data include live births and fetal deaths only.
Poland	PL_04	Hospital discharge	± 1945	2004	H	R	60%	C	Data of 11 of 16 main administrative regions. Data aggregated according to the primary reason for the hospital admission (ICD10 code O15)
Poland	PL_05	National Health Survey	1996	2004	P	N	92%	V	A national sample, the data are restricted here to children 0-4 years old.
Portugal	PT_01	Health Statistics - National Institute of Statistics	1969	2004	P	C	100%	C	
Portugal	PT_02	Demographic Statistics - National Institute of Statistics	1881	2004	P	C	100%	C	
Portugal	PT_03	Prenatal Care Survey	2005	2005	O	C	missing	V	Perinatal Survey by personal invitation
Portugal	PT_04	DGS - Directorate-general of health	missing	2004	H	C	100%	C	100% of public hospitals
Portugal	PT_05	National Registry of Very Low Birthweight	1994	2004	H	C		V	44 national maternity units
Slovenia	SI_01	National perinatal system of Slovenia	1987	2004	H	N	± 100%	C	
Slovenia	SI_02	Mortality database	NA	2001-2002	P	N	100%	C	
Slovak Republic	SK_01	SOR - report on delivering mother	1996	2004	H	N	100%	C	
Finland	FI_01	Medical Birth Register	1987	2004	P	N	100%	C	100% after data linkage to Central Population Register and Cause-of-Death Register
Finland	FI_02	Cause-of-Death Register	1936	2004	P	N	good	C	Complete regarding deaths occurring in Finland, causes for death in other countries may be incomplete
Finland	FI_03	Register on Congenital Malformations and Birth Defects	1963	2004	P	N	good	C	Data is collected from various sources, after this the data is believed to be complete
Finland	FI_04	Hospital Discharge Register	1969	2004	P	N	> 95%	C	Estimated coverage is more than 95% as well as accuracy of main diagnosis. Data includes all inpatient care in all hospitals (since 1969 with ID codes) and outpatient care in public hospitals (since 1998).
Finland	FI_05	Population Register at Statistics Finland	1973	2004	P	N	excellent	C	The data includes all Finnish citizens and permanent residents (identification number available).
Sweden	SE_01	Medical birth register	1973	2004	H	N	U	C	
Sweden	SE_02	Cause of death register	1952	2004	P	N	U	U	
Sweden	SE_03	BVC	2004	2004	P	N	U	C	
Sweden	SE_04	The Swedish Birth Defects Registry	1965	2004	H	N	U	C	
United Kingdom, England and Wales	UK_01	Civil registration of births and deaths, England and Wales, ONS	1837	2004-2005	P	N	100%	C	Published statistics do include births to mothers resident outside UK. http://www.statistics.gov.uk/statbase/Product.asp?vlnk=5768 http://www.statistics.gov.uk/statbase/Product.asp?vlnk=6305

Table: Data sources general information

Country	Source No	Source name	Start date	Data from	Type of data	Coverage	Completeness	Participation	Other comments on data source
United Kingdom, Scotland	UK_02	Civil registration of births and deaths, Scotland, GROS	1855	2004	P	N	100%	C	http://www.gro-scotland.gov.uk/statistics/index.html
United Kingdom, Northern Ireland	UK_03	Civil registration of births and deaths, Northern Ireland, GRO(NI)/ NISRA	1922	2004	P	N	100%	C	Registration based. Published data do not include births and stillbirths to non-Northern Ireland resident mothers. http://www.nisra.gov.uk/demography/default.asp.htm
United Kingdom, England	UK_04	Maternity Hospital Episode Statistics	1989-1990	2004-2005	H	N	Records for nearly all hospital births, but delivery information for only 75% of them	V	Delivery information grossed up to allow for missing data. Most home birth data missing. http://www.ic.nhs.uk/statistics-and-data-collections/hospital-care/maternity
United Kingdom, Wales	UK_05	National Community Child Health Database	1987	2004	P	N	Most key birth items 90% or more	C	http://new.wales.gov.uk/topics/statistics/headlines/health2008/hdw200806262/?lang=en
United Kingdom, Scotland	UK_06	Scottish Morbidity Record (SMR02)	1975	2004	H	N	± 98%	V	http://www.isdscotland.org/isd/1018.html
United Kingdom, Northern Ireland	UK_07	Data from the Child Health Systems, Area Health Boards and NISRA (Northern Ireland Statistics and Research Agency)	NA	2004	O	N	U	V	
United Kingdom, Northern Ireland	UK_08	Confidential Enquiry into Maternal and Child Health, perinatal death reports	1992	2004	P	N	U	V	Perinatal death reports cover England, Wales and Northern Ireland, but only Northern Ireland data used for peristat. http://www.cemach.org.uk/Regional-Offices/Affiliated-Offices/CEMACH-Northern-Ireland-Office.aspx
United Kingdom, Scotland	UK_09	Scottish Stillbirth and Infant Death Enquiry	1977	2004	P	N	100%	C	http://www.isdscotland.org/isd/3109.html
United Kingdom, Wales	UK_10	Patient Episode data Wales (PEDW)	1991	2004-2005	H	N	Coverage of hospital births nearly complete; does not include home births. ± 25% for well babies	V	Data for well babies should be included in the database but completeness is very poor (25% approx). http://new.wales.gov.uk/topics/statistics/headlines/health2008/hdw200803182/?lang=en
United Kingdom, Northern Ireland	UK_11	NIMATS	NA	NA	H	N	6 out of 8 hospital trusts in 2004/5	V	
United Kingdom, Northern Ireland	UK_12	Neonatal Intensive Care Outcomes and Evaluation (NICORE)	1994	2001-2002	H	N	U	V	All Neonatal Units contribute
United Kingdom, England and Wales	UK_13	National Congenital Anomaly System	1964	2004	P	N/R	Variable	V	Wales and about half the area of England have dedicated congenital anomaly registers which share their data with the system. In the rest of England, anomalies are notified directly to the system and there is considerable under-notification. http://www.statistics.gov.uk/statbase/Product.asp?vlnk=5799
United Kingdom, Scotland	UK_14	Scottish Linked Congenital Anomaly Database	1992	2004	P	N	100%	C	100%, but at present only singletons are included and there may also be issues regarding case ascertainment as cases are determined retrospectively. http://binocar.org/registers.htm
United Kingdom	UK_15	Infant Feeding Survey	1975	2005	S	S		V	http://www.ic.nhs.uk/statistics-and-data-collections/health-and-lifestyles-related-surveys/infant-feeding-survey
United Kingdom	UK_16	Human Fertilisation and Embryology Authority	1991	2004	H	N	Procedures covered by legislation only	C	http://www.hfea.gov.uk/
United Kingdom, England and Wales	UK_17	Abortion notifications, England and Wales	1968	2004	P	N	Required by law	C	Also includes non-residents tabulated separately, so includes most terminations to residents of Northern Ireland and Irish Republic. http://www.dh.gov.uk/en/Publicationsandstatistics/Statistics/StatisticalWorkAreas/Statisticalpublichealth/index.htm
Norway	NO_01	Medical Birth Registry of Norway	2004	2004	P	N	U	C	

