



MDE

Confidential
Maternal Death Enquiry
Ireland

MDE Ireland:
Data Brief No 2. December 2016

Release of this data brief coincides with publication in December 2016 of the third annual report incorporating Irish data in the long-established UK Confidential Enquiry into Maternal Deaths (CEMD)¹. It covers the same timeframe as the latter and aims to publish surveillance data on maternal deaths occurring in Ireland for the years 2012 to 2014.

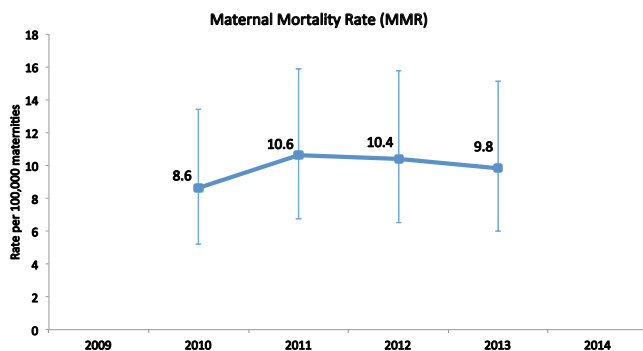
It is recommended that this data brief is read in conjunction with the MBRRACE-UK 2016 report¹ which details enquiry findings and lessons learned from women who died from specific causes in both the UK and Ireland. Please note that surveillance data on maternal deaths occurring in Ireland is not included in the MBRRACE-UK report.

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MATERNAL MORTALITY IN IRELAND: 2012-2014

For the years 2012 – 2014, a total of 22 maternal deaths, occurring during or within 42 days of pregnancy end, were identified by MDE Ireland. Of these 22 deaths, 20 were classified as direct or indirect maternal deaths among 204,999 maternities, giving a maternal mortality rate (MMR) of 9.8 per 100,000 maternities (95% CI 6.0 – 15.1). A further 2 maternal deaths were attributed to coincidental causes. Definitions of maternal deaths are outlined in Table 1.

Figure 1: MMR per 100,000 maternities (95% CI) Ireland: rolling three year average 2009-2014



Note: Three-year moving average rates are plotted in middle year of triennium

Table 1: Definitions of Maternal Deaths: (World Health Organisation 2010)

Maternal Death	Deaths of women while pregnant or within 42 days of the end of the pregnancy* from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.
Direct	Deaths resulting from obstetric complications of the pregnant state (pregnancy, labour and puerperium), from interventions, omissions, incorrect treatment or from a chain of events resulting from any of the above.
Indirect	Deaths resulting from previous existing disease, or disease that developed during pregnancy and which was not the result of direct obstetric causes, but which was aggravated by the physiological effects of pregnancy.
Late	Deaths occurring between 42 days and 1 year after the pregnancy end* that are the result of Direct or Indirect maternal causes.
Coincidental ‡	Deaths from unrelated causes which happen to occur in pregnancy or the puerperium.

* Includes giving birth, ectopic pregnancy, miscarriage or termination of pregnancy.
‡ Termed "Fortuitous" in the International Classification of Diseases (ICD)

To facilitate international comparisons, all maternal death rates (MMR) are presented as a rolling three year average. This includes deaths due to direct and indirect causes during pregnancy and up to 42 days postpartum but not deaths due to coincidental causes or late maternal deaths. These rates are plotted in the middle year of the triennium in Figures 1, 2 and 3. Eight out of the twenty women who died from direct and indirect causes (40%) were still pregnant at time of death.

COMPARISON OF MATERNAL MORTALITY RATE: IRELAND AND THE UK 2012-2014

For the triennium 2012 – 2014, the Irish MMR was 9.8 per 100,000 maternities (95% CI 6.0 – 15.1) and the UK MMR was 8.54 per 100,000 maternities (95% CI 7.4 – 9.81). This does not represent a statistically significant difference in MMR between countries (Risk ratio 1.14, p = 0.570).

LATE MATERNAL DEATHS: IRELAND 2012-2014

Seven late maternal deaths were reported to MDE Ireland in the triennium 2012-2014. The causes of death were: psychiatric causes (4 cases), thromboembolism (1 case) and 2 cases of malignant disease which were classified as coincidental to the pregnancy.





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CLASSIFICATION OF MATERNAL DEATHS

Historically, the UK Confidential Enquiry into Maternal Deaths (CEMD) classified maternal mortality as direct or indirect using a disease-based classification system. Within this classification, deaths due to suicide were classified as indirect maternal deaths.

