CHAPTER 22

Confidential Enquiries into Maternal Deaths: developments and trends from 1952 onwards

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Introduction

It is often stated that confidential enquiries into maternal deaths started in 1952, but what actually happened in that year was a major development in a system which had already been established in 1928 and had its roots in enquiries in the 19th and early 20th centuries (Figure 22.1). Because of concern about the persistently high level of maternal mortality, local enquiries into individual maternal deaths started in Aberdeen in 1917 and led into major national enquiries in Scotland, England and Wales in the 1920s and 1930s.[1–8] These formed part of wider investigations of maternal mortality which looked at the provision of services, maternal morbidity and the social backgrounds of the women who died.

In its final report, published in 1932, the Departmental Committee on Maternal and Morbidity expressed the view that the confidential enquiries into individual deaths were valuable and recommended that they should continue in a modified form. The Ministry of Health responded by sending out a circular in August 1932 to all maternity and child welfare authorities asking them to continue the reporting and enclosing a revised form 97MCW for them to use in compiling confidential reports to be returned directly to the Chief Medical Officer.[9] George Gibberd and Arnold Walker, who had acted as Obstetric Assessors for the Committee's Enquiry agreed to continue their work. Data about maternal deaths from summaries of these enquiries were published in the Annual Report of the Chief Medical Officer and used to inform special enquiries, such as that of the Interdepartmental Committee on Abortion.[10]

Over the same period, the decline in maternal mortality from the late 1930s onwards shown in Figure 22.2 was investigated in analyses of death registration data. In 1939, Richard Titmuss analysed the initial decline by comparing the rate in the years 1935–37 combined with the rate in the years 1929–31 in groups of the more populous counties. He found that the decrease was 31% in the counties of London and Middlesex, 22% in Hertfordshire, Bedfordshire, Essex and Yorkshire, but only 9% in Durham, 6% in Lancashire, and 5% in Warwickshire and Staffordshire, while the rate had risen by 2% in Glamorgan.[11]

A series of analyses in the early 1950s analysed the major downwards trends shown in Figure 22.2.[12–14] They pointed to major therapeutic advances which had played a part, notably prontosil, sulphonamides and penicillin in the case of puerperal deaths from sepsis and blood transfusions in the case of haemorrhage. They also suggested that other factors were likely to have contributed, including social improvements or better access to health care following the 1936 Midwives Act. One of the articles, published in 1951, pointed out that services needed to be organised in a way that would enable women

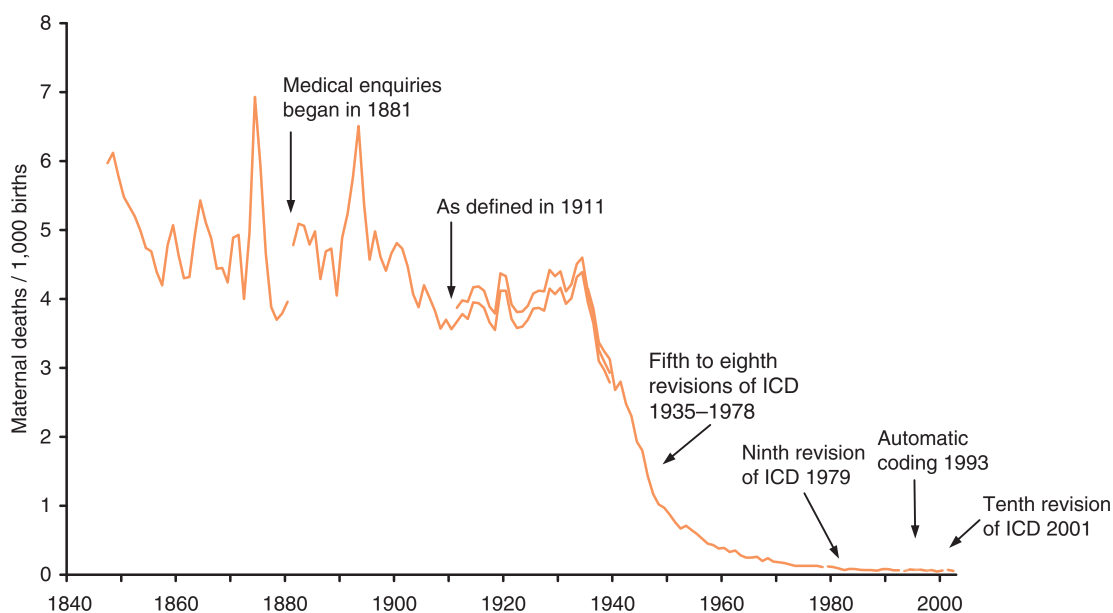

Figure 22.1 Maternal mortality; England and Wales 1847–2002
Source: General Register Office, OPCS and ONS mortality statistics reproduced in *Birth Counts*. Tables A10.1.1–A10.1.4

with complications to access maternity care: "The constant point of view underlying this analysis of maternal deaths is that, despite their infrequency, they should still be regarded as a problem requiring continuous scrutiny and possibly a shift of emphasis in the measures taken to eliminate them".[13]

By the early 1950s, reporting to the Ministry of Health had ceased in some areas and was incomplete in others.[16] This, together with a desire for more detailed information and a

