



NATIONAL PERINATAL
EPIDEMIOLOGY CENTRE



**SEVERE
MATERNAL
MORBIDITY**
in Ireland

Lay Summary 2020

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 the complications 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

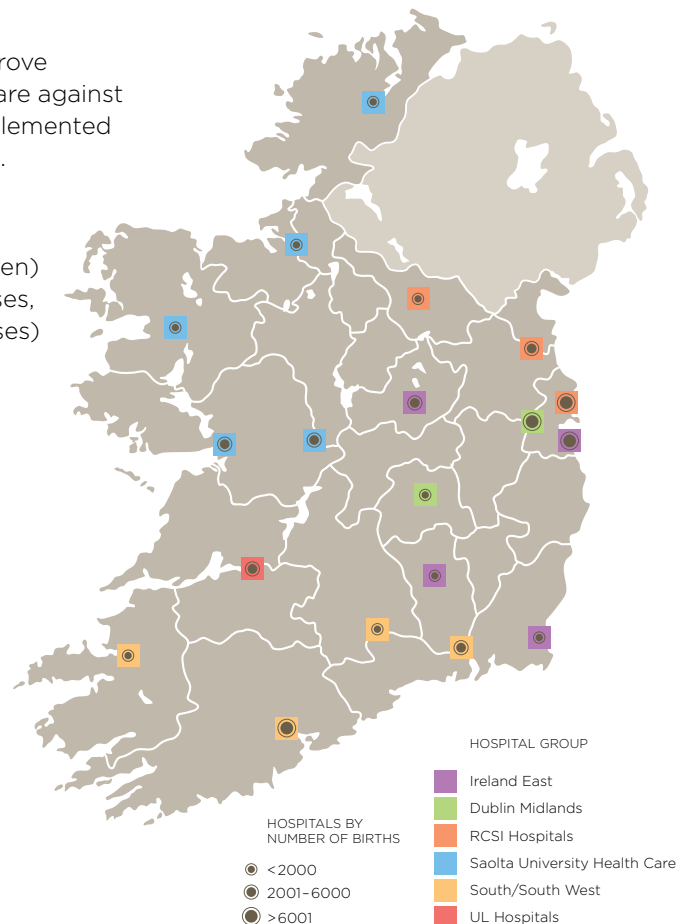
NPEC report on Severe Maternal Morbidity in Ireland 2020

This is the ninth 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



55,281 MATERNITIES IN IRELAND IN 2020

329 WOMEN EXPERIENCED A SEVERE MATERNAL MORBIDITY DURING OR SHORTLY AFTER PREGNANCY IN 2020

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

Definitions

Severe maternal morbidity

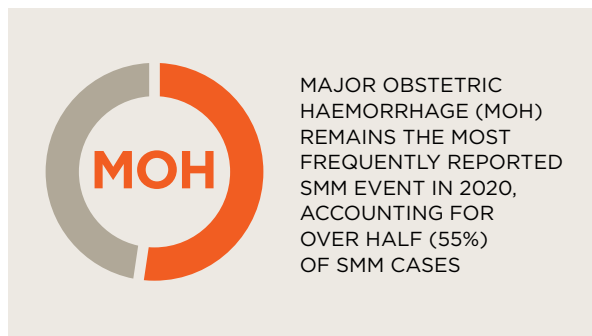
Severe maternal morbidity (SMM) was defined as a pregnant or recently-pregnant woman (i.e. up to 42 days following the pregnancy end) who experienced any of the following sixteen, clearly defined, maternal morbidities: major obstetric haemorrhage, uterine rupture, eclampsia, renal or liver dysfunction, pulmonary oedema, acute respiratory dysfunction, pulmonary embolism, cardiac arrest, coma, cerebrovascular event, status epilepticus, septicæmic 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 2020 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.



What severe morbidities were experienced by mothers in 2020?

Major obstetric haemorrhage (MOH)

remains the most frequently reported SMM event in 2020, accounting for over half (55%) of SMM cases. The incidence of MOH in Ireland has increased significantly (43%) 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 has implemented a detailed audit on MOH in January 2021 to identify risk factors associated with this morbidity and evaluate clinical practice in the management of MOH.

Admission to an intensive or coronary care unit (ICU/CCU)

was the second most common event, reported in over a third (35%) of SMM cases. This rate has stabilised over the last two years (Figure 1). In 2020, there was a slight decrease in the rate of ICU/CCU admissions. This decrease may have been associated with the increased demand on ICU/CCU beds during 2020 due to severe COVID-19 cases in

the non-pregnant population. 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.