Table: Data sources procedures

Country	Source No	Source name	Type of data	Collection procedures	Institution	Expansion plans/use of data
			P=population H=hospital O=other			
Belgium/Flanders	BE_01	SPE	H	Midwifes or gynaecologists. The data are collected by SPE in Brussels.	SPE	No
Belgium/Brussels	BE_02	Linked birth and death certificates	P	Medical data are filled in by midwives or obstetricians inside the maternity service/hospital, just after birth. For death, medical data are entered by the physician who establishes the death. Social data are filled in by civilian registration services.	Observatoire de la Santé et du Social de Bruxelles-Capitale.	
Belgium/Brussels	BE_03	Death certificates (vital records)	P			
Czech Republic	CZ_01	UZIS CR	H	Physician or health care worker of the first contact. Health care facility.	Office of Health Statistics and Information of the Czech Republic	working on the change of registration legislation regarding "abortions" under 1000 grams
Czech Republic	CZ_02	CSO	P	Where the deaths occur on death certificate.	Czech Statistical Office	
Czech Republic	CZ_03	Database of aggregated data of the Czech Society of Perinatal Medicine	H	At the hospital level.	Czech Society of Perinatal Medicine - WHO Collaborating Center of the Institute for the Care of Mother and Child, Prague	
Denmark	DK_01	Danish perinatal database	P	Midwife or doctor.	National Board of health	
Denmark	DK_02	Danish Fertility Register	P	Fertility clinics.	Prof. Anders Nyboe Andersen, Rigshospitalet, University of Copenhagen	
Denmark	DK_03	National patient register	P	Secretary, midwife or doctor.	National board of health	Ongoing data modifications in order to improve relevance to the perinatal statistics
Germany	DE_01	www.bqs-online.de	H	Exclusively computerized records completed by hospital staff generally using linked terminals.	www.bqs-online.de at federal level; regional offices such as www.baq-online.de in Bavaria; quant – Service für das Gesundheitswesen again at federal level in lieu of non-data processing regions	annual reviews are undertaken with a view to identify areas in need of change, however the database has remained remarkably stable in the last 5 years.
Germany	DE_02	www.destatis.de	P	Municipal registry clerks.	regional and federal statistical offices; e.g. www.destatis.de (federal);www.statistik.bayern.de/ (regional: Bavaria)	national information is available with some temporal delay and not (nearly) as detailed as that form www.bqs-online.de; However, destatis provides data on the late neonatal period and thereafter nor obtainable from the perinatal surveys.
Germany/Bavaria	DE_03	www.baq-bayern.de	H	Exclusively computerized records completed by hospital staff generally using linked terminals.	see above	see above
Estonia	EE_01	Statistics Estonia	P	Physician or forensic medic.	Statistics Estonia	
Estonia	EE_02	Estonian Medical Birth Registry	O	At the delivery unit the certificate is fulfilled, the data is entered at Estonian Medical Birth Registry. Those who deliver at home have to report their deliveries through delivery units.	Estonian Medical Birth Registry at National Health Development Institute	Yes, there are plans to modify the certificate depending on the possibilities of financial resources in the coming years, in particular extending the data on morbidity of neonatal period, modifying the data on morbidity conditions of mothers during pregnant
Estonia	EE_03	Estonian Abortion Registry	O	At the health care institutions the special registry card is fulfilled by medical personnel, entered by the registry personnel.	Estonian Abortion Registry, National Health Development Institute	Yes, when a new law on sterilisation and law will be adopted, it is meant to be personalised again (now individual cases without personalised information are collected since 1998?), and also with the development of digital health record by 2009 or 2010 se
Estonia	EE_04	Ministry of Social Affairs annual report on morbidity incidences	O	Health care provider through a website specifically designed for reporting morbidity data.	Ministry of Social Affairs	it is planned to be modified during the launching of E-health info system around 2012
Ireland	IE_01	National Perinatal Reporting System (NPRS)	P	Hospital Administration/Ward Clerk/Medical Records Personnel/Nurse/Midwives complete a Birth Notification Form at the hospital/home where the birth occurred. Part 3 sent to NPRS at the Economic and Social Research Institute (ESRI) for compilation.	The Economic and Social Research Institute	Current developments mainly involve trying to advance to computerised data collection. There are no current plans to alter the content of the data collected.
Ireland	IE_02	Central Statistics Office (CSO), Vital Statistics	P	Cause of death recorded on death certificate by doctor. Certificate given to parents and is registered at register offices by parents, data entry takes place at registration offices. Data forwarded to CSO by General Register Office (GRO).	GRO and CSO	No current plans to modify data source.
Greece	GR_01	National database	P	Parents or others give details to local register of births and deaths to local register office. If a death or stillbirth occurs, they bring a medical certificate of cause of death or stillbirth completed by a doctor.	National Statistics Service; data given from hospitals and general register office.	Unfortunately not. Linkage should be included but it is not allowed.
Spain	ES_01	Registro de Mortalidad Perinatal	H			
Spain	ES_02	National Institute for Statistics (INE). Movir	P			
Spain	ES_03	CMBD (Hospital Registers including private hospitals)	H			
Spain	ES_04	Pregnancy Summary Sheet	P			
Spain	ES_05	Metabolopathies (Metabolic Diseases) Register	H	Midwives in hospital.		
Spain	ES_06	ESCRI (Health Survey in internship regime)	H			
France	FR_01	National Perinatal Survey	P	Midwives in the maternity units (mother's interview and data collection from the medical records).	INSERM U149	No regular basis: surveys in 1995, 1998, 2003 and 2009 Births in the overseas territories were excluded.

