



Perinatal Mortality 2005

Executive Summary

April 2007

England, Wales and Northern Ireland

CEMACH Mission statement

Our aim is to improve the health of mothers, babies and children by carrying out confidential enquiries on a nationwide basis and by widely disseminating our findings and recommendations.

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The recommendations contained in this report represent the view of CEMACH, which was arrived at after a careful consideration of the available evidence. It does not override healthcare professionals' individual responsibility to make appropriate decisions in the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

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Executive Summary

Overview

Just over 1 in 200 pregnancies end in a stillbirth and around 1 in 300 babies die in the first four weeks of life. Not all these deaths are preventable, but surveillance of them is critical to identify trends and problem areas. Furthermore, mortality is but the tip of an iceberg of ill health and these data can provide an insight into how to address morbidity problems.

This report identifies major maternal risk factors associated with perinatal mortality, such as social deprivation, ethnicity and maternal age. Given the role played by these risks, further progress in reducing mortality at the beginning of life is likely to require account to be taken of these factors.

The 2005 report provides further evidence that the stillbirth rate has in recent years ceased to decline and remains consistent with levels experienced during the early 1990s. This has ended a long period of steady progress since the early 1950s in reducing the stillbirth rate. Stillbirths are the major component of perinatal mortality, with over 3600 a year, of which approximately one-third occur at term. They are twice as common as early neonatal deaths and account for over 50% of all fetal and neonatal deaths. The lack of progress in reducing the stillbirth rate is a matter of considerable public health concern meriting further initiatives and research.

CEMACH found wide variations in perinatal mortality between trusts and between neonatal networks. There are a variety of possible explanations and the Enquiry recognises that these are, at this stage, crude data. CEMACH will continue to analyse the factors involved, but, would recommend that those trusts and neonatal networks whose rates identify them as possible outliers should look into local factors that may be contributing to mortality. With the agreement of the trusts involved CEMACH can provide neonatal networks with data on their perinatal mortality and will contact them in the near future.

The CEMACH perinatal mortality surveillance programme

CEMACH carries out surveillance of perinatal deaths and is able to prepare reports at a national level and for strategic health authorities, neonatal networks and NHS trusts from the same data system. CEMACH collects data on all perinatal deaths using a specific notification form, the Perinatal Death Notification (PDN) in England, Wales and Northern Ireland. These data are then processed, analysed and collated into an annual national report at CEMACH central office. The surveillance report for 2005 provides a “clinician-friendly” epidemiological description of stillbirth and neonatal mortality, aimed at all involved directly in the care of mothers and babies.

Perinatal mortality in 2005

In 2005 in England, Wales and Northern Ireland there were 668,681 total live births notified to the Office of National Statistics (ONS) and 7225 deaths notified to CEMACH: 1193 late fetal losses, 3676 stillbirths and 2356 neonatal deaths. Overall the stillbirth rate [95% Confidence Intervals (CI)] was 5.5 [5.3-5.6] per 1000 total births, the neonatal mortality rate 3.5 [3.4-3.7] per 1000 live births and the perinatal mortality rate was 8.2 [8.0-8.4] per 1000 total births. These mortality rates in 2005 were similar to the average mortality rates recorded between 2000 and 2004. This report conveys some progress but also highlights areas of concern.

Progress Achieved:

Key finding 1: The multiple stillbirth rate has declined steadily between 2003 and 2005.

Multiple pregnancies continue to carry an increased risk of stillbirth (3 fold) and neonatal deaths (8 fold) compared to singleton pregnancies. However, the stillbirth rate in multiple pregnancies has declined steadily from 20.2 per 1000 in 2003 [95% CI 18.3-22.3] to 15.6 per 1000 in 2005 [95% CI 14.0-17.5].