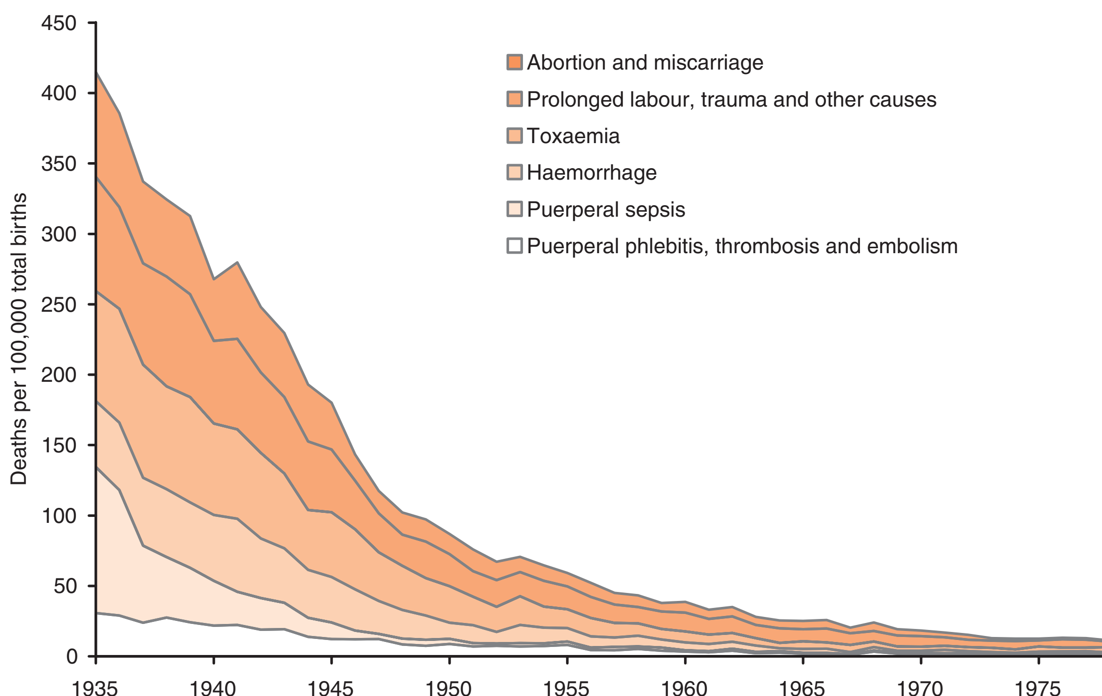

Figure 22.2 Maternal mortality by underlying cause; England and Wales 1935–78
Source: General Register Office and OPCS, Reproduced in *Birth Counts*, Table A10.1.3

review of the clinical care of individual patients led to the establishment of a new system. According to the Ministry, "Its prime purpose was to place the clinical enquiries and assessment of avoidable factors in the hands of practising consultant obstetricians".[15] A *British Medical Journal* editorial, which welcomed the first triennial Report covering the years 1952–54, described the changes made: "In 1951, however, the study, and method of assessment of maternal deaths was broadened and more information obtained. A maternal death is now noted by the medical officer of health of the local health authority and he initiates the inquiry. The local consultant obstetrician obtains all the information possible from those who were in attendance on the patient – midwife, family doctor, hospital or local authority staff".[16]

The new system involved assessment by an experienced obstetrician at regional level in England and at a national level in Wales. The assessors' reports were then sent to the Chief Medical Officer and were finally assessed and classified by the Ministry's consultant advisers on obstetrics. One of these was Arnold Walker, who had been involved with the previous enquiries since 1928. He and another obstetrician, AJ Wrigley, continued as Advisers until they retired in 1966. Similar systems were introduced in Northern Ireland in 1956 and in Scotland in 1965.

A fuller account of developments in Enquiries earlier in the 20th century can be found in Appendix 3 of the 1997–99 Report. This chapter focuses on trends and developments in the triennial enquiries from 1952–54 to 2000–02. In doing so, it follows in the footsteps of the Alec Turnbull's retrospective overview published in the 1982–84 Report, the last for England and Wales on its own. Since 1985–87, reports have covered the United Kingdom as a whole. Because of the small numbers of deaths involved, it was no longer feasible for Scotland and Northern Ireland to continue publishing separate reports. Appendix 3 lists all the Reports published to date.

Scope of the Reports and the agenda for Enquiries from 1952 onwards

A broad picture of the changing agenda of the Enquiry can be gained from the chapter titles in each Report, summarised in Table 22.1. These reflect the way that some causes, such as abortion, ectopic pregnancy and ruptured uterus have become relatively less common and are no longer the subject of whole chapters, while others such as amniotic fluid embolism were not recognised in the 1950s. Other causes of death have increased in relative importance in the context of an overall decline, for a variety of reasons. This includes fuller ascertainment and changes in the agenda to take greater account of the social factors leading to maternal death. The separate chapter on caesarean section was dropped at a time of rising caesarean sections rates because of the incompleteness of data about numbers of deliveries by caesarean section in the United Kingdom.

Another indication of the widening scope of the enquiries is the range of professions represented among the Ministry's consultant advisors and assessors. The two consultant obstetricians were joined by an anaesthetist in 1955–57. In 1980, a pathologist was added to the group. A major expansion occurred in 1985–87 when consultants from each discipline from each of the four countries of the United Kingdom were brought together in a 'clinical subgroup'. The range of disciplines expanded in the 1990s. A physician was added to the Central Assessors in 1991–93 and midwives joined regional

Table 22.1 Chapter headings in the triennial Reports

	1952–54	1955–57	1958–60	1961–63	1964–66	1967–69	1970–72	1973–75	1976–78	1979–81	1982–84	1985–87	1988–90	1991–93	1994–96	1997–99	2000–02
Toxaemia/eclampsia/hypertension	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Haemorrhage	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Pulmonary embolism	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Abortion	•	•	•	•	•	•	•	•	•	•	•						
Ectopic pregnancy					•	•	•	•	•	•	•						
Early pregnancy deaths												•	•	•	•	•	•
Amniotic fluid embolism				•	•	•	•	•	•	•	•	•	•	•	•	•	•
Sepsis					•	•	•	•	•	•	•	•	•	•	•	•	•
Sudden death		•															
Ruptured uterus		•	•	•	•	•	•	•	•	•	•						
Genital tract trauma												•	•	•	•	•	•
Miscellaneous causes					•	•	•	•	•	•							
Other direct deaths											•	•	•	•	•	•	•
Anaesthesia	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Caesarean section	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
Cardiac disease	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
Asian influenza 1957		•															
Psychiatric causes															•	•	•
Malignancies																•	•
Associated causes						•	•	•	•	•							
Indirect causes											•	•	•	•	•	•	•
Fortuitous deaths											•	•	•	•	•	•	•
'Late' deaths										•	•	•	•	•	•	•	•
Pathology									•	•	•	•	•	•	•	•	•
Intensive care														•	•	•	•
Midwifery practice															•	•	•
Domestic violence																•	•
Near misses and severe morbidity																•	•
Booking arrangements			•	•	•	•	•	•	•								
Avoidable factors	•	•	•	•													
Substandard care														•			
Factors influencing maternal mortality					•	•	•	•	•								
Trends in maternal mortality													•	•	•	•	•
Maternal mortality in Europe													•				

panels. A midwife and a psychiatrist were appointed as Central Assessors in 1994–96 and an intensive care specialist in 1997–99.

