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DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY
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The impact of intrapartum fetal death and other serious adverse perinatal events on healthcare professionals and the maternity services

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A thesis submitted to the National University of Ireland, Cork for the degree of Doctor of Philosophy in Medicine, 2019.

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Glossary

AB	Assisted Breech
APH	Anti-partum Haemorrhage
BMI	Body Mass Index
CMACE	Centre for Maternal and Child Enquiries
CMO	Chief Medical Officer
CS	Caesarean Section
CUMH	Cork University Maternity Hospital
DIT	Doctor in Training
EWTD	European Working Time Directive
HCP	Health Care Professional
HIE	Hypoxic ischaemic encephalopathy
HIQA	Health Information and Quality Authority
HSE	Health Service Executive
IOG	Institute of Obstetricians and Gynaecologists
IOL	Induction of Labour
IPA	Interpretative phenomenological analysis
IPD	Intrapartum Fetal Death

IQR	Inter-quartile Range
LFD	Large for dates
MBI	Maslach Burnout Index
NCHD	Non-Consultant Hospital Doctor
NHS	National Health Service (UK)
NMH	National Maternity Hospital
NPEC	National Perinatal Epidemiology Centre
NPRS	National Perinatal Reporting System
NWIHP	National Women and Infants Health Programme
OECD	Organisation for Economic Co-operation and Development
OVD	Operative Vaginal Delivery
PM	Post-mortem
PPROM	Preterm premature rupture of the membranes
ProQol	Professional Quality of Life
RCPI	Royal College of Physicians in Ireland
ROI	Republic of Ireland
SPSS	Statistical Package for the Social Sciences
STS	Secondary Traumatic Stress

SVD	Spontaneous Vaginal Delivery
UMHL	University Maternity Hospital Limerick
uNND	Unexpected Neonatal Death
WHO	World Health Organisation
WTE	Whole Time Equivalent

Declaration

I declare that this thesis has not been submitted as an exercise for a degree at this or any other university. The work, upon which this thesis is based, was carried out in collaboration with a team of researchers and supervisors who are duly acknowledged in the text of the thesis. The library may lend or copy this thesis upon request.

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Researching and, in particular, writing this thesis has been one of the more challenging goals I have set for myself. Those who know me are acutely aware of my Gaelcholaiste schooling and as such my somewhat limited grasp of “proper” English. It has taken immeasurable patience, and dare I say suffering from a distinct group of people to educate me on the nuances of academic English writing. They know who they are.

The studies presented in this thesis while performed and written by me are not solely my own but are the result of collaboration with a talented, generous varied group of individuals.

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Publications and Presentations given during my time as a PhD student

Publications (related to thesis – pre viva voce):

Healthcare professionals' response to intrapartum death: A cross- sectional study. **McNamara K**, Meaney S, O'Connell O, McCarthy M, Greene RA, O'Donoghue K, Arch Gynecol Obstet 2017 Apr;295(4):845-852. doi: 10.1007/s00404-017-4309-9. Epub 2017 Feb 17

Intrapartum fetal deaths and unexpected neonatal deaths in The Republic of Ireland: 2011- 2014; a descriptive study. **McNamara K**, O 'Donoghue K, Greene RA. BMC Pregnancy and Childbirth, 2018 Jan 4;18(1):9. doi: 10.1186/s12884-017-1636-6

Invited Commentary: Perinatal mortality in Ireland, annual report 2016. Reducing the burden of intrapartum death (Published 2018), **McNamara K**

Intrapartum fetal death and doctors, A qualitative exploration. **McNamara K**, Meaney S, O 'Donoghue K, Acta Obstet Gynaecol Scand, 2018 Jul;97(7):890-898. doi:10.1111/aogs.13354. Epub 2018 Apr 21

Publications (related to thesis – post viva voce):

The perceived effect of serious adverse perinatal events on clinical practice. Can it be objectively measured? **McNamara K**, O'Donoghue K. Eur J Obstet Gynecol Reprod Biol. 2019 Sep; 240:267-272. Doi 10.1016/j.ejogrb.2019.05.026

Interventions to improve wellbeing among obstetricians and midwives at Cork University Maternity Hospital. O'Riordan S, O'Donoghue K, **McNamara K**. Ir J Med Sci. 2019 Oct 10. doi: 10.1007/s11845-019-02098-1. [Epub ahead of print]

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Psychological and support interventions to reduce levels of stress, anxiety or depression on women's subsequent pregnancy with a history of miscarriage: an empty systematic review. San Lazaro Campillo I, Meaney S**, McNamara K,** O' Donoghue K, BMJ Open 2017 Sep 7;7(9):e017802. Doi:10.1136/bmjopen-2017-017802

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Serious adverse events in obstetrics and subsequent effects on clinical activity. BMFMS 2017. Published in BJOG 2017, Volume 124, 59-59, Issue S2. Doi: 10.1111/1471-0528.14587

An evaluation of interventions to support obstetricians when dealing with burnout: a systematic review. Published in BJOG 2017, Volume 124 (134-135), Issue S2. Doi: 10.1111/1471-0528.14589

Intrapartum fetal death and doctors; A qualitative exploration. BMC Pregnancy and Childbirth 2017. Volume 17 Supplement 1 (1457).

Intrapartum fetal deaths and unexpected neonatal deaths in the Republic of Ireland: a descriptive study. Published in BJOG 2016. Volume 123. Issue S1. DOI 10.1111/1471-0528.13987

The impact of intrapartum death on midwives. Published in the Journal of Pain and Symptom Management 2017. Volume 52, Issue 6 (e61).

Healthcare professionals' response to intrapartum death; a cross-sectional study. BJOG 2016. Supplement 1:5-116. Doi 10.1111/1471-0528.13988

Presentations:

Oral (Local, National and International)

The impact of serious adverse events on maternity professionals, Anu Research Study Day, Cork, Ireland, 2018

Educational opportunities for staff in perinatal bereavement in the ROI, International Stillbirth Alliance Meeting, Glasgow, United Kingdom, 2018

The Impact of serious adverse events on maternity professionals, Grand Rounds Cork University Maternity Hospital, Cork, Ireland, 2018

Intrapartum death and doctors, INFANT study day, UCC, Cork, Ireland, 2017

Intrapartum death and doctors, International Stillbirth Alliance Meeting, Cork, Ireland 2017

Intrapartum fetal deaths and unexpected neonatal deaths in the Republic of Ireland: a descriptive study: 3rd Annual Star legacy Stillbirth Summit, Minnesota, USA, June 2017

Intrapartum death and doctors. Anu Research Study day, UCC, Cork, Ireland, 2017

Intrapartum fetal deaths and unexpected neonatal deaths in the Republic of Ireland: a descriptive study. JOGS annual meeting, Dublin, Ireland, 2016

Intrapartum fetal deaths and unexpected neonatal deaths in the Republic of Ireland: a descriptive study. INFANT study day Cork, Ireland, 2016

Healthcare professionals' response to intrapartum death: a cross-sectional study. JOGS annual meeting, Dublin, Ireland, 2016

The Grand Plan, UCC Postgraduate Showcase, Final, Cork, Ireland 2016

Posters (National and International)

Maternity ultrasound in the republic of Ireland, 2016. JOGS, Dublin, Ireland 2017

Interventions to improve wellbeing among obstetricians and midwives in Cork University Maternity Hospital. ISA Cork, Ireland, 2017

Serious adverse events in obstetrics and subsequent effects on clinical activity. BMFMS, Amsterdam, the Netherlands 2017

An evaluation of interventions to support obstetricians when dealing with burnout: a systematic review. BMFMS. Amsterdam, the Netherlands 2017

Healthcare professionals' response to intrapartum death: a cross-sectional study. 21st International Conference on Palliative Care, Montreal, Canada. 2016

Healthcare professionals' response to intrapartum death: a cross-sectional study. INFANT Research day, UCC, Ireland. 2016

Healthcare professionals' response to intrapartum death: a cross-sectional study. BMFMS, Birmingham, United Kingdom, 2016

Healthcare professionals' response to intrapartum death: a cross-sectional study. Irish Hospice Friendly Hospitals Conference, Limerick, Ireland 2016

Intrapartum fetal deaths and unexpected neonatal deaths in the Republic of Ireland: a descriptive study. BMFMS , Birmingham, UK. 2016

Awards and Prizes

Anu Research Medal 2018: Serious adverse events and subsequent impact on healthcare professionals: Anu Research Study day, South-southwest Hospital Group, Cork, Ireland.

Best oral presentation. Intrapartum fetal deaths and unexpected neonatal deaths in the republic of Ireland: a descriptive study. INFANT study day Cork, Ireland 2016

Second best oral presentation; Healthcare professionals' response to intrapartum death: a cross-sectional study. JOGS annual meeting 2016

Best poster presentation; Healthcare professionals' response to intrapartum death: a cross-sectional study . Irish Hospice Friendly Hospitals Conference Limerick 2016.

Preface – How this thesis is structured

This thesis is presented in the form of a publication based thesis.

Chapter 1, the introduction, gives an overview of the Irish maternity services and discusses some of the history of the Irish maternity services, both positive and negative, as well as current and topical issues and developments and the interplay between the public, media, medicine and medical professionals. While it is somewhat long I believe it is important for the reader of this thesis to have a thorough understanding of the current challenges faced by healthcare professionals working in the Irish maternity services. These day to day challenges undoubtedly colour how healthcare professionals process and deal with serious adverse perinatal events.

Chapter 2, is made up of two separate manuscripts, both focusing on the numbers of Intrapartum deaths and intrapartum event related neonatal deaths. The first is a study that was published in BMC Pregnancy and Childbirth in January 2018 and investigates the numbers and causes of intrapartum fetal deaths and intrapartum event related neonatal deaths that occurred in Ireland between 2011 and 2014. The second manuscript is an **invited commentary** I wrote for the **National Perinatal Epidemiology Centre's Annual report, published in 2018**. This focuses specifically on intrapartum fetal death and presents some recommendations on how, in Ireland, we might improve our management and investigation of these deaths

Chapter 3 is also made up of two manuscripts and examines the human impact of intrapartum death on healthcare professionals. The first paper (Paper 3) is a cross-sectional study of both obstetricians and midwives and was **published in Archives of Gynaecology and Obstetrics in April 2017**. It documents the experiences of HCP's following exposure to intrapartum death (IPD), it identifies some of the opinions surrounding education and suitable support strategies following an IPD, and aims to ascertain if involvement with an IPD had any impact on clinical practice. Paper 4, which was published in **April 2018 in Acta Obstetricia et Gynecologica Scandinavica**, is a qualitative piece that provides an in-depth exploration of the attitudes and responses that Irish Obstetricians have following direct involvement with an intrapartum fetal death.

Chapter 4 focuses on the impact of adverse events on clinical practice and is made up of one manuscript (Paper 5). This paper was published in the **European Journal of Obstetrics and Gynaecology in September 2019**. The aim of this study was to identify if it was feasible to design a study that could objectively demonstrate if a change in labour ward activity occurred in the 28 days following a serious adverse perinatal event. If this proved possible, the second aim was to identify if these changes could be attributed to the preceding adverse event.

Chapter 5, is a systematic review (Paper 6) examining what pre-existing support structures and interventions are available for obstetricians to access to tackle both burnout and compassion fatigue. This is currently under review in Archives of Gynaecology and Obstetrics.

Chapter 6, is comprised of two manuscripts focusing on the development of new support tools for maternity healthcare professionals to access in the aftermath of a serious adverse event. Paper 7, which subsequent to my viva voce has been published in the **Irish Journal of Medical Science** (October 2019) focuses on the development of local support tools in a tertiary maternity hospital. The manuscript was drafted by a medical student, Sinead O'Riordan who was supervised by me, while completing her final year medical project. I was involved in the design of this study as well as the analysis of the data. In addition I revised the manuscript and made critical corrections to it. Paper 8, focuses on a national education tool for obstetricians and is currently under review in Acta Obstetricia et Gynecologica Scandinavica

Chapter 7 is the discussion of this thesis and follows the same structure as the chapters, i.e. each chapter is discussed in sequence.

Abstract

Obstetrics and midwifery are high risk specialties. Sometimes and even despite the provision of the best medical care possible, serious adverse events do occur. While patients and service users of the Irish maternity services bear the bulk of the burden of harm from these adverse events, the healthcare staff who are also involved in these cases can be substantially affected. Stillbirth, which encompasses both antenatal and intrapartum death, is one of the more serious adverse events or outcomes that can happen during a pregnancy. Existing research focuses largely on the impact that antenatal stillbirth has on obstetricians and midwives, with no research focusing specifically on the impact that intrapartum fetal death has on maternity service healthcare professionals

Much is also now known and acknowledged about the increasing levels of burnout and compassion fatigue that are affecting healthcare professionals. In fact, it has been recognised that healthcare professionals are more likely to experience burnout than the general workforce and it is now estimated that burnout affects 1 in 2 doctors. Healthcare professionals in the maternity services are not exempt from these issues. What is apparent, however, is that relative to the literature pertaining to the general medical specialties, there is a clear paucity of research investigating the effectiveness of available support strategies for maternity healthcare professionals to access either in the aftermath of an adverse event or to help them tackle burnout in the longer term.

This thesis focuses on the specific impact that intrapartum death, and other serious perinatal adverse events have on healthcare professionals. I have utilised both quantitative and qualitative research methods to describe in detail the scale of the impact, both personally and professionally, that these events have on the involved healthcare professionals. Obstetricians and midwives are profoundly and negatively affected by a personal involvement in an intrapartum death.

Following a review of the existing literature, I identified a substantial lack of effective support strategies for maternity healthcare professionals to access to help them with the impact of adverse events. This finding was echoed by my research with the cohort of obstetricians and midwives who participated in my studies. By and large they had received no training in dealing with intrapartum death nor had they received any education on self-care strategies.

This thesis concludes with two studies, aimed at addressing this deficit and these studies are an evaluation of both local and national support strategies for maternity healthcare professionals to potentially utilise on an ongoing basis.

Finally, I discuss the implications that my research has on clinical practice, and I discuss the possibilities for future research that may potentially improve the support that maternity healthcare professionals are given in the aftermath of these adverse events.

Chapter 1

Introduction

1. Introduction

For the most part pregnancy and childbirth are times of excited anticipation and happiness for parents as they prepare to welcome a new baby into their home and life. Obstetrics and midwifery are professions concerned with the safe provision of care to these mothers, babies and families in the pre-conceptual, antenatal, intrapartum and postpartum periods(1, 2). While the majority of pregnancy outcomes are positive, sometimes, however, and even despite best medical practice serious adverse perinatal events occur (3). In particular the death of a baby at any stage during a pregnancy or the postnatal period is profoundly traumatic for parents and there is now a substantial body of research acknowledging and focusing on this impact (4-8). It is only in the last decade or so that it has also been acknowledged that healthcare professionals who care for these families can also be substantially affected (9-12).

Most of the literature which focuses on the impact of adverse perinatal events on healthcare professionals (HCPs), focuses on the impact of antenatal stillbirth (9, 12, 13). There is comparatively little research investigating the specific impact of intrapartum fetal death or other severe adverse labour ward outcomes on HCPs. In addition, there is even less research focusing on how best to support HCPs in the aftermath of an intrapartum death or other serious adverse event. It was for these reasons that I chose to direct my research attention specifically on these topics; intrapartum fetal death and other serious adverse perinatal events occurring on the labour ward, giving primary focus to intrapartum fetal death.

Based on the little research that was available, I hypothesised, that being directly involved with a serious adverse perinatal event such as an intrapartum death would have a substantial and largely negative impact on healthcare professionals from both a personal and a professional point of view, and may even contribute to a change in their clinical practice. I hypothesised that IPDs might prove to be uniquely traumatic for the involved healthcare professionals especially in circumstances where the pregnancy has been uncomplicated and the IPD unexpected. I anticipated that the development and introduction of support systems and structures for healthcare professionals to access in the aftermath of a serious adverse event, would be welcomed and prove acceptable and beneficial for staff.

As this research was undertaken in Ireland it is important for the reader to understand some of the history of the Irish maternity services, both positive and negative, as well as current and topical issues and developments and the interplay between the public, media, medicine and medical professionals. The maternity services in Ireland are commonly reported to be 'at breaking point' (14). There are unprecedented levels of mistrust amongst the general public towards the health service as a whole but in particular the maternity services. The level of burnout in maternity HCPs, both in Ireland and elsewhere, is at an all-time high and burnout can play a substantial role in how HCPs respond and deal with adverse events (15-17).

In this introductory chapter of my thesis I will firstly describe the current model of maternity care in Ireland. I will then give a brief overview of some of the more

controversial and topical issues that have plagued the Irish maternity service and its staff over the last two decades, what was done about these controversies and what positive developments have arisen as a result. It is important that I take the time to discuss these topics as it sets the scene for what is to come. Finally, I will examine what can go wrong in maternity care, giving special attention to intrapartum fetal death, and discuss what is known about the impact of these specific adverse outcomes on HCPs.

1.1 An Overview of Maternity Care in Ireland

1.1.1 Irish maternity services – historical context

The infrastructure

In Ireland we have some of the oldest maternity hospitals in the world, with two of our hospitals' histories tracing back to the 18th century. The Rotunda Hospital Dublin, first opened its doors in 1745, in George's Lane in Dublin (18). At this time, it was known as 'The Dublin Lying-in Hospital'; it quickly became too small for purpose and in 1757 moved to its current location on Parnell St in Dublin's north side. The first Caesarean Section in Ireland was performed in the Rotunda Hospital in 1889 (18).

The Coombe Women and Infant's University Hospital was established as a maternity hospital in 1826, but the beginning of this hospital was in October 1770 when Lord Brabazon laid the foundation for a general hospital located in the Coombe area (19). It continued to operate as a general hospital until 1826 when Mrs Margaret Boyle refurbished the hospital for both maternity care and "diseases peculiar to

women" with a 100-pound donation. In 1829 the hospitals name was changed to 'The Coombe Lying-in hospital'. It was not until 1993 that the name of the hospital changed again to 'The Coombe Women's Hospital' making it the first named women's hospital in the country.

The people

Up until the 20th century obstetricians in Ireland and elsewhere were known as midwives. The first Caesarean section performed in Britain and Ireland, and where the mother survived was by an Irish midwife, Mary Donally, in 1738. Emily Winifred Dickson (1866-1944), a practising gynaecologist from Tyrone, trained in midwifery in the Rotunda hospital and became the first female fellow (FRCSI) to be elected to any of the colleges of surgeons in Britain or Ireland(20). Anne Louise McIlroy (1878 – 1968), born in Antrim, became the first female founder of the Royal College of Obstetricians and Gynaecologists (RCOG) in 1929 and in addition to this was the first female Professor of Obstetrics and Gynaecology in the University of London(20). In more recent times, Professor Patricia Crowley, a recently retired consultant obstetrician who worked in The Coombe Women and Infant's University Hospital was instrumental in introducing systematic reviews and meta-analysis into obstetrics. Her Systematic Review entitled 'Antenatal Corticosteroids before Premature Labour for Fetal Lung Maturation' published in 1990 was the first to be listed in the Oxford Database of Perinatal Trials. This database subsequently became the Cochrane Library and the logo for Cochrane is based on a forest plot, showing the benefit of corticosteroids, where information from 7 randomised controlled trials is pooled together. This forest plot is taken from Crowley's review.

More recently again in 2001, Dr Michael Robson, a Consultant Obstetrician in the National Maternity Hospital, Dublin developed the Robson Classification for analysing Caesarean Section rates. In 2015 this system was adopted by the World Health Organisation (WHO) as a global standard for assessing, monitoring and comparing caesarean section rates both within healthcare facilities and between them (21).

This short history hopefully shows that Ireland has for the most part had a long and proud tradition of providing maternity care to its citizens, and that Irish obstetricians and midwives have had a modest international impact in their respective fields.

Controversy

The history of the Irish maternity services is not, however, without controversy. In 1944 the National Maternity Hospital (NMH) pioneered the use of symphysiotomy as the procedure of choice in certain cases of obstructed childbirth (22). This procedure is now outdated and the subject of much ongoing media interest because of the apparent long-term sequelae for those women who were subjected to it (23, 24). At the time it was used as an alternative to Caesarean Section (CS). There were two main motivations behind its use; an avoidance of multiple CS in women and of the perceived dangers that repeat CS had at the time, and in addition to this if multiple repeat CS could be avoided it negated the need to recommend sterilisation to women who had three or more Caesarean Sections (25). This was in line with the Catholic Church's teaching on sterilisation and contraception (i.e. that

it was morally wrong to offer or provide sterilisation to Irish families) and the National Maternity Hospital (NMH) at the time was Irelands' leading Catholic Identified maternity hospital (22, 25). Symphysiotomy was thought to permanently enlarge the pelvis, and if it was carried out in a first pregnancy where obstructed labour was diagnosed, it was thought that it may avoid the need for women to have repeated Caesarean Sections in further pregnancies. Symphysiotomy was also used frequently in the Coombe Hospital, Our lady of Lourdes Hospital, Drogheda and in the Cork Unified Maternity Services (25). It was used rarely in other Irish maternity units (25). The use of symphysiotomy was questioned and criticised by multiple international experts and in 1966, under the mastership of Dr Kieran O'Driscoll the procedure was finally abandoned. In the NMH O'Driscoll proved to be quite progressive in a staunchly catholic hospital and introduced family planning talks and instruction in 'natural' methods of contraception (22). Unfortunately, symphysiotomy continued to be practiced in other Irish maternity units until the 1980s. The women who were in receipt of a symphysiotomy continue to report a substantially negative impact on their lives (25). More will be discussed about the controversies within Irish obstetrics in a later section.

1.1.2 Irish Maternity Services — Current Model of Care

I am now going to describe in brief how the Irish Maternity Service works. This is important as it will help the reader understand why the Irish Maternity Service is often referred to as being "in crises".

The Health Service Executive (HSE), established in 2005 is the national agency responsible for the delivery of health services in the Republic of Ireland (from here on referred to as Ireland) and this includes the maternity services. Under the 1954 Maternity and Infant Scheme all pregnant women who are ordinarily resident in Ireland are eligible to receive free public maternity care (26).

The Nineteen Maternity Units

Over 99% of the births that happen in Ireland each year occur in a hospital setting, in one of the 19 maternity units around the country (27). The maternity units are divided into six hospital groups and their relative size in terms of births per annum is shown in Table 1.1 (28). The smallest unit is South Tipperary General Hospital with approximately 1100 births per annum while the largest is the National Maternity Hospital in Dublin with approximately 9200 births per annum. The majority (16/19) of the hospitals/units are managed and run by the HSE while the other three (NMH, the Rotunda and the Coombe) are Voluntary hospitals. Voluntary hospitals, which can be owned by a private body, and are usually run by a hospital board as opposed to the HSE, receive most of their funding from the Irish government.

Of the 19 maternity units in the country, four are standalone hospitals, i.e. they are not co-located with other adult or paediatric medical, surgical or intensive care services. These hospitals are the NMH, the Rotunda, the Coombe and University Maternity Hospital Limerick. At the time of writing plans are underway to co-locate the NMH with St Vincent's University Hospital and UMHL with University Hospital

Limerick. The CWIUH will also ultimately be co-located onto the St-James Hospital Site while there are also plans for the Rotunda Hospital to be co-located with Connolly Hospital (29).