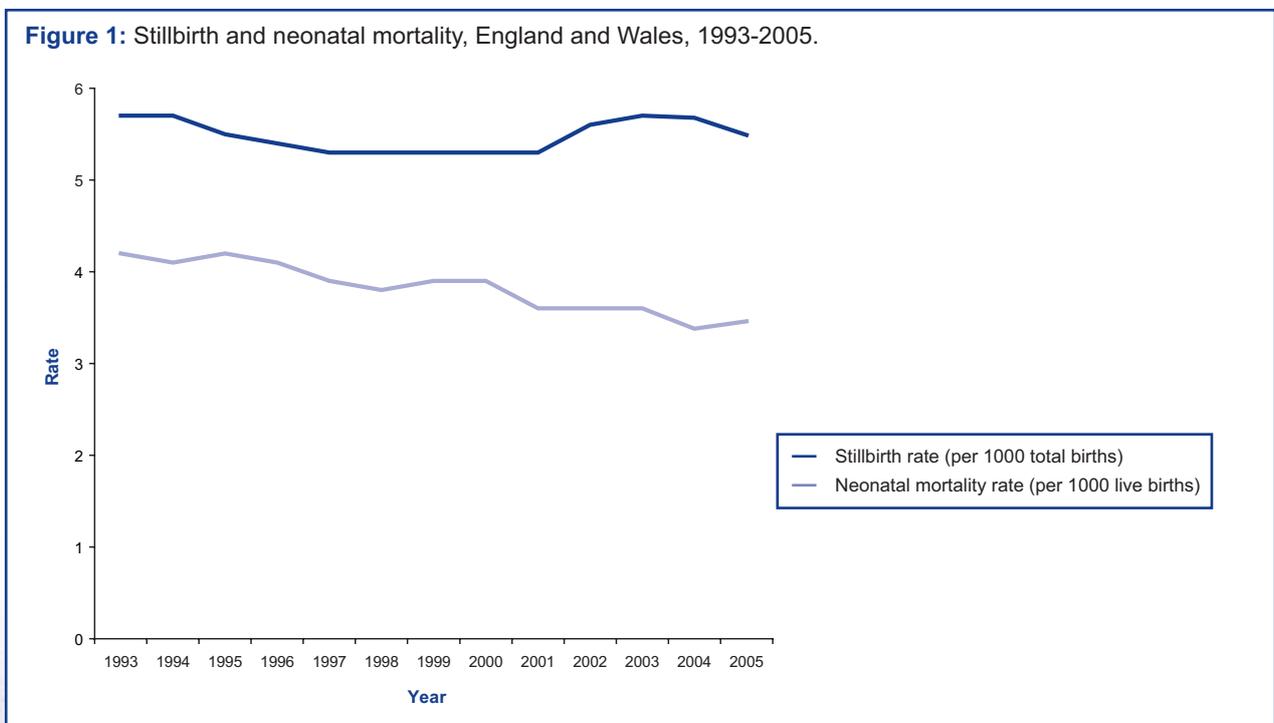
Key finding 2: The neonatal survival rate of very preterm babies has improved over the last 10 years.

Gestation-specific mortality rates were crudely estimated using information on gestational age collected in England as part of the delivery record of the Hospital Episode Statistics (HES). Within the limitations of these estimates, 58% of babies born at 24 weeks gestation survived the neonatal period increasing to 77% at 25 weeks' gestation. This is an increase compared to observations of a decade ago (43% and 59% respectively). Similarly, survival at 27-28 weeks' gestation was 92% an increase of 4% in comparison to national data from 1998-2000. The Epicure 2 study should provide further precise information on the neonatal survival rates of very preterm babies.

Areas of concern:

Key finding 3: No progress is being made in reducing the stillbirth rate

Figure 1 shows that since 1992 the stillbirth rate has remained largely unchanged while the neonatal mortality rate has declined significantly (Cochran-Armitage test for linear trends $p < 0.001$). This lack of progress in reducing the stillbirth rate is a matter of public health concern.

