NATIONAL PERINATAL EPIDEMIOLOGY CENTRE

SEVERE MATERNAL MORBIDITY in Ireland

Lay Summary 2021

National Perinatal Epidemiology Centre

The National Perinatal Epidemiology Centre (NPEC) works with the maternity services in Ireland. The NPEC, directed by Professor Richard A Greene, is comprised of a team of midwives, researchers, administrators and clinicians. Every time a mother gives birth in Ireland, the important interventions, clinical and adverse outcomes are recorded and analysed at this national specialist centre.[1] The NPEC produces annual clinical audit reports on perinatal mortality, maternal morbidity, home births and very low birth weight babies in Ireland. At local hospital level, the NPEC provides customised feedback to individual hospitals on how they compare against the national average. Funded by the Health Service Executive (HSE), the NPEC is based at Cork University Maternity Hospital in the UCC Department of Obstetrics and Gynaecology. The NPEC continues to build on its existing portfolio of audit and quality review.

What is clinical audit?

A clinically led, quality improvement process that seeks to improve patient care and outcomes through the systematic review of care against explicit criteria. Where standards are not met, changes are implemented and re-auditing is used to confirm improvement in patient care.

What is Epidemiology?

Epidemiology is the study (scientific, systematic, and data-driven) of the distribution (frequency, pattern) and determinants (causes, risk factors) of health-related states and events (not just diseases) in specified populations (neighbourhood, school, city, state, country, global).[2]

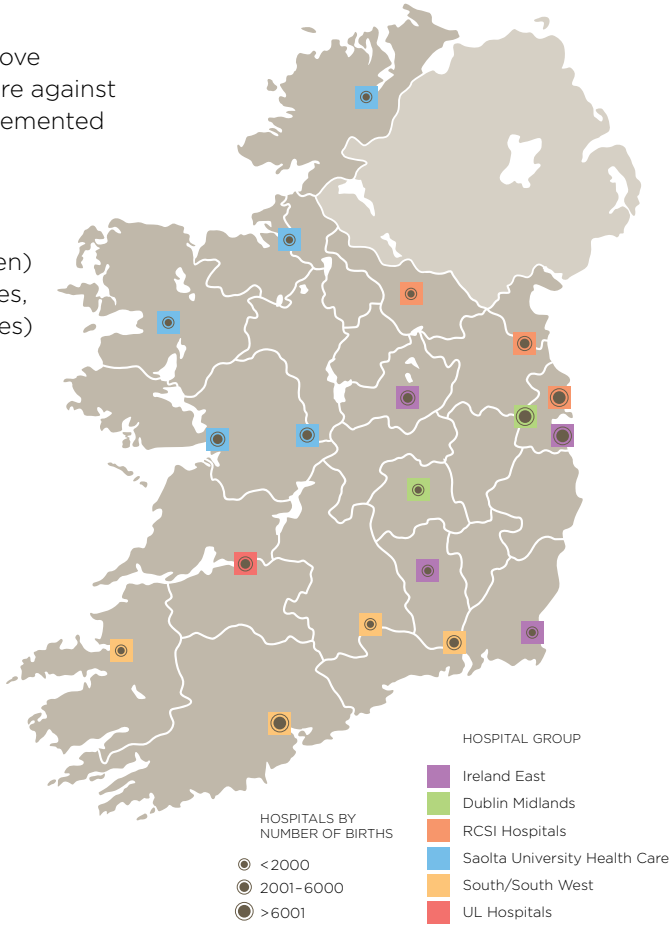
NPEC report on Severe Maternal Morbidity in Ireland 2021

This is the tenth report of the national clinical audit on severe maternal morbidity (SMM) in Ireland published by the National Perinatal Epidemiology Centre (NPEC). The fundamental aim of the audit is to provide a national review of women experiencing severe maternal morbidities, to identify quality improvement initiatives and make recommendations for the improvement of maternal care in Ireland. All 19 maternity units provide data to the NPEC on women attending their unit who experienced a severe maternal morbidity.

What is Severe Maternal Morbidity?

The World Health Organisation (WHO) defines maternal morbidity as "any health condition attributed to and/or aggravated by pregnancy and childbirth that has a negative impact on the woman's wellbeing". There is a wide range of maternal morbidities and unfortunately there is a lack of international consensus in defining the severity of maternal morbidity.

In order to clearly understand and evaluate how much severe maternal morbidity affects women in Ireland, and to make international comparisons, the NPEC adapted a validated international measurement tool using specific definitions used by a comparable national audit in Scotland.[3]



58,953 MATERNITIES IN IRELAND IN 2021

374 WOMEN EXPERIENCED A SEVERE MATERNAL MORBIDITY (SMM) DURING OR SHORTLY AFTER PREGNANCY IN 2021

Full report available at: **www.ucc.ie/en/npec/**

[1] health.gov.ie/blog/press-release/tanaiste-announces-new-national-perinatal-epidemiology-centre-in-cork-university-hospital/

[2] www.cdc.gov/careerpaths/k12teacherroadmap/epidemiology.html

[3] Scottish Confidential Audit of Severe Maternal Morbidity: 10th Annual Report (2014). Available from: www.healthcareimprovementscotland.org/our_work/reproductive,_maternal__child/programme_resources/scasmm.aspx

What severe morbidities were experienced by mothers in 2021?

