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Maternal health outcomes in Europe

Sophie Alexander[a,*], Katherine Wildman[b], Weihong Zhang[a], Martin Langer[c], Christian Vutuc[d], Gunilla Lindmark[e]

[a]*Reproductive Health Unit, School of Public Health, Université Libre de Bruxelles, 808, Route de Lennik, 1070 Brussels, Belgium*
[b]*INSERM Unité 149, Epidiomiological Research Unit on Perinatal and Women's Health, Paris, France*
[c]*Institute of Obstetrics and Gynecology, Universitätsklinik für Frauenheilkunde, Vienna, Austria*
[d]*Abtellung für Epidemiologie, Insitute für Krebsforschung der Universität Wien, Wien, Austria*
[e]*International Maternal and Child Health Unit, Uppsala University, Uppsala, Sweden*

Abstract

Objectives: To use PERISTAT data on indicators of maternal mortality and morbidity to explore maternal health outcomes in Europe, and to discuss the implications of variations in the data sources for these indicators. *Study design*: The PERISTAT feasibility study provides the source for this descriptive study, covering 15 European countries. Maternal mortality ratios are calculated, and data to describe maternal mortality by age, cause of death and mode of delivery are pooled for the countries that provided data. *Results*: Data presented show an increased risk of maternal death among older mothers and for caesarean sections compared with other modes of delivery, and the three most prevalent causes of maternal deaths reported were embolism, hypertensive diseases of pregnancy, and haemorrhage. *Conclusions*: Variations in maternal mortality ratios reflect different data sources with varying levels of ascertainment in addition to differences in the number of maternal deaths. Further development is needed to construct comparable indicators of maternal morbidity.

Keywords: Maternal mortality; Maternal morbidity; Health indicators

1. Introduction

Before considering the maternal health outcome indicators identified by the PERISTAT group, some definitions need to be clarified and addressed. First, we note that all indicators in this paper pertain to unfavourable outcomes and that other indicators related to maternal health can be found in Bréart et al. (characteristics of the childbearing population in Europe) and Wildman et al. (European indicators of health care during pregnancy, delivery and the postpartum period) of this special issue. The PERISTAT group was aware of the need to consider indicators of desirable or satisfactory maternal outcomes. Two such indicators—maternal satisfaction and birth without medical intervention—are discussed in Wildman et al. in this issue, which also describes other indicators of maternal health related to intervention and care, including induction of labour, caesarean section, instrumental vaginal deliveries, and episiotomies. In addition, certain complementary aspects of family health and women's sexual and reproductive health are addressed by the CHILD and REPROSTAT projects funded by the European Commission's Health Monitoring Programme.

The present paper is therefore restricted to a limited number of indicators of unfavourable maternal health outcomes. These fall under two headings: death and disease. The first is expressed as the maternal mortality ratio, a complex fraction in which the numerator is maternal deaths and the denominator is live born children. This denominator is a surrogate for a more desirable but more difficult to assess denominator: pregnant women, the full population at risk for maternal death. It is thus appropriate to use the expression maternal mortality ratio rather than rate, to reflect the fact that the numerator is not entirely included in the denominator.

The second unfavourable outcome, maternal morbidity, is difficult to define clearly for various reasons, including these three: the selection of conditions to include, the means of identifying cases, and a relative lack of experience with the concept. Should morbidity indicators be restricted to conditions that leave the mother with permanent disability, such as infertility, vaginal fistulae, retinal displacement or other long-term impairments? These are exceptional in Europe as in most of the rest of the developed world. Another approach is to consider ''near-misses'' or ''life-threatening'' events.

* Corresponding author.
E-mail address: salexand@ulb.ac.be (S. Alexander).

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This approach is garnering broad support, and Geller et al. [1] recently developed a conceptual framework for it. Another approach is to consider that all cases of pregnancy-related ill health, including self-perceived, are noteworthy [2]. Finally, interest has risen over the last 20 years in the risks of pregnancy or childbirth-related injuries that lead to urinary and faecal incontinence. This area, while new and developing, cannot be neglected in monitoring both long and short-term health outcomes related to the perinatal period.