These professionals have made a major contribution to the enquiries but the crucial role has always been played by the 'women from the Ministry'. Medical staff in the Ministry of Health, subsequently the Department of Health and Social Security and the Department of Health, have been responsible for the day-to-day running of the Enquiries at a national level. Statistical help has been provided successively by the General Register Office, the Office of Population Censuses and Surveys and, since 1996, the Office for National Statistics.

Trends in maternal mortality since 1952

Trends in numbers and rates of maternal death reported to the Enquiries before 1985–87 are shown later and compared with data from civil registration. In trying to interpret trends in mortality over half a century, two major issues arise. The first is changes in definition and the second is completeness of ascertainment.

Table 22.2 Use of revisions of the International Classification of Diseases

Revision of the ICD	Introduced in England and Wales for coding death certificates
Fifth revision	1940
Sixth revision	1950
Seventh revision	1958
Eighth revision	1968
Ninth revision	1979
Tenth revision	2001

Changes in classification

The ways in which maternal and indeed all other deaths are classified changes each time a new revision of the International Classification of Diseases (ICD) is introduced. As well as reflecting changes in perceptions of causality and advances in knowledge, the amount of detail used in coding specific causes may reflect their contribution to overall mortality. Table 22.2 shows the years when each revision was introduced in England and Wales. As the Confidential Enquiry process involves retrospective reviews which can lead to different causes being assigned, this can result in new revisions of the classification being applied to data for years preceding those in which they were used for coding death certificates.

As far as maternal mortality was concerned, the fifth to eighth revisions of the ICD had a fairly consistent structure, making it possible to construct the trends in registered maternal deaths shown in Figure 22.2 and those in deaths reported to the enquiries up to 1978, shown in Table 22.3. A death was either described as a 'true maternal death', with

Table 22.3 Main causes of true maternal deaths reported to confidential enquiries; England and Wales 1952–78

Cause	1952–54	1955–57	1958–60	1961–63	1964–66	1967–69	1970–72	1973–75	1976–78
					Numbers reported				
Abortion	153	141	135	139	133	117	81	29	19**
Pulmonary embolism	138	157	132	129	91	75	61	35	45
Haemorrhage	220*	138	130	92	68	41	27	21	26
Hypertensive diseases of pregnancy	246	171	118	104	67	53	47	39	29
All other causes	369	254	227	228	220	169	139	111	108
All	1,094	861	742	692	579	455	355	235	227
					Rates per million maternities				
Abortion	74.5	66.7	58.8	55.1	51.1	47.6	35.2	15.1	10.9
Pulmonary embolism	67.2	74.3	57.5	51.2	35.0	30.5	26.5	18.2	25.7
Haemorrhage	107.2*	65.3	56.7	36.5	26.2	16.7	11.7	10.9	14.9
Hypertensive diseases of pregnancy	119.8	80.9	51.4	41.3	25.8	21.6	20.5	20.3	16.6
All other causes	179.7	120.2	98.9	90.5	84.6	68.8	60.5	57.8	61.7
All	532.9	407.4	323.4	274.6	222.7	185.2	154.5	122.3	129.8
Deaths known to Registrar General	1,404	1,112	928	816	671	527	387	254	228
Percentage reported to Enquiry	77.9	77.4	80.0	84.8	86.3	86.3	91.7	92.5	99.6*

* Corrected figures
**Including five deaths from anaesthesia associated with operations for abortion for comparison with previous triennia*
Source: Confidential Enquiries into Maternal Deaths in England and Wales and Birth Counts[17] Table 10.4.1

an underlying cause in the chapter used to code conditions of pregnancy, childbirth and the puerperium or as an 'associated death' of a woman known to have been pregnant but having an underlying cause in another chapter of the ICD.[18]

In the ninth revision of the ICD, a major change in structure was introduced, with the introduction of the definitions of 'direct' and 'indirect' maternal deaths set out in Section 1 of this Report.[19] Some of what had been formerly classified as 'associated' deaths were considered 'indirect' and allocated the relevant codes within the chapter of the ICD relating to 'conditions of pregnancy, childbirth and the puerperium' while others were categorised as 'fortuitous'. As Chapter 1 of this Report points out, countries differ in what they include in the 'indirect' category.[20] In particular, suicide and other deaths from psychiatric causes are considered by the compilers of international classifications to be fortuitous rather indirect, but have increasingly been categorised as *Indirect* over the past five triennia in the Confidential Enquiries in the United Kingdom.

The same structure was maintained in the tenth revision of the ICD, used in 2000–02 in this Enquiry.[21] It has also been used from 2000 onwards for coding death certificates in Scotland and from 2001 for coding death certificates in England, Wales and Northern Ireland. Although the term 'late maternal death' did not appear in the ICD until the tenth revision, the concept was used from a much earlier stage, both when reporting data from death registration[17] and in the Confidential Enquiries, as Table 22.1 shows. They have been the subject of a separate chapter since 1979–81, but were discussed in earlier Reports. Although the ICD still uses the term '*Fortuitous*', the term '*Coincidental'* has been used since 1997–99 to describe these deaths in the Confidential Enquiry Reports.

In the Confidential Enquiries, deaths in earlier triennia were re-categorised retrospectively. Table 22.4, taken from the Report for 1982–84, shows *Direct* maternal deaths in England from 1970–72 to 1976–78 re-categorised in this way and Table 22.5, taken from the same Report, shows how deaths previously classed as associated deaths were categorised subsequently. Tables 22.6 and 22.7 summarise deaths reported to Confidential Enquiries in Scotland and Northern Ireland.