Major obstetric haemorrhage (MOH) remains the most frequently reported SMM event in 2021, accounting for over half (53%) of SMM cases. The incidence of MOH in Ireland has increased significantly (47%) since the inception of the audit in 2011. Increasing rates of MOH have also been reported in the UK and other EU countries. There was a variance in the rate of MOH across Irish maternity units. The NPEC have implemented a detailed audit on MOH for the reporting years 2021 and 2022 to identify risk factors associated with this morbidity and evaluate clinical practice in the management of MOH. Further, in collaboration with the National Women and Infants Health Programme in the HSE, the NPEC have developed a quality improvement initiative around postpartum haemorrhage (PPH) in order to standardise review of PPH/MOH events in order to learn lessons.

Admission to an intensive or coronary care unit (ICU/CCU) was the second most common event, reported in over a third (40%) of SMM cases. Admission to ICU/CCU impacts on resources within the maternity services and the maternal experience following birth including bonding with her baby who would most likely be nursed in a separate location.

In 2021, variants of the **COVID-19** impacting maternal and fetal well being affected Ireland during the 'third and forth wave' of COVID-19. A notable change in the SMM data in 2021 was the increased rate of ICU/CCU admission with acute respiratory dysfunction (i.e. respiratory distress requiring ventilation to assist breathing); women experiencing COVID-19 infection in the majority. Compared to previous years, there was a threefold increase in the incidence of acute respiratory dysfunction (7.5%), again in women experiencing COVID-19 infection.

The next most common reported morbidities were **renal or liver dysfunction** (abnormal blood tests results indicating renal or liver compromise) 7.0%, **peripartum hysterectomy** (i.e.surgical removal of the uterus (womb) at time of birth or in the early post-natal period) 6.7% and **pulmonary embolism**, i.e., a clot in the lung (5.9%). The rate of peripartum hysterectomy (PH) has increased in recent years and in 2019-2021 it was 42% higher than in 2011-2013. This indicates that 1 in 2,000 women in Ireland experienced a PH. Abnormal location of the placenta (a condition that can lead to massive bleeding and increased risk of maternal death) was the most commonly reported cause for performing a PH.

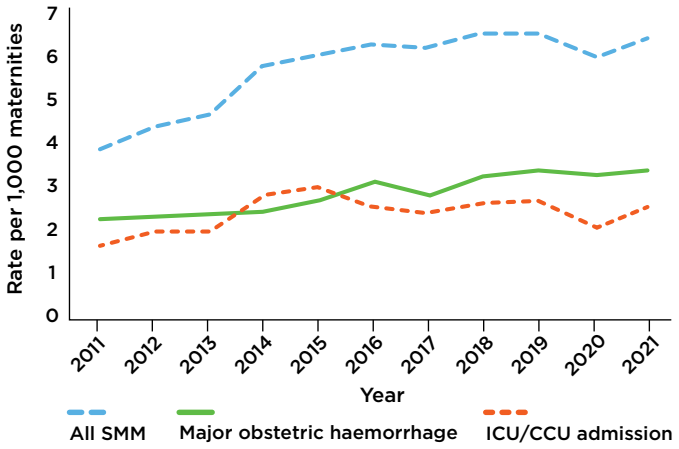


Figure 1: Trend in rate of severe maternal morbidity (SMM), major obstetric haemorrhage and intensive care admission/ coronary care admission (ICU/CCU), 2011-2021

Definitions

Severe maternal morbidity
Severe maternal morbidity (SMM) was defined as a pregnant or recently-pregnant woman (i.e. up to 42 days following the pregnancy end) who experienced any of the following sixteen, clearly defined, maternal morbidities/care events: major obstetric haemorrhage, uterine rupture, eclampsia, renal or liver dysfunction, pulmonary oedema, acute respiratory dysfunction, pulmonary embolism, cardiac arrest, coma, cerebrovascular event, status epilepticus, septicaemic shock, anaesthetic complications and maternities involving peripartum hysterectomy, admission to an intensive care unit (ICU) and interventional radiology. Complete explanatory definitions of these morbidities are available in the annual 2021 NPEC SMM report.

Major obstetric haemorrhage (MOH)
A complication where a woman experienced an unexpected antenatal haemorrhage or a blood loss at or following birth greater equal to 2,500 mls and/or received a blood transfusion of 5 or more units. Bleeding may be vaginal or less commonly, internal, into the abdominal cavity. Obstetric haemorrhage is more likely to occur at or following birth. A point of reference is that a blood loss of less than 500mls at birth is considered to be 'within the normal' expected range of blood loss during birth.