There is a relative paucity of maternal health outcome indicators in the PERISTAT project, and most of them pertain to maternal death. The quality and availability of these indicators will be addressed in the discussion of this paper, as will their relevance in representing maternal health in the perinatal period.

2. Material and methods

PERISTAT's feasibility study collected the following aspects of maternal mortality as its maternal health indicators: global rates as well as those stratified by maternal age, cause of death, and mode of delivery. Macfarlane et al. in this issue describe the methods used in the feasibility study. The group had not reached a consensus about appropriate indicators of severe maternal morbidity when the feasibility data were collected, and so most participants did not provide them.

The maternal mortality tables were compiled from the following sources: data provided by the collaborators in the PERISTAT project, and data published by and available in the WHO-Europe Health for All database, provided by the various national offices for health statistics. Data provided by PERISTAT collaborators from confidential enquiries carried out in their country or maternal mortality committees were also used for this paper. These complementary data sources, with varying degrees of improved ascertainment and case description, come from France, The Netherlands, Austria, Bavaria, and UK. We describe how these processes vary across the EU member states and discuss the implications of these differences.

The principal definition of what constitutes a maternal death in European statistics is early obstetrical death, both direct (the pregnancy directly caused the death) and indirect (death is due to a cause which preceded the pregnancy but would presumably not have been lethal without it). The time period covered is from conception to 42 days after the outcome of the pregnancy. This means that so-called ''fortuitous'' or coincidental (not causally related to pregnancy) and ''late'' (between 43 and 365 days after the outcome of pregnancy) deaths are excluded. Figures for both early obstetrical and total 1 year maternal deaths were available for a few countries and regions, and they are included in the tables to illustrate the question of which definition to use.

Analysis of maternal mortality can be stratified according to maternal age, mode of delivery, and cause of death. For all of these, the available PERISTAT data were pooled for all member states providing data: because maternal deaths are rare events in Europe, this pooling is necessary to obtain sufficient numbers for analysis. This method also provides a unique perspective of the distribution of maternal deaths across Europe. For maternal deaths by cause, some countries provided ICD9 or ICD10 classifications, while others used their own subgroups. Consistency was obtained by re-coding all cases into the empirical subgroups identified by the European Association of Perinatal Medicine [3].

For severe maternal morbidity, only three countries provided data for a range of conditions and procedures: two of them had routine systems for collecting maternal morbidity, and one provided results from a population-based survey. We present these results, compare them insofar as possible with previously published rates, and discuss a composite indicator of severe maternal morbidity, which the PERISTAT group is proposing for further development. While this method of comparing rates is problematic because of its tendency to encourage regression towards the mean, it does provide a useful first-line comparison when data sources are difficult to validate.

For faecal incontinence, one of the indicators selected for further development, a review of recently published articles was made through a computer search of English or French language publications in the MEDLINE. Searches were conducted using various combinations of the following terms: delivery, vaginal birth, anal incontinence, faecal/faecal incontinence, and flatus incontinence. None of the countries that responded to the PERISTAT feasibility study reported the availability of data that could be used to assess the prevalence of faecal incontinence. As a baseline for understanding the scope of the problem, we therefore present the prevalence rates reported in the literature. These rates may help in developing the data collection tools needed to measure this maternal outcome indicator.

The PERISTAT group also included a measure of postpartum depression on its list of indicators recommended for further development. Because it was added only after the feasibility study, no relevant results are presented in this paper. Postpartum depression is estimated to affect up to 30% of women in the 6 weeks following delivery [4,5] and represents a significant cause of morbidity for women and their families. It has been associated with an increased risk of morbidity and death, and some suggest that it has negative implications for the development of children whose mothers experience it. The initial challenge for further development of this indicator will be harmonising the definition and identification of cases in the postpartum period across Europe. Measurement scales must be validated across the range of European populations, and an appropriate survey methodology must be developed to implement this indicator.