TABLE 1.1: MATERNITY UNITS PER HOSPITAL GROUP AND THEIR RELATIVE SIZE IN TERMS OF BIRTH RATE

Hospital Group	Maternity Unit	Units size (births/annum)
Ireland East Hospital Group	National Maternity Hospital	>6000
	Midland Regional Hospital, Mullingar	2000–6000
	St Luke's General Hospital, Kilkenny	<2000
	Wexford General Hospital	<2000
RCSI Hospital Group	Rotunda Hospital Dublin	>6000
	Our Lady of Lourdes Hospital, Drogheda	2000–6000
	Cavan General Hospital	<2000
Dublin Midlands Hospital Group	The Coombe Women and Infant University Hospital	>6000
	Midlands Regional Hospital, Portlaoise	<2000
University Limerick Hospitals Group	University Maternity Hospital Limerick	2000–6000
South/South West Hospital Group	Cork University Maternity Hospital	>6000
	University Hospital Waterford	2000–6000
	University Hospital Kerry	<2000
	South Tipperary General Hospital	<2000
Saolta Hospital Group	University Hospital Galway	2000–6000
	Sligo Regional Hospital	<2000
	Letterkenny University Hospital	<2000
	Mayo General Hospital	<2000
	Portinucula Hospital	<2000
Total		**19 units**

Irish Maternity Care Provision

Consultant Led Care: This service is provided in a maternity hospital or unit by a multidisciplinary team of midwives, non-consultant hospital doctors (NCHDS) and is led by a consultant obstetrician. This is currently the most commonly available service for women to access in Ireland.

Combined care: This type of care is shared between the GP and the hospital or Domiciliary in and out (DOMINO) services. The woman attends her GP for a set number of antenatal visits, and attends the hospital for another set number of antenatal visits. They can also attend for additional visits depending on clinical need. The woman also attends her GP for postnatal visits for both herself and her baby. This is currently the most commonly available service for women to access in Ireland.

Midwife-led Care and Units: There are two available Midwife Led Units (MLUs) in Ireland that are available to low risk women to utilise in both Cavan General Hospital and Our Lady of Lourdes Hospital Drogheda. The units are located within the maternity departments at these sites. The units are largely independent of the adjacent consultant- led maternity units and the service is planned, managed, coordinated and delivered by midwives. All antenatal, intrapartum and postnatal care is covered. In 2016, just 0.6% of all births in Ireland took place in one of these MLUS (27).

Domiciliary In and Out: Domiciliary In and Out (DOMINO) care is available in a small number of maternity hospitals and is offered to low risk women who live within a set distance of the provider hospital. The model differs slightly from hospital to hospital but the service is generally provided by a team of hospital based midwives who care for women throughout pregnancy, birth and during the postnatal period. Antenatal appointments can take place either in the hospital or in a community setting. The woman usually has her baby in the hospital and then generally transfers home within 12-24 hours after the birth. The midwife continues to look after mother and baby for the first few days at home. Up to 4% of mothers who gave birth in 2016 used available DOMINO services (27).

Home births: Home births are relatively uncommon in Ireland and account for approximately 0.2% of all births (27, 30). Two hospitals, the NMH and University Hospital Waterford offer a limited home birth service to low risk women(30). In addition to this 20 self-employed community midwives (SECM) have signed Memoranda of Understanding (MOU) with the HSE to provide planned home birth services to eligible women (27, 30). SECMs are bound by the terms of the MOU and are indemnified under the Clinical Indemnity Scheme operated by the State Claims Agency. The SECM is the primary carer for the woman throughout her pregnancy and for up to 14 days postnatally (27) (30).

Frontline Staff

Consultant Obstetricians and Gynaecologists: The Republic of Ireland has one of the lowest number of consultant obstetrician and gynaecologists (from here on referred to as consultant obstetricians) per 100,000 women in the Organisation for Economic Co-operation and Development (OECD)(31). The OECD which is made up of 35-member countries is an intergovernmental economic organisation which aims to promote policies that will improve the economic and social well-being of people around the world. Part of their work involves analysing and comparing data to predict future trends and to set standards on a wide range of worldwide issues, including issues pertaining to healthcare (32). In 2014 there were 162 consultant obstetricians, equating to 136 whole time equivalents (WTE), working In Ireland. This gave a ratio of 3.5 consultant obstetricians per 100,000 of the population. In 2003 under the direction of David Hanley the Report of the National Task Force on Medical Staffing was published (33). This report (from here on referred to as the Hanley report), recommended that in order to comply with the European Working Time Directive (EWTD) Ireland would require approximately 4.9 consultant obstetricians per 100,000 of the population by 2013. This would equate to approximately 226 consultant obstetricians (or 190 WTEs).

In 2015, some 12 years after the publication of the Hanley report, when a supplementary report on Consultant Workforce Planning was published by the HSE National Clinical Programme in Obstetrics and Gynaecology, Ireland again had the lowest number of obstetricians and gynaecologists per 100,000 women and the lowest per 1,000 live births of all the OECD countries. At least 100 more consultant obstetricians are required in Ireland to sustain a safe, consultant delivered maternity service, for both patients and doctors alike (34). This estimation is, however, based purely on the fact that in order to calculate the number of consultant obstetricians required for a population, the number of maternities/deliveries in the particular population is taken into account. This calculation does not take into account the increasingly complex cases that are being seen in modern Irish obstetrics, and the increase in clinical activity from prenatal diagnosis as well as fetal medicine (27). So it is possible that the number of extra consultant obstetricians needed to bridge the gap is higher than what has been quoted in the various reports.

Non-Consultant Hospital Doctors (Obstetrics and Gynaecology): The situation with respect to trainee obstetricians, or NCHDs is perhaps even more challenging (35-37). As it stands much of the current obstetric workforce is made up of NCHDs, some of whom are on an accredited training programme, some who are not. The current training structure comprises 3 years at Basic Specialist Training Scheme level and on successful completion of this a further 5 years at least on the Higher Specialist Training Scheme(1). The training schemes aim to equip trainees with the knowledge and experience to prepare them for an appropriate senior consultant

position in Ireland. Both these schemes are run and managed by the Institute of Obstetricians and Gynaecologists (IOG) of Ireland which is under the auspices of the Royal College of Physicians of Ireland (RCPI)(2). Trainees rotate through the maternity units in the country that are accredited teaching sites. Non-training NCHDs (i.e. those NCHDs who are not on a formal training scheme) fill the void in the hospitals that are either not accredited RCPI training sites or do not receive an adequate number of trainees to meet their clinical demand (38).

In recent years there has been a substantial expansion of trainees on the HST scheme. This scheme which was initially made up of 25 NCHDs has expanded to meet the projected future increased demand for consultant obstetricians(31). It is probable that as a result of this expansion that trainees on the scheme now are not being exposed to the same volume of cases as trainees in years gone by. In addition the need to comply with the European Working time directive (EWTD) which has led to an overall reduction in the working hours of trainees has also led to a 20% reduction in training time(39). So this poses the question as to whether current trainees will ultimately be as competent and secure in their clinical abilities as their predecessors(40).

Midwives: The role of the midwife in Ireland is a vitally important one. For most expectant mothers midwives are the most appropriate health care providers to attend them during pregnancy, labour, birth and the postnatal period. There is, however, a chronic and persistent shortage of midwives in Ireland. The current international recommendation for the ratio of midwives to births in order to

provide a safe and efficient maternity service is 1:29.5(41). In Ireland we fall well short of this ratio. A 2014 survey conducted by the INMO, identified the need to employ a further 621 midwives, within the public maternity healthcare service(42). The average ratio in Ireland of midwives to births is 1:40; the best staffed unit has a ratio of 1:32 with the worst having a ratio of 1:55 (42). Research has shown that a lower staffing ratio in both nursing and midwifery is associated with increased patient mortality rates, increased rates of adverse events and poor quality of patient care. This will be discussed in detail in a later section.

Neonatologists

Neonatology is a subspecialty of paediatrics and neonatologists care for well, ill or premature infants up to 6 weeks of age, as well as the longer term follow up of infants at risk of complications related to their newborn period, for example those at risk of neurodisability. For the most part consultant neonatologists as well as paediatric NCHDs, rotating through the neonatology service are responsible for the care provided to these vulnerable infants. While subspecialty trained neonatologists staff the tertiary maternity units, this is not always the case in the regional and local maternity units and neonatal care may be provided by a generalist paediatrician. With respect to staffing, neonatology faces all the same challenged as obstetrics and midwifery with just 24 WTE neonatologists employed in publicly funded hospitals. A further 10 WTEs work in the private sector. In order to provide a safe neonatology service in Ireland, it is estimated that at least 42 WTEs in neonatology

employed in the public sector is needed, which would require an almost doubling of the current numbers working in the HSE services (323).

1.2 Topical Issues in Maternity Care in Ireland

In this section I am going to describe some of the topical issues in the Irish Maternity Service and briefly outline the impact that these may have on HCPs. These are all issues that have potentially contributed to the perceived feeling of negativity that is associated in public discourse with the Irish Maternity Services (43). Ultimately these (36, 37, 44) are also concerns that have contributed to the high levels of burnout being experienced by HCPs in the Irish Health Service, and in turn may play a role in how HCPs cope with both workplace adversity and adverse events.

1.2.1 Financial Pressures and their impact on the Irish Maternity Service and Staff

Up until the year 2008, Ireland had one of the fastest growing economies in Europe. Public expenditure was high and had increased by 40% in a short time, between the years 2005 and 2008 (45). Despite this Ireland had relatively poorly developed primary and community health care services, and the general model of care, that patients depended upon within the health service was a hospital based one (46). The worldwide recession that began in 2008 in the United States, impacted Ireland more severely than most other European countries and there were sharp increases in unemployment, emigration and public debt (47). Ireland as a country was in receipt of substantial financial assistance from both the European Union and the

International Monetary Fund. To offset this growing debt and to stabilise the public finances, several budget cuts to public expenditure were required. In 2009, €1 billion was removed from the health budget and this was compounded by a further reduction in public expenditure of €5.5 billion between 2013 and 2015, some of which came from the health budget (48).

Prior to this recession the Irish government had committed to making significant and necessary improvements to primary and community care, and to mental health services and in addition to this the Irish population was rising and aging (46). In contrast to most other areas in Europe, the population continued to rise in the height of the recession (49). This was the backdrop on which all these financial cuts were made. These cuts impacted the health service in a largely negative way. While there was some improvement in the efficiency of the health service with respect to the proportion of day cases increasing between 2007 and 2011, this was offset by a reduction in inpatient beds, and a subsequent reduction in service availability (46). This in turn has led to an increase in both inpatients and outpatient hospital waiting lists (46).

All healthcare staff working in the public healthcare system are paid by the government. In order to reduce government debt and borrowing that occurred as a result of the recession, some of the money saving measures directly impacted on these frontline healthcare staff. The Haddington Road Agreement was introduced in 2013 in an attempt to reduce the Public Service Pay and Pensions Bill which at the time made up approximately 35% of government spending (50). The cost saving

measures laid out in the Haddington Road Agreement applied to all public servants in the country including healthcare staff. These measures included freezing of incremental pay rises, a cut to basic pay of between 5.5% and 10% for higher earners and cuts to overtime rates for all earners (50). In addition to this staff who worked less than 39 hours a week had their hours increased to 39 hours for no increase in pay and those already on or above a 39-hour working week worked an extra hour of overtime without pay (50).

Prior to the Haddington Road agreement the government instigated a moratorium on recruitment within the public services including the health service. This ban on recruitment which was supposed to last from March 2009 until the end of 2010 lasted in fact until 2014 and was used as another money saving scheme (51, 52). These budgetary cuts are one of the many factors that have been linked to a decrease in frontline staff morale and an increase in the migration of doctors from the health service (44).

Maternity staff as frontline healthcare professionals were also impacted by these budgetary cuts. As previously discussed in section 1.1.2, Ireland has one of the lowest number of consultant obstetricians per 100,000 women in the Organisation for Economic Co-operation and Development (OECD)(31). Based on our maternity population, in order to provide a safe and effective maternity service there needs to be at least 226 whole time equivalent consultant obstetricians employed in the public sector (31). As of 2014 this number stood at 136 (31). Recruitment of new consultants not just in obstetrics but across the whole of medicine has proved a real

challenge, in particular since the reduced salary-scales for new entrant consultants was initiated in 2012 (53).

We also have a comparatively low number of midwives and again in order to provide a safe and effective maternity service require at least another 621 midwives in the maternity hospitals (42). This is not something that will be rectified any time soon. For 2018, the Department of Health have been allocated €14.5 billion towards the running of the Irish health service (54). While this is an increase of 4.4% or €608 million on the 2017 health budget, the HSE's National Service Plan for 2018 has advised that there will still be an operational financial challenge of €346 million (54). Even more concerning is that in total just €4.6 million of this has been allocated towards the running of the maternity services and the implementation of the National Maternity Strategy (54). The NWIHP have advised that this money will be used to fund another 9 more consultant obstetrician/gynaecologists, 3 perinatal pathologists, 28 ultrasonographers, 52 registered midwives and 15 clinical midwife specialists in mental health (55). While this is undoubtedly a step in the right direction, this ultimately still leaves a shortfall in staff numbers.

1.2.2 Staff Retention in the Irish Health Service

In addition to the financial pressures being experienced by the Irish health service, another substantial issue is that of staff retention. The Irish public health service is one of the biggest employers in the state, with over 128,000 employees but it is a service facing a crisis with respect to the retention of Irish trained frontline staff (56). As outlined previously there have been multiple cuts made to frontline

resources since the economic crash of 2008. Interestingly though, in the same time period, Ireland has more than doubled the number of doctors being trained in its medical schools, from 340 in 2007 to 725 in 2017 (57). Despite this substantial investment in the training of Irish doctors, however, the Irish Health System is highly reliant on internationally trained doctors for its day-to day service provision. In fact, 36% of all registered doctors working in the health services are internationally trained (36). One of the reasons the health system has this much reliance on non-Irish trained doctors is because of the high level of migration that is occurring. Since 2008 it is estimated that at least 3798 doctors have left Ireland to work abroad, many of them do not intend on returning (37, 58). Emigration is not just an issue affecting the medical workforce; there is recent research that suggests that Irish nurses are also leaving the Irish health system to work abroad (59).

The reasons why these frontline staff are emigrating the Irish health system are multiple. There is evidence to support that doctors are unhappy with the current working conditions that exist within the Irish Health Service. They are unhappy with staff shortages and the concomitant workloads and long working hours (44). There is also evidence that Irish doctors are concerned that they are not in a position to provide best quality care for their patients (43). Nurses have cited poor working conditions and substantially salary cuts in the last decade as reasons why they are leaving (59). Research suggests that Irish doctors are experiencing burnout and feel undervalued by both the HSE and the public. Burnout in the specialty of Obstetrics is something I will focus on in more detail in a later section(43).

One recently published paper by Humphries et al, 2018 documented some interesting insights into the mentality of the younger generations of Irish doctors, with respect to the practice of medicine (36). In this qualitative paper, which is an analysis of 50 in-depth interviews with doctors the authors high-lighted multiple reasons why the Irish health system is failing to retain its highly qualified graduates. The authors identified a change in the psyche of newer generations of doctors with younger consultants and trainees no longer willing to spend 70-80 hours per week working. This newer generation also disagreed with the conventional medical view that the job should be prioritised over all other commitments, including family (36). In addition, the early experiences of medical practice for newer generations of Irish doctors has been in a system that is underfunded and short-staffed. One of the big issues for doctors who work in this system is a relative lack of supervision, and a sense that they had to be as independent as possible, particularly at the start of their medical careers. This was something they felt underprepared for particularly as the workload and intensity of the job has increased dramatically in the last 20 years (36). It is possible that these problems faced by the newer generations of Irish doctors play a role in how they are affected by, and how they deal with adverse events.

1.2.3 Geographical Inequality in the Irish Maternity Services

As I have previously alluded to there appears to be an underlying perception of negativity and mistrust towards the Irish maternity service and around the frontline staff who work in it in public and media discourse (60). This is not helped by the stark geographical inequality of certain services provided in the maternity service.

Two such examples of inequality are access to anomaly ultrasounds and perinatal post-mortem examinations.

Anomaly Ultrasound

Obstetric ultrasound is a recognised, critical component of good antenatal care (61, 62). Second trimester fetal anomaly ultrasound is routinely recommended by all obstetric policy-makers (62-65). If a fetal anomaly is detected, planned delivery of the infant at the right time and in the correct place can be facilitated, thus enabling rapid access to appropriate neonatal intensive care which may ultimately reduce neonatal morbidity and mortality (66, 67). Diagnosis can also provide adequate time to psychologically prepare parents for the challenges of the pregnancy, intrapartum, and postnatal period. A timely diagnosis of a lethal fetal anomaly, which is devastating for parents, can allow them time to adjust and make memories with their infant.(68, 69) In certain jurisdictions, and from 2019 here in Ireland the detection of a lethal fetal anomaly can also provide parents with the option to continue with the pregnancy or to terminate (64) (70).

In early 2017, a colleague , Dr D Hayes-Ryan and I conducted a review of the availability of maternity ultrasound in Ireland (71). We identified that fetal anomaly ultrasound is only offered universally to all women in 7/19 (37%) Irish maternity units, selectively to some women in 7/19 (37%) units and not offered at all in the remaining 5/19 (26%) units. At the time of our review just 64% of women were in receipt of a fetal anomaly ultrasound (71). One of the most concerning findings, however, was a substantial geographic variation in the availability of fetal anomaly

ultrasounds around the country. All mothers who attended a maternity unit in Dublin were provided with an anomaly US whereas just 38% of those outside Dublin were in receipt of an anomaly ultrasound (71). This further high-lights some of the current inequalities that exist in the maternity services in Ireland, based on where a woman lives and what maternity hospital she attends.

Perinatal Post-mortem Examinations

It is well accepted that perinatal post-mortem is the gold standard investigation that should be offered to parents who have experienced a perinatal death. It has been shown to increase the understanding of the cause of death in up to 86% of cases (72). Despite this being best practice, the rates of perinatal post-mortem are consistently falling both here in Ireland and worldwide. Initially one of the main reasons for this is the organ retention scandal of the 1990s that occurred in Ireland and the UK (72, 73). A governmental inquiry led by Dr Deirdre Madden identified that although post-mortems conducted in Ireland in the 1990s were done in accordance with best international standards, one of the key failures at the time was the way parents were communicated with (73). While parents were being consented for perinatal post-mortems they were not aware that some of their babies' organs were being retained. Once this became public knowledge it caused substantial mistrust in the public towards the maternity service and the number of post-mortems being conducted fell dramatically(73).

This does not, however, explain why levels of perinatal post-mortem are still lower than ideal some 20 years later. This is better explained by a recognised lack of

perinatal pathology specialists. The overall rate of perinatal post-mortem in Ireland is consistently around 50% with noticeable variation among the 19 maternity units (74-76). Some units have close to an 80% post-mortem uptake rate while others have as little as 10% (76). This is directly related to the availability of a perinatal pathology service. The NPEC have consistently over the last number of years highlighted this inequality in perinatal pathology and have called for the formation of a national perinatal pathology service (76). Without access to perinatal pathology, it is difficult to investigate stillbirths in an open and transparent manner and to provide parents with answers to their questions, something that can further fuel mistrust.

1.2.4 Termination of Pregnancy in Ireland

Until January 2019, Termination of Pregnancy in Ireland was illegal unless there was a real and substantial risk to life, as opposed to the health of the mother (77). In May 2018, the Irish public voted overwhelmingly in favour of removing the "eight amendment" from the Irish constitution; a phrase of the constitution that had given equal right to life of the unborn fetus to that of its mother. The referendum result allowed this clause in the constitution to be replaced with a one that enabled the Irish government to legislate for legal termination of pregnancy up to 12 weeks of gestational age, as well as in certain other circumstances after that gestational age cut off (70). The Government of Ireland enabled this legislation and termination of pregnancy has been legally and practicably available since January 2019 (78). This has placed added strain on an already stretched maternity service, and will continue

to do so unless more staff and infrastructure are provided to meet the increased demand for this new service.

1.2.5 Reports into serious adverse events in the Irish Maternity Services

The 21st Century has seen a rapid growth in both the supply and demand for on-line, instantly available news, as well as a substantial growth in social media platforms. Large scale international events occur and sometimes within minutes reports start appearing either on main-stream media websites or on social media websites, with respect to these events. There is a substantive amount of information available on-line. Some of this is reliable and credible, some of it is not. People in developed countries such has Ireland have easy access to an array of computers, tablets and smartphones all of which have the ability to provide instant access to the internet and web-based media sources. Social media sites such as Facebook, Instagram and Twitter have a large Irish consumer base with 64%, 27% and 28% of the Irish population over the age of 15 using these platforms respectively (79). An IPSOS-MRBI poll from August 2017 found that 1.7 million people over the age of 15 in Ireland use Facebook on a daily basis (79). In the annual Reuters Institute Digital Report from 2016, it was estimated that 52% of Irish media consumers get their news from social media sites with 12% advising it was their main source for news (80). In addition to this, an Irish study from 2014 has shown that 95% of the pregnant Irish population get their pregnancy information from online sources (81).

The Irish maternity services are regularly discussed in the Irish media. Some of the headlines seen on a regular basis, as well as the commentary on social media sites, could be interpreted as being both inflammatory and provocative. Figure 1.1 is representative of some of the more recent media headlines pertaining to the maternity services.

While I will give a brief outline of some of the various "maternity scandals" discussed in the Irish media that have impacted on the obstetric and midwifery professions in the last 25 years it is beyond the scope of this thesis to discuss each one in complete detail. It is also important to note that these "maternity scandals" have arisen both from serious adverse events that have occurred in Irish maternity hospitals around the country, and how they were handled by individual hospitals. The media reporting and public outcry that inevitably followed, led to various formal investigations and inquiries, published in several key reports. It is also beyond the scope of this thesis to discuss every recommendation made by all of these reports.

It is however, vitally important to discuss some of these reports in the context of this thesis. Both the content of the reports themselves, and the media's handling of the detail of these reports has had a role to play in the current low morale and level of anxiety affecting HCPs in the Irish maternity service and this is something that is discussed in one of my published papers forming the basis of this thesis. Staffing deficiencies (82, 83), poor infrastructure (84) and a lack of senior supervision and oversight (84) are all concerns that feature highly in these reports, and in turn have

in other published literature been associated with burnout and poor staff morale. Concerns around poor communication and a lack of openness by healthcare staff with parents who have experienced a perinatal death or other serious adverse event have also been repeatedly identified (83, 84). The publication of these reports has, however, led to some important changes within the Irish maternity services, and hopefully these are changes that will prove to benefit parents and HCPs alike. For the purposes of this thesis I will only discuss those reports that relate to perinatal death.