Calculating rates
The incidence rate of SMM and of specific morbidities are calculated per 1,000 maternities resulting in the live birth or stillbirth of a baby weighing at least 500g.

Maternal characteristics associated with SMM

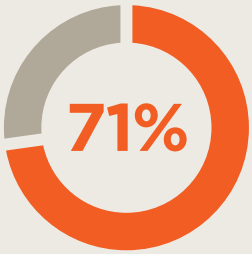
The report explores a number of maternal characteristics associated with SMM. SMM was more common in women aged 40 years or older. There was a slight overrepresentation of women experiencing SMM whose ethnicity was described as Black, Asian and Irish traveller.

The report highlighted an association between increased BMI and SMM. It was observed that of the total number of women experiencing two SMMs or more in 2021, a higher proportion (66%) were classified as obese. Women who were obese had double the risk of SMM compared to women with a healthy BMI. Additionally, women with high BMI had approximately 50% higher risk of MOH and ICU/CCU admission and twice the risk of peripartum hysterectomy and pulmonary embolism.

The perinatal mortality rate (rate of stillbirths and live born babies who die within 7 days of delivery) in women experiencing SMM was approximately 5 times the perinatal mortality rate observed for all births in Ireland. This finding is similar to findings in previous year reports.

Virtually all of the women who experienced SMM in 2021 required an increased level of clinical support, often outside the normal post-natal ward in a critical care setting.

There is a statistically increased risk of SMM associated with multiple pregnancy (twins, triplets or more); the risk was 4.5 times higher than that associated with a singleton pregnancy.



NEARLY THREE QUARTERS (71%) OF THE WOMEN WHO EXPERIENCED SMM IN 2021 WERE DIAGNOSED WITH ONE MORBIDITY

How many women experienced severe maternal morbidity?

The number of women experiencing one or more SMM was 6.34 per 1,000 maternities or one in 158 maternities in 2021.

Over the ten-year period of this national clinical audit, 2011-2021, the SMM rate has increased by 65%, from 3.85 to 6.34 per 1,000 maternities.

Nearly three quarters (71%) of the women who experienced SMM in 2021 were diagnosed with one morbidity; 23% had two morbidities; 5% with three SMMs; 1% with four morbidities and one (0.3%) women experienced six morbidities.

A message from our public representative

This is my fifth Lay Summary of the NPEC Severe Maternal Morbidity (SMM) report. With each report I feel compelled to remind the reader that each of the statistics contained within this report is a woman at her most vulnerable. This can never be overstated.

With this and previous reports I am further educated on Severe Maternity Morbidity, and I am encouraged to see recommendations from previous reports taken on board and progressed; specifically in relation to Major Obstetric Haemorrhage (MOH), morbidly adherent placenta and blood loss. These reports offer us all an opportunity to learn. It is up to the organisations who have been identified to take ownership of progressing recommendations and whether they choose to learn from this report.

It is disappointing to note that the timeline associated with the submission of data continues to pose a challenge, but it further highlights the necessity of protected time for clinical staff (albeit in an over-stretched health service). The benefit to clinicians and service users because of the constant collation and evaluation of data from each of the 19 maternity units lends itself to enhanced awareness and learning. This report is crucial when considering potential further learning & education.

Year on year the production of this report highlights the need for education; public health education and antenatal education. I have noted this recommendation since I became involved with the NPEC in 2017. If the woman is educated on maternal morbidity this may lessen her trauma. This is my lay summary of the NPEC SMM report. I am not a medical person; I am the patient representative. Simply put, I was a patient.

Educate the woman on Maternal Morbidity, give her the tools to ask questions, take steps to alleviate her fears. Learn from her.

To not progress the recommendations within this report is a lost opportunity for all within the obstetrics and midwifery sector and it may perpetuate the fear for women on their maternity journey today.

Claire Jones
Patient Representative
NPEC Severe Maternal Morbidity Group

Recommendations

- Robust clinical audit on adverse maternal outcomes requires the protected time of clinical staff. Funding should be provided by the Health Service Executive (HSE) to facilitate the same.
- A public health education programme on maternal morbidity and modifiable risk factors should be developed.
- Antenatal education:

  (a) Antenatal education/information should be provided by the multidisciplinary team to women to ensure an understanding of maternal morbidity and complication awareness.

  (b) When a pregnant woman is identified as high risk for significant morbidity, specific education should be available during antenatal care and birth preparation.

  (c) The national standards on antenatal education should provide guidance on specific education for maternal morbidity awareness.
- Internationally, social inequalities have been shown to impact on risk of SMM. There is a need to establish the evidence in this regard in Ireland. This requires improved maternity data at national level and more research in order to establish this evidence.

  There is an opportunity with the Maternal Newborn Clinical Management System (MN_CMS) data from Irish maternity units to mine data at national level. These data could be collated to identify the influence of risk factors for SMM in Ireland including ethnicity, maternal age, body mass index (BMI), smoking, employment status and other socio-economic factors. This should overcome the current deficit in the pregnant population data at national level.

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