Table: Data sources procedures

Country	Source No	Source name	Type of data	Collection procedures	Institution	Expansion plans/use of data
France	FR_02	National statistics of causes of death, CepiDC, INSERM	P	Medical doctors in hospital (or at home).	INSERM : CepiDc	
France	FR_03	National hospital discharge database, ATIH	O	Midwives in the maternity units (mother's interview and data collection from the medical records).	ATIH	Unable to assess, but this data source has been established for management
France	FR_04	Vital Statistics, INSEE	P	Medical secretary or midwife in the maternity unit or secretary in the city hall.	INSEE National Institute of Statistics and Economics Studies	Oversea territories excluded
France	FR_05	Paris Registry of Congenital Anomalies, INSERM	P	Research nurse in the maternity unit.	Paris Registry of Congenital Anomalies INSERM U149	
France	FR_06	Enquete confidentielle sur les morts maternalles 2000-2001	P	Medical experts of a national committee.	INSERM U149 and Institute of Health Surveillance (InVS)	Still under estimation of maternal deaths. It is planned to improve exhaustively.
Italy	IT_01	National Register of Deaths - Istat National Institute of Statistics	P	Doctor who ascertains death (part A of the death certificates); Municipality civil officer (Ufficiale di Stato Civile) for Part B.	Istat National Institute of Statistics	No
Italy	IT_02	National Register of hospital discharges after miscarriage - Istat National Institute of Statistics	P	Staff from hospital where the woman is admitted for a miscarriage.	Istat National Institute of Statistics	No
Italy	IT_03	National Register of induced abortions (voluntary terminations of pregnancy)- Istat National Institute of Statistics	P	Physician performing the procedure.	Istat National Institute of Statistics	No
Italy	IT_04	National Birth Certificates Register	P	The midwife attending birth.	Ministry of Health.	Up to 1998 the Birth Registry was under the responsibility of ISTAT. This data source was dismantled because of change in legislation; a new one was started in 2002 under the responsibility of the Ministry of Health.
Italy	IT_05	National survey on births - Istat National Institute of Statistics	P	Computer Assisted Telephone Interview (CATI).	Istat National Institute of Statistics.	
Italy	IT_06	National hospital discharge database	H	Staff from hospital discharging the patient.	Regional Health Authorities and, at national level, Ministry of Health.	No
Cyprus	CY_01	Live births	P	Ministry of Interior (secretaries).	The Ministry of Interior collects the data in forms and the Statistical Service of Cyprus does the data entry and the analysis.	No plans to expand this source.
Cyprus	CY_02	Public Hospital Discharges	H	Data is collected in electronic form from the General-Rural Public Hospitals. The collected data is analysed by the Statistical Service of Cyprus.	The Statistical Service of Cyprus.	There are no plans for expansion of this data source, since it's aim is the collection of data on hospital discharges, not information on perinatal health indicators. This data source is not very reliable for analysing data concerning perinatal indicators
Cyprus	CY_03	Death Register	P	Doctors, coroners and forensic fill the death certificates.	Health Monitoring Unit (Ministry of Health), Statistical Service of Cyprus.	Trying to improve the procedures of certification and codification in order to improve the overall quality of data.
Latvia	LV_01	Newborns Register of Latvia	P	Paper format filled by maternity professionals (midwife, ob/gyn, neonatologist), computer record from paper format filled by the physicians- specialists of the Newborn Register of the Health Statistics and Medical Technologies State Agency.	Health Statistics and Medical Technologies Sate Agency	Presently on the basis of Newborn register there is in development process Register of Diseases of Neonates and Children, which will cover all severe morbidity of the age up to 18 years
Latvia	LV_02	Death Cause Data Base	P	Paper format filled by pathologist (autopsy mandatory for perinatal and infant death), computer record filled by physicians specialists of Death Cause data base of Health Statistics and Medical Technologies State Agency.	Health Statistics and Medical Technologies State Agency	No
Lithuania	LT_01	Medical Data of Births	H	Filled by hospital; collected by Health Information Centre (LHIC).	LHIC responsible for processing; Vilnius University Children's Hospital Centre of Neonatology responsible for analysing	We plan to modify this data source for using on the European level
Lithuania	LT_02	Database of the Demographic Statistics	MV	Physicians of the health care institutions.	Statistics Lithuania	No
Luxembourg	LU_01	FIMENA Fiche Médicale de Naissance	O	The certificate is filled in by the midwife or the obstetrician attending the birth. The coding, the data entry is realized in the statically service of the Directorate of Health, Ministry of health where the data are collected and saved.	Ministry of health and for the project: Improvement of the perinatal data: the CRP Santé / Research centre in public health	We are intensively working at the improvement of the whole perinatal surveillance system including: collection, coverage, definitions, validity, comparability, information system, regular update and evaluation
Luxembourg	LU_02	Mortality statistics / Ministry of health	P	The death certificate is filled out by the death certifying medical doctor. The coding and the registration of the data is realized in the statistical service of the Directorate of Health, Ministry of Health.	Statistical service of the Directorate of Health / Ministry of Health.	Yes
Hungary	HU_01	Hungarian Central Statistics Office	MV			
Hungary	HU_02	National Registry of Congenital Anomalies	MV			
Hungary	HU_03	National Institution of Obstetrics and Gynaecology	MV			
Malta	MT_01	National Obstetrics Information System (NOIS)	P	Midwives or nurses at postnatal wards.	Department of Health Information	It is planned to increase data items collected for information.
Malta	MT_02	National Mortality Register	P	The doctor certifying the death	Department of Health Information	