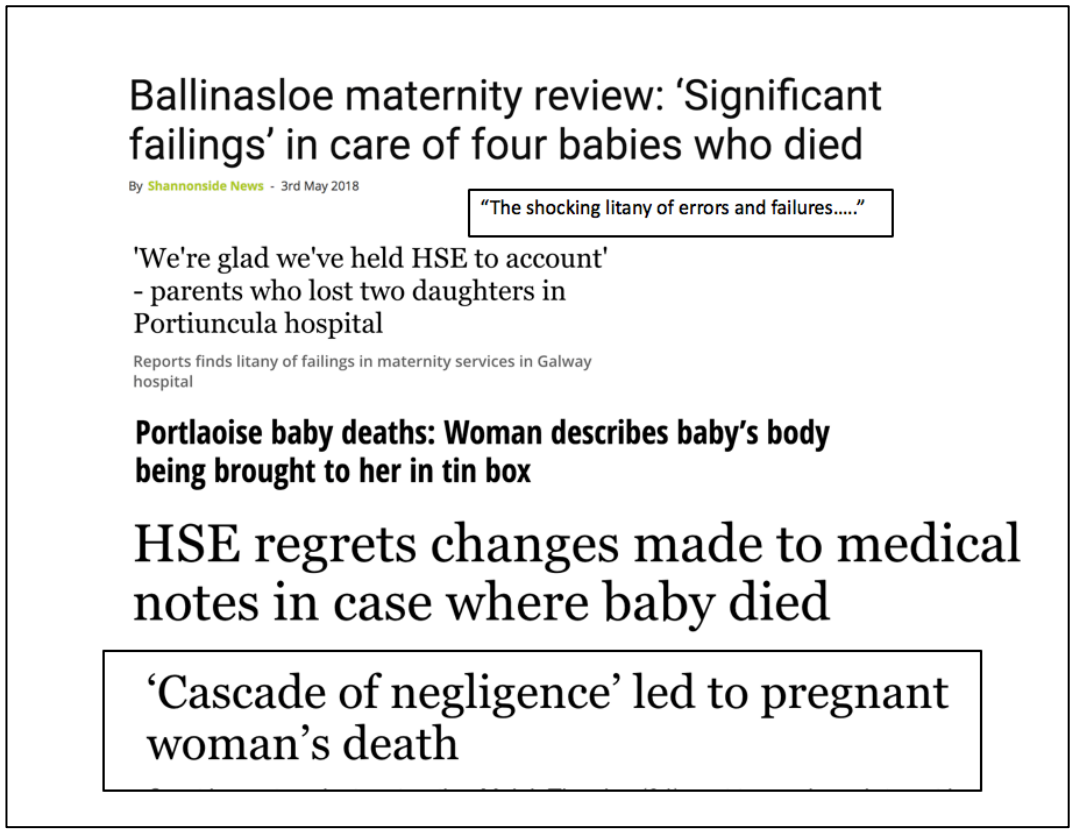

Figure 1.1: Some of the recent media headlines pertaining to the Irish maternity services

Portlaoise Hospital Inquiry – Chief Medical Officer, Department of Health

On the 30th of January 2014, the Irish National Broadcaster, Raidio Teilifis Eireann (RTE) broadcast a programme entitled 'Fatal Failures' about a number of perinatal deaths at the Midland Regional Hospital Portlaoise and about the way the hospital and the HSE subsequently managed and communicated with the families involved. The public outcry that followed this broadcast was extreme. One study by Meaney et al investigated the reaction on Twitter to this programme and its negative portrayal of the HCPs involved (60). They found that the public who used Twitter were angry, upset and distressed by what was reported by RTE, and believed that HCPs and hospital management were more concerned with covering up the deaths than dealing with the aftermath.

As a result of this broadcast the Minister for Health at the time requested the Chief Medical Officer (CMO) of the Department of Health to conduct an assessment into the perinatal deaths and other maternity complications that occurred in Portlaoise Hospital from 2006 up to 2014 (83). The CMO, Dr Tony Holohan, identified a number of shortcomings in the care provided by Portlaoise Maternity Services and made a number of recommendations based on his findings (83). The main shortcomings in care related to communication with parents and to the poor delivery and quality of information given to parents following a perinatal death. In addition, Dr Holohan identified that the maternity service in Portlaoise could not be regarded as safe and sustainable within its governance arrangement at the time. He also recognised that there were some poor outcomes that could likely have been prevented at the time and that these had been identified by the hospital but were

not acted upon. Overall the report was very critical of the risk management structures within the hospital, the way clinical care was communicated and the way patient handover was conducted between staff members. While Dr Holohan did portray a very negative picture of the maternity service in Portlaoise he did at least recognise that the senior management team and clinicians in Portlaoise were both stressed and isolated and lacked the support, tools and infrastructure to maintain a safe service (83). This point, however, seemed to have been lost in the media's reporting of the perinatal deaths in Portlaoise.

Portlaoise Hospital Inquiry - HIQA

Following publication of the CMO's report, the Health Information and Quality Authority (HIQA) were tasked with independently investigating all medical and surgical services provided by the HSE in Portlaoise Hospital. This included an independent assessment of the maternity services and was published in 2015. With respect to the provision of maternity services HIQA reported that interviews with impacted parents had shown an 'apparent lack of skill and sensitivity among staff, including management, in communicating sensitively and empathising with people'(84). While investigations into specific adverse events were occurring, there was no evidence to suggest that learning from these investigations was put into practice to benefit other patients. The investigation team also identified from speaking with staff members that the risk management structures in the hospital were under developed and that the staff working there had little confidence in both the local and regional systems in place to deal with risk events (84). They high-lighted the need for a clinical governance network between Portlaoise and the

Coombe Women and Infants Hospital- an initiative that had been originally suggested by the Institute of Obstetricians and Gynaecologists of Ireland in 2006 (84). The investigation team identified that the development of a clinical network was essential in ensuring the quality and safety of the maternity services at Portlaoise Hospital. In addition, the investigation team high-lighted the substantial deficiencies in staffing at both a midwifery level and a junior doctor level; this had also previously been identified. Following the publication of the CMO's report there was an increase in recruitment with the appointment of senior clinical midwifery managers, shift leaders, a bereavement specialist, a clinical skills coordinator and a clinical midwife specialist. An additional consultant obstetrician was also appointed (84).

Cavan General Hospital 2015 (Flory report)

Between the years 2012 and 2015, four perinatal deaths which occurred in Cavan General Hospital were reported in the mainstream media. Following this, the HSE ordered independent external investigations into these deaths while also commissioning a quality risk and patient safety review by Dr David Flory, a former senior executive in the NHS in Britain. This quality and patient safety review did not investigate the deaths but focused instead on the management and running of the maternity unit.

Dr Flory's report into the maternity services in Cavan while mainly positive did raise some concerns. Dr Flory identified that while the infrastructure of the hospital was sound, the management structure in the hospital was heavily reliant on a small key

number of individuals and that these individuals were working above and beyond what was practicably sustainable in the long term. Dr Flory acknowledged that there was a very strong commitment from staff working in Cavan general hospital towards the running of the hospital, as evidenced by the many examples of staff coming in on days off when the maternity unit was at capacity. He also noted the negative impact that the media spotlight was having on maternity staff both in Cavan and in other maternity units around the country. He noted that this spotlight was impacting 'the mood and morale of members of the maternity team' and commented on how this was affecting clinical risk assessments and decisions.

He noted that the bereavement service and the quality and patient safety service were of high calibre. In fact, he noted that hospital had undertaken a thorough assessment of its practices following the publication of the Portlaoise reports and he commended them for this. Despite all this, however, he noted that there were significant staff shortages in Cavan General hospital and this was one of the biggest challenges that the hospital faced.

External Independent Clinical Review of the Maternity Services at Portiuncula Hospital, Ballinasloe

In January 2015, in response to concerns regarding the delivery and neonatal care of 18 babies at the hospital, the HSE commissioned a review into the maternity services at Portiuncula University Hospital. The publication of this report experienced many delays and was finally published in April 2018 (85).

In 2014, six babies were referred from this small maternity unit for therapeutic hypothermia following a suspected hypoxic insult at birth. At the time this number was thought to be higher than the national norm and a preliminary review was conducted. Following some concerning findings in this preliminary review the HSE commissioned an external review into the maternity services at Portiuncula (85).

One of the striking features of this report is that the investigating team pointed out that the incidents regarding care that occurred in Ballinasloe had previously been highlighted in other Irish maternity reports, and that unless substantial learning and change in process occurred they would undoubtedly happen again. There were numerous issues with the standard of clinical care provided to parents identified in this report, mainly to do with a suboptimal level of medical training and supervision. The hospital was highly reliant on locum staff. Across the board there were shortages in all levels of staff; midwives, NCHDs and consultant obstetricians and this led to a lack of support and supervision in key clinical areas. It was identified that there was a lack of communication between staff groups, which led to a failure to appropriately escalate care where necessary. It was also, unfortunately, identified that there were incidents of poor communication and a lack of open disclosure with families in the aftermath of a complicated delivery(85).

Summary of reports

As discussed above, these reports were all commissioned following the identification of a number of serious adverse events in particular maternity units or hospitals. Without acknowledging the backdrop in which these serious adverse

events were occurring, and the difficult working conditions that the involved healthcare professionals were faced with on a daily basis, reading these reports does little to instil confidence in the national maternity service. The media's handling of these reports further erodes confidence in the services. The findings of each report highlight the pressure and the level of crises that is currently being felt by maternity healthcare professionals across the country and this is something that the media reporting, in general, rarely acknowledges. In turn this lack of public confidence in the maternity services may have further implications on staff morale.

1.2.6 Never Events and Medico-Legal Issues in the Maternity Services

The two remaining topical issues that I will finish this section with are the use of the controversial term 'never-event' to describe adverse events, including stillbirths, and the ongoing medico-legal concerns in Obstetrics.

Never Events

The term 'Never Event' was first coined by Ken Kizer in 2001 (86). Dr Kizer was the then Chief Executive Officer (CEO) of the National Quality Forum in the United States (US). He introduced this term in reference to particular medical errors such as wrong- site surgery that should never occur. This list has grown substantially and now includes significant adverse events that are identifiable, serious (resulting in death or significant disability) and usually preventable (86). This term first came to prominence in the maternity services in Ireland with the publication of the CMO's report into the Portlaoise Perinatal Deaths in 2014. In his report, Dr Holohan recommended that perinatal death or serious injury of a neonate associated with

labour or delivery in a low-risk pregnancy be listed as a perinatal 'never event'(83). The term 'never- event' caused much debate and anxiety amongst maternity HCPs as there was concern that this would lead to the belief that all types of perinatal death were preventable, and that this would fuel further public outcry. These events have since been renamed "Serious Reportable Events" (87).

Medico - Legal Concerns in the Maternity Service

In May 2017, the national State Claims Agency, which is the body responsible for providing asset and liability management services to the Irish government, published a 5-year review of clinical incidents in Ireland. They found that during the review period of 2010-2014, the number of clinical incidents reported to them increased as did the rate of clinical negligence claims. In addition, and although there are more medico-legal claims in both medicine and surgery than in obstetrics, the quantum with certain obstetric and midwifery related claims is huge. In Ireland, during the time period 2010-2014, over €288m was paid out in medical negligence claims and 43% of this was for obstetrics and midwifery claims. This is not unique to Ireland and is a trend that is mirrored in other countries around the world such as the UK, the US, Spain and France (88).

The national State Claims Agency devise a list of recurring areas of concern with respect to the claims they are involved with in Ireland. Perinatal death features on this list, as do some other potentially unpreventable adverse events such as shoulder dystocia and placental abruption (88).

This fact has not gone unnoticed by obstetricians and there is now evidence to suggest that one of the professional effects of perinatal death on obstetricians is the fear of litigation (89).

This fear of medical litigation, is ultimately not beneficial for patients. There is evidence from the general medical literature to suggest that this medical litigation fear can lead to a change in clinical practice with doctors more likely to practice defensive medicine (90). This change in practice may result in doctors avoiding certain procedures that may be associated with a high level of risk, and in addition doctors may over use imaging technology in clinically unnecessary situations which can have negative repercussions on the functioning of the health service as a whole (90).

1.3 New Maternity Service Developments and Initiatives

Section 1.2.5 of this thesis discusses the reports that have been published in response to the various serious adverse events that have occurred in the maternity services in Ireland over the last 2 decades (83). These reports contain a substantial number of recommendations, all with the common aim of improving maternity care throughout the 19 maternity units in Ireland. In response to these reports, a number of new developments and initiatives specifically targeted at the maternity services have arisen and most have the welfare of HCPs, as well as parents / service users as one of their main priorities. The overarching aim of all of these strategies is however, to recreate a culture of trust in the Irish maternity services by being open and transparent in the way HCPs communicate with service users.

1.3.1 National Perinatal Epidemiology Centre

The National Perinatal Epidemiology Centre (NPEC) was founded in 2006 on foot of recommendations in the Lourdes Hospital Inquiry Report. This was a report into the abnormally high number of peripartum hysterectomies that occurred in Our lady of Lourdes Hospital, Drogheda between 1996 and 1998. It was published by Judge Maureen Harding in 2006 and one of the recommendations indicated that annual clinical reports of activity and outcomes of individual maternity units should be prepared and published within 9 months of the previous years end. The main objective of NPEC is to collaborate with all Irish maternity services to translate clinical audit data and epidemiological evidence into improved maternity care for families in Ireland (91).

The NPEC works in collaboration with all 19 of Irelands' maternity units to audit and review the practice of the Irish maternity services with a view to enabling learning and making recommendations based on that learning. The NPEC produces annual reports on perinatal mortality in Ireland (74), severe maternal morbidity in Ireland (92), home births in Ireland (30) and neonatal intensive care outcomes of very low birth weight babies born in Ireland (93). It funds and facilitates Ireland's membership with the Vermont- Oxford Network (91).

The NPEC makes recommendations in its annual audit reports. However, it recognises that recommendations are ineffective if they are not implemented. In order to ensure that its recommendations are acted upon and that learning is achieved from its audits at both hospital level and national level, the NPEC aligned

with the National Office of Clinical Audit (NOCA) in 2014. NOCA supports institutions and individuals to review and action audit findings arising from national clinical audit (91).

At local level, the NPEC provides customised feedback to individual hospitals on how they compare and what areas of their care they might review in the context of comparisons against the national average. To this end, it publishes annual individual hospital reports and presents data from reports at individual hospitals (91).

1.3.2 Irish Maternity Indicator System

The Irish Maternity Indicator System was launched in 2014 by the HSE Clinical Programme in Obstetrics and Gynaecology (94). It was developed in conjunction with the Acute Hospitals Division of the HSE as a direct response to national recommendations in various reports from the HSE and from HIQA. It tracks and logs 30 metrics or outcomes from all public maternity units around the country. It allows comparison between hospitals at a national level and ensure clinical activity and outcomes are interpreted in an appropriate context (94). The 30 metrics or outcomes belong to five different domains; hospital activities, neonatal metrics, laboratory metrics, obstetric metrics and deliveries. Data is standardised across all domains to allow each hospital to reliability assess their performance over time and against other maternity units in the country (94). By improving data collection and analysis on a national level it is hoped that measures will be taken in individual maternity units to improve the quality of care being delivered to patients (94).

1.3.3 HIQA National Standards for Safer and Better Maternity Services

In response to recommendations in the various maternity reports discussed in section 1.2.5, and other such reports, the Health Information and Quality Authority (HIQA) set about publishing its own set of standards to improve the quality of care delivered in the maternity services. These standards were published in 2016, and together with the National Maternity Strategy, aim to present the necessary building blocks to provide consistently safe, and high-quality maternity care to all women in Ireland. One of the four key strategic priorities of these set of standards focuses largely on resources and training and aims to ensure that "Maternity services are appropriately resourced, underpinned by strong and effective leadership, governance and management arrangements, and delivered by a competent workforce, in partnership with women." HIQA is currently assessing the national maternity units against its standards.

1.3.4 National Maternity Strategy 2016- 2026

Ireland's first National Maternity Strategy entitled 'Creating a Better Future Together' was published in January of 2016 (27). On foot of the HIQA report and its recommendations following the death of Ms. Savita Halappanavar in 2012 (95), this strategy was commissioned and developed to provide standardised, consistent, evidence based and equitable maternity care to all pregnant women in Ireland (96). It is intended to provide the blueprint for a new and improved maternity system. The strategy recognises that pregnancy and childbirth is a normal physiological process and where it is safe to do so, the mother's choice should be facilitated. It also recognises, however, that the percentage of complex pregnancies is increasing,

as are the numbers of Caesarean Sections and acknowledges that the Irish maternity service is currently under resourced.

The responsibility for implementing this strategy lies with the newly formed National Women & Infants Health Programme (NWIHP)(55). This implementation will involve examining existing arrangements and putting the necessary architecture, staffing and processes in place to ensure the delivery of safe maternity services across the whole of Ireland. In addition, increased funding from the HSE will be necessary to resource the new maternity service envisioned in this Strategy. In 2017, the NWIHP developed a 10-year implementation plan for the National Maternity Strategy that involves 230 steps. In 2018 the areas of the Strategy that will be focused on include; universal provision of anomaly ultrasound, quality and safety in the maternity services and the commencement of implementing the new models of maternity care (54).

1.3.5 National Clinical Programme for Obstetrics and Gynaecology

In Ireland at present there are 33 National Clinical Programmes in operation (97). These clinical programmes are tasked with improving specific areas within the Irish health service. The HSE National Clinical Programme for Obstetrics and Gynaecology was established in 2010 and is a joint initiative between the HSE Clinical Strategy and Programmes Division and the Institute of Obstetricians and Gynaecologists (98). The main aim of this programme is to improve the level of choice available to women in the maternity services. The programme also publishes national clinical guidelines that provide guidance on the management of both

common and serious conditions in Obstetrics and Gynaecology. Since 2010, 40 clinical guidelines have been published as well as four national reports (99).

1.3.6 National Standards for Bereavement Care Following Pregnancy Loss and Perinatal Death

Over the last 40 years there has been a wealth of research examining and acknowledging the substantial and devastating impact that a pregnancy loss at any gestation has on parents (5, 7, 100-104), grandparents (105) and siblings (106, 107). In addition, more recent research, has shown the impact of perinatal death on the frontline healthcare staff who care for this vulnerable group of patients (11-13). Despite all this ongoing research at both an international (7) and a national level (102-104), Ireland until as recently as 2016, did not have any document or guideline outlining the HSE's formal stance on bereavement care in the maternity services, on how this should be delivered and/or by whom it should be delivered.

In 2013, the HSE National Incident Management Team reported on the death of Ms Savita Halappanavar in October 2012 (NIMT Report 50278) (108) and one of the recommendations in this report led to the development of the National Standards for Bereavement Care Following Pregnancy Loss and Perinatal Death (109). These standards, of which there are four, were published in August 2016 and clearly define the care that parents and families can expect to receive in the aftermath of a miscarriage, ectopic pregnancy, stillbirth, neonatal death or in the aftermath of a diagnosis of a baby with a lethal fetal abnormality (109). The Standards recognise that bereavement care is a fundamental and integral component of an effective maternity service, but also importantly recognise the impact that these cases can

have on frontline staff members, and crucially call for the development of support structures for these staff members (109). The Standards also recognise the variation in the bereavement care provided to families around the country in the 19 maternity units, and describe the processes by which this care needs to be and will be improved upon in the coming years.

1.3.7 National Women and Infants Health Programme

The National Women and Infants Health Programme (NWIHP) was founded in January 2017 by the Health Service Executive. It is led by a National Clinical Director, a programme director and a Lead Midwife. The main functions of the Programme are to lead the management, organisation and delivery of maternity, gynaecology and neonatal services throughout Ireland (55). The NWIHP is involved in overseeing the implementation of the National Maternity Strategy and The National Standards for Bereavement Care Following Pregnancy Loss and Perinatal Death and in doing so aims to ensure that high quality maternity care is consistently delivered in the 19 maternity units as well as in primary and community care settings around the country (55).

1.4 What can go wrong in the Maternity Services

Approximately 6 million inpatient, outpatient and emergency department attendances are recorded on a yearly basis in the Irish Health Service (87). While the majority of interactions are positive and the care received of a high- quality standard, inevitably adverse events will occur. Some of these may not have any serious implications but others can cause considerable impact and patients can be

harmed as a result of these events (87, 110). Why adverse events happen is usually multifactorial. Sometimes they happen despite best medical practice, while sometimes they are the result of medical error. In the United States it is estimated that medical error is the third most common cause of death, after heart disease and cancer and is responsible for between 210,000 and 440,000 deaths annually (111). More commonly though than medical error, adverse events happen as a result of systems failures, process failures, or working in conditions that lead healthcare professionals to either make mistakes or fail to prevent them (110, 112).

In Ireland, in early 2018 the HSE launched the Incident Management Framework which replaces the older and slightly more austere Safety Incident Management Policy of 2014 (110). This document recognises, that while patients and service users of the Irish health service bear the bulk of the burden of harm from these incidents, the healthcare staff who are also involved in these cases can be substantially affected (110). This document also clearly sets out the process by which adverse events or incidents should be reported, both locally and nationally and what type of investigation, if any, is needed.

The following sections of my thesis will discuss some adverse events in the maternity service in detail, along with the impact, if known, that they have on the involved healthcare professionals. It is beyond the scope of this thesis to discuss every adverse event that can happen in maternity care and as such I will focus predominantly on perinatal death and significant adverse events on the labour

ward. I will firstly outline the definitions, incidence and aetiology of these events and then will separately examine the impact that they can have on HCPs.

1.4.1 Definition and incidence of Perinatal Death and other adverse events

Perinatal Death includes both stillbirths and early neonatal deaths.

Stillbirth: Stillbirth is defined as the death of a fetus in-utero. The gestational age at which a fetal death is classified and reported as a stillbirth and not a second trimester miscarriage differs around the world (113). The World Health Organisation (WHO) advocates that where possible a fetal death should be termed a stillbirth when the fetus weighs greater than 500g at birth (114). If the fetal weight is not known then a gestational age cut of 22 weeks should be used (114). For national reporting purposes the WHO allows each country to define the gestational age a stillbirth occurs and as such some countries define stillbirth as a fetal death in utero after 16 weeks' gestation while others do not include fetal deaths in their statistics until 28 weeks of gestational age (113). To allow for accurate and meaningful international stillbirth rate comparison the WHO recommends that a weight cut-off of greater than 1000g should be used. In contrast to this the Lancet's Ending Preventable Stillbirth Series which was published in 2016, advocated for using a gestational age cut off of 28 weeks to allow meaningful comparison of stillbirth rates between countries (115).

This Irish definition of stillbirth, as defined by the *Stillbirths Registration Act 1994* is 'a child born weighing 500 grammes or more or having a gestational age of 24

weeks or more who shows no sign of life' (116). The Irish definition, unless otherwise specified, is the one used throughout this thesis.