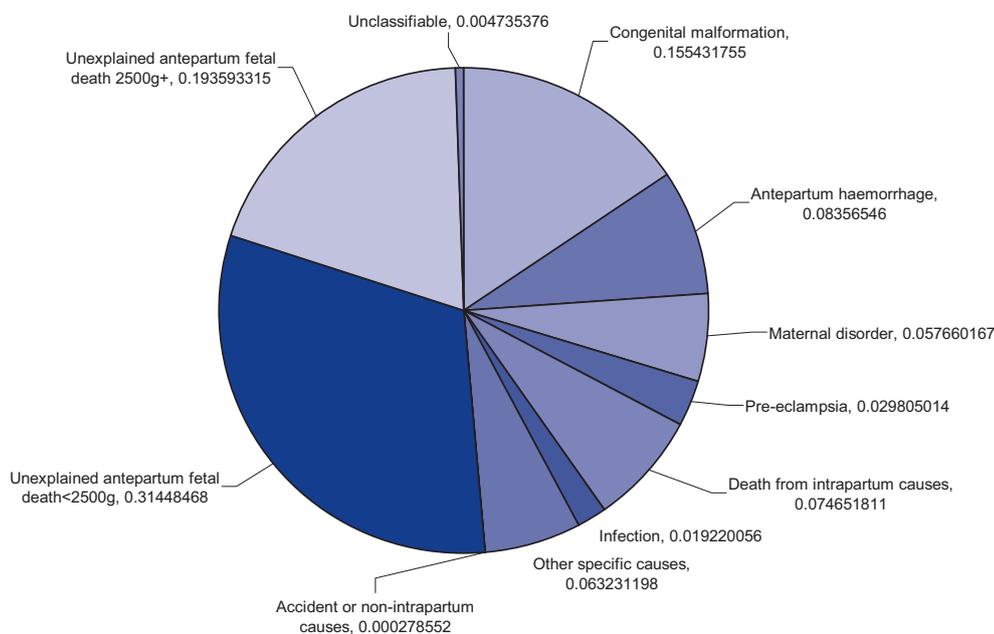


Sources: CEMACH and ONS

Key finding 4: Over half of stillbirths remain unexplained.

Public health initiatives aiming at reducing the incidence of stillbirth require a better understanding of its causes. Using the current classification system, just over 50% of stillbirths were classified as 'unexplained' (Figure 2) and 48% of neonatal deaths were classified as due to 'immaturity'. This lack of precision inhibits the usefulness of the data to clinicians, epidemiologists and those responsible for planning services. A revision of the perinatal mortality classification system used in this report will be piloted in 2007 with a view to being implemented in 2008 with the aim of further enhancing the value of future perinatal mortality surveillance.

Figure 2: Percentage distributions of causes of stillbirths, England, Wales and Northern Ireland, 2005