Increasing completeness of ascertainment

Completeness of ascertainment, discussed in Chapter 1 with respect to changes in the methods used to code causes of death on death certificates and linkage studies in England and Wales from the mid-1990s onwards, has always been an issue. In the early years, the major problem was under-reporting compared with death registration. The *British Medical Journal* leader on the 1,094 deaths classified as due to pregnancy and childbirth and 316 deaths classified as due to associated causes in 1952–54 Report commented that "This figure represents only 71% of the total registered maternal deaths. It is to be hoped that in the future all maternal deaths will be included. There is no question of the Ministry searching for a scapegoat and exposing a person or institution to public condemnation: it is only by revealing deficiencies in the maternity services that preventable deaths will be eliminated, administration improved, and maternity made safer".[16]

As Table 22.3 shows, 77.9% of registered true maternal deaths were included in the Enquiries in 1952–54 and this dropped marginally to 77.4% in the next triennium before gradually increasing until 99.6% of true maternal deaths were included in 1976–78. Figure 22.3 compares 'true' maternal mortality rates from death registration and the Enquiry up to 1978, the last year in which the eighth revision of the ICD was used.

Table 22.4 Causes of *Direct* maternal deaths reported to the Confidential Enquiries; England and Wales 1970–84

Causes of *Direct* maternal death	1970–72	1973–75	1976–78	1979–81	1982–84
			Numbers reported		
Pulmonary embolism	51	33	43	23	25
Hypertensive diseases of pregnancy	43	34	29	36	25
Anaesthesia	37	27	27	22	18
Amniotic fluid embolism	14	14	11	18	14
Abortion	73	27	14	14	11
Ectopic pregnancy	34	19	21	20	10
Haemorrhage	30	21	24	14	9
Sepsis, excluding abortion	30	19	15	8	2
Ruptured uterus	11	11	14	4	3
Other direct causes	20	22	19	19	21
All deaths	343	227	217	178	138
			Rates per million pregnancies*		
Pulmonary embolism	17.6	12.8	18.5	9.0	10.0
Hypertensive diseases of pregnancy	14.9	13.2	12.5	14.2	10.0
Anaesthesia	12.8	10.5	11.6	8.7	7.2
Amniotic fluid embolism	4.8	5.4	4.7	7.1	5.6
Abortion	25.3	10.5	6.0	5.5	4.4
Ectopic pregnancy	11.5	7.4	9.0	7.9	4.0
Haemorrhage	10.4	8.1	10.3	5.5	3.6
Sepsis, excluding abortion	10.4	7.4	6.5	3.1	1.0
Ruptured uterus	3.8	4.3	6.0	1.6	1.2
Other direct causes	6.9	8.5	8.2	7.5	8.4
All deaths	118.7	88.0	93.4	70.0	55.0
			Rates per million maternities		
	154.3	122.6	121.8	93.1	72.4
			Thousands		
Estimated number of pregnancies*	2,890.7	2,578.4	2,323.8	2,543.2	2,507.0
Estimated number of maternities	2,222.5	1,851.9	1,781.3	1,910.9	1,905.8

* Pregnancies leading to registrable births, legal abortions or hospital stays for miscarriage or ectopic pregnancy
Source: Confidential Enquiries into Maternal Deaths in England and Wales, 1982–84, Tables 1.7, 18.1 and 18.2 and Birth Counts[17] Table 10.4.2

Table 22.5 Numbers of associated, indirect, and fortuitous deaths, England and Wales, 1952–84

	'Associated'		Indirect	Fortuitous
	All	Excluding late deaths		
1952–54	316			
1955–57	339			
1958–60	254			
1961–63	244			
1964–66	176			
1967–69	246	221		
1970–72	251	206		
1973–75	155	111		
1976–78		134	78	56
1979–81		121	90	31
1982–84		105	72	34

Late deaths from 1967–69? onwards are excluded from this table.
Source: *Report on confidential enquiries into maternal deaths in England and Wales, 1982–84*, Table 19.6

Table 22.6 Maternal deaths by diagnostic group; Scotland 1965–85

Diagnostic group	1965–71	1972–75	1976–80	1981–85	1986–90	1965–71	1972–75	1976–80	1981–85	1986–90
	Numbers					Rates per million maternities				
Pulmonary embolism	25	3	7	8	..	38.1	10.3	21.3	24.2	..
Cardiac	18	5	2	8	..	27.5	17.1	6.1	24.2	..
Ectopic	3	5	1	5	..	4.6	17.1	3.0	15.1	..
Amniotic fluid embolism	7	5	6	3	..	10.7	17.1	18.3	9.1	..
Anaesthetic complication	5	7	6	3	..	7.6	24.0	18.3	9.1	..
Pregnancy hypertension	17	3	4	2	..	25.9	10.3	12.2	6	..
Sepsis	18	5	1	1	..	27.5	17.1	3.0	3.0	..
Dystocia	7	0	1	1	..	10.7	–	3.0	3.0	..
Abortion	14	11	5	1	..	21.4	37.7	15.2	3.0	..
Vesicular mole	1	1	0	0	..	1.5	3.4	–	–	..
Haemorrhage	16	9	7	0	..	24.4	30.9	21.3	–	..
Other *Direct* or *Indirect*	35	15	24	12	..	53.4	51.4	73.1	36.3	..
All *Direct* or *Indirect*	166	69	64	44	27	25.3	23.7	19.5	13.3	8.3
Other *Fortuitous*	22	23	19	11	..	3.4	7.9	5.8	3.3	..
All maternal deaths	188	92	83	55	..	28.7	31.5	25.3	16.6	..
Maternities	655,551	291,615	328,304	330,746	325,783					

Source: Scottish Home and Health Department, *Reports on maternal and perinatal deaths in Scotland*, *1981–85, 1986–90* and Birth counts[17], Table A10.4.4
The numbers of deaths in 1986–90 were too low for analysis by diagnostic group