3. Results

Table 1 presents data for maternal mortality by country.

The maternal mortality ratios reported here range from 2.8 in Ireland to 11.4 in the United Kingdom for early obstetrical death. It is very difficult to determine with certainty what the degree of under-registration might be in any given country. Substantial evidence shows that any initiative to improve registration systematically yields an important increase in the number of maternal deaths; increases of 26% have been reported in The Netherlands, nearly 40% in the UK and Austria, 56% in France, and 80% in the US [6–9]. The results in the table must therefore be interpreted circumspectly, not as a league table, because higher ratios may well reflect better registration rather than more maternal deaths. Another cause of concern is the small numbers and the differences from year to year. Especially interesting are the differences between early obstetrical deaths and all maternal deaths to one year, which can be seen in the data for Flanders and for the UK presented in Table 1. For Flanders, the total deaths, ascertained through the systematic use of a data linkage computer programme that identifies all women who died within 365 days of giving birth, are almost triple the early obstetrical deaths. Table 1 also presents two datasets for France and the UK, respectively, showing registration in both countries for confidential inquiries and for routine statistics. In the UK, this increased registration through the confidential inquiry demonstrates improved case-finding. In France, there is an increase in cases identified for review by the inquiry compared to vital statistics, then an overall reduction in the cases attributed to obstetric causes by the expert committee. The 108 maternal deaths from the French confidential inquiry in Table 1 represent early obstetric deaths, while 180 deaths were identified by the inquiry for the same time period. Causes of under-registration as well as possible solutions are addressed in the discussion.

Maternal mortality by maternal age is presented in Fig. 1.

Fig. 1 and Tables 2 and 3 were obtained by pooling results from the countries able to provide this information. The graph of maternal mortality by age shows a classic J curve with a slight rise for mothers younger than 20 and a 10-fold rise between 25 and 40 years. As demographic shifts in fertility persist and more European women delay childbearing, the increased risk associated with pregnancy among older mothers becomes a serious consideration for health systems across the European Union. Monitoring maternal age and maternal health outcomes by age is critical for tracking this development and comparing outcomes between member states. The risk for maternal mortality associated

Table 1
Maternal mortality ratios (MMR) per 100,000 live births from PERISTAT and WHO Health for All

Country	PERISTAT study					WHO[a]	
	Source	Year	Live birth (*n*)	Death (*n*)	Rate (10^{-5})	Rate (10^{-5})	Year
Austria	Confidential inquiry	2000–2001	153682	10	6.5	4.6	2000–2001
Belgium—SPE[b]	Vital records	1999–2000	122902	8	6.5	6.9	1996–1997
Belgium—Flanders[c]	Vital records	1999–2000	124658	35[d]	28.1	NA	1996–1997
Belgium—National	Vital records linkage	1995	115542	11	9.5	9.5	1995
Denmark[e]	Perinatal database	1997–1999	200042	17	8.5	8.3	1997–1999
Finland	Vital records linkage	1999–2000	113987	5	4.4	4.4	1999–2000
France	Vital records	1998–1999	1482871	130	8.8	8.8	1998–1999
France	Confidential inquiry	1997–1998	1464878	108[f]	7.4	9.9	1997–1998
Germany—Bavaria	Confidential inquiry	1999–2000	244008	22	9.0	5.2[g]	1999–2000
Greece	No data provided	NA	NA	NA	NA	6.5	1998–1999
Luxembourg	Vital records	1999–2000	11305	1	8.8	17.5	2000
The Netherlands	Perinatal database	1999	200115	18	9.0	9.5	1999
Spain	SSN	2000	363589	26	7.2	3.7	1999
Ireland	Vital records	1998–1999	107893	3	2.8	2.8	1998–1999
Portugal	Vital records	1999–2000	236099	9	3.8	3.8	1999–2000
Sweden	Vital records linkage	1996–2000	438423	20	4.6	1.1	1999–2000
United Kingdom	Civil registration	UK-EW1,S1,NI1999–2000	1379005	83	6.0	6.0	1999–2000
United Kingdom	Confidential enquiries[h]	UK1-1997–1999	2123614[i]	242	11.4	5.8	1997–1999