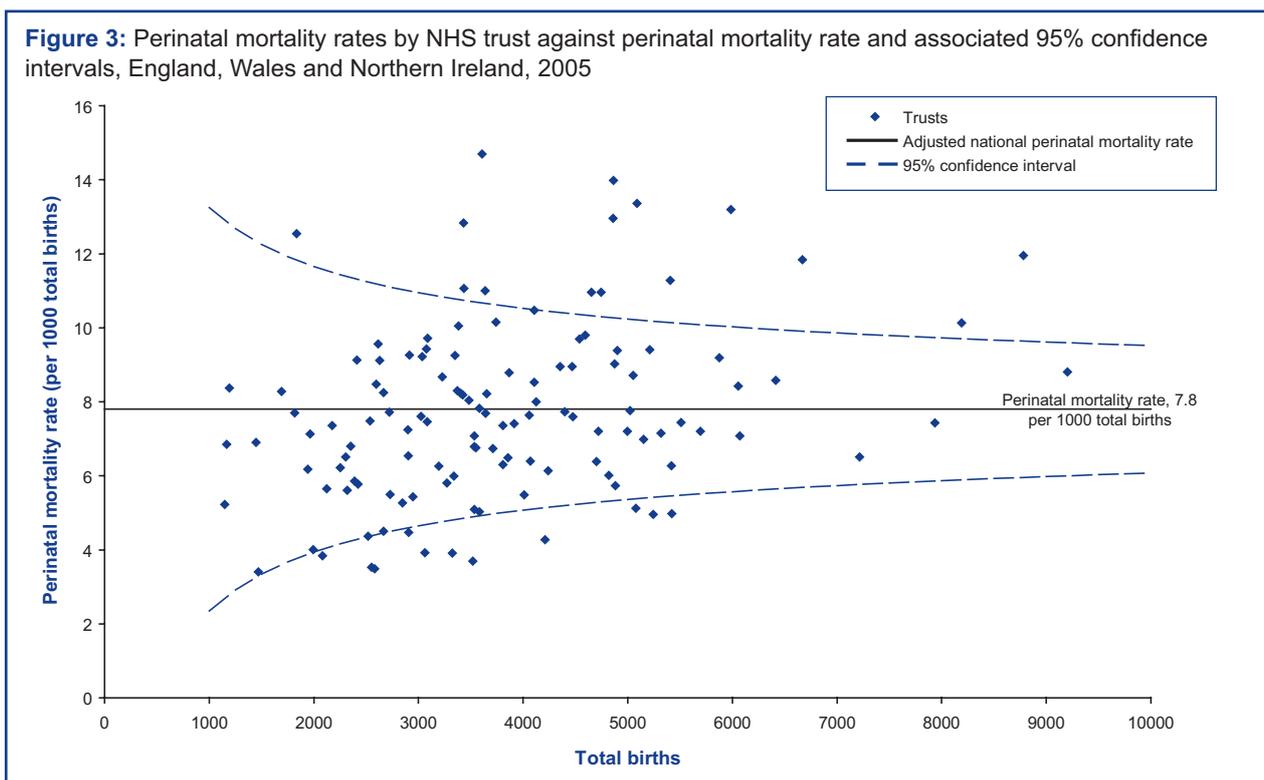
Sources: CEMACH PDN 2005 & 2006

Key finding 5: There were wide variations in perinatal mortality rates between individual trusts and between neonatal networks.

Perinatal mortality rates for trusts and neonatal networks are presented in Figures 3 and 4. These figures show mortality rates plotted against the number of livebirths, the average mortality rate and associated 95% confidence intervals. If a trust or neonatal network lies within the 95% confidence interval, it has a crude mortality rate that is statistically consistent with the average rate. If a trust or neonatal network lies outside the 95% confidence limits, then it has a crude rate that is significantly different from the average rate.

Wide variations in the crude perinatal mortality rate between NHS Trusts can be seen in Figure 3. These variations should not be interpreted as direct indicators of the quality of care. Other factors may influence rates such as differences in the way data is reported from individual trusts, socio-demographic characteristics of the population or the case mix or referral pattern of an individual trust.