Table 22.7 Main causes of true maternal deaths reported to Confidential Enquiries; Northern Ireland 1956–84

Cause	1956–59	1960–63	1964–67	1968–77	1978–84
			Numbers reported		
Abortion	1	2	5	7	1
Ectopic pregnancy	1	1	1	2	2
Haemorrhage	23	9	2	9	3
Hypertensive disease	25	15	9	6	6
Pulmonary embolism	12	6	11	3	0
Sepsis	15	3	2	2	1
Associated with anaesthesia	3	3	2	5	2
Associated with, but not necessarily due to caesarean section	15	10	1	14	*
Rupture of the uterus	3	3	1	2	2
Cardiac disease*	13	13	11	6	3
Miscellaneous	0	0	0	1	3
Total deaths reported to the Enquiry**	116	61	37	54	23
			Rates		
Deaths per 100,000 maternities	–	–	27.2	18.4	12.0
Deaths per 100,000 live births	96.1	47.0	27.4	18.4	12.0
			Numbers reported		
Maternities	–	–	135,819	294,014	191,778
Live births	120,707	129,883	134,878	293,734	192,277

* Not given explicitly for 1978–84
** Numbers and percentages may exceed the total as some deaths were included in more than one category
Source: Confidential Enquiries into Maternal Deaths in Northern Ireland and Birth Counts[17] Table A10.3.5

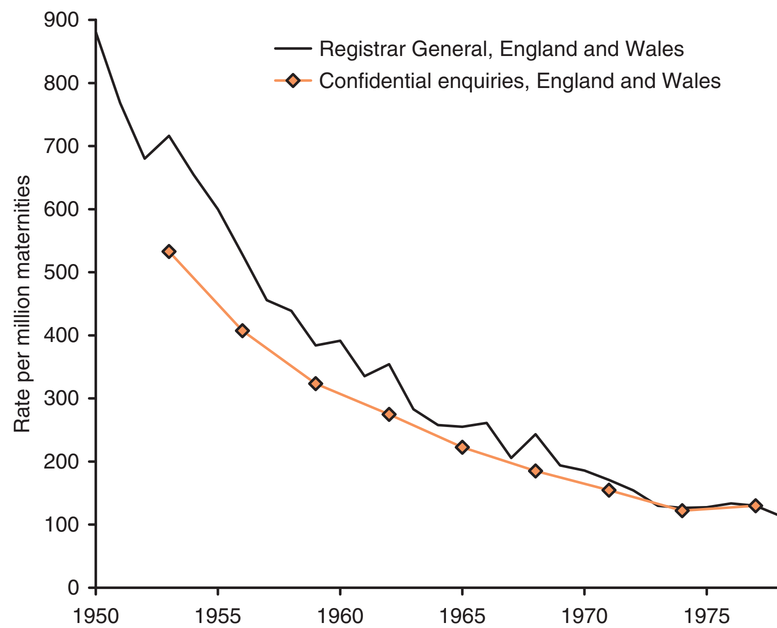

Figure 22.3 'True maternal deaths' reported to Confidential Enquiries and derived from death registration; England and Wales 1950–78
Source: Confidential enquiries and death registration

Crosschecks were made between the two and it was reported that the distribution by very broad cause was similar for death registration and the enquiries. It was difficult to make direct comparisons as the Enquiry Assessors reassigned some of the causes of death on the death certificates in the light of the fuller information assembled for the enquiries. In addition, even in the pre-computer era, the Enquiry brought to light deaths which had not been classified as maternal on death certificates. For example, in 1955–57, there were 361 deaths registered by the Registrar General which had not been reported to the enquiries but an additional 96 deaths which, "due to faulty or incomplete certification of death, were not registered as maternal deaths by the Registrar General".

The situation is now different, as Table 1.1 shows. All the deaths known to the Registrars General are now included in the Enquiries, together with the further deaths which did not originally have maternal underlying causes and those where the pregnancy was not even mentioned. These are ascertained in the ways described in Chapter 1.

Trends up to 2002 in the causes of maternal death which were the leading causes in the early 1950s, are shown in Figure 22.4, drawn on a common scale. For comparative purpose, mortality rates derived from death registration up to 1978 are shown to give a fuller picture of trends in the first 25 years.

The leading cause of death in 1952–54 was those attributed at various periods to toxaemia, hypertension or eclampsia. Rates were already falling in the 1950s, as Figure 22.2 shows, and continued to fall rapidly up the mid 1960s. The decline has been much slower since then and pregnancy-induced hypertension was still one of the leading causes of death in 2000–02.

Mortality attributed to haemorrhage was also high in 1952–54 but already falling, probably because of widening access to blood transfusion. Rates have fluctuated about a similar level since the 1980s and the disappointing upturn in 2000–02 could well be part of this longer-term pattern.