[a] European health for all database: http://hfadb.who.dk/hfa.
[b] Clinical register: Studiecentrum voor Perinatale Epidemiologie.
[c] Civil register: Ministerie van de Vlaamse gemeenschap, includes all deaths to women in the year following the end of pregnancy.
[d] Seven cases were direct maternal death.
[e] All obstetric deaths to women with a hospital visit indicated by an obstetric code (ICD-10 O00-O08) within 42 days of death.
[f] Cases identified as obstetric deaths by the confidential inquiry.
[g] All Germany.
[h] [15].
[i] Number of maternities.

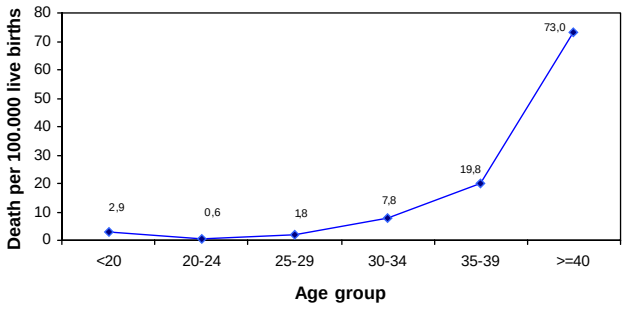

Fig. 1. Maternal mortality ratios by age in Europe in the PERISTAT feasibility study (data are available from Austria (2 years), Belgium (2 years), Denmark (3 years), Finland (2 years), France (2 years), Germany (2 years), Luxembourg (2 years), The Netherlands (1 year), Portugal (2 years), Sweden (1 year) and UK (2 years)).

with advanced maternal age is considered further in Bréart et al. of this issue.

Maternal mortality by cause of death is presented in Table 2. The leading causes of direct death were embolism, haemorrhage and pregnancy-induced hypertension. Sepsis and first-trimester deaths were also important contributors, and deaths from anaesthesia still occur. Details of the causes of the indirect deaths are unknown. It is noteworthy that almost 15% of these early obstetrical deaths are considered to be of unknown cause.

Maternal mortality by mode of delivery is presented in Table 3. The risk of maternal death was four times higher among women who delivered by caesarean section than among those who had a vaginal birth. While this overall elevated risk reflects previously published findings in the UK and The Netherlands [10,11], these data also show a higher risk for caesarean sections performed before labour, often-termed planned caesareans. These results contrast with other studies that report a lower risk of death from planned caesareans than from those conducted during labour, typically under urgent circumstances [12]. Unfortunately, although

Table 2
Number of deaths, death rates and range in 10 countries by principal cause of death per 100,000 live births in Europe 1995–2000[a]

Cause	*n*	Rate (10^{-5})	Range in 10 countries[a] (10^{-5})
Embolism	70	1.2	0.0–8.8
Hypertension	40	0.8	0.0–2.0
Haemorrhage	44	1.0	0.0–2.2
Sepsis	28	0.4	0.0–2.2
Abortion/ectopic	24	0.5	0.0–0.8
Anaesthetic	6	0.1	0.0–0.2
Other direct	34	0.6	0.0–9.5
All direct	259	4.9	2.2–8.8
Indirect	185	1.5	0.0–6.4

[a] Data are available from Austria (3 years), Belgium (2 years), Denmark (3 years), Finland (2 years), France (2 years), Luxembourg (2 years), Ireland (2 years), Spain (1 year only for number of total direct and indirect causes), Sweden (5 years) and UK (2 years). All live births (denominator) total are 6,133,473.