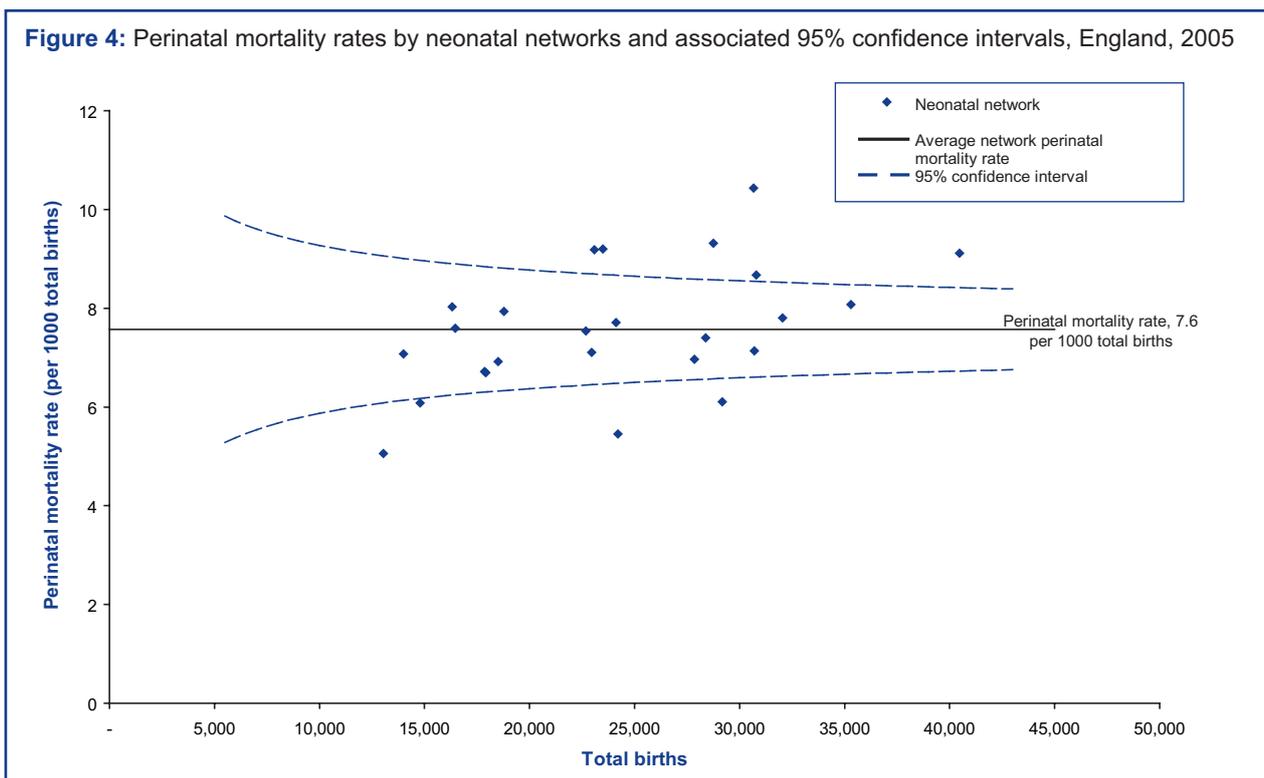
There were also wide variations in crude perinatal mortality rates between the 25 neonatal networks recently established in England (Figure 4). Crude mortality for neonatal networks should not need to be adjusted for case mix, as each network should deal with all levels of complexity. Variation may, however, be linked to the socio demographic characteristics of the population served.



Sources: CEMACH PDN 2005 & 2006

Note: Due to the high variance in rates calculated using events numbering less than five, data presented in the graph are for trusts that have 5 or more deaths delivering in the trust during 2005. The national perinatal mortality rate has been adjusted accordingly.

Figure 4: Perinatal mortality rates by neonatal networks and associated 95% confidence intervals, England, 2005



Sources: CEMACH PDN 2005 & 2006

Note: Data presented in figure 4 include all early neonatal deaths with gestational age of 22 weeks or more.

Key finding 6: Social deprivation appears to be an important factor for perinatal mortality

Confirming previous findings, mothers living in the most deprived areas (calculated using the Index for Multiple Deprivation (IMD) score 2004, a measure of deprivation at the small area level) appear to be twice more likely to have a stillbirth than mothers living in the least deprived areas. Furthermore, the babies of such mothers appear to be 2.2 times more likely to die in their first month of life (Table 1).

Table 1

Stillbirths and neonatal mortality rates by quintiles of deprivation, England, 2005

	Live births		Stillbirth		Neonatal death		
	Number	Rate ^a	Rate Ratio ^c [95% CI]	Number	Rate ^b	Rate Ratio ^c [95% CI]	
Total	607,090	3064	..	..	1726	..	..
1 (least deprived)	167,684	345	3.5	..	171	1.7	..
2	129,918	421	4.2	1.2 [1.1, 1.4]	224	2.2	1.3 [1.1, 1.6]
3	109,868	531	4.8	1.4 [1.2, 1.6]	277	2.5	1.5 [1.2, 1.8]
4	100,815	714	5.5	1.6 [1.4, 1.8]	404	3.1	1.8 [1.5, 2.2]
5 (most deprived)	98,805	1040	6.2	1.8 [1.6, 2]	640	3.8	2.2 [1.9, 2.6]
Missing	..	13	..	..	10	..	..