Table: Data sources procedures

Country	Source No	Source name	Type of data	Collection procedures	Institution	Expansion plans/use of data
Malta	MT_03	Malta Congenital Anomalies Register	P	Staff at the registry after going through the patient hospital record files.	Department of Health Information	No plans to modify at this stage. The register is a member of EUROCAT and follows guidelines and standards set by this organisation. Induced abortions are not legal in Malta
Netherlands	NL_01	*The Netherlands* Perinatal Registry	O	This person can be any caregiver or person related to the caregiver, e.g. the physician, the assistant-physician, the nurse, the secretary.	The Netherlands Perinatal Registry, TietoEnator, AMC	There are plans to modify and expand the data source in the near future.
Netherlands	NL_02	*The Netherlands* Perinatal Registry	O	Data can be filled in by any caregiver or person related to the caregiver, e.g. physician, assistant-physician, nurse, secretary and so on.	The Netherlands Perinatal Registry, TietoEnator, AMC	There are plans to modify and expand the data source in the near future.
Netherlands	NL_03	*The Netherlands* Perinatal Registry	O	This person can be any caregiver or person related to a caregiver, e.g. a physician, an assistant-physician, a nurse, a secretary and so on.	The Netherlands Perinatal Registry, TietoEnator, AMC	There are plans to modify and expand the data source in the near future.
Netherlands	NL_04	Infant Feeding Questionnaire Survey	P	Questionnaires are given to mothers of newborns visiting the Child Health Clinic within the first 6 months after birth. Mothers fill in the questionnaire.	TNO Quality of Live, Leiden, The Netherlands	No plans to modify. Every survey new data items are added to the basic questionnaire.
Netherlands	NL_05	LEMMoN Study	P	Cases are reported by the local coordinator and entered into a central Access-database by one research-fellow.	Leiden University Medical Centre, in cooperation with TNO Prevention and Care	This was a two-year study, one of the aims being to formulate a proposal for concise future registration of severe maternal morbidity on a nationwide level
Netherlands	NL_06	Commission on maternal mortality	P			
Netherlands	NL_07	Central Statistics Office	P			
Austria	AT_01	causes of death statistics	P	Coronar fills in the death certificate, civil registrar the demographic part, Statistics Austria collects the data.	Statistics Austria	No
Austria	AT_02	Birth statistics	P	Midwives fill in the medical part, civil registrars fill in the demographic part, Statistics Austria collects the data.	Statistics Austria	No
Austria	AT_03	birth + cause of death statistics for infant deaths	P	See birth statistics and causes of death statistics	Statistics Austria	no
Austria	AT_04	hospital discharges	P	administrative data from hospitals	Ministry of Health and Statistics Austria	
Poland	PL_01	Birth and death certificates	P	Medical part - medical personnel, social part - local administrator responsible for the registration of birth/death	Central Statistical Office	Polish birth and death certificate should be modified, however, both CSO and Ministry of Health are resistant to changes.
Poland	PL_02	Health statistics	H	Statistical offices in hospitals.	The Center of Information Systems in Healthcare in Warsaw (agenda of the Ministry of Health)	Continuous modifications.
Poland	PL_03	EUROCAT	HO	Medical personnel in hospitals.	PRWW - Polish Register of Congenital Malformations	Plans of expanding to the national level.
Poland	PL_04	Hospital discharge	H	Medical personnel in hospitals.	National Institute of Hygiene	Minor modifications probably and plans of expanding to the national level.
Poland	PL_05	National Health Survey	P	Professional interviewer.	Central Statistical Office	The study will be probably repeated in the unknown future.
Portugal	PT_01	Health Statistics - National Institute of Statistics	P	Qualified notary (civil registration); medical doctors (hospital).	National Institute of Statistics	No
Portugal	PT_02	Demographic Statistics - National Institute of Statistics	P	Qualified notary at civil registration; medical doctors (hospital).	National Institute of Statistics	No
Portugal	PT_03	Prenatal Care Survey	O	Obstetricians.	Department of Hygiene and Epidemiology University of Porto Medical School	No
Portugal	PT_04	DGS - Directorate-general of health	H	Local administrators.	Direccao Geral Saude, Statistical Division	No
Portugal	PT_05	National Registry of Very Low Birthweight	H	Clinicians.	National Registry of Very Low birthweight - Neonatal care unit	I don't think so
Slovenia	SI_01	National perinatal system of Slovenia	H	Nurses, obstetricians, midwives in hospitals. Computer data entry is done by administrative clerks.	Institute of publish health (processing) Department of Obst/Gyn, Ljubljana Medical Center (analysing)	No
Slovenia	SI_02	Mortality database	P		The Institute of Public Health of the Republic of Slovenia	
Slovakia	SK_01	SOR - report on delivering mother	H	Data entry form is filled in maternity hospital. Data are collected in National Health Information Center.	National Health Information Center	
Finland	FI_01	Medical Birth Register	P	MBR data is filled by hospital personnel (midwives, secretaries, diagnosis checked by medical doctors), in case of home birth the health care professional attending the birth fills in the data collection form	STAKES National Research and Development Centre for Welfare and Health	-
Finland	FI_02	Cause-of-Death Register	P	The physician who took care of the patient fills in the death certificate, which is thereafter checked by County Medical Officer and medical experts at Statistics Finland.	Statistics Finland	-
Finland	FI_03	Register on Congenital Malformations and Birth Defects	P	In hospitals, health care personnel fills out the data collection form or provides similar information for the register e.g. by sending medical records. Several other data sources, such as Medical Birth Register and Hospital Discharge Register, is used to complete the register.	STAKES National Research and Development Centre for Welfare and Health	-
Finland	FI_04	Hospital Discharge Register	P	Data is taken directly from electronic patient journals, which are filled by health care professionals.	STAKES National Research and Development Centre for Welfare and Health	-
Finland	FI_05	Population Register at Statistics Finland	P	Data is collected from various official sources, such as district registration office and local courts of justice.	Statistics Finland	-
Sweden	SE_01	Medical birth register	H			