In recognition of the importance of maternal suicide and its direct link to pregnancy, the most recent WHO guidance on classification of maternal mortality (ICD-MM, WHO 2012) has recommended that maternal deaths due to suicide are classified as direct rather than indirect maternal deaths.² In line with WHO² and MBRRACE-UK¹, MDE Ireland has adopted this changed classification. To facilitate comparisons with UK CEMD reports, and comparability of Irish data over time, we have presented causes of maternal deaths using both the conventional disease based categories previously used by the UK CEMD (Figure 2 and Table 3) and the ICD-MM classification (Figure 3 and Tables 4 & 5).

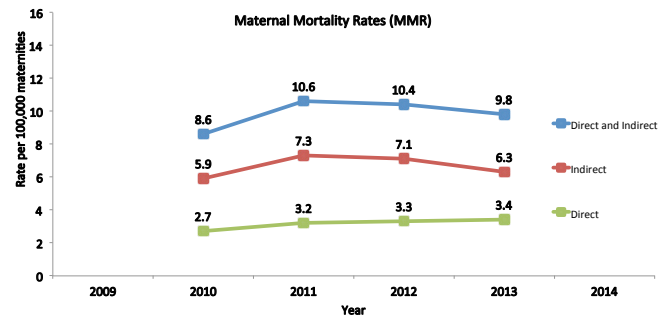
Table 2. MMR in Ireland 2009-2014: Comparison of UK CEMD classification with ICD-MM classification

3 Year Period	Total Maternities	Total Maternal Mortality Rate (95% CI)	Direct Maternal Deaths		Change in Rate Rate Ratio (95% CI) P Value	Indirect Maternal Deaths		Change in Rate Rate Ratio (95% CI) P Value
			Previous UK CEMD*	ICD-MM**		Previous UK CEMD*	ICD-MM**	
2009-2011	222,136	8.6 (5.2-13.4)	2.7 (1.0-5.9)	3.6 (1.6-7.1)	1.33 (0.46-3.84) P=0.594	5.9 (3.1-10.0)	5.0 (2.5-8.9)	0.85 (0.38-1.89) P=0.683
2012-2014	204,999	9.8 (6.0-15.1)	3.4 (1.4-7.0)	4.9 (2.3-9.0)	1.43 (0.54-3.75) P=0.469	6.3 (3.4-10.8)	4.9 (2.3-9.0)	0.77 (0.34-1.75) P=0.533

*Previous UK CEMD classification
 **ICD-MM classification

While the overall Irish MMR was not changed by adopting the ICD-MM classification, it did result in an increased rate of direct maternal deaths with a decrease in the rate of indirect maternal deaths (Table 2). Using the UK CEMD disease based classification, the proportion of direct and indirect maternal deaths was 35% and 65% respectively in Ireland for 2012 – 2014 (Table 2). In contrast, the proportion of direct and indirect maternal deaths was 50% and 50% respectively using the ICD-MM classification for the same time frame (Table 2). However, this finding was not statistically significant, and therefore similar to the UK where the impact of reclassifying maternal deaths according to ICD-MM was minimal.^{3,1}

Figure 2. Direct and Indirect MMR per 100,000 maternities in Ireland 2009-2014 using the conventional UK CEMD classification on cause of death: rolling three year average



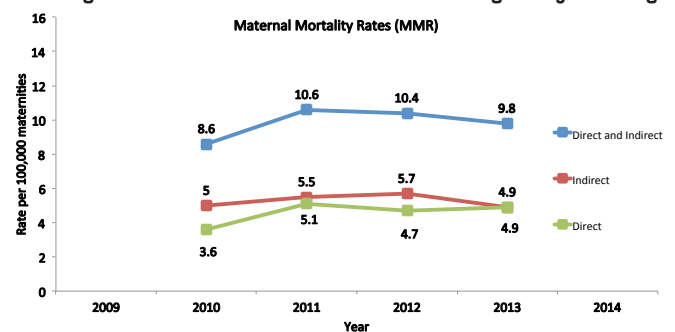
Note: Three-year moving average rates are plotted in middle year of triennium

Table 3: Causes of Maternal Deaths in Ireland 2009 – 2014 (Maternal Deaths by suicide classified as indirect for comparability with previous reports)

Cause of death	2009-2011 (n)	2012-2014 (n)	2009-2014 (n)
Direct Maternal Deaths	6	7	13
Thrombosis/thromboembolism	3	2	5
Pre-eclampsia and eclampsia	1	1	2
Amniotic fluid embolism	1	2	3
Genital tract sepsis*	-	1	1
Haemorrhage	1	1	2
Anaesthesia	-	-	-
Indirect Maternal Deaths	13	13	26
Cardiac disease	4	7	11
Other indirect causes†	4	1	5
Indirect neurological conditions‡	3	2	5
Psychiatric causes -suicide	2	3	5
Coincidental Maternal Deaths	6	2	8

*Genital tract sepsis deaths only, including early pregnancy deaths as the result of genital tract sepsis. Other deaths from infectious causes are classified under other indirect causes
 †Includes 2 deaths attributed to H1N1 influenza ‡Includes 2 cases of Epilepsy related mortality