^a Rate per 1000 total births

Sources: CEMACH PDN 2005, 2006

^b Rate per 1000 live births ^c Rate ratio using least deprived as baseline

ONS 2005

Note: second or subsequent deaths from pregnancies with multiple losses excluded from this analysis.

Key finding 7: Mothers from ethnic minorities were at increased risk of having a stillbirth or a neonatal death

Confirming previous findings, there were higher stillbirth and neonatal mortality rates for women of black ethnicity (1.9 and 2.2 times higher respectively) and Asian ethnicity (1.5 and 1.6 times higher respectively) when compared with those for women of white ethnicity (Table 2).

Table 2:

Stillbirth and neonatal mortality rates by ethnicity, England, 2005

	Live births		Stillbirths		Neonatal deaths		
	Number	Number	Rate ^b	Rate Ratio ^d [95% CI]	Number	Rate ^c	Rate Ratio ^d [95% CI]
Total	613,028	3,390	..	..	2,149	..	..
White	476,900 ^a	2,302	4.8	..	1,476	3.1	..
Black	28,200 ^a	331	11.6	1.9 [1.7, 2.1]	192	6.8	2.2 [1.9, 2.6]
Asian	50,800 ^a	455	8.9	1.5 [1.4, 1.7]	246	4.8	1.6 [1.4, 1.8]
Chinese	2,400 ^a	10	4.1	0.7 [0.4, 1.3]	10	4.2	1.3 [0.7, 2.4]
Other & mixed origin	18,400 ^a	177	9.5	1.6 [1.4, 1.9]	119	6.5	2.1 [1.7, 2.5]
Not known	36,500 ^a	58	..	..	69	..	..
Missing	..	57	..	..	37	..	..

^a Estimated distribution according to maternity HES

Sources: CEMACH PDN 2005 & 2006

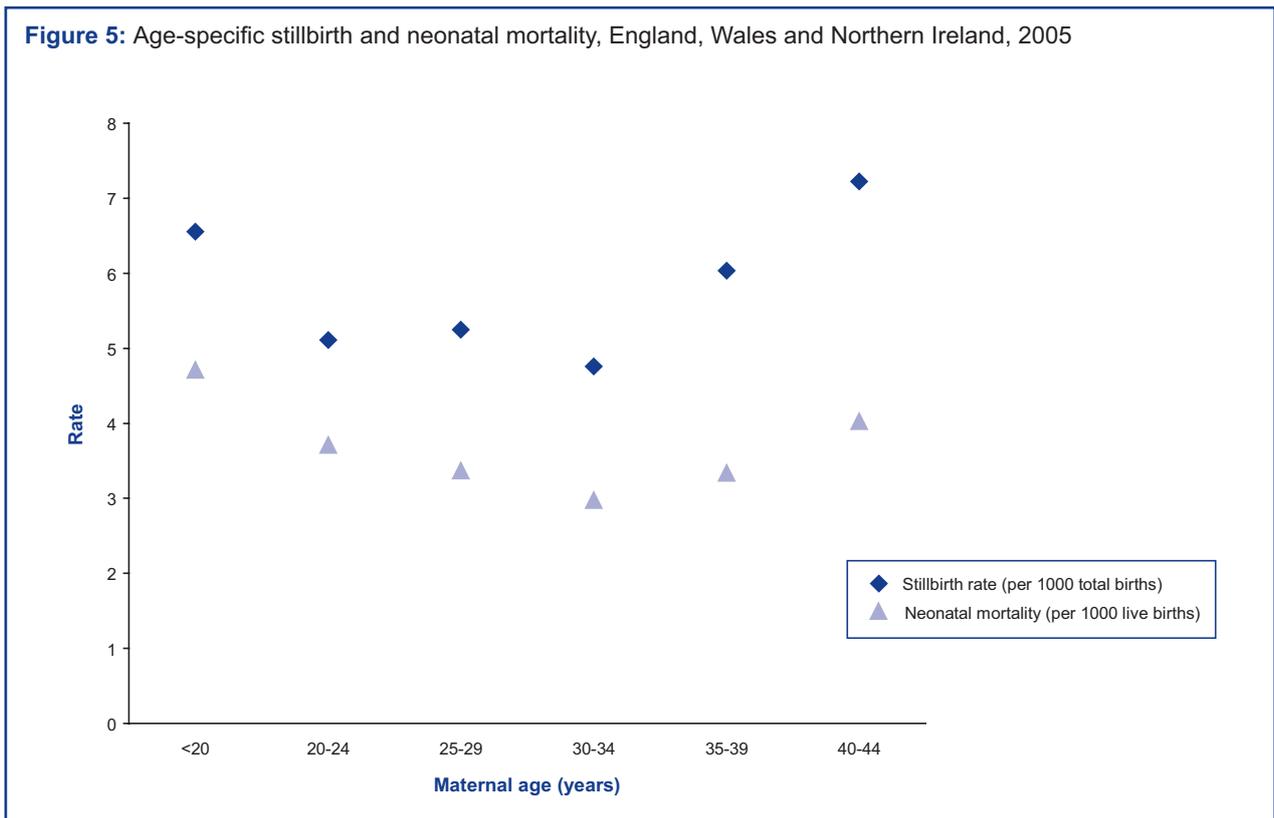
^b Rate per 1000 total births ^c Rate per 1000 live births