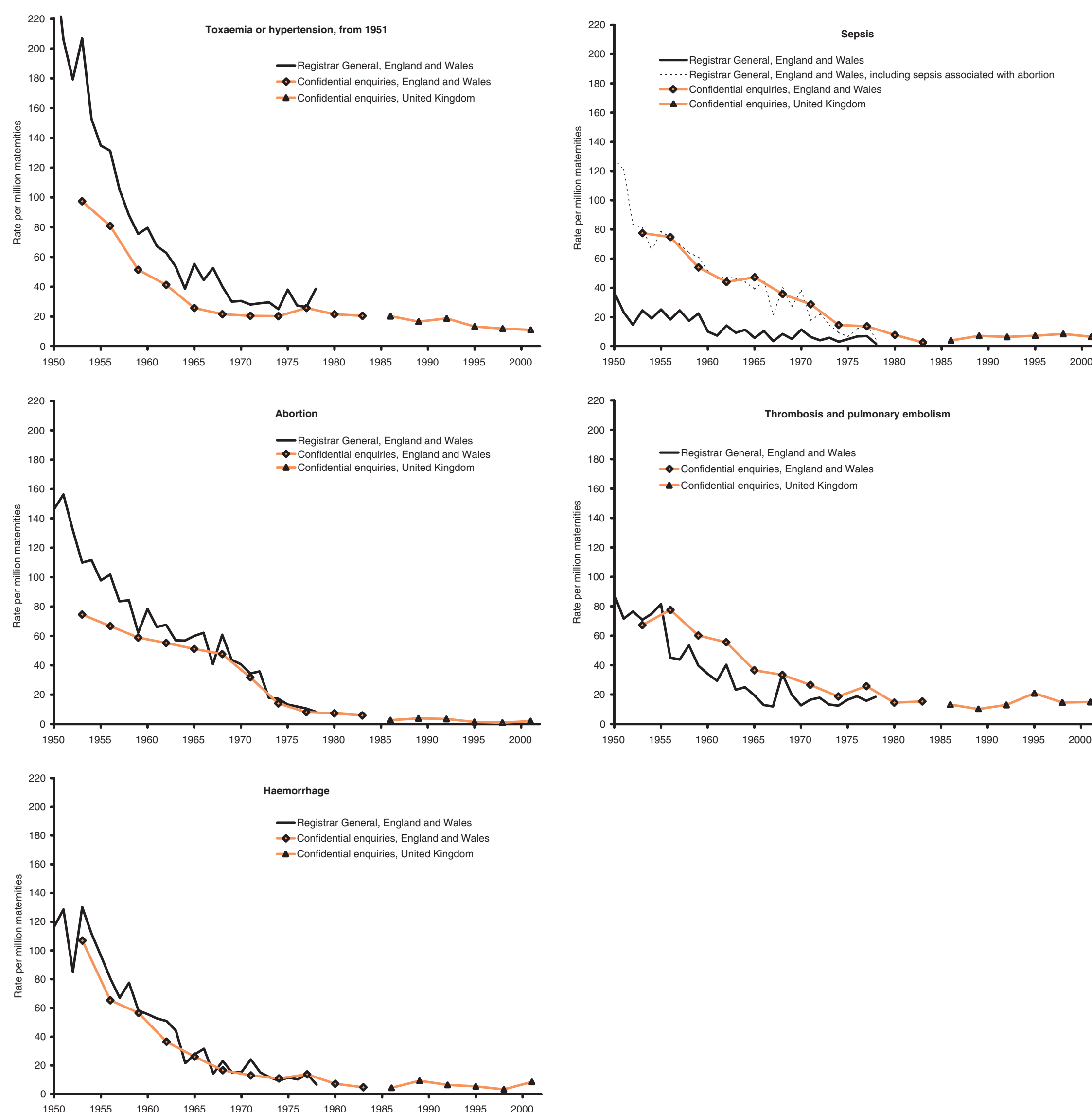

Figure 22.4 Trends in rates of maternal death by leading cause reported to confidential enquiries: England and Wales, 1952–84, United Kingdom 1985–2002 and rates of maternal death registered in England and Wales, 1950–78
Source: Confidential enquiries and death registration

Mortality attributed to thrombosis and pulmonary embolism based on reports to the enquiries was higher than that among registered deaths in seven of the first nine triennia. This, along with the slow nature of the decline, the reported increase in 1994–96 and its persisting position as the leading cause of direct death in 2000–02 may be a consequence of improved ascertainment. Nevertheless the reported rate for 2000–02 remains at nearly a quarter of the rate for 1952–54.

The rate of deaths attributed to abortion and miscarriage declined relatively slowly in the 1950s and 1960s. The role of antibiotics and the changing nature of puerperal sepsis undoubtedly had an impact on death rates from septic abortion.[22] Rates fell quickly, although not instantly, in the aftermath of the implementation of 1967 Abortion Act. Commenting on the first signs of a downturn in 1969, the 1967–69 Report suggested that the availability of contraception under the NHS from 1967 onwards should also have contributed to it. The timing of trends reflects the time it took to establish

contraceptive services and safe services for termination of pregnancy and ensure that they were accessible to women who need them.

Deaths from the consequences of miscarriage and abortion had virtually but not completely disappeared from the scene by 2000–02, when the majority of early pregnancy deaths were associated with ectopic pregnancy. Trends in deaths from sepsis overall are difficult to interpret in the early triennia, as deaths from septic abortion were not initially separated from post-abortive sepsis. Overall rates had fallen dramatically since the mid-1930s, as Figure 7.1 (page 110) shows, and the major drop in deaths from abortion contributed substantially to the further decline in the 1970s. After this, the rate levelled off.

Trends in deaths from 'associated causes' are difficult to interpret, because of their subsequent subdivision into *Indirect* and *Fortuitous* and the further subdivision into deaths before 42 days after the end of a pregnancy and *Late* deaths. This is further compounded by changing views about which deaths should be included and increasing levels of ascertainment, notably as a result of changes in the processing of death registration data and the linkage exercise described in Chapter 1. Nevertheless, two aspects stand out from the rest. The first is the decline in numbers of deaths associated with rheumatic heart disease in pregnancy, as the disease itself declined in the 1950s and 1960s. In 1952–54, 38.2% of associated deaths were attributed to cardiac disease as a whole, falling to 16.% in 1973–75. The second is the considerable mortality in 2000–02 from suicide and misadventure in the first year after women gave birth which was revealed by the ONS record linkage exercise.

'Avoidable factors' and 'substandard care'

As the 1952–54 Report commented with respect to the earlier enquiry, "One of the chief features of the investigation initiated by the Departmental Committee was the assessment of what was termed the 'primary avoidable factor' in the circumstances of a maternal death, that is some departure from the (then) accepted standards off satisfactory care, from which ensued the train of events resulting in the death". The same concept was used from 1952–54 onwards, but the procedures and the criteria adopted were made more stringent. Whereas the earlier procedure used a questionnaire "which seldom derived from consultant opinion", from 1952 onwards, a consultant obstetrician was involved in compiling the Report locally, in addition to the obstetricians involved at regional and national levels. It was stated that "practical and generally accepted standards, attainable under average practice conditions, have been applied rather than an ideal". The Report went on to acknowledge that "It is not, of course, suggested that, in all cases in which avoidable factors were considered to be present, death could have been certainly prevented, but the presence of an avoidable factor is regarded as an indication that the risk of death could have been, at least, materially lessened". This was reiterated in subsequent Reports.