Figure 3. Direct and Indirect MMR per 100,000 maternities in Ireland 2009-2014 using ICD-MM classification on cause of death: rolling three year average



Note: Three-year moving average rates are plotted in middle year of triennium





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CAUSES OF DIRECT AND INDIRECT MATERNAL DEATHS: IRELAND

Direct and Indirect maternal deaths by cause are categorised and detailed in Tables 3 and 4 using the conventional UK CEMD categories and Table 5 using the ICD-MM classification. For comparability of Irish data over time, Table 3 details deaths due to suicide as indirect maternal deaths. On account of the small number of cases per category in Ireland and the limited power of analysis in a small cohort, rates per category are not appropriate and have not been calculated.

Table 4: Causes of Maternal Deaths in Ireland 2009 – 2014
(Maternal deaths by suicide classified as direct)

Cause of Death	2009-11 (n)	2012-2014 (n)	2009-2014 (n)
Direct Maternal Deaths	8	10	18
Thrombosis/thromboembolism	3	2	5
Pre-eclampsia and eclampsia	1	1	2
Amniotic fluid embolism	1	2	3
Genital tract sepsis*	-	1	1
Haemorrhage	1	1	2
Psychiatric causes-suicide	2	3	5
Indirect Maternal Deaths	11	10	21
Cardiac disease	4	7	11
Other indirect causes†	4	1	5
Indirect neurological conditions‡	3	2	5
Coincidental Maternal Deaths	6	2	8

*Genital tract sepsis deaths only, including early pregnancy deaths as the result of genital tract sepsis. Other deaths from infectious causes are classified under other indirect causes

†Includes 2 deaths attributed to H1N1 influenza ‡ Includes 2 cases of Epilepsy related mortality

Similar to the UK, cardiac disease remains the single most common cause of maternal death in Ireland. Thrombosis continues to feature prominently as a cause of direct maternal death. However, with the introduction of the ICD-MM classification system, suicide was the most common cause of direct maternal death for the triennium 2012-2014 (Table 4). Further, suicide was also the most common cause of late maternal deaths (4 of 7) occurring between 42 days and one year of pregnancy end. This reflects findings in the UK.¹

Table 5: Maternal Deaths in Ireland by cause using the ICD-MM classification, 2009 – 2014

Cause of Death	2009-11 (n)	2012-2014 (n)	2009-2014 (n)
Direct causes	8	10	18
Group 1: Pregnancy with abortive outcome	0	0	0
Group 2: Hypertensive disorders	1	1	2
Group 3: Obstetric Haemorrhage	1	1	2
Group 4: Pregnancy-related infection	0	1	1
Group 5: Other obstetric complications	6	7	13
Group 6: Unanticipated complications of management	-	-	-
Indirect causes			
Group 7: Non-obstetric complications	11	10	21
Group 8: Unknown/undetermined	-	-	-
Group 9: Coincidental causes	6	2	8

LESSONS LEARNED FROM THE UK AND IRELAND CONFIDENTIAL ENQUIRIES INTO MATERNAL DEATHS

Confidential enquiry findings into the care of women who died from cardiac disease, hypertensive disorders, maternal deaths occurring less than 24 weeks gestation (early pregnancy) and messages for critical care in the UK and Ireland are described in detail in the MBRRACE-UK 2016 report.¹

In the past, UK CEMD reports were produced on a triennial basis. A report is now published annually and topic-specific chapters which appeared in previous triennial reports now appear once every three years on a cyclical basis.¹

REFERENCES

1. Knight M, Nair M, Tuffnell D, Kenyon S, Shakespeare J, Brocklehurst P, Kurinczuk JJ (Eds.) on behalf of MBRRACE-UK. Saving Lives, Improving Mothers' Care - Surveillance of maternal deaths in the UK 2012-14 and lessons learned to inform maternity care from the UK and Ireland. Confidential Enquiries into Maternal Deaths and Morbidity 2012-14. Oxford: National Perinatal Epidemiology Unit, University of Oxford 2016. Available at: <https://www.npeu.ox.ac.uk/mbrrace-uk>
2. World Health Organisation. (2012). The WHO Application of ICD-10 to deaths during pregnancy and the puerperium: ICD-MM. Available at :<http://www.who.int/reproductivehealth/publications/monitoring/9789241548458/en/>
3. Knight M, Nair M, et al (2016) Examining the impact of introducing ICD-MM on observed trends in maternal mortality rates in the UK 2003–13. BMC Pregnancy and Childbirth 16:178

CITATION FOR THIS DATA BRIEF

O'Hare MF, Manning E, Corcoran P, Greene RA on behalf of MDE Ireland. Confidential Maternal Enquiry in Ireland, Data Brief No 2. Cork: MDE Ireland, December 2016.