Maternity HES 2004-2005, ONS 2005

^d Rate ratio using White ethnicity as baseline

Key finding 8: The Perinatal mortality rate was higher in mothers aged less than 20 and above 40

Confirming previous findings, Figure 5 shows that mothers aged less than 20 and above 40 had the highest rates of stillbirth (6.6 and 7.2 per 1000 respectively) and the highest rates of neonatal deaths (4.7 and 4.0 per 1000 live births respectively). The percentage of livebirths in mothers over 40 years old almost doubled from 1.8% in 1995 to 3.4% in 2005. Given the steadily increasing average maternal age in the UK maintaining perinatal mortality at current rates may be a challenge in the years ahead.



Key finding 9: National perinatal autopsy uptake has declined by over a third in the last 10 years.

Postmortem examination uptake has declined from 58% of all deaths in 1993 to 39% (45% of stillbirths and 29% of neonatal deaths) in 2005. There were marked regional variations in examination uptake (27%-51%). There were also variations in the uptake of post mortem according to the cause of death reflecting possibly an a priori perception of the clinical usefulness of the examination during the decision making process.

Other finding of potential interest for health policy:

Key finding 10: Most perinatal deaths resulting from homebirths were not planned home deliveries

Out of 16737 home deliveries in England, Wales and Northern Ireland in 2005, there were 119 notified deaths. However the vast majority of these were not planned home births and should not of themselves give rise to concern about risk management standards in respect of planned home deliveries: over half had intended to deliver at a hospital and over one quarter were unbooked pregnancies. A small proportion of deaths at home (four stillbirths and nine neonatal deaths, all at occurring at term) occurred in planned home deliveries and four of these were related to an intrapartum cause. The lack of national denominator data for planned home deliveries precluded the calculation of a mortality rate. In order to provide further information relevant to evaluation of the safety of planned home deliveries, CEMACH has, during 2006, collected information on deaths in hospital where delivery, at onset of labour, was planned to be at home. This will provide a more complete picture of perinatal mortality and its relationship with both planned and unplanned home delivery.

Key areas for action

The development of services which target the major maternal risk factors in pregnancy such as social deprivation and ethnicity

Greater focus on reducing the stillbirth rate through further public health initiatives and research

Better understanding of the reasons for variations in perinatal mortality

Improving the postmortem rate

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A more detailed explanation of the report findings and supporting evidence can be found in the full report, which can be obtained from:

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The report can also be found on the CEMACH website www.cemach.org.uk



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