The subjective nature of the process was acknowledged on a number of occasions. For example, in the 1967–69 Report, the Assessors commented on this: "For example they have not assessed the use of utus paste to induce abortion as an avoidable factor, even though some consider this to be hazardous; neither has the failure to use anticoagulant drugs in the prevention or treatment of thromboembolic disease been regarded as an

avoidable factor". In contrast, an avoidable factor was always considered to be present in illegal abortions.

The Assessors attributed responsibility for avoidable factors to specific categories of staff or to the patient or relatives. The 1952–54 Report stated that "In no case has a patient's refusal to accept termination of pregnancy or to practise contraception been regarded as an avoidable factor". This was reiterated in subsequent Reports and the 1964–66 Report, published in 1969, drew attention to the fact that the National Health Service (Family Planning) Act, which came into force in 1967, had made contraception available under the NHS.

The way in which responsibility was attributed changed over time. The 1958–60 Report commented that. "In order to avoid unjust imputation of blame to persons or to particular professional groups, it was decided in the Report for 1955–57 to ascribe the avoidable factors to the services in which they were made, that is domiciliary or hospital, except where the patient herself contributed to her death. The factors were further subdivided into the period of pregnancy or childbirth in which they occurred. In this Report, it has been decided to ascribe the factor to the person who was responsible for the mistake". This raised questions about the extent to which experienced staff were responsible for actions taken, in their absence, by less experienced staff.

The term 'substandard care' superseded 'avoidable factors' in the 1979–81 Report onwards. "This is because the term was sometimes misinterpreted to mean that avoiding these factors would have prevented the death. The term 'substandard care' has been used to take into account not only failure in clinical care but also some of the underlying factors which may also have produced a low standard of care for the patient. These include shortage of resources for staffing facilities and administrative failure in the maternity services and back-up facilities such as anaesthetic, radiological and pathology services."

Booking arrangements

A recurring feature in the discussion of 'avoidable factors' in the early Reports was booking for delivery, at a time when there were not enough hospital beds for the women who wanted to give birth in hospital. Although the beds should have been allocated on the basis of need for hospital care, this did not necessarily happen in practice. The 1955–57 Report contained may references to the need for better selection of women for hospital care, based on its definition of the 'priority classes', which were categories of women with high maternal mortality rates. It was pointed out in the 1958–60 Report that it was usual to list the indications for hospital care, but the report suggested that it would be simpler to list criteria for delivery at home or in a GP maternity home. These criteria were:

1. As far as can be ascertained, the woman's general physical state is unimpaired.
2. She is pregnant for the second, third or fourth time, the previous pregnancies, labours and puerperia have been normal and she is under 35 years of age.
3. She is a primagravida under 30 years of age.
4. She is rhesus positive or is known to have no antibodies.
5. The home conditions are suitable.

Table 22.8 Numbers of true and associated maternal deaths by initial place of booking, England and Wales; 1961–81

	1961-63	1964–66	1967–69	1970–72	1973–75	1976–78	1979–81
Domiciliary	194	125	68	34	7	6	4
General practioner (all)	96	76	77	60	32	34	24
Separate						10	7
With consultant unit						24	17
Private nursing home		8	1	2	1	1	1
Consultant unit	428	349	352	285	226	224	213
Armed forces hospital		0	0	4	2	2	2
No booking made	218	190	166	148	68	82	46
No information		7	34	16	2	2	9
Total	936	755	698	549	338	351	299

Late deaths are excluded for 1970–72 onwards
Source: Reports on Confidential Enquiries into Maternal Deaths, 1961–63, 1967–69, 1979–81

From 1961–63 to 1976–78, the Reports had a separate chapter on booking arrangements. This was dropped when the structure was organised in 1979–81, on the grounds that "it no longer provided much relevant information". This is not surprising, as, by 1986, when the 1979–81 Report was published, only 0.9% of deliveries in England and Wales took place at home, compared with 28.6% in 1964. Deliveries in isolated GP units had fallen from 12.3% of all deliveries in 1969 to 2.3% in 1986.[17] As Table 22.8 shows, only a handful of deaths in 1979–81 were of women who had booked for home delivery, compared with nearly 200 in 1961–63.

Many of the women for whom no booking had been made died before the 28th week of pregnancy and included a substantial proportion of abortions up to the beginning of the 1970s. The decline in deaths from abortion contributed substantially to the decline of numbers of deaths in this category.

A table of data on deaths by place of booking was included in the 1979–81 Report and has been used in compiling Table 22.8. After 1979–81, the subject of place of delivery was dropped until 1994–96, by which time the percentage of deliveries at home had risen to just over 2% and midwife-led units were replacing the remaining GP maternity units. As Table 22.9 shows, the overwhelming majority of *Direct* and *Indirect* deaths are now of women who give birth in hospital, as that is where over 97 per cent of deliveries took place.

Table 22.9 Numbers of direct and indirect deaths reported to confidential enquiries by place of delivery; United Kingdom 1994–2002

	1994–96	1997–99	2000–02
Consultant unit	152	132	152
Stand-alone GP/midwife-led unit	1	3	1
Accident and emergency	12	11	15
Intensive care unit	2	2	1
Hospital other	0	3	3
Home	2	4	3
Total	169	155	175

Source: Reports on Confidential Enquiries into Maternal Deaths, 1994–96, 1997–99, 2000–02

Social factors

Before the very explicit shift to a greater emphasis on social factors in the 1994–96 Report, the focus of the Reports was predominantly clinical. Nevertheless, the social factors behind maternal death were still apparent to a varying extent. In particular, from the 1950s to the 1970s, the deaths of women who had made no arrangements for delivery included many women who would now be described as 'socially excluded'. Among those repeatedly mentioned were young women, women who had concealed their pregnancies and migrant women. The 1967–69 Report commented that "Of the 166 unbooked women, 37 were of African or West Indian origin, six were Asian and two were non-British European. There is a need for health education among women who because of language barriers or cultural differences may not appreciate the importance of ante-natal care and do not avail themselves of maternity services. The abortion chapter commented that of the 117 deaths from abortion, 40 were to women from the 'New Commonwealth' and 32 of these were due to 'illegal interference'.