Table 3
Estimated maternal mortality ratio and relative risk by type of delivery for maternal death in Europe[a]

Type of delivery	Total	Maternal deaths	Deaths per 10^5	RR	95% CI
All live births	569397	41	7.2		
All vaginal deliveries	486717	23	4.7		
Spontaneous	424370	19	4.5	1	
Instrumental	62347	4	6.4	1.4	0.49–4.21
All caesarean sections	82134	14	17.0	3.8	1.91–7.59
No labour	39352	10	25.4	5.7	2.64–12.21
Labour	42782	4	9.3	2.1	0.81–6.14

[a] Data are available for Belgium (2 years), Denmark (2 years), Finland (2 years) and The Netherlands (1 year).

the data made it possible to distinguish spontaneous vaginal births, operative vaginal deliveries and caesarean sections, reasons for caesareans could not be identified, nor could it be determined whether they had been performed because of a potentially life-threatening maternal condition such as severe pre-eclampsia or chorioamnionitis.

Statistics for severe maternal morbidity were available from only three countries and for the following conditions: eclampsia, pre-eclampsia, haemorrhage and diabetes. These data were compared with published series. Two indicators appeared to be within plausible value ranges compared to previously published data: eclamptic fits and hysterectomy. Eclampsia rates ranged from 0.3 to 3.0 per 1000 births, and hysterectomies ranged from 0.1 to 0.9 per 1000. Rates of severe postpartum haemorrhage ranged from 0.04 to 4 per 1000 births, a 100-fold difference; the lowest rates appear to be an almost impossible achievement. Similar differences were observed for diabetes (14–64 per 1000) and blood transfusion (0.01–13 per 1000). European regional rates are available for 1996, from the MOMS B survey of 48,665 pregnant women, where the following rates per 1000 births were observed: eclampsia: 0.8, severe postpartum haemorrhage: 4.4 and sepsis 0.7. Table 4 summarises the literature about faecal incontinence.

Rates ranged from 1.8 to 25%, but the studies varied widely in at least three aspects: study design, time after birth and diagnosis criteria. Study size also varied broadly, ranging from 59 to 7557.

4. Discussion

As previously noted, maternal health outcome indicators have a relatively small weight in PERISTAT. This presumably reflects the mandate for this project, which focused primarily on perinatal, not maternal, health. The study group included a large proportion of neonatologists and paediatricians, who are not usually concerned with maternal health. Suggestions that there is a tendency to "forget" about maternal health in favour of the child when considering

Table 4
Summary of prevalence estimates for faecal incontinence

Study	Study design	Definition	Mode delivery	Study period	Denominator	Prevalence
Donnelly, 1998 (Ireland)	Prospective	Stool	Vaginal	6 weeks after delivery	168	4%
Mayer, 1998 (Switzerland)	Prospective	Stool	Vaginal	9 weeks after delivery	116	5.10%
Signorello, 2000 (USA)	Retrospective	Faecal	Vaginal	3 months and 6 months after delivery	626	5.2% and 2.3%
Zetterstrom,1999 (Sweden)	Prospective	Faecal	Vaginal	5 months and 9 months after delivery	620	1.8%
MacArthuret, 1997 (UK)	Cohort study	Faecal	Vaginal and CS	10 months after delivery	906	4%
Meyer, 2000 (Switzerland)	Prospective	Faecal	Vaginal	10 weeks and 10 months after delivery	107	6% and 4.5%
Groutz, 1999 (Israel)	Prospective	Stool or flatus	Vaginal	3 months after delivery	300	7%
Benifla, 2000 (France)	Prospective	Stool or flatus	Vaginal and CS	8 weeks after delivery	233	9%
Sultan, 1993 (UK)	Prospective	Stool or flatus	Vaginal	6 weeks after delivery	79	13%
Fynes, 1999 (Ireland)	Prospective	Stool or flatus	Second vaginal	6–12 weeks after delivery	59	22%
Eason, 2002 (Quebec)	Retrospective	Stool	Vaginal	3 months	834	3.2% for stool and 25.9 for flatus
Faltin, 2001 (Switzerland)	Prospective	Stool or flatus	Vaginal	3 and 30 months after delivery	100	17% and 14%
Nazir, 2002 (Norway)	Prospective	Flatus	Vaginal	5 months after delivery	76	25%
Hojberg, 2000 (Denmark)	Cross-section	Stool or flatus		16 weeks gestational age	7557	8.6%
Lal, 2003 (UK)	Retrospective	Stool or flatus	Vaginal	10 ± 2 months after delivery	100	8%