Table: Data sources procedures

Country	Source No	Source name	Type of data	Collection procedures	Institution	Expansion plans/use of data
Sweden	SE_02	Cause of death register	P			
Sweden	SE_03	BVC	P			
Sweden	SE_04	Swedish birth defects registry	H			
United Kingdom, England and Wales	UK_01	Civil registration of births and deaths, England and Wales, ONS	P	Local registrar of births, marriages and deaths for the General Register Office.	Data analysed and published by the Office for National Statistics	Birth records now linked to NHS Numbers for Babies dataset which has additional data items. Project for linkage to Maternity Hospital Episode Statistics, PEDW and Welsh Child Health system has been funded and is about to start.
United Kingdom, Scotland	UK_02	Civil registration of births and deaths, Scotland, GRO(S)	P	Local registrar of births, marriages and deaths for the General Register Office (Scotland)	General Register Office for Scotland	
United Kingdom, Northern Ireland	UK_03	Civil registration of births and deaths, Northern Ireland, GRO(NI)/ NISRA	P	Local registrar of births, marriages and deaths for the General Register Office (Northern Ireland). Based in local and central offices.	Northern Ireland Statistics and Research Agency Demography and Methodology branch	none known
United Kingdom, England	UK_04	Maternity Hospital Episode Statistics	H	Records transferred from hospital systems to Secondary Uses Service.	Information Centre for Health and Social Care	New much larger maternity dataset has been developed. Meanwhile project to link to enhanced birth registration dataset has been funded.
United Kingdom, Wales	UK_05	National Community Child Health Database	P	Midwives submit birth notification to Central Issuing System as a result of which a record is set up on local child health systems	Health Solutions Wales extracts data from local child health systems.	Project to link to enhanced birth registration dataset has been funded.
United Kingdom, Scotland	UK_06	Scottish Morbidity Record (SMR02)	H	clinical coders	Information Services Division of the NHS National Services Scotland	
United Kingdom, Northern Ireland	UK_07	Data from the Child Health Systems, Area Health Boards and NISRA (Northern Ireland Statistics and Research Agency)	O			
United Kingdom, Northern Ireland	UK_08	Confidential Enquiry into Maternal and Child Health, perinatal death reports	P	Perinatal death notification form completed by local coordinators and forwarded to		
United Kingdom, Scotland	UK_09	Scottish Stillbirth and Infant Death Enquiry	P	Source information of all stillbirths and infant deaths occurring in Scotland is received from the General Register Office Scotland and a request is made to specified co-ordinators at each Scottish hospital for completion of data entry forms.	Information Services Division of National Services Scotland	no
United Kingdom, Wales	UK_10	Patient Episode data Wales (PEDW)	H	Data compiled from mothers' in-patient records in hospital systems	Health Solutions Wales	Some pilot work being done to look at maternity data flows in Wales. Project to link to enhanced birth registration dataset has been funded.
United Kingdom, Northern Ireland	UK_11	NIMATS	H			
United Kingdom, Northern Ireland	UK_12	Neonatal Intensive Care Outcomes and Evaluation (NICORE)	H	Medical or nursing staff	School of medicine Division of maternal and child health Queen's University of Belfast.	
United Kingdom, England and Wales	UK_13	National Congenital Anomaly System	P	In Wales and areas of England which have congenital anomaly registers, required data items are forwarded to National Congenital Anomaly System.		
United Kingdom, Scotland	UK_14	Scottish Linked Congenital Anomaly Database	P	Data sources include routine hospital data collection, General Register Office for Scotland birth and death registrations and the annual Scottish Stillbirth and Infant Death Survey.	Information Services Division of the National Services Scotland.	The system is updated annually and currently only includes singleton births. Plans are in place to extend this to multiple births.
United Kingdom	UK_15	Infant Feeding Survey	S	Sample selected from birth registration and data collected through postal questionnaires.	Market research companies are commissioned to do the survey.	The Information Centre on behalf of the four UK health departments
United Kingdom	UK_16	Human Fertilisation and Embryology Authority	H	Clinics registered to provide services under the Human Fertilisation and Human Embryology ACT are required to keep registers and submit data.	Human Fertilisation and Embryology Authority.	
United Kingdom, England and Wales	UK_17	Abortion notifications, England and Wales	P	Form completed by doctor undertaking the termination and notification sent to Chief Medical Officer of country in which termination takes place.	Data processed and published by the Department of Health for England on behalf of the Chief Medical Officers of England and Wales.	
Norway	NO_01	Medical birth registry of Norway	P	Hospital staff	Medical birth registry of Norway	Not at the current time.