Other SMMs

The next most common reported morbidities were **renal or liver dysfunction** (abnormal blood tests results indicating renal or liver compromise) 10.3%, **peripartum hysterectomy** (i.e. surgical removal of the uterus (womb) at time of birth or in the early post-natal period) 8.2% and **pulmonary embolism**, i.e., a clot in the lung (6.4%). The rate of peripartum hysterectomy (PH) has increased in recent years and in 2018-2020 it was 45% higher than in 2011-2013. This indicates that 1 in 3,000 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.

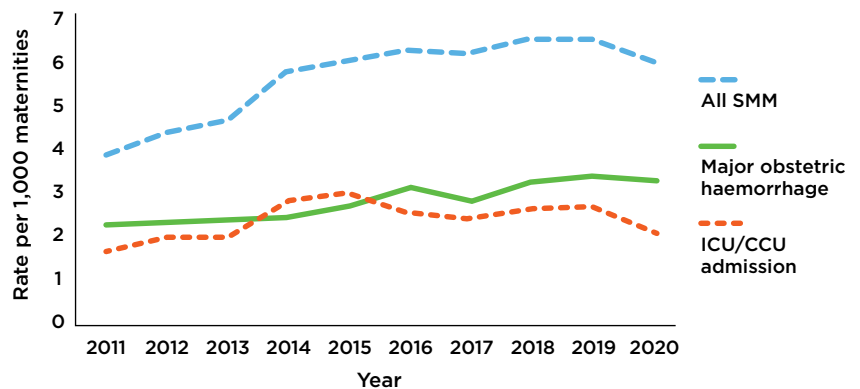


Figure 1: Trend in rate of severe maternal morbidity (SMM), major obstetric haemorrhage and intensive care admission/coronary care admission (ICU/CCU), 2011-2020

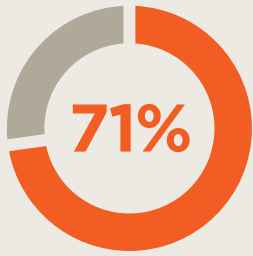
Maternal characteristics associated with SMM

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 2020, a higher proportion 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 4.5 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 2020 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 three times higher than that associated with a singleton pregnancy.



NEARLY THREE QUARTERS (71%) OF THE WOMEN WHO EXPERIENCED SMM IN 2020 WERE DIAGNOSED WITH ONE MORBIDITY

How many women experienced severe maternal morbidity?

The number of women experiencing one or more SMM was 5.95 per 1,000 maternities or one in 168 maternities in 2020.

Over the ten-year period of this national clinical audit, 2011-2020, the SMM rate has increased by 54%, from 3.85 to 5.95 per 1,000 maternities.

Nearly three quarters (71%) of the women who experienced SMM in 2020 were diagnosed with one morbidity; 22% had two morbidities; 5% with three SMMs; 0.6% with four morbidities and the same number of women reported five morbidities.

A message from our public representative

Severe Maternal Morbidity is the term used to encompass specific chronic and acute pregnancy and childbirth complications; it's not something a pregnant woman wants to know about or even consider as her reality, but it is a reality for a small percentage of women; 1 in 168 maternities in 2020. For that one woman and her family, severe maternal morbidity is 100% her reality. So much can be learned from her experience, not only in terms of this and other audits but also in terms of education and support for the pregnant woman.

Every statistic in this audit represents the experience of a woman in a maternity unit in Ireland in 2020; a woman at her most vulnerable, relying on the ongoing education, professionalism and care afforded to her by the obstetric and midwifery team at her bedside.

The findings of the SMM audits over the last nine years continues to lend itself to educating our obstetric and midwifery staff; greater education results in earlier identification and treatment of SMM and more positive outcomes for women; our partners, daughters, sisters, mothers and friends.

Maternal welfare is the priority of this audit.

The universal and timely contribution of the unit co-ordinators within the 19 maternity units demonstrates the want for improvement, understanding and education on Severe Maternal Morbidity. This audit encompasses all elements of a woman's being in order to educate and accurately identify quality improvement initiatives and make recommendations to improve maternal care for the woman in our lives today.

These recommendations must be acted upon and funded by the appropriate agencies in order to progress change. The welfare of our pregnant women in maternity hospitals today is at stake. My hope is that the recommendations contained in this report, and proceeding SMM audit reports, are wholeheartedly considered and implemented by the HSE to effect change and improvement for the welfare and outcome of our pregnant women.

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 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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