the perinatal period were summarised most notably in a often-quoted Lancet title: ''Where is the M in MCH?'' [13]. While that article focused on issues in developing countries, a similar trend has been observed in Europe and the US: it has become obvious that severe maternal morbidity and even mortality are not just ''concerns of the past'' [9]. In the industrialised world, and in Europe particularly, complacency set in during the 1980s, a feeling that maternal mortality was no longer an issue. This vision was reinforced for health professionals by the official figures for maternal mortality—well below 10 per 100,000, and even below 5 in some countries. It gradually became clear, however, that the situation was not as satisfactory as believed. Four different regional surveys in France in the late 1980's, for example showed that under-registration was still an issue, and the estimate from the national data over a 4 month-period was 50% [8]. More recently, Austria has estimated 36% under-reporting of maternal deaths in their national registration [7], and similar estimates have been cited in other European countries.

The PERISTAT group considered both maternal death and disease to be important health outcome indicators, but had concerns about the validity and feasibility of specific indicators for each. There is no clear-cut way to decide which results in Table 1 come close to capturing the true level of maternal mortality and which do not. Rather than ranking countries based on their reported MMR, we should focus our attention on improving our methodology for finding and describing maternal deaths. Although maternal deaths appear to have increased in recent years according to the US data [14], this is thought to be related to better ascertainment rather than worsening care.

Data quality for maternal deaths must be considered on two levels: ascertainment (completeness of registration) and case description. Improvement of ascertainment has been studied thoroughly and includes all of the following: record linkage (births, deaths, induced abortions, antenatal surveillance program data), a pregnancy check box on the death certificate, and an informant network [9]. Nonetheless, problems remain, even where all these methods are employed. In some European countries, for example, a maternal death of a woman who is an illegal resident or an asylum seeker would not be counted, and the French data often do not include deaths from overseas possessions.

The description and analysis of individual cases includes full discussion of the cause and details of the clinical management, including peer review of possible sub-standard care. The Confidential Inquiry on Maternal Deaths in the UK is often considered to be the model for this procedure. These began more than half a century ago, and they examine all cases of maternal death reported voluntarily by the physicians involved. The cases are then published in a book, easily accessible to professionals and lay people. The book also discusses specific current topics, or presents guidelines related to the results of these enquiries; in the last issue [15], mortality and caesarean section were discussed, and in the previous one, car seat-belts and pregnancy. Other European countries (France, The Netherlands) have now adopted similar procedures, but the results are not yet disseminated as broadly as the UK report. Other countries or regions (Austria and Bavaria, Germany) have incorporated systematic reviews of maternal deaths identified either through death certification or by clinicians involved with the cases.

Each of these models for improving ascertainment or reviewing cases comes with a unique set of advantages for enhancing our understanding of the circumstances surrounding maternal deaths. Each has its own costs and disadvantages as well. It may be that the next appropriate

step towards monitoring maternal mortality in Europe is to develop a common methodology for a European level confidential inquiry. Such an effort would bring us closer to a true measurement of maternal mortality in Europe.