Table: Data source inclusion criteria

Country	Source No	Source Name	Type deaths	Inclusion fetal deaths	Inclusion live births	TOP included	TOP separate source	WHO recommendations
			C=cohort deaths P=deaths during year R=deaths registered in year					
Belgium/Flanders	BE_01	SPE	C	BW ≥ 500 grams	No criterion	No	No	Yes
Belgium/Brussels	BE_02	Linked birth and death certificates	P	GA ≥ 22 weeks or BW ≥ 500 grams	No criterion	No	No	Yes
Belgium/Brussels	BE_03	Death certificates (vital records)						Yes
Czech Republic	CZ_01	UZIS CR	P	GA ≥ 22 weeks	BW ≥ 500 grams or any BW surviving first 24 hours	No	Abortion database	No, although registered, the stillborn babies under 1000 grams are considered abortion
Czech Republic	CZ_02	CSO	P	only BW criterion; the same as UZIS CR	only BW criterion	No		No, stillborn under 1000 grams are registered as abortions
Czech Republic	CZ_03	Database of aggregated data of the Czech Society of Perinatal Medicine	P	BW ≥ 500 grams	No criterion	Yes with inclusion criteria		No, all from 500 grams and more
Denmark	DK_01	Danish perinatal database	C	GA ≥ 22 weeks	No criterion	No	National Abortion Registry	Yes
Denmark	DK_02	Danish Fertility Register		No criterion	No criterion	No	Yes	
Denmark	DK_03	National patient register		GA ≥ 22 weeks	No criterion	Yes with inclusion criteria		Yes
Germany	DE_01	www.bqs-online.de	C	BW ≥ 500 grams	No criterion	No	www.destatis.de	No, 500 grams or more for fetal deaths,
Germany	DE_02	www.destatis.de	P	BW ≥ 500 grams	No criterion	Yes without inclusion criteria	missing	No, do not know yet, fetal deaths >=500gr
Germany/Bavaria	DE_03	www.baq-bayern.de	C	BW ≥ 500 grams	No criterion	No	www.destatis.de	No, fetal deaths >=500 Gr
Estonia	EE_01	Statistics Estonia	C	GA and BW criterion	GA and BW criterion	No	Abortion registry	Yes
Estonia	EE_02	Estonian Medical Birth Registry	P	GA ≥ 22 weeks and BW ≥ 500 grams	No criterion	No	Estonian Abortion Registry	No, Fetal death is related with the criterion of perinatal period; death of mothers cannot be recorded.
Estonia	EE_03	Estonian Abortion Registry		No criterion	No criterion	Yes without inclusion criteria		No, all terminated pregnancies ending up to 22 of GA
Estonia	EE_04	Ministry of Social Affairs annual report on morbidity incidences		No criterion	No criterion	No	No	
Ireland	IE_01	National Perinatal Reporting System (NPRS)	P	BW ≥ 500 grams	BW ≥ 500 grams	No	No	Identical definition, other than exclusion of birth/death of a foetus weighing less than 500grams
Ireland	IE_02	Central Statistics Office (CSO), Vital Statistics	P	GA ≥ 24 weeks or BW ≥ 500 grams	No criterion	No	No	Yes
Greece	GR_01	National database	P	GA ≥ 28 weeks	No criterion	Yes	No	Yes. Only abortions on ground of congenital anomaly are permitted after 12 weeks of pregnancy. No abortions are permitted after 25 weeks of pregnancy.
Spain	ES_01	Registro de Mortalidad Perinatal	R	GA > 22 weeks	No criterion	No	Registro Interrupciones Voluntarias Embarazo	Yes
Spain	ES_02	National Institute for Statistics (INE). Movi	R			No	Induced Abortions Registry	Yes
Spain	ES_03	CMBD (Hospital Registers including private hospitals)				No	National Register of Induced Abortions	Yes
Spain	ES_04	Pregnancy Summary Sheet						missing
Spain	ES_05	Metabolopathies (Metabolic Diseases) Register		No criterion	No criterion	No	National Register of Induced Abortions	missing
Spain	ES_06	ESCRI (Health Survey in internship regime)			GA < 32 weeks	No	Induced Abortions Register	Yes
France	FR_01	National Perinatal Survey	Deaths during one week (October 2003)	GA ≥ 22 weeks or BW ≥ 500 grams	GA ≥ 22 weeks or BW ≥ 500 grams	Yes with inclusion criteria		Yes
France	FR_02	National statistics of causes of death, CepiDC, INSERM	P	Fetal deaths are not included	GA ≥ 22 weeks or BW ≥ 500 grams	No	No	Yes
France	FR_03	National hospital discharge database, ATIH	P	Not relevant	Not relevant	Not relevant	This data base is not used to assess fetal and infant mortality rates	No, no limit
France	FR_04	Vital Statistics, INSEE	P	GA ≥ 22 weeks or BW ≥ 500 grams	GA ≥ 22 weeks or BW ≥ 500 grams	Yes with inclusion criteria		Yes
France	FR_05	Paris Registry of Congenital Anomalies, INSERM	C	GA ≥ 20 weeks	No criterion	Yes without inclusion criteria		No, no limit; inclusion criteria are different.
France	FR_06	Enquete confidentielle sur les morts maternalles 2000-2001	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant
Italy	IT_01	National Register of Deaths - Istat National Institute of Statistics	P	No criterion	No criterion	No	National Register of induced abortions	Yes
Italy	IT_02	National Register of hospital discharges after miscarriage - Istat National Institute of Statistics	P	within 180 days of gestation	No criterion	No	National ongoing survey on induced abortions - Istat - National Institute of Statistics -	According to ISTAT definition fetal deaths are recorded as spontaneous abortions (miscarriages) if occurred within 180 days of amenorrhea.