Tabulations of maternal deaths by mother's country of birth were included in the Reports for 1970–72 to 1982–84. Each of these showed much higher mortality rates among women born in the 'New Commonwealth' than among those born in the United Kingdom. An analysis of death registration data for the years 1970–78 led to similar conclusions.[23] The 1982–84 Report pointed out that country of birth did not necessarily equate to ethnic origin and the subject was dropped from subsequent Reports until analyses by ethnic origin were attempted in 1994–96. Its absence was noted in a *British Medical Journal* editorial welcoming the Report for 1988–90: "Not quite breaking the surface, but stretching its surface tension, are mentions throughout the Report of 'recent immigrants' or women speaking 'little English'. These may well be numerators in search of a denominator, but the hidden message is clear".[24]

Formal analyses of maternal deaths by social class were included in the Reports for England and Wales for 1970–72 to 1979–81 and the Report for Scotland for 1972–75 also contained a section on social factors. Together with the analyses by country of birth, the analyses for England and Wales probably reflect the influence of Abe Adelstein, head of the Medical Statistics Division of the Office of Population Censuses and Surveys, where work was under way on the Registrar General's Decennial Supplement for 1970–72.[25] The Decennial Supplement and the Confidential Enquiry Reports for 1970–72 and 1979–81 all showed maternal mortality to be highest among women with husbands in manual occupations. After health inequalities disappeared from the national political agenda in the 1980s, these analyses were dropped from the confidential Enquiry Report for 1982–84 on the grounds that "Data on social class are usually based on the occupation of the woman's partner. These data have not been included in this Report because of the increasing difficulty in interpreting social class information on women, many of whom are working and not influenced by their partner's occupation".

No further attempt at analyses by social class was made until 1997–99, when the main finding was not the difference between occupational classes but the differences between the high rates for women who did not have an occupation or a partner with an occupation and the much lower rates for other women.

The inequalities in maternal mortality in the second half of the 20th century contrast with those seen in the 19th century and in the early part of the 20th century. At that time

maternal mortality rates were even higher in more affluent districts and among more privileged sections of the population who had access to care which was dangerous than they were among less advantaged women.[26]

International comparisons

From time to time, the Reports have included comparisons with maternal mortality rates for other developed countries. A table of rates was included in the Report for 1967–69, together with a warning that countries vary in their interpretation of international rules for data collection. A further table in the 1970–72 Report showed that England and Wales compared unfavourably with Nordic countries but that rates within England and Wales ranged from 5.9 per 100,000 live births in the Oxford Region to 17.2 per 100,000 live births in the Leeds Region.

The 1988–90 Report included the results of a survey of maternal mortality in countries which were members of the European College of Obstetrics and Gynaecology. The questionnaire asked about the classifications used, the extent to which postmortem examinations were performed and about several aspects of data collection. These included whether the death certificate included a special question on pregnancy and what efforts were made to ensure complete ascertainment of maternal deaths. This survey highlighted considerable discrepancies between countries. The Report warned that caution was needed in comparing data for different countries, especially small countries with few maternal deaths, and called for confidential enquiries to be conducted at a European level. This need for caution was confirmed in a European collaborative study in which international panels of clinicians assessed anonymised data from participating countries, including a subset of UK Enquiry data for 1993, in terms of their classification as *Direct* and *Indirect* and used the results to recalculate direct and indirect mortality rates for the countries concerned.[20]

Severe maternal morbidity

Although maternal morbidity was discussed in the Enquiry Reports published in the 1930s[3,4,6] it did not appear explicitly on the agenda of the current series of Enquiries until 1997–99. A one-off study in the former South East Thames Region,[27] formed part of a European study whose results suggested that, even when working to a common protocol, differences in ascertainment may still affect observed variations between countries.[28] The approach developed in Scotland to routine audit of obstetric haemorrhage, described in Chapter 19 of this Report, is a major step forward and it will be interesting to see what developments follow elsewhere.

Changing maternal mortality

In his preface to the 1967–69 Report, the Chief Medical Officer, Sir George Godber, who had been involved in the implementing the new system in 1952 commented that, "None of us contemplated in 1952 that the number of maternal deaths would be reduced to the extent that it has been. Now we can all see that in the light of this present Report

that it may become possible to reduce the number of true maternal deaths below a hundred a year". In a similarly optimistic vein, former Obstetric Assessor, Alec Turnbull, in his overview of the period from 1952–54 to 1982–84 included in the 1982–84 Report, pointed out that maternal mortality had halved in every decade since 1937 from 989 per million maternities in 1951 to 86 in 1984. He predicted that if it continued to decline at the same rate, maternal mortality in England and Wales would reach approximately 44 per million in 1991 and approximately 22 per million in 2001.

Neither of these predictions proved to be true. As the *BMJ* editorial cited earlier pointed out, maternal mortality levelled off from 1985–87 onwards.[24] As this Report makes clear, rising trends at the beginning of the 21st century are not simply a consequence of improvements in ascertainment. Changes in the childbearing population may also play a part. As long ago as 1975, it was suggested that Enquiry data should be standardised for mothers' ages and parity and other relevant factors.[29] Such analyses are needed today to allow for rising age at childbirth, increasing rates of multiple birth and other trends documented in Chapter 21 of this Report. Questions also arise about the use of controls in Confidential Enquiries. So far, the only example use of a comparison group in an enquiry into maternal mortality in the United Kingdom is in the report of the enquiry in Scotland published in 1935.[6]

Like its predecessors, this 50th anniversary Report is intended to stimulate practical action, but, like them, it also raises questions for further debate and investigation.

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