Each year, approximately 2.1 – 2.6 million babies are stillborn worldwide, equating to an annual rate of approximately 18.4 per 1000 births (115, 117). This is just an estimation, and in reality it is likely to be much higher as not all countries report or record their stillbirths (115). Of those that do record and report on stillbirths, there is large heterogeneity in stillbirth rates per country, with Iceland reporting the lowest worldwide rate of 1.23 per 1000 births and Sudan reporting the highest rate of approximately 56 per 1000 births annually (117).

The most recent stillbirth rate in Ireland is from 2016 (74). Applying the Irish definition of stillbirth, the rate was 4.5 per 1000 live births (74). This equates to an annual incidence of approximately 1 in 238 births (8, 74).

Prior to the Publication of the Lancet's Stillbirth Series in 2011, Stillbirth was one of the most neglected areas of public health concern (118). While there has been some economic and social progress and recognition of the global burden of stillbirth since then, and while rates of stillbirth have been falling slowly, there remains a lot more to do to eradicate preventable stillbirth (115).

Intrapartum Fetal Death: Intrapartum fetal death (IPD), or intrapartum stillbirth is the death of a fetus that occurs during labour, and this is perhaps one of the most traumatic types of stillbirth, particularly when there are no apparent antecedent risk factors(119).

In high-income countries the diagnosis of an intrapartum death is usually reliable; there is a recorded presence of a fetal heart rate at the onset of labour and the baby is dead at birth (115). The diagnosis of when a stillbirth occurred, i.e. if it was truly an intrapartum stillbirth or not can be more challenging in low to middle income countries, as these are countries where mothers may not have access to timely, high quality antenatal and intrapartum care (115). Fetal heart rate monitoring may not be readily available and as a surrogate to classify a stillbirth as intrapartum, assessment of the appearance of the skin is used. This is because skin maceration does not happen until 6-12 hours post death. This way of classifying whether a stillbirth is antepartum or intrapartum is crude at best and to further complicate matters, it is usually used in countries where the death may happen at home and there is a delay in the mother accessing medical care (115). Lawn et al in the Ending Preventable Stillbirth Series which was published in the Lancet in 2015, estimated that up to half of all stillbirths or 1.3million stillbirths were intrapartum (115). Up to two thirds of all stillbirths and intrapartum deaths are thought to occur in low to middle income countries with relatively fewer occurring in higher income countries. They also identified that there were marked differences in the proportion of stillbirths that were intrapartum stillbirths between higher and lower income countries. They estimated that for higher income countries intrapartum deaths make up 10% of all stillbirths (range; 5.5-18.4%) and that for lower income countries approximately 59% of stillbirths are intrapartum (range; 32-84%)(115).

Neonatal Death: A neonatal death is defined as the death of a baby within the first 28 days of life (120). These deaths are further divided into early and late neonatal

deaths. An early neonatal death, which I will focus on for the remainder of this section is defined as the death of a baby within the first seven days of life, while a late neonatal death is a death that occurs after the 7th day to day 28 of life (120). The neonatal period is recognised as the most vulnerable time in a young child's life with up to 40% of childhood deaths occurring in the neonatal period (121). In Ireland, in 2016, 124 babies died in the early neonatal time period (giving an early neonatal death rate of 1.9 per 1000 births) (76). For seven of these babies their deaths were associated with an intrapartum event. It is not known if these deaths could have been prevented or not, despite 6 of the 7 having had a perinatal post-mortem examination (76).

Other Adverse Events

Hypoxic Ischaemic Encephalopathy: One of the most serious adverse outcomes of pregnancy that affects the infant, and one that garners much attention from the media, the public and from obstetricians, midwives and neonatologists is Hypoxic-Ischaemic Encephalopathy (HIE). Hypoxic-ischemic encephalopathy which is sometimes referred to as perinatal or birth asphyxia is characterised by both clinical and laboratory evidence of acute or subacute brain injury due to asphyxia. It is a condition that is mediated by either systemic hypoxaemia or reduced cerebral blood flow which causes infarction in certain areas of the brain. Severe HIE can manifest as cerebral palsy and is also a cause of neonatal death (122). Not all neonatal encephalopathy cases are caused by an intrapartum insult. In fact the aetiology of HIE is poorly understood, and is thought to be multifactorial. There are, however, some intrapartum events, which can be particularly traumatic, that are associated with the development of HIE such as cord prolapse, severe shoulder dystocia, uterine rupture, maternal eclampsia and intrapartum haemorrhage.

1.4.2 Other serious adverse labour ward events

In this subsection I will discuss two further serious adverse events as they are both discussed in one of the research papers presented in this thesis.

Shoulder Dystocia

A shoulder dystocia is an obstetric emergency (123) which affects approximately 0.5 to 0.7% of all vaginal deliveries. It is defined as a failure of the shoulders to spontaneously deliver following delivery of the baby's head, due to impaction of the

anterior shoulder behind the mother's symphysis pubis. Even when appropriately and expertly managed it can be associated with much neonatal morbidity and mortality. The most significant neonatal injury is injury to the brachial plexus which occurs in between 2 and 16% of all deliveries that are associated with a shoulder dystocia (123). Neonatal brachial plexus injury is one of the most commonly litigated obstetric-related complications in the UK (123).

Peripartum Hysterectomy

A peripartum hysterectomy is one of the most serious operations in obstetrics. It is only performed in the setting of life-threatening post-partum haemorrhage (PPH) and is performed when all other conservative measures at managing PPH have failed. The incidence of peripartum hysterectomy in Ireland is approximately 0.3 per 1000 deliveries so it is a rare procedure (124). Peripartum hysterectomy can be associated with substantial maternal morbidity, both physical and psychological, as it renders the woman infertile.

1.5 The Impact of Perinatal Death and Other Severe Adverse Events

1.5.1 The Impact of Stillbirth and Neonatal Death on healthcare professionals

Much is now known and acknowledged about the devastating impact that stillbirth has on parents (8, 125). The loss of a child at any stage, either before or after birth is one of the most difficult and distressing bereavement experiences for parents (6). This is, however, only a recently recognised and researched grief, as for the most part of the twentieth century the implications of stillbirth for parents were overlooked (89). Pregnancy is usually a time of great excitement and joyful

anticipation for parents and a stillbirth brings with it a whole range of largely negative emotions including shock, sadness, guilt, fear and regret (8). Parents have reported feeling confused, panicked and afraid in the aftermath of a stillbirth diagnosis (8). A 2016, literature review, conducted as part of the Lancet Ending Preventable Stillbirth Series identified that for parents the most frequently reported experiences after stillbirth were depression, PTSD, suicidal ideation, panic and phobias (89). These are negative psychological emotions and symptoms that for some parents last long after the baby has been born (126-128). For other parents, the psychosocial impact of a stillbirth can extend long after the birth of a subsequent healthy child (6, 129, 130). Central to their grieving process, however, is the relationship they have with hospital staff members, and parents can vividly recall the specific conversations they have with staff members who care for them at this difficult time (8). It is vital that the relationship between the parents and their healthcare providers is a positive one as this will help to reduce the negative psychosocial burden that parents experience both immediately after their stillbirth and in the longer term (130, 131). Research with parents has shown that they recognise when healthcare staff are untrained in the area of bereavement care and they notice when healthcare staff feel uncomfortable communicating with them (130, 132).

So what impact, if any does involvement in a stillbirth have on frontline healthcare maternity staff? This is an area that over the last 5 - 10 years has received some badly needed research attention (9, 12, 13, 130, 133-135). The psychological sequelae of stillbirth on obstetricians and midwives are not dissimilar to those

experienced by parents, and it is clear that stillbirth is a profoundly devastating experience for maternity staff (89) (13, 135). Both obstetricians and midwives have described feeling shocked, sad, isolated, afraid, angry and traumatised in the aftermath of a stillbirth (13, 133, 135). Research from Nuzum et al, 2014, has shown that for some consultants they consider stillbirth as the worst outcome of pregnancy for parents (13). Gold et al, 2008, identified that up to 1 in 10 consultant obstetricians had contemplated leaving obstetrics as a direct response to the emotional burden they experienced while caring for bereaved families (12). Similar to parents, obstetricians and midwives have been able to recall the minutiae of some of the stillbirths they have been involved with in vivid detail, and this has brought up some particularly painful memories for some (13, 133). There is evidence to suggest that obstetricians are unable to leave work in the workplace and dwell on the specifics of the stillbirth after they have left the workplace (13). Others have advised they find it difficult to speak about these events, with colleagues or with family members (13). The difficulty with speaking with colleagues may be due to the fact that some obstetricians have reported stillbirth essentially being a non-entity when they were in training (13).

The burden of professional responsibility is something that obstetricians and midwives have also struggled with (13, 89). There is a sense that obstetricians in particular are quick to blame themselves even when the fault is not their own, but in addition to this both obstetricians and midwives have expressed having substantial medico-legal concerns in the aftermath of a stillbirth (89) (13). In the study by Nuzum et al, 2014, some consultant obstetricians also reported concerns

regarding the blame culture that existed within their own hospital and from the general public and mainstream media (13).

Despite the considerable impact that involvement in a stillbirth has on both obstetricians and midwives, existing research shows that few if any at all receive adequate training in how to sufficiently care for parents in the aftermath of a stillbirth (89) (13, 136). Importantly there is some evidence to suggest that those obstetricians and midwives who have received adequate education in stillbirth care are less likely to report feeling guilty and afraid of litigation in the aftermath of their involvement with a stillbirth (137) . In contrast, when untrained in the area of stillbirth management this can impact negatively on the care that obstetricians and midwives give to bereaved parents. A recent Italian cross-sectional study of 750 healthcare professionals working in the maternity services has shown that international guidelines and recommendations for stillbirth care in Italy are largely ignored (137). Maternity healthcare professionals (HCPs) in Italy are undertrained in the management of stillbirth. More than half of HCPs in this study felt inadequate in their care of bereaved parents, while others have reported that they failed to provide any support to parents who had experienced a stillbirth.

In addition to highlighting the lack of educational opportunities in the area of stillbirth management and bereavement care, HCPs have also recognised a lack of formal support structures in the maternity services (13). Obstetricians and midwives have both lauded the benefits of informal peer support but there is also an acknowledgement that formal support structures are necessary to help alleviate the

psychological burden associated with stillbirth. What is available is limited and the types of support structures and how effective or ineffective they are will be discussed in a later part in this thesis.

1.5.2 The Impact of HIE and other Adverse Perinatal Events on healthcare professionals

There is no identifiable literature focusing on the impact of HIE specifically on maternity staff. There have, however, been a small number of studies conducted which examine the impact of traumatic childbirth on healthcare professionals (138, 139). Schroder et al, 2016 investigated the psychological health and well-being of over 1000 midwives and obstetricians who had been involved in a traumatic childbirth in Denmark. The authors defined traumatic childbirth as any intrapartum event that resulted in either the mother or the baby suffering presumed permanent severe or possibly fatal injuries related to birth (138); HIE would come under this umbrella definition. This study identified that in the four weeks after involvement with traumatic childbirth both midwives and obstetricians experienced sleep disorders and depressive symptoms (138). The authors also identified that female midwives in their study had higher burnout scores in general than female obstetricians, however, female obstetricians had higher burnout scores than their male counterparts (138). At the time their study was conducted 21% of respondents no longer worked on the labour ward and interestingly of these 25% had left the labour ward as they felt the burden of responsibility was too high. This is consistent with research examining the impact of stillbirth and neonatal death on obstetricians, where obstetricians have contemplated leaving the specialty due to the emotional burden of caring for women who have had a stillbirth (12). A second,

this time qualitative study, using a smaller cohort from the larger study, also by Schroder et al, 2016 identified that fear of blame, regardless of whether the trauma was preventable or not was a substantial concern for maternity staff (139). In addition guilt was reported by almost 50% of respondents (139).

The impact of traumatic childbirth was not however, always negative; 65% of respondents described how they felt involvement in a particular traumatic birth made them better at their job (138, 139).

There is even less research focusing on the impact of maternal death on maternity HCPs. The World Health Organisation defines maternal death as 'the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes (140) .' Some deaths may occur in the perinatal period but for the most part discussion of maternal deaths is outside the scope of this thesis. While conducting a literature review on the impact of adverse events on healthcare staff, I could however, identify just one study that focused specifically on the impact of maternal death. In 2015, Cauldwell et al performed a qualitative research study aimed at documenting the experiences, thoughts and beliefs of maternity HCPs regarding maternal death (141). This study discussed the profoundly negative impact that a maternal death has on HCPs, on a professional level and a personal one. It found that HCPs have concerns that involvement in a maternal death may have long term potentially damaging implications on their careers (141). The HCPs in this study felt

professionally and personally isolated in the aftermath of a maternal death and the level of support they received from the hospital was not always adequate (141). One of the more interesting themes discussed in this study, which is reflective of some of the stillbirth research, was the issue of self-blame following a maternal death (13, 141). Similar to involvement with a stillbirth, HCPs continuously questioned their involvement in each maternal death and were concerned that their actions may have contributed to the death (141).

1.6 The Specific Impact of Intrapartum Fetal Death on healthcare professionals

The existing research focuses on the impact that all types of perinatal death have on HCPs (13, 142) but prior to conducting my studies I was unable to identify any existing literature relating to the specific impact of intrapartum fetal death (IPD). An unexpected IPD may be seen as a uniquely traumatic experience for HCPs, and the impact, especially where the pregnancy is uncomplicated and the unborn infant is healthy entering labour, may be substantial. The immediate emotions described by parents who have lost a baby during pregnancy include shock, sadness, loneliness, and a sense of being numb and fearful, while a profound sense of guilt as well as anger become more apparent in the longer term (5, 7, 131, 143). These emotions are not dissimilar to those expressed by healthcare professionals who have been involved with a stillbirth. It is likely that these emotions are also experienced by HCPs who are involved in an IPD but it is also likely that involvement with an IPD brings with it an added layer of emotional burden. IPDs may be associated with questions about clinical decision making, as it is often suggested that the IPD rate of a hospital is reflective of the quality of care provided during labour (115, 144, 145).

This in turn could potentially lead to medico-legal concerns for HCPs which can then lead to added anxiety and stress.

One of the main aims of my thesis was to address this gap in the literature by investigating the specific impact that Intrapartum deaths and Intrapartum Event Related Neonatal Deaths have on maternity HCPs and two of my papers have this as their main theme.

1.7 Burnout and Compassion fatigue

When discussing the impact of adverse events on healthcare professionals it is also crucial to discuss burnout and compassion fatigue. These are two terms that are appearing with increasing frequency in the published literature. They are also intrinsically linked with the issue of staff morale in the workplace and in turn may also play a part in how adverse events impact on healthcare professionals.

1.7.1 Burnout

Burnout is a psychological syndrome that was first acknowledged and described in 1974 (146, 147). There are three main symptoms of burnout and these include emotional exhaustion, depersonalisation and a reduced sense of personal accomplishment in the workplace (146, 147). It is situation-specific, with work, and in particular exposure to workplace adversity, being a fixed component of burnout and while it has similar features to a depressive disorder, it is a unique entity in its own right (148, 149).

The features of each separate component of burnout are intrinsically linked. Emotional exhaustion happens when HCPs feel that they are not able to engage with their patients at a psychological level. If this is left unchecked and unrecognised by the HCPs, they can then go on to develop negative and cynical attitudes towards their patients and this is known as depersonalisation. They sometimes view their patients as objects and not people (150). Finally, reduced personal accomplishment occurs when HCPs become unhappy about themselves and dissatisfied and frustrated with their achievements in the workplace (146).

Burnout can effect individuals from all occupations but is particularly prevalent in those who work intensively with other people, for example teachers, police and healthcare professionals (147). In the healthcare profession, the patient-professional relationship is always centered around the patient and their medical problems, be they physical or psychological(146). Unfortunately, the treatments and remedies for some of the more complex medical conditions are not always easily recognisable and usually do not involve a quick-fix or obvious solution (146). This has the potential to cause tension in the patient-professional relationship. In addition, HCPs regularly engage in high- stakes and sometimes risky decision making with no guarantee of a positive outcome. Healthcare professionals who are regularly exposed to these types of relationships and situations can become chronically stressed and this in turn can lead to burnout (146, 150).

Evidence also shows that in comparison to other professions, HCPs and doctors in particular, often struggle to adequately balance their personal and professional

lives. Burnout is acknowledged to be a factor in the development of insomnia, marital and family problems and dependencies on alcohol and illicit drugs (146, 151).

In the United States, it has been recognised that healthcare professionals are more likely to experience burnout than the general workforce and it is now estimated that burnout affects 1 in 2 doctors (150). In fact, in the short time period between 2011 and 2014, the rate of burnout among US doctors increased by almost 10% from 45.5% to 54.4% (150).

In Ireland, this rate has been shown to be somewhat lower but still substantial. A study by Sulaiman et al, 2017 found that 26.4% of NCHDs in all specialties experienced high levels of burnout(152) The RCPI reported, in their national survey of wellbeing of hospital doctors in Ireland, that in 2014, 1 in 3 doctors were burnt out (153). Within medicine there is a large degree of variation in the rate of burnout and this appears to be both specialty dependent and career stage dependent. Doctors who practice in specialties with a relatively high-level of patient contact such as Obstetrics, and doctors who are in the middle of the career ladder appear to be most at risk (151).

In Ireland, physicians across all specialties continue to work outside the remits of the European Working Time Directive (EWTD), and this may also potentially contribute to the high levels of burnout seen in Irish doctors (152). The EWTD dictates that no doctor should work in excess of a 48hour week, but in reality the

Irish situation is very different with upwards of 70% of NCHDs normally working in excess of a 48 hour week (152).

Burnout in Obstetricians is becoming increasingly more prevalent. In a questionnaire study of US doctors, Shanafelt et al, 2015, identified that over 50% of obstetricians were experiencing burnout (150). Again the rate of burnout in Irish obstetricians is slightly lower, with 1 in 4 Irish obstetricians experiencing burnout at some stage in their career(153)

It is acknowledged that when doctors are experiencing burnout that the quality of care they provide to their patients reduces (146). Objective evidence has shown that higher levels of burnout are associated with higher rates of negative outcomes for patients (154). The time doctors spend clinically assessing patients reduces, the number of self-reported medical errors increases and mortality rates in hospitalised patients are increased (155). Evidence has also shown that affected physicians can show impaired clinical judgment, poor professional conduct, can suffer from low morale, and that their empathy levels reduce (146, 156, 157). They are more likely to be absent from work and it has been reported that they are more likely to retire early and this can affect the sustainability of certain medical disciplines (146, 156, 157).

1.7.2 Compassion Fatigue

The definition of compassion fatigue is more complicated (158). Compassion refers to “the emotion one experiences when feeling concern for another’s suffering and

desiring to enhance that person's welfare"(159). There are numerous reasons why people enter the medical and nursing professions, some of these are extrinsic (salary, professional status) while others are intrinsic (intellectual challenge, altruism, and a desire to provide compassion to others) (160, 161). Following sustained exposure to patients who are suffering and without regular self-care, professionals can experience a blunting or an indifference towards the suffering of others and their level of compassion fades (162, 163). Compassion fatigue, therefore, is a normal human response to recurrent exposure to traumatizing events that occur to other people (164, 165). Professionals experiencing compassion fatigue can become physically and mentally exhausted, with "nothing left to give", can experience feelings of worthlessness and depressed mood and can emotionally detach themselves from their patients (165, 166). Another of the hallmark symptoms of compassion fatigue is a readiness to blame others and blame the system for errors or difficulties encountered in the workplace (166). Some authors recognise compassion fatigue as a completely separate entity to burnout while others acknowledge that one can progress to the other (162, 167). Regardless of the definition, the effects are similar to burnout with poor professional performance and poor clinical judgment being commonplace in professionals who experience it (162, 168). Compassion fatigue, while not as well researched as burnout, has been demonstrated in oncologists, emergency department nurses, paediatricians, paediatric nurses, surgeons and hospice workers (158, 162, 165, 168). It is likely that it is prevalent in most, if not all medical and surgical specialties.

1.8 Support Structures for Maternity Healthcare Professionals

As this thesis progresses it will become apparent that severe adverse perinatal events, and in particular intrapartum fetal deaths exert a substantial toll on maternity HCPs. The impact of these events undoubtedly contributes to the low morale, and high levels of staff burnout that currently exist within the Irish maternity services. It would not, however, be appropriate to investigate the impact of these events without also investigating what is available to help mitigate these negative professional and personal outcomes for HCPs. While there is evidence describing the intense impact that these events have on the health and well-being of obstetricians, there is also evidence to suggest that this impact is sometimes forgotten (10, 12, 13, 138, 139, 141, 169-171).

It is also increasingly recognised that the provision of support strategies by healthcare organisations for staff members to deal with all types of workplace adversity and not just adverse events can help to ensure that morale within the hospital is high and this in turn can promote productivity and reduce unnecessary absenteeism (147, 172). The types of support tools described in the literature available to the general medical and nursing professions are numerous, and include; mindfulness based stress reduction (MBSR) initiatives (173-176), workplace based support networks (177-179), debriefing (180, 181), the provision of dedicated support teams for on-the-spot care following serious adverse events (182-184), referral to an employee assistance program (185), web-based self-management tools (186), undergraduate and postgraduate education programmes (187, 188) and Schwartz Rounds (189-193). They have not all been shown to be effective, nor have

they all been formally evaluated (185), and importantly there is a clear paucity of research investigating the effectiveness of available support strategies for maternity HCPs.

1.9 Summary

From what I have described above, it should be obvious to the reader that the Irish maternity service is in a state of flux and turmoil. While there have been some positive developments over the last two decades most of these are overshadowed by an overriding sense of negativity in the maternity service. Budgetary cuts, frontline staff shortages, geographical inequality of services, ever-growing waiting lists, successive reports into adverse events and the media's handling of these, high quantum in medico-legal cases, along with an erosion of postgraduate medical training brought on in part by the need to adhere to the EWTD have all contributed to low staff morale. This in turn, has been compounded by increasing patient expectations but low public confidence in the maternity service. These ongoing issues, are important to recall and to acknowledge when reading the research papers presented as part of this thesis, as they have a role to play in the findings.

Existing research has highlighted a substantive personal and professional burden on healthcare professionals in the aftermath of serious adverse events such as perinatal death, and burnout amongst healthcare professionals is at a scarily high level. In addition, research into support tools and systems for maternity professionals to access in the aftermath of a serious adverse event is all but non-existent.

1.10 Thesis Outline and Aims

1.10.1 Thesis Outline

This thesis is concerned with the impact that serious adverse perinatal events, primarily intrapartum fetal deaths, have on healthcare professionals and the healthcare services. It also focuses on the lack of support interventions and systems available to HCPs to access in the aftermath of a serious perinatal event.

There were a number of reasons why I chose to research this topic.

I am an obstetrician and I work in a busy tertiary Irish maternity hospital. I have myself been involved in a number of intrapartum events, and each one has left its own mark on me professionally and personally. I have also seen the impact that these events have on colleagues and know of at least three excellent NCHDs who have left obstetrics as a direct result of their involvement with an intrapartum death. I know of four excellent labour ward midwives, who have requested a transfer off the delivery suite, again as a result of their involvement with an intrapartum fetal death.