Table: Data source inclusion criteria

Country	Source No	Source Name	Type deaths	Inclusion fetal deaths	Inclusion live births	TOP included	TOP separate source	WHO recommendations
Italy	IT_03	National Register of induced abortions (voluntary terminations of pregnancy) - Istat National Institute of Statistics	P	No criterion	No criterion	Yes	Not relevant	According to Italian law induced abortions can be performed within 90 days of gestation or after 90 days in case of severe health problems.
Italy	IT_04	National Birth Certificates Register		within 180 days of gestation	according to WHO definition	No	National survey on induced abortions	Yes
Italy	IT_05	National survey on births - Istat National Institute of Statistics		No criterion	according to WHO definition	No	Yes	Yes
Italy	IT_06	National hospital discharge database		No criterion	No criterion	No	Yes, already described	
Cyprus	CY_01	Live births	C	No criterion	No criterion	No	No	Yes
Cyprus	CY_02	Public Hospital Discharges		No criterion	No criterion	No	No	
Cyprus	CY_03	Death Register	P	No criterion	No criterion	No	No	Yes
Latvia	LV_01	Newborns Register of Latvia	P	GA or BW criterion	GA or BW criterion; Present heart beat	No	Routine statistics	Yes
Latvia	LV_02	Death Cause Data Base	P	GA or BW criterion	GA or BW criterion; no heartbeat	No	Routine statistics	Yes
Lithuania	LT_01	Medical Data of Births	P	GA and BW criterion	GA and BW criterion	No	LHIC, annual report data	Yes
Lithuania	LT_02	Database of the Demographic Statistics	P	other criterion; WHO definition	other criterion; WHO definition	No	Yes	Yes
Luxembourg	LU_01	FIMENA Fiche Médicale de Naissance	R	No criterion	No criterion	No	No	No; 2004 only the babies with an age of 26 weeks of gestation were registered
Luxembourg	LU_02	Mortality statistics / Ministry of health	R	No criterion	No criterion	No	No	Yes
Hungary	HU_01	Hungarian Central Statistics Office	missing	missing	missing	missing	missing	missing
Hungary	HU_02	National Registry of Congenital Anomalies	missing	missing	missing	missing	missing	missing
Hungary	HU_03	National Institution of Obstetrics and Gynaecology	missing	missing	missing	missing	missing	missing
Malta	MT_01	National Obstetrics Information System (NOIS)	C	GA ≥ 22 weeks or BW ≥ 500 grams	No criterion	missing	missing	Yes
Malta	MT_02	National Mortality Register	C	GA ≥ 22 weeks or BW ≥ 500 grams	GA ≥ 22 weeks or BW ≥ 500 grams	missing	missing	Yes
Malta	MT_03	Malta Congenital Anomalies Register	C	GA ≥ 20 weeks. Induced abortions are not legal in Malta	No criterion	missing	missing	WHO recommends 22 weeks gestation, this database takes all cases from 20 weeks gestation
Netherlands	NL_01	*The Netherlands* Perinatal Registry	R	GA criterion, but newborns with unknown GA and BW < 500 grams are excluded.	GA and BW criterion (see criterion for fetal deaths), and apgar scores.	Yes with inclusion criteria	Register on Induced Abortions	Yes
Netherlands	NL_02	*The Netherlands* Perinatal Registry	R	GA criterion, but newborns with unknown GA and BW < 500 grams are excluded.	GA and BW criterion (see criterion for fetal deaths), and apgar scores.	Yes with inclusion criteria	Register on Induced Abortions	Yes
Netherlands	NL_03	*The Netherlands* Perinatal Registry	R	GA criterion, but newborns with unknown GA and BW < 500 grams are excluded.	GA and BW criterion (see criterion for fetal deaths), and apgar scores.	Yes with inclusion criteria	Register on Induced Abortions	Yes
Netherlands	NL_04	Infant Feeding Questionnaire Survey		missing	missing	No	No	missing
Netherlands	NL_05	LEMMoN Study		No criterion	No criterion	missing	missing	missing
Netherlands	NL_06	Commission on maternal mortality		missing	missing	missing	missing	missing
Netherlands	NL_07	Central Statistics Office		missing	missing	missing	missing	missing
Austria	AT_01	causes of death statistics	P	missing	missing	missing	missing	Yes
Austria	AT_02	Birth statistics		only BW criterion; Only still birth (=late fetal death) are included, still birth are defined according to WHO definition (500g limit)	all live birth are included in the birth statistics according to WHO definition	No	No	Yes
Austria	AT_03	birth + cause of death statistics for infant deaths	P	only BW criterion; only stillbirths according to WHO-definition are included.	No criterion	No	No	Yes
Austria	AT_04	hospital discharges	P	missing	missing	missing	missing	Yes
Poland	PL_01	Birth and death certificates	R	BW ≥ 500 grams	BW ≥ 500 grams	No	Yes, Hospital discharge	Yes, but analyzed only ≥ 500 grams.
Poland	PL_02	Health statistics	P	all	all	yes	Yes, Hospital discharge	Yes
Poland	PL_03	EUROCAT	P	GA ≥ 20 weeks	GA ≥ 20 weeks	No	Yes, Health statistics and Hospital discharge	Yes
Poland	PL_04	Hospital discharge	P	all	all	yes	Yes, Health statistics	Yes
Poland	PL_05	National Health Survey	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable
Portugal	PT_01	Health Statistics - National Institute of Statistics	P	GA ≥ 22 weeks	No criterion	No	No	Yes
Portugal	PT_02	Demographic Statistics - National Institute of Statistics	P	GA ≥ 22 weeks	No criterion	No	No	Yes
Portugal	PT_03	Prenatal Care Survey	P	No criterion	No criterion	No	No	Yes
Portugal	PT_04	DGS - Directorate-general of health	P	No criterion	No criterion	No	No	missing