Another important element requiring discussion is the definition of maternal mortality, in terms of both timing of death and attribution of cause. In the WHO International Classification of Diseases through the ninth edition, inclusive, it was restricted to obstetric (direct and indirect) deaths. The tenth revision, however, recommends the collection as well of fortuitous deaths up to 42 days and late deaths up to 365 days, but only if they are obstetrical. A more pragmatic approach can be found in the UK Confidential Inquiry, which collects all deaths between conception and 365 days, which are then presented as direct, indirect, coincidental (or fortuitous), and late. This approach is probably the best in countries with good death certification, because it brings together all the cases and leaves the decision about the cause of death to an expert committee.

A re-coding exercise for maternal deaths by European experts was conducted to assess how classification might affect maternal mortality ratios. The overall number of deaths attributed to obstetric causes increased from 229 to 260, an increase of more than 10% [16]. Another illustration can be seen in the two sets of Flemish data presented in Table 1: those recorded in the SPE database, and those including all deaths to one year. Flanders uses a computer programme that automatically links the death certificate of any women of reproductive age to any birth registered under her name in the preceding 365 days.

Accurate MMRs also require the inclusion of a sufficiently large number of births, certainly no fewer than 100,000. For smaller countries, this will require a span of many years. In the future, another alternative may be to treat the European Union as one entity.

As expected, pregnancy-related mortality was lowest for women aged 20–24 years, as it is in the US [14]. This must be considered in the light of the important demographic shift in the childbearing population throughout Europe, which could, in theory at least, lead to an increase in maternal mortality [17]. It must also be kept in mind when ''comparing'' mortality ratios. Salanave and Bouvier-Colle [18] showed that the difference in maternal mortality between the UK and France disappears after adjustment for age distribution.

The leading causes of death were embolism and haemorrhage. Both should be preventable to a very large extent. Information about indirect and other direct causes was sparse, but for further European work full details about such rare conditions as cardiomyopathy should also be available. Violent deaths are another cause for concern. Homicide and suicide may be important but sometimes hidden sources of maternal deaths as the last UK Confidential Inquiry discussed; though others have found that pregnant women experience less violence than the wider population of women of reproductive age [23].

Mortality data by mode of delivery are only available for a few countries. Death is least likely with spontaneous vaginal births, and most likely with caesarean deliveries, but our data do not now allow us to distinguish between caesareans for maternal conditions from those in low-risk situations such as breech or repeat caesarean. The priority here should be to establish a common definition and to collect deaths during or after caesareans by indication and emergency status, as has been done in the UK Confidential Inquiry. Like maternal age, caesarean rates are increasing, both for risk-factor caesareans and elective caesareans [19]. It is more frequently acknowledged that there may sometimes be a conflict of interest between the mother and the child [20].

Severe maternal morbidity is estimated to range between 9.5 and 16 cases per 1000 deliveries throughout Europe [21]. Attention to this factor as a marker of the quality of obstetric care represents a relatively recent shift in interest, from maternal deaths. In essence, it broadens the scope of inquiry to include what have been termed ''near-miss'' cases, where a death was narrowly averted. The main rationale for measuring severe maternal morbidity is to gain better understanding of differences in mortality ratios. In effect, these are related both to the prevalence of the morbid condition and to the likelihood of dying from the condition when it occurs. Measures that address morbidity include the diagnosis of specific pathologies (haemorrhage, eclampsia), medical interventions, including blood transfusions, and transfers to intensive care units. Thus, there is no widely accepted definition or inclusion criterion for the conditions that constitute severe maternal morbidity.

The PERISTAT group agreed on an operational definition that, as discussed by Geller et al. [1], includes markers of both conditions and interventions and consists of the following components:

The number of women experiencing any combination of the following conditions or procedures as a proportion of all women delivering live and still-born babies:

(1) eclamptic seizures;
(2) surgery (other than tubal ligation or caesarean section) or embolisation;
(3) blood transfusion;
(4) ICU >24 hours.

Each component of the indicator should be identified and quantified separately in the data compilation. These were selected because they were believed to combine three important aspects: unequivocal definition, clinical relevance and feasibility. It is likely however that surveys rather than routine hospital discharge data will be required to ensure good quality.