When researching this topic in early 2015, it became apparent that there was a paucity of information in the published literature pertaining to intrapartum deaths and the impact they have on both healthcare professionals and the health service. While there are studies published which investigate the impact of stillbirth in all in forms on both parents and healthcare professionals (4, 5, 8, 13, 194), prior to work conducted as part of this thesis, there were no published studies focusing

specifically on intrapartum death. I am unsure as to why this important gap in the literature has not previously been addressed. It has also been speculated in the general medical literature that exposure to patient complaints, medical litigation, patient death or other unanticipated adverse events can lead to an alteration in clinical practice. Again, during a review of the literature, it became apparent that there have been no published studies focusing on how intrapartum death or other serious adverse perinatal events can impact on the clinical activity that occurs in a hospital setting. As previously discussed, there is also a lack of support systems and tools for HCPs to access in the aftermath of one of these events.

With this is mind, this thesis has a number of general aims. To address these aims this thesis is comprised of a number of studies that are presented in paper format. Studies with similar themes are presented as individual chapters. It is hoped that the findings of this thesis will finally allow the substantive impact that events such as intrapartum deaths have on HCPS to be acknowledged and will ensure that adequate and appropriate support is provided where necessary, at both a local and a national level.

1.10.2 Thesis Aims

Overall Aims

1. To address the gap in the literature with respect to the impact that intrapartum death has on healthcare professionals
2. To identify whether exposure to a serious adverse event has any impact on clinical practice or activity

3. To develop a set of tools and supports that may be of benefit for healthcare professionals to access in the aftermath of a serious adverse event such as an intrapartum death, and that may be used to combat the ongoing issues of burnout and compassion fatigue

Chapter 2 Aims

1. To identify the Intrapartum death rate in Ireland from 2011-2016
2. To describe both maternal, fetal and neonatal demographics pertaining to antenatal, intrapartum and postpartum care
3. To ascertain causation and to identify if any or all or none of these cases could have been prevented

Chapter 3 Aims

1. To document the effects on healthcare professionals when a baby dies either during or shortly after labour
2. To ascertain what support strategies were available to HCPs after an IPD.
3. To ascertain how much training or education HCPs have received in the area of intrapartum death management

Chapter 4 Aims

1. To identify if it was feasible to design a study that could objectively demonstrate if a change in labour ward clinical activity occurred in the 28 days following a serious adverse perinatal event.
2. If this proved feasible then the secondary aim was to identify if these changes could be attributed to the preceding adverse event.

Chapter 5 Aims

1. To identify all interventions that have been introduced and evaluated in supporting obstetricians to tackle burnout and compassion fatigue in the workplace

2. To analyse the findings to ascertain if any type of intervention has proven beneficial.

Chapter 6 Aims

1. To investigate the levels of burnout, compassion fatigue and perceived stress among midwives and obstetricians in a tertiary maternity hospital

2. To investigate whether it is feasible to establish support interventions for this cohort.

3. To investigate whether an intervention that increases staff support is effective at reducing burnout, compassion fatigue and perceived stress

4. To evaluate an innovative educational intervention for trainees in Obstetrics and Gynaecology with respect to communication and self-care around the time of stillbirth

Chapter 2

The numbers

Paper 1: **Intrapartum Fetal Deaths and Unexpected Neonatal Deaths in the Republic of Ireland: 2011 – 2014; a descriptive study**

K McNamara, K O'Donoghue, R A Greene
Published in BMC Pregnancy and Childbirth, 2018 Jan 4;18(1):9. doi: 10.1186/s12884-017-1636-6

Paper 2: **Reducing the burden of intrapartum fetal deaths**

K McNamara

Published as the invited commentary in the National Perinatal Epidemiology Centres Annual *Perinatal Mortality in Ireland Report 2016.* Published in March 2018

2.1 Intrapartum Fetal Deaths and Unexpected Neonatal Deaths in the Republic of Ireland: 2011 – 2014; a descriptive study (Paper1)

2.1.1 Abstract

Background: Intrapartum fetal death, the death of a fetus during labour, is a tragic outcome of pregnancy. The intrapartum death rate of a country is reflective of the care received by mothers and babies in labour and it is through analysing these cases that good aspects of care, as well as areas for improvement can be identified. Investigating unexpected neonatal deaths that may be associated with an intrapartum event is also helpful to fully appraise intrapartum care. This is a descriptive study of intrapartum fetal deaths and unexpected neonatal deaths in Ireland from 2011-2014.

Methods: Anonymised data pertaining to all intrapartum fetal deaths and unexpected neonatal deaths for the study time period was obtained from the national perinatal epidemiology centre. All statistical analyses were conducted using Statistical package for the Social Sciences (SPSS)

Results: There were 81 intrapartum fetal deaths from 2011 to 2014, and 36 unexpected neonatal deaths from 2012-2014. The overall intrapartum death rate was 0.29 per 1000 births and the corrected intrapartum fetal death rate was 0.16 per 1000 births. The overall unexpected neonatal death rate was 0.17 per 1000 live births. Major Congenital Malformation accounted for 36/81 intrapartum deaths , chorioamnionitis for 18/81, and placental abruption accounted for eight babies' deaths. Intrapartum asphyxia accounted for eight of the intrapartum deaths. With

respect to the neonatal deaths over half (21/36, 58.3 %) of the babies died as a result of hypoxic ischaemic encephalopathy. Information is also reported on both maternal and individual baby demographics.

Conclusions: This is the first detailed descriptive analysis of intrapartum deaths and unexpected intrapartum event related neonatal deaths in Ireland. The corrected intrapartum fetal death rate was 0.16 per 1000 births. Despite our results being based on the best available national data on intrapartum deaths and unexpected neonatal deaths, we were unable to identify if any of these deaths could have been prevented. A more formal confidential inquiry based system is necessary to fully appraise these cases

2.1.2 Background

Intrapartum fetal death, the death of a fetus during labour is a tragic and traumatic outcome of pregnancy (195). Globally intrapartum fetal deaths exert a massive healthcare burden and it is estimated that approximately 1.3 million infants die each year during labour (115). The number of intrapartum fetal deaths (IPDs) that occur in high income countries is small (0.3 – 0.7/1000 births) (115, 196) but each one leaves a profound impact, not just on the parents but also on the healthcare professionals involved (171, 197).

It is widely accepted that the intrapartum death rate of a particular hospital or country is reflective of the care received by mothers and infants in labour and that access to and utilisation of high quality, evidence-based intrapartum care is one way

to further reduce intrapartum death rates (74, 115, 145, 196, 198-200). It is only through analysing these cases that good aspects of care, as well as areas for improvement can be identified (201). In addition, investigating unexpected neonatal deaths that may be associated with an intrapartum event is helpful to fully appraise intrapartum care, and evidence shows that improved intrapartum care can also reduce unexpected neonatal deaths (202, 203).

For these reasons we decided to collect and analyse data pertaining to all IPDs (normally formed and anomalous) and unexpected neonatal deaths of infants born after 34 weeks of gestational age that occurred in the ROI between the years 2011 and 2014. The aims of this study were; to identify the IPD rate during the time period studied; to describe both maternal, fetal and neonatal demographics pertaining to antenatal, intrapartum and postpartum care; to ascertain causation and to identify if any or all or none of these cases could have been prevented.

In 2010, the National Perinatal Epidemiology Centre (NPEC) began to collect, analyse and audit data pertaining to all births in the ROI (74), and as such this is the first time a study like this has been attempted in this country. A previous study conducted by Walsh et al (200) identified trends in intrapartum deaths in three large Dublin maternity hospitals over a 20-year period, but ours is the first descriptive study from Ireland that uses national perinatal data, obtained from NPEC to accurately describe the national intrapartum death rate, underlying maternal and fetal/neonatal demographics, available intrapartum details, postnatal investigations and causes of death.

2.1.3 Methods

Design and setting

Since 2010 the National Perinatal Epidemiology Centre (NPEC) has been collecting and auditing anonymised data on all stillbirths and neonatal deaths that occur in the original 20, but since 2014, 19 maternity units in the Republic of Ireland(74). A stillbirth in Ireland is defined as a baby delivered without signs of life from 24 weeks gestation or with a birth weight equal to or greater than 500g, while an early neonatal death is the death of a live born baby within 7 completed days of birth (74). Data is collected by nominated individuals, either obstetricians or midwives directly from the patient charts in each maternity unit and sent to NPEC via their online Perinatal Mortality Notification Form (91). This is a standardised notification form that is based on the previously validated Centre for Maternal and Child Enquiries (CMACE) Perinatal Death Notification Form (204). Using this form, the nominated individuals in each hospital are asked to identify any maternal, fetal or neonatal conditions or complications that may have contributed to the infant's death. These individuals are also requested to document the main cause of death while referencing the post-mortem and placental pathology reports, if available. These anonymised data are stored electronically in the NPEC database and form the basis of the clinical perinatal mortality reports produced by NPEC each year (74).

Since 2014, the NPEC have been consolidating their data with that of the National Perinatal Reporting System (NPRS) which is the perinatal surveillance body in Ireland concerned with the collection and reporting of all births in the Republic of Ireland. From 2011 to 2014 all stillbirths and neonatal deaths were cross-referenced

off published annual hospital reports. It is possible, therefore that some cases may be unaccounted for, but as the NPEC data represents the most complete dataset with respect perinatal deaths this is why it was used.

For the purposes of this study, a request was made to the NPEC data access committee, to grant access to the information stored on all of the intrapartum deaths and unexpected neonatal deaths that occurred in the ROI between 2011 and 2014. These years were chosen as the database for this time period was likely to contain the most complete data. We defined intrapartum fetal death as the death of any infant occurring in labour, while an unexpected neonatal death referred to any infant that died in the early neonatal period, born at a gestational age of more than 34 weeks, or with a birth weight of more than 2500g (that was not secondary to a known major congenital malformation). These cut offs were chosen by the national perinatal epidemiology centre, as infants born after this gestational age and above this weight cut off are expected to survive. Data on intrapartum deaths were available for the four years in question but for the unexpected neonatal deaths data were available for 2012-2014 only.

Statistical Analysis

All statistical analyses were conducted using Statistical package for the Social Sciences (SPSS) version 22. This is a descriptive study and all maternal and infant characteristics are presented in detail. Where appropriate for continuous data variables, and where the data is normally distributed, the mean and standard deviation are reported. Where the data is not normally distributed the median and

interquartile range (IQR) are presented. In order for our intrapartum death rates to be compared off international data we have presented two figures. Firstly, an uncorrected rate which represents all intrapartum deaths in Ireland and secondly a corrected rate which is calculated after all infants who died secondary to a major congenital malformation were removed.

2.1.4 Results

There were 81 intrapartum fetal deaths from 2011 to 2014, and 36 unexpected neonatal deaths from 2012—2014. The overall IPD rate was 0.29 per 1000 births. When this rate was corrected for infants with a major congenital malformation it was 0.16 per 1000 total births. The overall unexpected neonatal death rate was 0.17 per 1000 live births. The individual death rates for each year are presented in Table 2.1.

TABLE 2.1: INDIVIDUAL IPD RATES AND UNEXPECTED NEONATAL DEATH (UNND) RATES

	2011	2012	2013	2014	Total
Total Births	74265	71755	69146	67663	282829
IPDs§	24	15	23	19	81
uNND¥	—	11	11	14	36^
IPD rate/ 1000 total births (corrected*)	0.32 (0.19)	0.20 (0.12)	0.33 (0.21)	0.28 (0.11)	0.29 (0.16)
uNND rate/ 1000 live births	—	0.15	0.16	0.20	—

*Corrected for major congenital malformation. ¥uNND – unexplained neonatal death, § IPD – intrapartum deaths, ^ total uNNDs excluding 2011

Maternal Characteristics

During our study period, and based on our inclusion criteria, 117 mothers delivered an infant who died during labour or in the early neonatal period. The mean maternal age was 31 years. Ethnicity was reported in 115 of the 117 mothers in this cohort. The majority (n=97, 82.9%) were of white Irish origin. Occupation was documented for 105 of the 117 mothers, with 10% (n=12) being unemployed at the time of their pregnancy. At their booking visit 25 (21.4%) mothers smoked, with 16 continuing to do so for the duration of the pregnancy. Smoking status at booking was not recorded for 12 (10%) of the mothers. The median BMI was 25 kg/m^2, with an IQR of 7.2 kg/m^2. In total, 42% (n=49) of mothers in this cohort were overweight or obese. Additional data on the maternal age range, ethnicity and BMI are presented in Table 2.2.

TABLE 2.2: MATERNAL DEMOGRAPHICS

Age Group (years)	IPDs (N=81, %)	Neonatal Deaths (N =36, %)	All Deaths (N=117, %)
<20	3 (3.7)	3 (8.3)	6 (5.1)
20 – 24	15 (18.5)	2 (5.6)	17 (14.5)
25 – 29	11 (13.6)	5 (13.9)	16 (13.7)
30 – 34	25 (30.9)	16 (44.4)	41 (35)
35 – 39	22 (27.2)	6 (16.7)	28 (23.9)
>40	5 (6.2)	4 (11.1)	9 (7.7)
Total	**81 (100)**	**36 (100)**	**117 (100)**
Ethnic Group			
White Irish	66 (81.5)	31 (86.1)	97 (82.9)
Irish traveller	2 (2.5)	0	2 (1.7)
Other white	7 (8.6)	3 (8.3)	10 (8.5)
Asian	2 (2.5)	1 (2.8)	3 (2.6)
Black	2 (2.5)	0	2 (1.7)
Other Mixed	0	1 (2.8)	1 (0.9)
Not recorded/missing	2 (2.5)	0	2 (1.7)
Total	**81 (100)**	**36 (100)**	**117 (100)**
BMI* (kg/m^2)			
Underweight (<18.5)	1 (1.2)	0	1 (0.8)
Healthy (18.6 – 24.9)	37 (45.7)	10 (27.8)	47 (40.2)
Overweight (25- 29.9)	20 (24.7)	9 (25)	29 (24.8)
Obese (>30)	9 (11.1)	11 (30.6)	20 (17.1)
Not recorded/missing	14 (17.3)	6 (16.7)	20 (17.1)
Total	**81 (100)**	**36 (100)**	**117 (100)**

*BMI – Body Mass Index

A third (39/117, 33.3%) of mothers had a documented pre-existing medical condition. Some mothers had more than one medical condition while no information about past medical history was given on others. The most common medical conditions were: diabetes (4/39, 10.2%), other endocrine disorders (3/39, 7.7%) psychiatric conditions (2/39, 5.1%), and epilepsy (2/39, 5.1%). With respect to their past obstetric history, for 41 mothers this was their first pregnancy. Of the remaining 76 mothers, 35 (29.9%) had at least one prior miscarriage with three having had three or more miscarriages. There were 11 mothers in our cohort who had at least one previous Caesarean section. In terms of previous pregnancy complications, a minority of mothers (n=3, 2.5%) had other infants with congenital abnormalities, one mother had a past history of pre-eclampsia while another mother had a previous stillbirth.

Gestational Age at booking in pregnancy was unknown or was missing from the dataset for 22 (18.8%) of the mothers. Almost 60% (69) booked at a gestational age of less than 16 weeks with the remaining 23% (26) booking after 16 weeks of gestational age.

Labour commenced spontaneously in 68% (80/117) of mothers, 23% (27/117) had their labours induced while the remaining 8.5% (10) underwent a pre-labour emergency Caesarean Section (CS).

The presentation at delivery was recorded for 111 of the 117 infants. Most infants were in a vertex presentation at delivery (77, 65.8%), while 32 (27.4%) presented breech at delivery.

With respect to the mode of delivery, six mothers had a pre-existing plan for delivery by CS. Of these two had assisted breech deliveries at very preterm gestations and the remaining four had a CS after the onset of labour, one of which was following an unsuccessful instrumental delivery. Additional data on the mode of delivery are presented in Table 2.3.

TABLE 2.3: MODE OF DELIVERY

Mode of delivery	IPDs (N=81, %)	Neonatal Deaths (N =36, %)	All Deaths (N=117, %)
SVD	36 (44.4)	8 (22.2)	44 (37.9)
Vacuum	3 (3.7)	6 (16.7)	9 (7.7)
Forceps	4 (4.9)	0	4 (3.5)
AB delivery	28 (34.6)	0	28 (23.9)
CS pre-labour	2 (2.5)	8 (22.2)	10 (8.5)
CS after onset of labour	8 (9.9)	14 (38.9)	22 (18.8)
Total	81 (100)	36 (100)	117 (100)

SVD- Spontaneous vaginal delivery, AB delivery- Assisted Breech Delivery, CS- Caesarean section

Fetal and neonatal characteristics

There were more male infants than female infants in this cohort (Male 62, 53%, Female 54, 46.2%). One intrapartum death was associated with an infant of indeterminate sex. The majority of pregnancies were singleton pregnancies. In total four of the infants born were of a twin pair, two from a dichorionic diamniotic twin

pregnancy, one from a monochorionic diamniotic twin pregnancy and one from a twin pregnancy of unknown chorionicity. The outcomes of the surviving twins are not known.

With respect to gestational age the majority of intrapartum fetal deaths (57/81, 70.4%) occurred in infants at opposite ends of the gestational age spectrum: twenty-eight deaths occurred between 22 and 27^{+6} weeks of gestational age, while a further twenty-nine deaths occurred after 37 weeks of gestational age. When infants with a major congenital malformation were excluded (35/81), the predominant gestational age range of the infants who died during labour was 22 to 27^{+6} weeks (26, 56.5%).

Gestational age was unknown for three of the infants who died in the neonatal period. The remaining 33 infants were delivered after 34 weeks of gestational age, with 27/36 (75%) being born after 37 weeks.

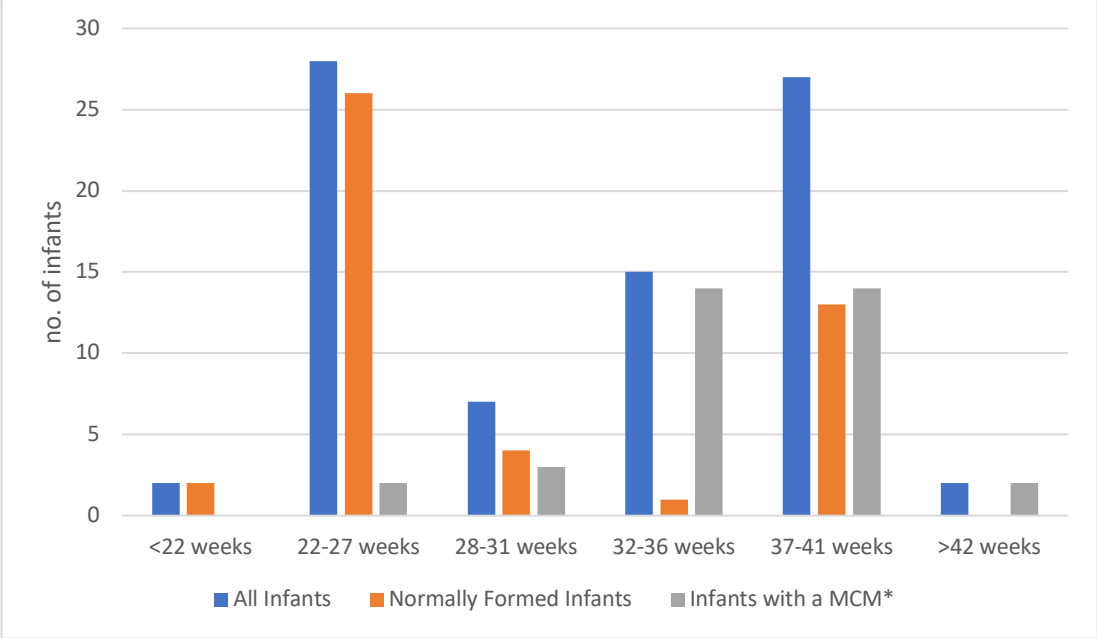

Figure 2.1 Gestational Age at delivery of all infants, normally formed infants and infants with a Major Congenital malformation (MCM)

The median birth weight for all infants was 2280g with an IQR of 2424g. The median birth weight of all infants who had an IPD was 1300g with an IQR of 1745g while the mean birth weight of all infants who died in the neonatal period was 3370g with a standard deviation of 579g.

Of the 82 normally formed infants 20.7% (17/82) had a customised birth weight less than the 10th percentile for gestational age. The Gestation Related Optimum Weight (GROW) software was used to calculate these centiles(205). Complete data was missing for three of the infants and their birth weight centiles could not be calculated. Growth restriction was suspected antenatally for only one of the infants. Most infants (28/35, 80%) with a major congenital malformation had a birth weight less than the 10th percentile for gestation. Overall, 40/117 infants were normally formed and had a gestational age of more than 37 weeks. When GROW centiles

were calculated 7 of the 40 (17.5%) normally formed infants had a birth weight less than the 10th percentile for gestation. This was suspected antenatally for four of the infants.

Postnatal investigations

In our cohort of infants, the post-mortem rate was 47.9% (56/117) with a further 43.6% (51/117) of parents being offered the choice to proceed with a post-mortem examination on the infant and declining. It is not clear from the dataset why post-mortems were declined for this group of infants, or whether the Coroner was contacted in any case. By law in Ireland, all unnatural stillbirths and intrauterine deaths must be reported to the local coroner. It is usual practice, therefore, that all normally formed intrapartum deaths are reported to the coroner.

The post-mortem rate for infants who died in the neonatal period was higher (34/36, 94.4%) than for those who died during labour (27.2%). Of the normally formed infants, 61% (50/82) underwent a post-mortem examination while 92% (37/40) of infants who were normally formed and had a gestational age of more than 37 weeks had a post-mortem. It cannot be interpreted from the data how many cases were referred to the Coroner. Table 2.4 describes the post-mortem examination rates and placental histology rates for each group of infants.

TABLE 2.4: POST-MORTEM RATES

Investigation	IPDs (N=81, %)	Neonatal Deaths (N =36, %)	All Deaths (N=117, %)
Coroner's Case	9 (11.1)	31 (86.1)	40 (34.2)
Total PM	22(27.2)	34 (94.4)	56 (47.9)
Offered and declined	49 (60.5)	2 (5.6)	51 (43.6)
Placental Histology	76 (93.8)	31 (86.1)	107 (91.5)
Investigation	**Infants, MCM (n= 35, %)**	**Normally formed (n= 82, %)**	**Normally formed >37/40 (n=40)**
Coroner's Case	0	40 (48.4)	33 (82.5)
Total PM	6 (17.1)	50 (61)	37 (92.5)
Offered and declined	22 (62.9)	29 (35.4)	3 (7.5)
Placental Histology	30 (85.7)	77 (93.9)	36 (90)

PM — Post-mortem examination MCM — Major congenital malformation

Placental histology was available in 91% (107/117) of cases. Specific placental pathology was identified in over 50% of cases. Some placentas had more than one documented pathology and the different pathologies are documented in Table 2.5. There was no universal structure to the way placental pathology reports were documented. Some collaborators entered the full pathology report as a free text to allow the reviewers in NPEC to decipher the report while others completed the form with minimal data. It is not clear from the dataset if this was because the original report contained minimal data or not.