Table: Data source inclusion criteria

Country	Source No	Source Name	Type deaths	Inclusion fetal deaths	Inclusion live births	TOP included	TOP separate source	WHO recommendations
Portugal	PT_05	National Registry of Very Low Birthweight	P	BW <1500g	BW <1500g	No	missing	Yes
Slovenia	SI_01	National perinatal system of Slovenia	C	BW ≥ 500 grams; or in case of multiple pregnancy: if one fetus fulfil inclusion criterion all fetuses are included	No criterion	No	Fetal deaths database	Yes
Slovenia	SI_02	Mortality database	P	missing	missing	missing	missing	Yes
Slovak Republic	SK_01	SOR - report on delivering mother	P	No criterion	No criterion	Yes with inclusion criteria		Yes
Finland	FI_01	Medical Birth Register	C	GA ≥ 22 weeks or BW ≥ 500 grams	No criterion	No	Register on Induced Abortions	Yes
Finland	FI_02	Cause-of-Death Register	P	GA ≥ 22 weeks or BW ≥ 500 grams	No criterion	No	Register on Induced Abortions	Yes
Finland	FI_03	Register on Congenital Malformations and Birth Defects	C	GA ≥ 22 weeks or BW ≥ 500 grams	No criterion	Yes without inclusion criteria	Included, if performed due to congenital anomaly	No, all induced abortions are included, if performed due to congenital anomaly (up to 24 weeks as stated in national law))
Finland	FI_04	Hospital Discharge Register	C	No criterion	No criterion	No	Register on Induced Abortions	Yes
Finland	FI_05	Population Register at Statistics Finland	C	GA ≥ 22 weeks or BW ≥ 500 grams	No criterion	No	Register on Induced Abortions	Yes
Sweden	SE_01	Medical birth register	C	GA ≥ 28 weeks	No criterion	No	Swedish birth defects registry	fetal deaths 28 weeks or more
Sweden	SE_02	Cause of death register	P	Fetal deaths are not included	No criterion	No	Yes	Yes
Sweden	SE_03	BVC		missing	missing	No	No	missing
Sweden	SE_04	The Swedish birth defects registry		GA ≥ 22 weeks	other criterion	Yes		Yes
United Kingdom, England and Wales	UK_01	Civil registration of births and deaths, England and Wales, ONS	C, P, R	GA ≥ 24 weeks	'born alive'	Terminations at 24 plus weeks should be registered as stillbirths as well as being notified as abortions	Yes, abortion notifications cover all terminations in England and Wales, both to residents and to non-residents, including residents of Northern Ireland and Irish Republic	
United Kingdom, Scotland	UK_02	Civil registration of births and deaths, Scotland, GROS	R	GA ≥ 24 weeks	'born alive'			
United Kingdom, Northern Ireland	UK_03	Civil registration of births and deaths, Northern Ireland, GRO(NI)/ NISRA	R	GA ≥ 24 weeks	'born alive'	No		Yes
United Kingdom, England	UK_04	Maternity Hospital Episode Statistics	Deaths during delivery episode	GA ≥ 24 weeks	'born alive'			
United Kingdom, Wales	UK_05	National Community Child Health Database	P	GA ≥ 24 weeks	'born alive'	No		
United Kingdom, Scotland	UK_06	Scottish Morbidity Record (SMR02)	P	No criterion	No criterion	No	Scottish Morbidity Record (SMR01)	missing
United Kingdom, Northern Ireland	UK_07	CMO Report - Data from the Child Health System, Area Health Boards and NISRA (Northern Ireland Statistics and Research Agency)		missing	missing	missing	missing	missing
United Kingdom, Northern Ireland	UK_08	CEMACH	P	Registrable stillbirths plus voluntary notification of late fetal deaths at 22 and 23 weeks	Does not collect data about live births	missing	missing	missing
United Kingdom, Scotland	UK_09	Scottish Stillbirth & Infant Death Enquiry	R	Registrable stillbirths plus voluntary notification of late fetal deaths at 22 and 23 weeks	No criterion	No	missing	No
United Kingdom, Wales	UK_10	Patient Episode data Wales (PEDW)	Deaths during delivery episode	No criterion	No criterion	No	Yes	missing
United Kingdom, Northern Ireland	UK_11	NIMATS		missing	missing	missing	missing	missing
United Kingdom, Northern Ireland	UK_12	Neonatal Intensive Care Outcomes and Evaluation (NICORE)		missing	data collected for each infant admitted or re admitted to any neonatal facility who requires intensive care (level 1 or level 2) within first 4 weeks of life	missing	missing	missing
United Kingdom, England and Wales	UK_13	National Congenital Anomaly System						
United Kingdom, Scotland	UK_14	Scottish Linked Congenital Anomaly Database	C	GA ≥ 24 weeks	No criterion	No	Abortion Act Scotland Statistics	Stillbirths (>=24wks gest); Perinatal period commences at 24 wks; Fetal Deaths (20-23 wks gest or 500g and more)
United Kingdom	UK_15	Infant Feeding Survey	Survey of mothers of live births	Not included in survey	Check made to ensure that child has not died after birth before questionnaire is sent to mother.			Not applicable
United Kingdom	UK_16	Human Fertilisation and Embryology Authority	Deaths by year of procedure					

Table: Data source inclusion criteria

Country	Source No	Source Name	Type deaths	Inclusion fetal deaths	Inclusion live births	TOP included	TOP separate source	WHO recommendations
United Kingdom, England and Wales	UK_17	Abortion notifications, England and Wales	Terminations in year	Terminations at 24 or more completed weeks should also be registered as stillbirths	Not applicable	Only terminations included	Purpose of system is to monitor terminations	No
Norway	NO_01	Medical birth registry of Norway	C	GA ≥ 12 weeks	GA ≥ 12 weeks	Yes with inclusion criteria		No

LIST OF APPENDIX TABLES