Finally, the group selected faecal incontinence as a priority indicator for further development. This choice reflects the increasing interest in and research attention to this issue, which can be observed in the published literature. This long-term consequence of pregnancy is not found in routine data and would require a survey for collection. Many questions

about it remain unanswered, including its relation to mode of delivery, real prevalence, burden, etc. This new issue in obstetric management has until now been a cause of concern mainly in Nordic and English-speaking countries. A European endeavour would be very interesting.

In conclusion, the group agreed that morbidity studies are desirable, but that improving maternal mortality data remains the priority. It may seem strange that maternal mortality, as rare as it may be in Europe, is still an important measure. Nonetheless, several considerations make it relevant: (i) death in childbirth is a major disaster not only for a young (and generally healthy) woman, but also for her spouse and children; (ii) it can be equated with death in service to the community (anonymous, 1994); (iii) it is potentially trans-generational [22]; and (iv) it is generally considered to reflect quality of care.

Appendix A. Data sources used for constructing PERISTAT tables

Member state	Coverage (if not national)	Data source	Year(s) provided	Abbreviation	Total births
Austria		Confidential Inquiry Division of Epidemiology Institute of Cancer Research	2000/2001	A2-2000–2001	152684
Belgium		National Institute of Statistics and Scientific Institute of Public Health	1995	B1-1995	116122
Belgium	Flanders	Studiecentrum voor Pernatale Epidemiologie (SPE)	2000	B2-2000	62122
Belgium	Flanders	Ministrie van Vlaamse Gemeenschap–Administatie gezondheidszorg	2000	B4-2000	62585
Denmark		Danish perinatal database	2000	DK1-2000	67337
Finland		Medical birth registry—STAKES	2000	FIN1-2000	56768
Finland		Cause of death registry—Statistics Finland	2000	FIN2-2000	
Finland		Population statistics—Statistics Finland	2000	FIN5-2000	
France		INSEE	2000	F2-2000	778341
France		CepiDC	1999	F3-1999	
France		Confidential Inquiry on maternal mortality	1998–1999	F4-9899	
Germany	Bavaria	Maternal mortality committee	1999–2000	D3-1999–2000	120000 per year
Ireland		Birth Registration System	1999	IR2-1999	54242
Italy		ISTAT, civil birth and death registration. Discontinued in 1998	1998	I-1998	533808
Luxembourg		National Statistics on cause of death	2000	L1-2000	n/a
Luxembourg		FIMENA 2000	2000	L2-2000	5430
Luxembourg		Annuaire Statistique 2001	2001	L3-2000	5723
The Netherlands		Merged database from professional registers. LVR: data on course of pregnancy and delivery. LNR: diagnoses of the child, duration of hospital stay, treatments	1999	NL-1999	201600
Portugal		Estatisticas Demograficas			
Estatisticas de Saude INE, Instituto Nacional de Estatistica	1999	P1-1999	120871		
Spain	Madrid, Valencia, Pais Vasco (74% of births)	Spanish Society of Neonatology	2000	E2-2000	86656 (live births)

Appendix A. (*Continued*)

Member state	Coverage (if not national)	Data source	Year(s) provided	Abbreviation	Total births
Sweden		Medical Birth Register	2000	S1-2000	89722
Sweden		Vital records linkage	1996–2000	S2-1996–2000	
United Kingdom	England and Wales	Office for National Statistics. Civil registration.	2000	UK1-2000	607644
United Kingdom	Scotland	General Register Office, Scotland. Civil registration.	2000	UK2-2000	53076 (live births)
United Kingdom	Northern Ireland	General Register Office, Northern Ireland. Civil registration.	2000	UK3-2000	21512 (live births)
United Kingdom		Report on combined data from separate confidential enquiries into maternal deaths in England, Wales, Scotland and Northern Ireland.	1997–1999	UK12-1997–1999	2123614 (maternities)

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