TABLE 2.5: PLACENTAL PATHOLOGY*

Investigation	IPDs (N=81, %)	Neonatal Deaths (N =36, %)	All Deaths (N=117, %)
Velamentous Insertion	2 (2.5)	2 (5.6)	4 (3.4)
Vasa Praevia	0	3 (8.3)	3 (2.6)
Placental Infarction	1 (1.2)	0	1 (0.9)
Chorioamnionitis	17 (21)	3 (8.3)	20 (17.1)
Fetal Vasculitis	2 (2.4)	2 (4.2)	4 (3.4)
Retroplacental haemorrhage	8 (9.9)	1 (2.8)	9 (7.7)
Villitis	1 (1.2)	3 (8.3)	4 (3.4)
Other	19 (23.5)	13 (36.1)	32 (27.4)
No findings	35 (43.2)	10 (27.8)	45 (38.5)

*does not equal 100% as some placentas had multiple documented pathologies

Of the deaths that occurred in normally formed infants (82/117), 52 underwent local hospital review (63.4%) and of those with a major congenital malformation (35/117) 15 had a hospital review (42.9%). Of those infants who were normally formed and delivered after 37 weeks gestational age (40/117) 33 had a local hospital review (82.5%). From the dataset it was unclear as to why these reviews did not take place for all cases.

Causes of death — intrapartum fetal deaths (N=81)

TABLE 2.6: MAIN CAUSE OF DEATH

Cause of Death	(n, %)
Major congenital malformation	35 (43.2)
Chorioamnionitis	18 (22.2)
APH from a placental Abruption	8 (9.9)
Intrapartum Asphyxia	8 (9.9)
Unexplained	4 (5)
Specific placental	3 (3.7)
Mechanical	2 (2.5)
APH from a placenta praevia	1 (1.2)
Cord accident	1 (1.2)
Associated Obstetric factors (PPROM)	1 (1.2)
Total	**81 (100)**

APH – Antepartum haemorrhage, PPROM – Preterm Prelabour rupture of membranes

Table 2.6 lists the main causes of death for all infants who died during labour. In total, 36/81 infants were diagnosed with a major congenital malformation, but one of these infants (Trisomy 21) died as a result of severe chorioamnionitis. Of the remaining 35, abnormalities in the central nervous system (16/35, 45.7%) and chromosomal abnormalities (15/35, 42.9%) were given as the most common reasons why the infant died.

Chorioamnionitis was reported as the main cause of death in 18 of the remaining infants. With the exception of two infants, all were born at a gestational age of less than 28 weeks. The first of the term infants died at 41 weeks of gestational age following a ventouse delivery. This was the infant that at post-mortem was found to have trisomy 21. The second of these infants died following an induction of labour and ventouse delivery at 41+5 weeks gestational age. A hospital post-mortem

examination was performed, and the cause of death was reported as severe chorioamnionitis and meconium aspiration with ensuing asphyxia. It was impossible to ascertain from the dataset if chorioamnionitis was suspected during these mothers' labours or not.

Antepartum haemorrhage from a placental abruption was another common cause of death, accounting for eight infants' deaths. Only one infant died at term; the others were all less than 28 weeks of gestational age. The term infant was delivered by forceps after an induced labour at 37+6 weeks of gestation. A post-mortem examination was not undertaken but placental histology agreed with the clinical diagnosis of placental abruption.

Placental lesions were identified in 50/81, (56.8%) of the infants who died but were only classed as the main cause of death in three cases. The specific pathologies included maternal vascular malperfusion and fetal vasculitis. One of these infants was born at 40^{+8} weeks of gestational age, the others were both born prior to 30 weeks.

Intrapartum asphyxia accounted for eight of the intrapartum deaths. Coroner's Post-mortems were carried out in five of the cases, a hospital post-mortem in one case and in the remaining two cases parents were offered post- mortem examinations but declined. The majority, (6/8) had some other contributing condition: Uterine rupture, premature prelabour rupture of the membranes (two cases), cord accident, placental lesion, and fetal growth restriction.

Of the remaining eight infants, one died secondary to antepartum haemorrhage from placenta praevia, one died following a preterm prelabour rupture of membranes (PPROM), two died as a result of mechanical causes (uterine anomalies and cord prolapse) and four deaths were unexplained. Post-mortem examinations were conducted in three of the four unexplained cases.

Causes of death — intrapartum event related neonatal deaths (N=36)

Over half (21/36, 58.3%) of the infants died as a result of hypoxic ischaemic encephalopathy (HIE). The majority of these infants were delivered at a gestational age of greater than 37 weeks (19/21). With respect to labour, 12/21 were spontaneous labours and 4/21 were induced labours. The most common mode of delivery was Caesarean Section (15/21). Five of the CS were pre-labour while the rest were conducted after the onset of labour. There was one unsuccessful instrumental delivery that was then converted to a CS in this group.

The mean birth weight at delivery was 3526g with a standard deviation of 598g. Utilising the GROW software to predict centiles, 3 infants were small for gestational age (<10^{th} percentile). It is not clear if this was suspected antenatally or not.

Most (19/21) infants in this group had a post-mortem examination with 18 being directed by the Coroner.

TABLE 2.7: CHARACTERISTICS OF INFANTS WHO DIED SECONDARY TO HIE

GA	BW centile	Mode of Delivery	Obstetric factors
34+4	50th – 89th	SOL and EMCS	Placental-MVM, spontaneous PTL
35+6	>90th	SOL and EMCS	Placental-DVI, hx mat smoking, endocrine and inflammatory disease
36+1	50th – 89th	Pre-labour CS	APH- vasa praevia
36+3	10th – 49th	Pre-labour CS	Abruption
38+4	<10th	Pre-labour CS	Other maternal disorder- haemoperitoneum
39+0	50th – 89th	Perimortem CS	Maternal cardiac arrest at home, maternal, maternal death
39+2	50th – 89th	SOL and EMCS	Unexplained
39+6	50th – 89th	IOL and CS after onset of labour,	APH -Vasa praevia
40+0	50th – 89th	IOL and SVD	Placental- fetal thrombotic vasculopathy, abnormal uncoiled cord
40+0	50th – 89th	SOL and SVD	Nuchal cord, FBS result <7.25 intrapartum
40+1	10th – 49th	SOL and Ventouse	Uterine Rupture
40+3	10th – 49th	SOL and EmCS	Uterine rupture-previous vaginal deliveries only
40+3	<10th (<3rd)	SOL and EM CS	Pathological CTG, meconium, placenta-severe chorio and fetal vasculitis, PM mec aspiration
40+5	10th – 49th	Pre-labour CS	Placental – DVI/ umbilical cord haematoma
40+5	50th – 89th	SOL and vacuum delivery	Placental – DVI, mild choriodeciduitis
40+6	<3rd	Pre-labour CS	Placental – DVI
41+2	10th – 49th	Pre-labour CS	Hypercoiled cord
41+2	10th – 49th	SOL and EMCS	APH -Vasa praevia
41+2	50th – 89th	SOL and EMCS	Unexplained
41+3	>90th	IOL and SVD	Shoulder dystocia (IOL post dates)
41+5	50th – 89th	IOL, unsuccessful instrumental and EMCS	Unexplained

GA —Gestational Age; BW — Birth Weight

There were six unexplained neonatal deaths between 2012 and 2014. Further, at the time of entry into the NPEC database four cases were still waiting a post-mortem report from the Coroner.

In total there were nine other neonatal deaths secondary to intrapartum events. Perinatal infection was responsible for six of these. Two infants were delivered at home to mothers who were not booked to any maternity unit. These were concealed pregnancies and the gestational age of both infants was unknown. The first weighed 2500g at delivery; there was a suspicion of prolonged rupture of membranes and the placenta revealed acute chorioamnionitis. The second infant weighed 3070g and Coronial post-mortem report concluded the cause of death was secondary to Group B Streptococcal septic shock.

Another infant was born to a mother who underwent a pre-labour CS at 34+1 weeks of gestational age. It is unclear why this mother had a CS at this gestation. A hospital post-mortem revealed congenital toxoplasmosis and placental histology confirmed this diagnosis.

Another infant died following a ventouse delivery at 38+5 weeks of gestational age and a coroner directed post-mortem PM confirmed Escherichia. coli sepsis. Another infant died from a gram-negative meningitis. This infant was delivered by CS, for a breech presentation at 39+2 weeks gestation following spontaneous onset of labour. A sixth infant died from acute chorioamnionitis following a ventouse delivery.

The three remaining infants died from a range of other conditions. One following a ruptured vasa praevia. The second of these has been attributed to Sudden Infant Death Syndrome (SIDS) and had no identifiable antecedent or obstetric factors. This was an infant that was well at birth following spontaneous vaginal delivery but died at 10 hours of age. The last infant died at day zero of life, following a ventouse delivery at 41+6 weeks of gestational age. This baby was small for gestational age, less than the 10th percentile for birth-weight. The coroner directed post-mortem for this infant revealed extensive traumatic intracranial haemorrhage, bilateral parietal and parietotemporal fractures, and soft cranial bones with prominent cranio-lacunae and osteopenia. “Fracture” was the coded cause of death.

2.1.5 Discussion

This is the first detailed descriptive analysis of intrapartum deaths and unexpected intrapartum event related neonatal deaths in the Republic of Ireland.

The corrected intrapartum fetal death rate of 0.16 per 1000 births in this study compares favourably with that of the United Kingdom (0.35) (206) and other high-income countries (115) but given the differences in maternal demographics that exist internationally, as well as the differing definitions of stillbirth, and hence intrapartum stillbirth, it is difficult to draw any conclusion from this figure alone (115). It has, however, been recognised that in countries where women receive good quality intrapartum care that the proportion of intrapartum deaths is less than

10% of all stillbirths (145). Since 2011 there have been 1,253 stillbirths in the ROI (4.4 per 1000 live births, uncorrected for major congenital malformations) and intrapartum deaths make up 6.4% of all cases. While these figures point towards good overall maternity care, this study has revealed interesting aspects of both maternal and infant demographics and it has identified areas for improvement in antenatal care and post-mortem investigations.

Maternal smoking, obesity and timely booking to a hospital or a midwife in the pregnancy are all areas that need to be improved upon. In this study 21% of mothers smoked, while 42% were either over-weight or obese. Over one fifth of the mothers who experienced an intrapartum fetal death or unexpected neonatal death booked late or not at all to the pregnancy. These three areas have all been previously associated with all types of stillbirth, including intrapartum fetal death and adverse pregnancy outcome (91, 115, 206-209) and despite ongoing efforts to improve antenatal education, unless there is engagement from the public, as well as acceptance of the risks associated with these lifestyle choices, these efforts will be futile. We suggest the need for a greater public health awareness program with respect to the benefits of healthy eating, exercise, obesity modification and smoking cessation in pregnancy for potential future parents. This information is better imparted pre-conceptually to enable potential parents to optimise their lifestyle pre-pregnancy.

Improved antenatal recognition of fetal growth restriction was also identified as an area for improvement. In our study 20% of normally formed infants had a birth-

weight less than the 10th percentile for gestational age, and with the exception of one infant this was not recognised antenatally. Fetal growth restriction in utero is associated with perinatal death and consideration should be given to the use of customised growth centiles in order to aid accurate prediction of infants who do not meet their genetic growth potential (206, 210-217). Identification of risk factors for fetal growth restriction is key and the subsequent management once it is identified may further reduce the risk of intrapartum fetal death (211, 213, 218, 219). We were unable to identify reasons from the dataset as to why growth restriction was missed so frequently in our cohort. Failure to detect growth restriction in the antenatal period is, however, a finding that is not unique to our study. In the most recent perinatal mortality report from NPEC in Ireland growth restriction was suspected antenatally in just 61% of those infants who were in fact growth restricted(74). Research from New Zealand and Norway has also identified this as a substantial issue in stillbirth prevention (211, 220).

With respect to the normally formed infants in our cohort, just 60% had a post-mortem examination performed. Most international guidance advocates for the routine use of post-mortem examination and placental histology and it is unclear from the dataset why some infants did not have either test performed (113, 221, 222). One potential reason may have been lack of access to a dedicated perinatal pathologist, but this does not explain why those who were offered a post-mortem declined. There is also clear guidance nationally on when to inform the Coroner of a perinatal death (113). All unexpected neonatal deaths and intrapartum deaths

should be referred through the Coronial system. It is also unclear from the dataset whether the Coroner was informed of some of the cases in this cohort.

Placental histology was available in 91% of cases but as described there was no universal structure to the way placental pathology reports were documented. For some cases, NPEC were given access to the full post-mortem report and this aided with interpretation of findings. There were, however, substantial differences in the way different units reported on placental histology. Some were very detailed while others were not. Formation of a national standardised placental reporting system should be encouraged to aid with accurate diagnosis of cause of death.

One limitation of this study was that data was either missing or unrecorded for some variables. If all data variables were complete, this may have altered the results. This was particularly important for maternal variables that are known risk factors for perinatal death such as smoking or BMI, and in our dataset 10% and 20% of that data was either missing or unrecorded. As the information in our dataset is based on maternal records, it is possible that the risk factor was identified in the antenatal period but not recorded accurately in the maternal record and that may explain some of the missing data.

Despite our results being based on the best available national data on intrapartum deaths and unexpected neonatal deaths, one of the main limitations of this study was the inability to fulfil one of our main aims; to identify if any of these deaths could have been prevented. While we were able to identify risk factors such as the

relatively poor antenatal detection of fetal growth restriction, and high rates of maternal obesity and smoking, we were unable to definitively conclude if an improvement through antenatal education of patients and training of healthcare professionals could improve outcomes and prevent deaths.

We were able to use the data provided on the perinatal mortality forms to document the reasons why these infants died, but we did not have access to the mothers' or infants' maternity charts, and in particular the labour component. While we were able to document that eight infants died in labour secondary to intrapartum asphyxia and that a further 21 infants died in the neonatal period from HIE it was not possible to conduct a root cause analysis of these cases and this further strengthens the recommendation by NPEC that these cases should all undergo a confidential enquiry process in Ireland (74). Confidential enquiries are a proven, validated, external review process that have been used extensively in the United Kingdom to investigate maternal death (3) and more recently perinatal fetal and infant death (206). They are an anonymised, non-judgemental and transparent review process that focus on both good aspects of care as well as identifying areas for improvement. Since 2009, maternity units in the Republic of Ireland through NPEC have been contributing to these maternal death enquiries but as of yet have not contributed to the perinatal death investigations (223). Development of a confidential enquiry system into intrapartum fetal deaths and unexpected neonatal deaths would provide learning at both local and national levels and might also help improve the poor public perception of the Irish maternity services. While healthcare professionals have an obligation to provide high-quality evidence based care at all

times (224), a confidential enquiry system will identify all areas in the patient journey that need to be improved, including medical and lifestyle factors.

2.1.6 Conclusions

This analysis reveals valuable information with respect to intrapartum fetal deaths and unexpected neonatal deaths in the Republic of Ireland. Despite using best available national data in this analysis, we were unable to ascertain if these deaths could have been prevented. The identification and reduction of preventable intrapartum fetal deaths and neonatal deaths secondary to intrapartum events would head the call from the Each Baby Counts project in the United Kingdom(203). This project aims to reduce loss of life from intrapartum events by 50% by 2030, and mirrors the World Health Organisation's Sustainable Development Goal Number 3; to end preventable deaths of new-borns and children under the age of five(225). We, therefore, highlight the absolute need for a confidential enquiry process in Ireland to ensure that all preventable intrapartum deaths and neonatal deaths are recognised and learned from in a timely manner, but equally to ensure that good aspects of maternity care are reported.

2.2 Reducing the Burden of Intrapartum Fetal Deaths (Paper 2)

Intrapartum fetal death (IPD), the death of a fetus during labour is a tragic and traumatic outcome of pregnancy (195). Worldwide there is a substantial healthcare burden associated with IPD and it is estimated that approximately half of the 2.6 million stillbirths that occur each year are intrapartum (115). The number of IPDs occurring in high income countries may be small (0.3-0.7/1000 births) but each one leaves a profound impact, on both the parents and the involved healthcare professionals (115, 171, 196).

It has been regularly suggested and now accepted that the intrapartum death rate of an individual country or maternity unit is reflective of the care provided to both mothers and infants in labour, and that access to and utilisation of high quality, evidence-based intrapartum care is one way to further reduce intrapartum death rates (74, 115, 145, 196, 198, 199). In-depth analysis of these cases will identify positive aspects of patient care, as well as point to areas of care that need to be improved upon (201).

The NPEC collects and audits anonymised data on all stillbirths and neonatal deaths that occur each year in the Republic of Ireland (ROI). The dataset, which now contains over 400 discrete variables, represents the most complete and best quality data pertaining to all perinatal deaths in the ROI. It is from this dataset that I present the below information pertaining to some of the most recent IPDs in the ROI. At the time of writing the data available to me for analysis were from the years 2011-2015.

2.2.1 The Irish situation with respect to Intrapartum Fetal Deaths 2011-2015

For the past number of years the IPD rate in the Republic of Ireland has remained static (226). There were 99 intrapartum deaths from 2011 to 2015 giving an overall IPD rate of 0.28 per 1000 births. When this is corrected for infants with a major congenital malformation then the rate is 0.12 per 1000 births.

Maternal Characteristics (n=99)

With respect to the 99 mothers, the mean maternal age was 31 years and the majority (80/99, 80.8%) as expected were white Irish. At their booking visit 26/99 (28.6%) mothers smoked with over half (15/26, 57.7%) continuing to do so for the remainder of their pregnancy. The median BMI was 23.7kg/m^2 but 33 mothers (34.3%) were either overweight or obese. Gestational age at booking was known for 83/99 mothers with 26/83 (31.3%) mothers booking outside the WHOs recommended gestational age for booking of less than 16 weeks.

Labour commenced spontaneously in 70% (70/99) of mothers, 27.3% (27/99) had their labours induced while the remaining 2 underwent a pre-labour emergency CS.

TABLE 2.8: DETAILS ON THE MODE OF DELIVERY FOR THE 99 MOTHERS IN THIS COHORT.

Mode of Delivery	IPDs N=99 (%)
SVD	49 (49.5)
Vacuum	3 (3)
Forceps	4 (4)
AB delivery	30 (30.3)
CS pre-labour	2 (2.1)
CS after the onset of labour	11 (11.1)
Total	**99 (100)**

Fetal Characteristics (N=99)

The majority (93/99) of pregnancies were singleton pregnancies and there were more female infants (50) than male infants (48) in the cohort. One IPD was associated with an infant of indeterminate sex. Gestational age of the infants who died was as expected with 2 distinct peaks occurring at opposite ends of the gestational age spectrum: thirty-six deaths occurred less than 27^{+6} weeks of gestational age with a further thirty-eight deaths occurring after 37 weeks of gestational age. Once infants with a major congenital malformation were excluded, however, the predominant gestational age range for the infants who died during labour was before 27^{+6} (34/56, 61.1%). The median birth weight for all infants was 1500g.

Normally Formed Intrapartum Deaths (n=56)

Of the 56 normally formed infants 15 (26.8%) had a customised birth weight less than the 10^{th} percentile for gestational age. Growth restriction was suspected antenatally for just 1 of these infants. Overall 16 infants were normally formed and had a gestational age over 37 weeks. When customised birth weight percentiles were calculated for these infants 4/16 (25%) measured less than the 10^{th} percentile. This was not suspected antenatally for any of these infants.

Postnatal investigations

National and most international guidance now recommends the use of post-mortem examination and placental histology in all cases of stillbirth (113, 221, 222). In addition, in the ROI any suspicious or "unnatural" death by law should be at the very least reported to the local Coroner. This includes all unexpected intrapartum deaths (113). Between 2011-2015 the post-mortem rate was 30.3% with a further 50.5% of parents being offered a post-mortem examination and declining. Coroner directed post-mortem examinations were conducted in 12.1% of cases. Placental histology was available for 97.8% of IPDs. The NPEC does not collect data on whether cases were referred to the Coroner or not or why parents chose to decline a post-mortem examination for their infant. The NPEC does collect information on whether a local hospital review was conducted on each case. In total, 45 (45.4%) hospital reviews were reportedly conducted on the 99 infants that died between 2011-2015.

Causes of death

Table 2.9 lists the main causes of death for all intrapartum deaths and I will now discuss some of these deaths in as much detail as the dataset allows. In total, 44/99 infants were diagnosed with a major congenital malformation and for all but one this was the documented cause of death. One infant was found to have Trisomy 21 on post-mortem but the main cause of death was severe chorioamnionitis.

Chorioamnionitis was reported as the main cause of death in 23 of the remaining infants. With the exception of two infants, all were born at a gestational age of less

than 28 weeks. The first of the term infants died at 41 weeks of gestational age following a ventouse delivery. This was the infant that at post-mortem was found to have trisomy 21. The second of these infants died following an induction of labour and ventouse delivery at 41+5 weeks gestational age. A hospital post-mortem examination was performed, and the cause of death was reported as severe chorioamnionitis and meconium aspiration with ensuing asphyxia. It was impossible to ascertain if chorioamnionitis was suspected during these mothers' labours or not.

Antepartum haemorrhage from a placental abruption was another relatively common cause of death, accounting for eight infants' deaths. Only one infant died at term; the others were all less than 28 weeks of gestational age. The term infant was delivered by forceps after an induced labour at 37+6 weeks of gestation. A post-mortem examination was not undertaken but placental histology agreed with the clinical diagnosis of placental abruption.

Intrapartum asphyxia accounted for eight of the intrapartum deaths. Coroner's Post-mortems were carried out in five of the cases, a hospital post-mortem in one case and in the remaining two cases parents were offered post- mortem examinations but declined. The majority, (6/8) had some other contributing condition: Uterine rupture, premature prelabour rupture of the membranes (two cases), cord accident, placental lesion, and fetal growth restriction.

With respect to the remaining cases, five deaths were unexplained. Post-mortem examinations were conducted in four of the five unexplained cases. A post-mortem was offered but declined by the parents in the fifth case.

TABLE 2.9: CAUSE OF DEATH; INTRAPARTUM DEATHS

Cause of Death	(n, %)
Major Congenital Malformation	43 (43.4)
Chorioamnionitis	23 (23.2)
APH from placental abruption	8 (8.1)
Intrapartum Asphyxia	8 (8.1)
Unexplained	5 (5)
Specific placental	4 (4)
Mechanical	3 (3)
Cord accident	1 (1)
APH from placenta praevia	2 (2.2)
Specific fetal, acute TTTS	1 (1)
Associated Obstetric Factors (PPROM)	1 (1)
Total	99 (100)

2.2.2 What do these findings represent and how can we reduce our intrapartum death rate further?

The corrected intrapartum fetal death rate of 0.12 per 1000 births in the ROI compares favourably with that of the United Kingdom (0.35) and other high- income countries (115,206)). In addition, the intrapartum death rate for normally formed infants greater than 37 weeks' gestation is 0.04 per 1000 births. It is difficult to draw any real conclusion from these figures alone, however, given the differences in maternal demographics and definitions of stillbirth and intrapartum death that exist internationally (115). It has also been recognised that in countries where

women receive good quality intrapartum care, the proportion of intrapartum deaths is less than 10% of all stillbirths (145). Since 2011 there have been 1,513 stillbirths in the ROI (3.6 per 1000 live births, uncorrected for major congenital malformations) and intrapartum deaths make up 7.8% of all cases. While these figures point towards good overall intrapartum care they are only numbers, and perhaps do not tell the full story. Despite the limitations of the data, I believe there are lessons in this analysis for care. I offer four such suggestions relating to particular areas of maternity care. These suggestions are based upon my analysis of the NPEC data and are reflective of areas where appropriate clinical improvement as well as financial investment may help to further reduce our intrapartum death rate. These suggestions will not be new or surprising, and for the most part echo points made in previous NPEC perinatal reports as well as the invited commentaries on stillbirth by Dr Keelin O'Donoghue and Professor Richard Greene (74, 92)

Improvement in Public Health Education

Maternal smoking, maternal obesity and late booking to a healthcare provider in pregnancy have previously been associated with all types of stillbirth, including intrapartum fetal death and adverse pregnancy outcome (115, 207-209). Analysis of the NPEC data revealed that 28% of mothers smoked, while 34% were either over-weight or obese. Almost one-third of the mothers who experienced an intrapartum fetal death booked late or not at all in their pregnancy. Despite ongoing efforts by maternity healthcare providers to improve antenatal education, unless there is significant engagement from the public, as well as acceptance of the risks associated with these lifestyle choices, these efforts will be futile. A recent study by

Nuzum et al, which surveyed 999 respondents from the general Irish population, identified that over half of respondents failed to identify any risk factors for stillbirth (210). With this in mind I suggest the need for a greater public health awareness programme with respect to the benefits of healthy eating, exercise, obesity modification and smoking cessation prior to pregnancy. This awareness programme could also educate future parents on the complications of pregnancy such as stillbirth. This information is best imparted some-time pre-conceptually to enable potential parents to optimise their lifestyle pre pregnancy. I note with considerable enthusiasm the development of Physical Education as a school leaving cert subject and this may offer an opportunity for enhanced education with respect to some of these important modifiable lifestyle areas.

Improvement in Antenatal Recognition of Fetal Growth Restriction

Analysis of the NPEC dataset revealed that fetal growth restriction was present in over a quarter of the infants who died in labour and that this was antenatally suspected in just one case. Fetal growth restriction in utero is associated with perinatal death and consideration should be given to the use of customised growth centiles in order to aid accurate prediction of infants who do not meet their genetic growth potential (211, 212, 214, 216). Identification of risk factors for fetal growth restriction is key and the subsequent management once it is identified may further reduce the risk of intrapartum fetal death (212, 219, 220). Reasons why growth restriction was missed so frequently is not something that is collected by the NPEC in individual cases but it is a finding that is not unique to Ireland. Enhancing education programmes for maternity healthcare providers to ensure a standardised

approach to both risk factor identification as well as antenatal surveillance of fetal growth should be of vital importance for healthcare policy makers. In addition to this the onus is on all maternity healthcare professionals to equip themselves with the most up to date knowledge about the risk factors for fetal growth restriction to facilitate identification and appropriate interventions.

Perinatal Post-mortem Examination and Placental Histology

All international guidance (including Irish guidance) advocates for the routine use of post-mortem examination and placental histology when investigating all types of stillbirth (113 ,222, 3). While placental histology was available in the majority of the cases I analysed (97.9%), according to the NPEC data less than one third of all intrapartum deaths were investigated with a post-mortem examination. Over half of parents were offered a post-mortem examination but declined. Of the normally formed infants in this cohort, 61.2% did not have a post-mortem examination conducted. We cannot hope to reduce the Intrapartum Death Rate unless we have a thorough understanding of each individual intrapartum death and post-mortem examination is the gold standard investigation when searching for causality. It is unclear why so few infants had a perinatal post-mortem examination. One potential reason, in some hospitals, may have been lack of access to a dedicated perinatal pathologist. I echo the call made by the NPEC and Professor Greene in his invited commentary (74) for the development of a national perinatal pathology service. Such a service would provide equitable access for parents and healthcare providers to specialised perinatal pathologists irrespective of where the infant was born. It is to be hoped that this will be one of the priorities for the National Women and

Infant's Health Programme to resource in 2018. This does not explain, however, why some parents who were offered a post-mortem declined nor is that information available in the NPEC dataset. From the existing literature on parental decision making with respect to perinatal post-mortem, it is clear that the timing of the discussion in relation to post-mortem can impact on whether a parent consents or declines the examination. In general, if parents are given more time to process the information in relation to post-mortem then they are more likely to consent (143). Another one of the perhaps modifiable reasons is in relation to the way parents are counselled towards post-mortem examination by health care professionals (72). It has been shown that when parents are counselled by appropriately trained senior healthcare professionals that consent is more likely to be obtained (109). In Ireland, few, if any of our senior medical or midwifery staff are appropriately trained in all aspects of bereavement care including how to consent for perinatal post-mortem examination (171). With the publication and now implementation of the National Standards for Bereavement Care following Pregnancy Loss and Perinatal Death (322); this area is finally being given due attention.

Development of a confidential enquiry into Intrapartum fetal death.

Analysis of the NPEC dataset revealed a number of interesting issues. I was able to identify risk factors for intrapartum death such as the relatively poor antenatal detection of fetal growth restriction, as well as high rates of maternal obesity and smoking. In addition, it gave a very good insight into the reported causes of intrapartum death in the Republic of Ireland. I did not, however, have access to the

mothers' or infants' maternity charts, and in particular the labour component. This meant that while I was able to document, for example, that eight infants died in labour secondary to intrapartum asphyxia it was not possible to conduct any analysis of these cases. It was, therefore, impossible to identify any good components or substandard aspects of maternity care or to postulate whether alterations in antenatal or intrapartum care would have made a difference to the outcomes. For the last number of years, both in their annual reports and invited commentaries, the NPEC have been vocal in recommending that a Confidential Enquiry into Perinatal Death in Ireland be established. Confidential enquiries are a proven, validated, external case review process that have been used extensively in the United Kingdom (3) to investigate maternal death and more recently perinatal, fetal and infant death (206). They are an anonymised, non-judgemental and transparent review process that focus on both good aspects of care as well as identifying areas for improvement. Since 2009, maternity units in the Republic of Ireland through NPEC have been contributing to these maternal death enquiries but as of yet have not contributed to the perinatal death investigations (223).

Development of a confidential enquiry system into all perinatal deaths, including intrapartum fetal deaths would provide learning at both local and national levels. While healthcare professionals have an obligation to provide high quality evidence based care at all times (224), a confidential enquiry system will identify all areas in the patient journey that need to be improved, including medical and lifestyle factors. There is undoubtedly currently a poor public perception of the Irish maternity services and a confidential enquiry system will further enable us to be

clear and open with parents with respect to the review process and this might improve the public perception of how these cases are dealt with. I suggest a confidential enquiry process into perinatal death alone misses an opportunity for learning, and any such process should also review the care received by infants who are born with a severe brain injury. Reviewing the intrapartum care provided to these infants has the potential to provide us with unique insights that may not be identifiable from analysis of perinatal deaths alone. The Each Baby Counts programme, supported by the Royal College of Obstetricians and Gynaecologists in the UK collects and pools the results of local risk management reviews on the care received by infants who have died in labour, shortly after labour or who have suffered a severe brain injury at birth (203). In addition, they have started assessing the quality of these local risk management reviews and to date have identified that almost one third (27%) did not contain enough clinical information to allow care to be appraised (201). With this in mind one further suggestion is that an Irish Confidential Enquiry System into Perinatal Deaths be extended to include those infants who suffer a severe brain injury. The optimal model would, therefore, be a national tool to facilitate a high quality enquiry in to all these cases. This tool could then be used at both local level, and be reviewed at hospital groups, and reviewed at a national level as necessary.

2.2.3 Conclusion

As maternity healthcare professionals we do a lot of good work on a day to day basis; much of it happens quietly and remains largely unseen. Sometimes, even with best care, serious adverse events such as intrapartum deaths do happen and not all

are preventable. All need to be investigated, however. The data available from NPEC is good but there is an absolute need for Confidential Enquiries. There is still a lot to learn and a lot to be improved upon and in order to facilitate this we urgently need enhanced recognition, support and investment from healthcare policy makers. Investment to assist the learning suggested by this analysis could reap great dividends for the health service in fewer deaths and brain injuries around the time of birth. This would be a significant benefit for the parents and families who use our maternity services every day.

Chapter 3

The Human impact of intrapartum death on healthcare professionals

Paper 3: **Healthcare professionals' response to intrapartum death; a cross-sectional study**

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Paper 4: **Intrapartum fetal death and doctors; a qualitative exploration**

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3.1 Healthcare professionals' response to intrapartum death; a cross-sectional study (Paper 3)

3.1.1 Abstract

Background: Exposure to adverse perinatal events can impact on the way healthcare professionals (HCPs) provide patient care. The aim of this study was to document the experiences of HCPs following exposure to intrapartum death (IPD), to identify opinions surrounding education and suitable support strategies, and to ascertain if involvement with an IPD had any impact on clinical practice.

Methods: A questionnaire study, with open and closed questions, was developed and set in a tertiary maternity hospital. Consultant Obstetricians, trainee Obstetricians and midwives were invited to participate. Respondents were questioned about the impact that an intrapartum death had on them, the support they received in the immediate aftermath and their opinions regarding ongoing education and training in the areas of intrapartum death and self-care.

Results: Eighty percent of HCPs in our study had a direct involvement with an IPD. Most (82%) HCPs received no training in dealing with IPD while 94% had no education on self-care strategies. Despite it being desired by most (80%), debriefing was offered to just 11% of HCPs who were involved in an IPD. Three main qualitative themes emerged from the data; the personal impact of IPDs on HCPs, implications for professional practice and future patient care, and the importance on non-judgemental support.

Conclusion: Maternity hospitals need to improve their support structures for HCPs following an IPD. It is hoped that this study will inform future educational practice and identify potential support strategies.

3.1.2 Introduction

An unexpected intrapartum fetal death (IPD) is a profound and tragic event for all involved. Each year, approximately 1.3 million infants worldwide die after the onset of labour and before they are born (115). Intrapartum death rates vary between countries; for the Republic of Ireland (ROI) and the United Kingdom (UK) the most recent perinatal mortality reports have quoted rates of 0.16 and 0.35 per 1000 births respectively (227, 228).

Research focusing on the effects of perinatal death on obstetricians and midwives has repeatedly identified a substantial emotional burden (10, 12, 13, 133, 135). High rates of post-traumatic stress disorder were observed in obstetric nurses who were exposed to a perinatal death (135). Almost one in ten obstetricians in the USA have considered leaving the profession secondary to the emotional effects of caring for parents following a perinatal death (12). Consultant obstetricians in the ROI have described the extensive burden of 'the weight of professional responsibility' they experience following a stillbirth (13). HCPs working in a low resource, high perinatal death setting experience the same emotional toll as HCPs in countries with low perinatal death rates (10).

The existing research focuses on the impact that all types of perinatal death have on HCPs (13, 142) but we were unable to identify any study relating to the specific impact of intrapartum death. It has been widely acknowledged that the intrapartum fetal death rate is reflective of care received by the mother and baby in labour (115, 144). When a baby dies unexpectedly during labour or at delivery, it is therefore reasonable to assume that the overall impact experienced by HCPs is substantial. The aims of this study were to document the effects on HCPs when a baby dies either during or shortly after labour, and to ascertain what support strategies were available to HCPs after an IPD.

3.1.3 Methods

In order to assess the attitudes and beliefs of as many HCPs as possible, with varying degrees of clinical experience, three groups of HCPs were recruited; consultant obstetricians/gynaecologists, non-consultant hospital doctors (NCHDs) training in obstetrics and gynaecology and labour ward midwives.

This questionnaire study was conducted in a tertiary-referral university-teaching hospital in the Republic of Ireland, with 8,200 deliveries per annum. The stillbirth rate in 2014 was 3.8 per 1000 births and the IPD rate was 0.37 per 1000 births. The hospital, which is affiliated with the national basic and higher specialist training schemes for doctors employs approximately twenty-five NCHDs each year (229).

All consultants (n=17) with labour ward sessions were invited to participate. NCHDs (n=101) who had worked in the hospital between 2010 and 2015 were also invited to participate. Each doctor received both a hard copy of the questionnaire with a self-addressed envelope for the primary author (KMcN), and up to three email reminders with electronic copies of the questionnaire. OOC recruited the midwives, which included the delivery suite (DS) midwives and those with prior experience on the DS (60).

The primary author (KMcN) developed a questionnaire, containing a mixture of twenty-nine open and closed questions specifically for this study (included in the supplementary material in this thesis). The topics addressed were guided by previously published literature pertaining to the impact of stillbirth on HCPs (12, 13), but the questionnaire content was novel. Demographics including, occupation, sex, and years of practice were collected. In addition, the study contained four sections relating to exposure to IPD, debriefing and support after exposure to IPD, other potential supports after IPD, and education and training. The survey issued to consultants included an additional nine questions focusing on supports the consultant had provided to more junior colleagues who were involved with an IPD. Free text options were included in all surveys to allow participants to provide additional data. Examples of questions from the consultant survey are included in Table 3.1.

TABLE 3.1 – SAMPLE QUESTIONS FROM CONSULTANT SURVEY

"Can you describe how this event impacted on you at the time it was happening, personally and professionally? (When answering this section, please relate to the intrapartum death that has had the most impact on you as a consultant)"
"After an intrapartum death, if you were told to go home - would you? Please explain why or why not?"
"Do you feel supported, judged or blamed by your colleagues after an adverse event such as an intrapartum death? Please explain"
"What do you do to look after yourself after an adverse event such as an intrapartum death?"
"How have you or would you advise junior team members to look after themselves after an adverse event or an intrapartum death?"
Have you ever arranged formal debriefing after an intrapartum death for team members?   **☐ yes ☐ no ☐ What is debriefing?**

Descriptive statistics were performed using IBM SPSS statistical software, while Qualitative data were managed using NVIVO 11.

The first author conducted all quantitative and qualitative data analysis. With respect to qualitative data, an open coding method was employed. Responses from each HCP were analysed individually and a table of initial codes was constructed. These codes were then categorised into potential themes, and all associated coded

data extracts were collated. A set of main or principal themes was then developed from these categories. Themes from each of the three groups of HCPS (consultants, midwives and trainee obstetricians) were analysed, and then the three groups were compared and contrasted. A master table of themes was created and was also reviewed by one of the co-authors (OOC) (Table 3.2).

TABLE 3.2. PROMINENT THEMES

Theme: The Personal Impact of IPDs on HCPs			
	Consultants	**Midwives**	**NCHDs**
Minor themes	• Guilt • Isolation • Shock • Conflicted opinions about going home • Long lasting emotional impact	• Sadness • Blame • Self-doubt • Culture of silence • Conflicted opinions about going home • Long lasting emotional impact	• Sadness • Anger • Self-doubt • Confusion • Conflicted opinions re going home • Long lasting emotional impact
Theme: Implications for professional practice and future patient care			
	Consultants	**Midwives**	**NCHDs**
Minor Themes	• Changes in clinical practice • Continued learning and education • Self-doubt about career choice	• Changes in clinical practice • Concerns re career choice • Continued learning and education • Self- questioning about decision making	• Changes in clinical practice • Concerns about career choice • Shared learning and education • Doubt over clinical decision making
Theme: The importance of Non-Judgmental Support			
	Consultants	**Midwives**	**NCHDs**
Minor Themes	• debriefing • self-care strategies • importance of collegiality	• debriefing • self-care strategies • nominated support team as an important development	• debriefing: mandatory vs voluntary • self-care strategies • perceived judgment from colleagues

3.1.4 Results

Quantitative findings: The response rate was 50% (n=89), comprising of 11 consultants, 58 NCHDs and 20 midwives. Three-quarters of respondents (n=69) were female, and 25% (n=23) had more than ten years of clinical experience. The basic demographics of the HCPs are detailed in Table 3.3.

TABLE 3.3 – DEMOGRAPHICS OF HEALTHCARE PROFESSIONALS

Characteristic	Response (N= 89, %*)
Position	
Consultant	11/89 (12.4)
NCHD	58/89 (65.2)
Midwife	20/89 (22.5)
Sub-Specialty/Grade	
Consultant	11
NCHD	
Senior/Specialist Registrar	37
Junior Registrar/Registrar	15
Senior House Officer	6
Midwife	
Midwife manager	2
Registered Midwife	18
Years of practice*	
<5	32 (36)
5-10	34 (38.2)
>10	23 (25.8)
Female	69 (77.5)
Male	20 (22.5)

*% where appropriate, ** for consultants, years as a consultant

Some questionnaires (n = 18, 20%) were completed by HCPs without experience of intrapartum death, and as such they provided answers to the section relating to education and training only. Their answers were included for the analysis of this section only.

In total 71/89 (79.8%) HCPs had direct involvement with at least one intrapartum death. All consultant obstetricians had experienced an IPD as did 19/20 midwives. Sixty-five percent (46/71) of HCPs experienced more than one IPD and of the consultants, all bar one (10/11) had experienced an IPD both as a NCHD and as a consultant. Two thirds (44/71, 62%) of HCPs were directly involved in a death they perceived as unexpected and potentially preventable (e.g. a death secondary to intrapartum asphyxia or intrapartum sepsis). With respect to the nature of the involvement, midwives in our hospital are the primary attendants in labour and conduct normal vaginal deliveries. Obstetricians are involved in the overall management of complicated labours and conduct operative deliveries. Each participant in our study was either the main labour attendant or conducted the delivery.

Over half of HCPs (40/71, 56.3%) indicated that they would prefer to stay in hospital in the immediate aftermath of an IPD. Overall 80% (54/67) agreed that debriefing would be beneficial after experiencing an IPD with only 11% (8/71) being offered a chance to formally debrief with colleagues.

Two HCPs advised that they had previously used specific support systems such as professional one-to-one counselling services, or professional group counselling services. One-to-one counselling was acceptable to 63% (47/74) of HCPs, mindfulness was appropriate for 61% (46/75) while 39% (28/72) of HCPs would avail of group counselling services. Overall, the preferred support system was meeting with a nominated support team immediately after an event (88%, 68/75).

Some 82% (73/89) of HCPs received no undergraduate or postgraduate training in dealing with intrapartum death, and 84% (75/89) agreed that this would be of use. In addition, no consultant had received training but members of both the NCHD group (9/58) and the midwifery group (7/20) had training. Training was largely received as part of a communication skills workshop, however 94% (84/89) of HCPs had received no education on self-care strategies.

Qualitative findings: Three main themes were identified from the data; the personal impact of IPD on HCPs, implications for professional practice and future patient care, and the importance of non-judgmental support following an IPD. The most prominent sub-themes for each group of HCPs are documented in Table 3.2.

Theme One: The personal impact of intrapartum deaths on healthcare professionals

The immediate emotional after-effects of IPDs were comparable amongst the three groups. Shock, isolation, guilt, sadness, and anxiety featured prominently in the free text responses:

"I was a year one SHO at the time, I felt so utterly useless at the time. I was trying to assist that CS as best I could. I had never seen a baby so grey when it was born. And then I had to get back to the patients waiting to be seen in the ER and act like everything was fine... I cried for hours that night when I woke up post-call"
NCHD

"As a student midwife in 1982 .... Fetal distress was noted... No doctor came until she was pushing for one hour. She delivered a live infant after two hours in 2nd stage. The baby died after one hour of delivery. I left prior to the baby being born… I knew the outcome was going to be bad... When I checked about her the next morning I heard the baby was dead. My first reaction was one of relief as I knew that had he lived he would have been severely brain damaged. I will never forget that mother and her labour as long as I live."
Midwife

Anger and blame were directed at the self, with HCPs doubting their own clinical decision-making. For some this was also directed at colleagues and at the healthcare system:

"Even though this happened many years ago, I still remember it and blame myself for the death of the baby"
NCHD

Some felt that a "culture of silence" prevailed and that self-protection from repercussions was what really mattered. This was a particularly prominent theme amongst the midwifery group:

"The medical and the nursing/midwifery teams discussed their issues but then nothing. Silence as to how to move forward again... I questioned my ability… even outside and at home. Kept searching to see if any other cause for what happened... Everyone was guarding their input."
Midwife

"Feels like everyone tries to identify 'whose fault is this' and everybody tries to protect themselves."
Midwife

Continuity of care for the parents, and staying around colleagues in a supportive environment were the main reasons why 56% (40/71) of HCPs preferred to remain working after an event:

"No – I would rather get on with the day – have others around. Be closer to the parents to check on them. At home I would only dwell on events I could not change."
Consultant

Those who wished to go home worried that staying at work compromised the care they had or would have provided to other parents. They also worried that their thought process would be impaired in the hours following the intrapartum death:

"Yes- I was extremely upset after this and as it was a night shift I had to continue on looking after my other 10 patients. I found it very difficult to ensure I gave them good care"
Midwife

Consultants were also asked if they would send home a junior colleague after an intrapartum death. Views on this were conflicting. In total seven consultants advised they would send a junior colleague home, including three of those who themselves preferred to stay in the hospital. No explanation for this difference was determined. One consultant in particular was strongly opposed to doctors remaining at work after an intrapartum death:

> *"An unexpected intrapartum event can be devastating. In the few cases where I have been directly involved I have asked the affected doctor to go home. It's akin to a train driver witnessing a suicide jump or crashing a car into a pedestrian. We would never expect people to work normally after these events so why should doctors?"*
> *Consultant*

Theme Two: Implications for professional practice and future patient care

Experiencing an IPD made some HCPs question their career choice. The doctors' main concerns were regarding their own clinical skills, the high expectations placed upon them and the level of risk associated with obstetric care provision:

> *"It made me question my career – the stakes being so high and whether I am able for it"*
> *NCHD*

Some of the midwives worried about their ability to cope with the sadness that sometimes accompanied the job, and two midwives advised that they had changed to a different clinical area after their experience:

> *"Personally, the next few days when I was off work I really contemplated midwifery. Why was I doing it? How was there so much sadness there?"*
> *Midwife*

There were some positive changes to clinical practice, as a result of an IPD experience. All groups felt that their communication skills (listening and questioning) had improved and that relationships with other parents were better as a result. Consultant obstetricians advised that they were more likely to get involved in the day to day clinical care of their patients. One consultant described the impact that both positive and negative events have had on them:

> *"All practice moulds you day by day, good outcomes and bad. Matures you as a human being and as a clinician. More reflective. More explanation of my decisions as making them to other staff and patients"*
> *Consultant*

Some HCPs, however did worry that their level of intervention might increase, while others admitted abandoning a particular obstetric procedure following their experience:

"For a period after it, it heightens your awareness and you are more 'careful', maybe intervene sooner than you were previously"
NCHD

Shared learning and multi-disciplinary discussion were highlighted as ways to improve patient safety and outcomes. There was a belief amongst HCPs that this would 'relieve the burden' associated with these cases, particularly where no substandard care is identified:

"…feel learning from such cases helps to relieve the burden as it is easy to feel you were sub optimal in your care (when) often that is not the case"
Consultant

Theme Three*:* The importance of non-judgmental support

Opinions differed as to whether a formal mandatory debriefing session or a more casual discussion with colleagues would be more beneficial. All groups advised that this should be non-judgmental and blame free. The NCHD group advocated a more formalised approach with a trusted senior mentor while the midwives preferred not to include senior management and preferred someone who was clinically active:

"Yes, an immediate debriefing. Time to unwind. Someone to be genuinely interested in how you are 'feeling'. Management more interested in getting boxes ticked, form filling etc. Who cares for the caring profession?"
Midwife

The importance of good relationships with colleagues was highlighted as another factor that had a somewhat pre-emptive role to play in supporting HCPs:

> *"I think the duration of time it takes to overcome an event is inversely proportional to the level of collegiality and team spirit that exists in the place of work. One indirect way of enhancing the reaction to adverse events would be to enhance team spirit"*
> *NCHD*

Despite eight of the eleven consultants advocating for formal debriefing, only two had ever organised a session. There were requests from this group to include education sessions on how to effectively debrief other colleagues within the hospital.

HCPs also documented a wide range of self-care strategies: exercise, talking with friends, sleep, but spending time outside of work with close friends or family was the most effective self-care strategy for most. A minority of HCPs did allude to using excessive alcohol, aggressive exercise or just simply ignoring the event as their way of coping and these could all be perceived as mal-adaptive coping mechanisms. Most HCPs (84%, 75/89) advocated the need for education on effective self- care strategies.

3.1.5 Discussion

This study reaffirms that serious adverse events negatively impact on HCPs (10, 13, 133, 141, 170, 230). Reflective of the wider body of medical literature on perinatal death, we found that involvement with an IPD exerts an emotional toll, with feelings of sadness, guilt, isolation and self-doubt being commonplace. It is unsurprising that the emotional burden experienced after and IPD is complex and profound, but HCPs have to balance their own sadness and grief for the loss of the baby, with the added pressure of providing compassionate care to the parents.

We found there was a dichotomy of opinion as to whether to continue working after an IPD and therefore mandatory leave of absence does not seem appropriate. HCPs advised that their thinking could be impaired in the hours following the IPD, so it may be beneficial for them to leave the clinical area in the immediate aftermath, to gather their thoughts and reflect on what happened. Certainly, it should not be expected of HCPs to carry on working as normal, without any recognition of their own emotional needs. Adequate emotional, in addition to clinical support is necessary for most HCPs if they are to continue to provide high quality individualised clinical care.

Of the 71 HCPs who were directly involved with an IPD, eight (11%) were given the opportunity to formally debrief. In total, 80% of HCPs (54/67) recognised the need for non-judgmental debriefing sessions, something that is congruent with suggestions from other studies (181, 231, 232). We believe this must be additional to the local systems analysis review that usually happens after a serious adverse

event (233). Furthermore, the HCPs in our study suggested that it was appropriate for these debriefing sessions should be conducted by doctors and midwives who were clinically active, and not just those in senior management positions. This is an important suggestion supported by recent research on optimising local hospital reviews after severe incidents in maternity care (234). In a comparative analysis of local and external hospital reviews, Shah et al advised that local hospital reviews are unlikely to identify aspects of good care in the management of adverse events and were highly likely to recommend disciplinary action for the involved HCPs (234). These clinical reviews are thus likely to be counterproductive in supporting the majority of HCPs after an IPD.

Consultant obstetricians in this study cited a “lack of time” as a main barrier to providing support to other colleagues. It is possible that this is a reason why just 11% of our HCPs were given the opportunity to debrief. It is also possible that senior HCPs do not believe themselves to have acquired the necessary skills, as indicated by the requests for the provision of educational workshops.

There was overwhelming support from HCPs to be given the chance to meet with a nominated support person/team immediately after the IPD. This strategy, known as Code Lavender™ has been employed with success in hospitals throughout the US and is one that is gaining in popularity in other medical fields (183).

This study also highlighted the positive effect that involvement in an IPD can sometimes have on clinical practice. Some HCPs became more actively involved in

other patients' care following their own experience. This is reflective of findings by others investigating the impact of perinatal death on HCPs (10).

Obstetrics and midwifery are high-risk career choices and there is a sense amongst this group of doctors and midwives that they are both undertrained and ill-equipped clinically and emotionally to deal with the most serious of outcomes on the labour ward. Previous research (12) has linked adequate training in stillbirth management with improved coping skills. Other recent research focusing on junior doctors in the early stages of their gynaecological careers, has shown that their involvement in an education program on coping skills substantially improved their job satisfaction, stress and exhaustion levels and aided them to effectively deal with problems in the work place (235). Mandatory communication skills workshops at both undergraduate and postgraduate level should therefore be encouraged.

Schwartz Centre Rounds® are multi-disciplinary meetings for HCPs aimed at exploring and discussing the human side of healthcare. Instead of focusing on the pathology and treatment of medical illness, the focus is on the emotional impact of medical conditions on patients and on the HCPs who care for them. HCPs who attend on a regular basis report reduced levels of stress and isolation and are themselves more likely to be open to receiving and giving support (191, 193) Schwartz Centre Rounds® have been utilised successfully in the US for more than a decade and more recently have been introduced in the UK (236). Early evidence suggests that they are as beneficial in the UK as they are in the US (192). At present Schwartz Centre Rounds® are subscribed to by just two Irish healthcare institutions

(237). Their application specific to obstetrics and midwifery has not been evaluated, however their use warrants further consideration.

The main strength of this study is that, to our knowledge it is the first to specifically explore the impact of intrapartum fetal death on HCPs. It presents compelling evidence that direct involvement in an intrapartum fetal death is stressful and upsetting. Another strength of this work is that it includes views from consultant obstetricians, NCHDs and midwifes. Despite what has been suggested in prior studies (12), the opinions of the 3 study groups here were largely comparable.

A limitation of this study is that it was conducted in a single maternity hospital, however its findings should be transferable to other units both in the ROI and abroad. Cork University Maternity Hospital is one of the four largest hospitals in the ROI, with over 8200 deliveries per annum. This also makes it one of the larger and busier maternity units in Europe. While the study participants were all based at this one hospital, both the doctors and midwives have trained and worked in many other maternity units. Not all of the deaths they described happened in their current place of work and as such their experiences are reflective also of the other hospitals that they have worked in.

Another limitation was that we didn't specifically enquire as to whether HCPS were being held directly responsible for the intrapartum fetal deaths, by hospital management, nor did we ask how this had impacted on them. This is something that could be investigated using further research.

This is a questionnaire-based study and therefore the qualitative findings are limited by this design. While free text was encouraged, and for the most part provided, it is unrealistic to expect a large amount of data for thematic analysis. The largely negative impact of intrapartum death on HCPs was apparent and a qualitative study is warranted to fully explore this experience. In addition, only 50% (n=89) of those who were approached responded, and self-selection bias may be another limitation. As this was an anonymous study, it is not possible to identify the non-responders to see if any demographic or other variable differed from the responders.

While there were some positive gains for HCPs following an intrapartum fetal death, the majority of their experience was negative. Despite this, the desire to continue to provide compassionate good quality care was highly visible within the responses from HCPs. A varied range of support systems that are acceptable to staff are necessary to alleviate some of the emotional burden experienced by HCPs after an intrapartum death. These may include; formal debriefing sessions, development of an on-site support team, participation in Schwartz Centre Rounds®, as well as the provision of workshops on "how to effectively debrief" and on self-care strategies.

3.1.6 Conclusion

Our study found a need for a more proactive approach towards providing emotional support for HCPs who are exposed to serious perinatal events such as intrapartum fetal death. We recommend mandatory education sessions on self-care and training in adverse outcome management for all HCPs both in training and during their

working life. The provision of a nominated support team in each maternity unit deserves further examination. Consideration should also be given towards the development and maintenance of Schwartz Centre rounds in maternity hospitals

3.2 Intrapartum fetal death and doctors: a qualitative exploration (Paper 4)

3.2.1 Abstract

Introduction: The death of an infant during a pregnancy is profoundly traumatic, both for the parents and the involved healthcare professionals. Most research focuses on the impact of antenatal stillbirth with very little research examining the specific impact an intrapartum fetal death has on obstetricians. The aim of this study was to provide an in-depth qualitative exploration of the attitudes and responses that Irish Obstetricians have following direct involvement with an intrapartum fetal death.

Materials and Methods: Qualitative semi-structured interviews were used. Interpretative phenomenology was used for data analysis. The setting was a tertiary university maternity unit in Ireland with 8200 deliveries per annum. Ten obstetricians were purposively sampled. The main outcome measures were the attitudes and responses of Irish obstetricians following exposure to an intrapartum death.

Results: Obstetricians were profoundly and negatively affected by a personal involvement with an intrapartum death. Analysis of the data revealed two superordinate themes; the doctor as a person and supporting each other. The

doctor as person was characterised by two subordinate themes; emotional impact and frustration. Supporting each other was also characterised by two subordinate themes; an unmet need and incidental support and what might work.

Conclusions: Obstetric doctors who are directly involved in an intrapartum death are the second victims of this event and this is something that needs to be acknowledged; by the public, by the healthcare system, by the media and by the doctors themselves. The development of effective emotional support interventions for all obstetricians is highly important

3.2.2 Introduction

Intrapartum fetal death (IPD), is defined as the death of an infant after the onset of labour but before they are born. More than 1.3million infants die annually during labour (115). The proportion occurring in higher-income countries such as the Republic of Ireland (ROI) and the United Kingdom (UK) is comparatively low with most recent IPD rates of 0.27 and 0.35 per 1000 births respectively (75, 206).

The death of an infant during pregnancy is traumatic for the parents and the healthcare professionals (HCPs) involved. Research in this area focusses on the effects of antenatal stillbirth or perinatal death on parents (4, 5, 7, 10) and HCPs (12, 13, 135), without investigating the specific impact of unexpected IPD.

The emotions described by parents after a stillbirth include shock, sadness and fear, with guilt and anger becoming apparent in the longer term (5, 7, 131, 143). These emotions resemble those expressed by HCPs involved in a stillbirth. Irish

obstetricians have described feeling sad, isolated and unsupported in the aftermath of a stillbirth (13). Israeli obstetric nurses who have experienced a perinatal death are more likely to be affected by post-traumatic stress disorder and depression than other uninvolved colleagues (135). US obstetricians regularly blame themselves for perinatal deaths (12) with almost one in ten considering leaving obstetrics secondary to the emotional burden of caring for parents after perinatal death (12).

An unexpected IPD is a uniquely traumatic experience for HCPs, especially where the pregnancy is uncomplicated and the unborn infant is healthy entering labour. There may be questions about clinical decision making as it is suggested that the IPD rate of a hospital is reflective of the quality of care provided during labour (115, 144, 145)

In addition, a recently published questionnaire study by these authors found that direct involvement with an IPD was stressful and upsetting, with obstetricians having to balance providing compassionate care to the parents with their own grief for the loss of the baby (171). It is therefore likely that responses of obstetricians to IPD differ to that of antenatal stillbirths.

Our study aims to provide an in-depth qualitative exploration of the attitudes and responses that Irish Obstetricians have following direct involvement with an intrapartum fetal death.

3.2.3 Material and Methods

How HCPs reflect on their own experiences and how this impacts on the care they provide to patients is something that cannot be investigated fully using traditional quantitative methods; hence qualitative research is appropriate.

Interpretative phenomenological analysis (IPA) was chosen as it explores how individuals make sense of major life experiences (238). While a specific event may be experienced by numerous individuals, their personal perception of this event is unique to them. IPA aims to provide a deep exploration, and interpretation of these individual reactions (238). Researchers using IPA need access to detailed personal accounts of the experience in question.

Purposive sampling was used to recruit participants who had worked in a large tertiary maternity hospital. All obstetricians with direct involvement with an IPD were eligible to participate. An email invitation was sent to potential participants informing them of the study. This initial email was followed by five further email reminders over the course of three months. Seventeen consultant obstetricians and twenty obstetric registrars were invited to participate. Ten obstetricians comprising five consultant obstetricians and five registrars agreed to participate. Written consent was obtained before commencing participation.

Semi-structured interviews were used in this study. The primary author and one of the co-authors designed the interview topic guide. The full topic guide is available in the supplementary material. The interviews were conducted by the primary author

or one of the co-authors at a time and location that suited the participant. The interviews were conducted between November 2015 and December 2016. Interviews were recorded and transcribed verbatim by the primary author. Interviews ranged between 33 and 101 minutes in duration. To ensure anonymity, the identities of participants were only known to the interviewing authors. In addition, to further preserve anonymity, and as Ireland is a small country and the participants are all known to each other, we presented minimal participant demographics.

Data were analysed by the primary author following a specific step-like sequence unique to IPA.(239) As the primary author is also an obstetrician, to ensure validity and reduce interpretation bias, a social scientist independently analysed data and consensus was reached on evolving themes. Step one involved reading the transcripts while listening to the audios of the interviews, to ensure a general knowledge and overview of the data. Step two involved identifying the preliminary themes in each transcript. Step three involved structuring the analysis, by grouping the preliminary themes into super-ordinate and sub-ordinate themes. Step four involved creating a master table of themes which highlighted the main concerns of the research participant and ascertained that saturation had been reached. Once these steps were completed, themes were examined to identify similarities and differences between the different transcripts. Data were managed using NVIVO 11.

Data are presented in tables using direct quotes from the participants. These tables are located after each subordinate theme. To protect their anonymity, we have not directly referenced each quote, as the participants are known to one another.

3.2.4 Results

Analysis of the data revealed two superordinate themes; the obstetrician as a person and supporting each other. Each superordinate theme was characterised by two subordinate themes are presented in detail below.

The obstetrician as a person: emotional impact: The devastation, shock and sadness experienced by obstetricians following an IPD was evident as they described their personal involvements with particular deaths [Table 3.4 – Q1, Q2, Q3]

Obstetricians remembered the minutiae of the cases in vivid detail, the names of the parents and baby, and the exact date and time the death occurred. They easily described other clinical activity, including other patients on the labour ward up to the point of the IPD and then recalled nothing. Most could not recall what happened for the remainder of the shift or what they did when they went home. [Table 3.4- Q4, Q5, Q6, Q7]

All obstetricians were acutely aware of the impact the baby's death had on the parents. Some struggled with having to break this news and the burden of this responsibility weighed heavily on them [Table 3.4- Q8, Q9]

Ultimately, obstetricians recognised that their own emotions and concerns were secondary to what the parents were experiencing and prioritised caring for them. They acknowledged the importance of good communication with parents, particularly in the immediate aftermath of the death and recognised the importance of consultant-led postpartum care [Table 3.4- Q10]

Obstetricians placed huge pressure on themselves with respect to the intrapartum care they provided, and this manifested itself as self-blame, guilt and a sense of failure in their duty as medical professionals. Regardless of the accepted cause of death, they questioned the standard of care they had personally provided to that mother and baby [Table 3.4 – Q11, Q12]

Irrespective of whether a clinical review dictated that their decision-making was appropriate they repeatedly held themselves personally responsible for the death of the baby and some carried guilt long after the death of the baby. Many continued to question their decision-making years after the event [Table 3.4 – Q13. Q14]

Obstetricians identified the challenging, sometimes difficult nature of their work, but ultimately recognised their job as rewarding.

They spoke about the privilege of being present with parents throughout the pregnancy. There was a sense of pride in being an obstetrician and no one discussed regret in their chosen career [Table 3.4 – Q15, Q16, Q17]

TABLE 3.4: THE OBSTETRICIAN AS A PERSON: EMOTIONAL IMPACT

Q1 ***"It was very difficult for me, I remember that case all the time, we had a shoulder dystocia… finally we had to go and surgically remove the left arm...it was really traumatic for everyone and everyone was crying in theatre as it was a really horrible experience"***

Q2 ***"It was a little girl and she just never, she never breathed, she never responded and she died on the resuscitair…and we were, it was just so unexpected. It was so completely and utterly not on the radar…yeah it was pretty shit"***

Q3 ***"I could feel my whole body shaking, I could feel my heart racing, I could feel myself shaking, I didn't really know how to react at that time…"***

Q4 ***"We just had to go back in and keep working. I don't actually remember too much more of the night to be honest I just know we were both incredibly shook"*** **[shocked]**

Q5 ***"I was just shattered, I was in bits but I don't really remember anything after that"***

Q6 ***"I can still see her face, I can still hear the screams of herself and her partner and I can remember it was my first night on call as a registrar"***

Q7 ***" I was working the New Year's Eve shift and as the bells struck midnight we could hear everyone partying outside and we were giving CPR to a baby who was declared dead shortly after midnight…they are all just awful"***

Q8 ***"You would love if a hole just opened up and swallowed you because you don't want to tell them this news that is just going to shatter their lives"***

Q9 ***"How in the hell am I going to tell this woman who has just had a general anaesthetic, who is asleep, how in the hell am I going to wake her up and tell her that her baby is dead?"***

Q10 ***"the priority has to be the parents and talking to them at this stage is hugely important…no matter how much you are worried about yourself you have got to just rise above that and you have got to go in and empathise"***

Q11 ***"What happened? What did I do? What should I have done? What could I have done?"***

Q12 ***"You are always in the back of your mind thinking what could I have done better? What did I miss? If I had gotten her to theatre two minutes earlier would the neonatal team have been able to save the baby?"***

Q13 ***"I have an awful lot of guilt but it is probably irrational guilt….it is coming back to the what ifs but you often say to yourself even though you have no clinical indication what if and they would have been this perfect happy family"***

Q14 ***"to this day I don't know if I could have done anything differently and I don't know if I anything I did caused this but at the time..., you know it must be my fault"***

Q15 ***"It is that ability to be there throughout the journey, especially when they are stressed out and you are trying to be there for them and just to let them know….all you are thinking of is them and the baby and for them to have a good outcome…"***

Q16 ***"Things could go wrong on a knife edge and it was the one place where I thought even as a med student that this is the one area of medicine where you can save a life and if you are not there it can be very different.***

Q17 ***"We get to be quite a big part of the best day of someone's life. And that is such a privilege.***

The Obstetrician as a person — frustration: Obstetricians were frustrated at the way they are treated by the media in the aftermath of an IPD. They were frustrated at what they perceived to be the media's inaccurate reporting and inappropriate sensationalising of IPD, and recognised the impact that this reporting has on bereaved parents and on the wider public. [Table 3.5- Q1, Q2, Q3, Q4]

One obstetrician voiced her concern and anger at the impact that the media coverage of IPDs could have on her family. [Table3.5 – Q5]

Others were frustrated at the lack of protection available from within the healthcare system in the aftermath of an IPD. [Table 3.5 – Q6, Q7]

They were also frustrated at what they believe is a perception by the general public that pregnancy and labour are risk-free and they expressed worry that the expectations levied upon them by the general public are too great and unrealistic;

there was also a sense of frustration that the medical profession did not act to change this perception. [Table 3.5 – Q8, Q9, Q10]

TABLE 3.5: THE OBSTETRICIAN AS A PERSON — FRUSTRATION

Q1 ***"When you see amazing people brought down by the media that you have worked with personally… and the media doesn't care what they have done before and it is that 5 minutes in the media on which they are judged…that worries me"***
Q2 ***"the portrayal of the ratio of Intrapartum deaths is not accurate but also the way the media will dramatise some poor couple's awful experience is not appropriate but will also try and dramatise the events that happened on the labour ward that day"***
Q3 ***"I think it is upsetting. I know all my colleagues. We do the best and we give the best and then we are portrayed as killers out there and not caring and it is very soul destroying"***
Q4 ***"For us it is really frustrating as we never hear the full clinical story and I think this ability for the papers to publish stuff that isn't factually correct without any clinical basis behind it needs to stop.***
Q5 ***"That's probably the thing that you cannot appreciate how awful it is until it happens to you or someone close to you. Just the devastation of having your face, your image, your name all over the national media, the 9 o'clock news, your parents, their friends, your kids, their school friends. 'Why is your mummy on the news? Did she kill the baby?'"***

Q6 ***"You have witch-hunts for doctors but it is not the doctor's fault, the system is never blamed… there should be a way to protect clinicians from this, from being vilified in the papers"***

Q7 ***"The doctors need to be protected and if it comes up that there is no negligence and there is no wrong decision made why should the parents be compensated for something like that, that is just life in itself, if it is nobody's fault"***

Q8 ***"..We have created an expectation that nothing can go wrong"***

Q9 ***"It's also very different he public perception versus reality…A lot of my family all say oh your job is so exciting… and you are dealing with happiness all the time… the easiest thing to do is just smile whereas what I am always thinking is you have no idea how sad this can be"***

Q10 ***" there is a complete mismatch between the reality of pregnancy and patients' expectations"***

Supporting each other — An unmet need: Differing levels of support were given to obstetricians following an IPD. When reflecting on their own experiences just four obstetricians were happy with the level of support they received from their colleagues and had some reservations as to whether they would receive the same level of support again if faced with a similar situation. The remaining six obstetricians were given no support. [Table 3.6- Q1, Q2]

For some there was a sense that a “blame culture” still existed following these events and that this was a reason why support received was suboptimal. There was a recognition that the amount of support received was very much hospital dependant and that the “blame culture” might be more apparent in some units more than others. [Table 3.6 – Q3, Q4]

In the consultant group it was apparent that those who had been well supported by colleagues in the past were happier to provide support to other consultant colleagues who were in the same situation.

TABLE 3.6: SUPPORTING EACH OTHER — AN UNMET NEED

Q1 ***“ there was no formal debriefing but an informal debriefing that was very valid and actually very timely as I hadn’t gone home and sat worried about it all night”***
Q2 ***“There is nothing. I have worked in 7 hospitals, 7 maternity units and I have never been formally debriefed, after a stillbirth or after an intrapartum death…. I don’t even think people asked us were we ok after it, we just continued on working and that was it you know”***
Q3 ***“I got a phone call that evening, at home in front of my parents from the consultant I had been on with that night to say “ that person that you were looking after, not that we were, that you were, is likely going to die over the weekend and I hope you have your statement ready…”***

Q4 ***"I was really discouraged by the response of the consultants there, it was more of a not our problem, not our case mentality. They had no idea of the impact that it had on the consultant who came on that day, me, the reg who was on the following night and the midwives who had been on that night with me... When I went to the external inquiry, I did my talking and answered all the questions. But it wasn't until the end of that, that I broke down and said that this is the first time that anybody has actually talked to me in a fair open way"***

Supporting each other — Incidental Support and what might work: All obstetricians requested the need for appropriate, timely emotional support in the aftermath of an IPD, separate from the formal case review which was accepted as a necessary component of the management of these cases [Table 3.7- Q1, Q2].

There was little consensus, as to how, when and who should provide it, whether it should be formal or informal and whether it should be self-sought after or readily available in the form of a support team [Table 3.7 - Q3].

For some, informal debriefing with their colleagues or mentors was critical to their emotional recovery. [Table 3.7 - Q4]

For others discussing the event with parents, spouses and friends and hearing an external non-medical perspective was beneficial. [Table 3.7 - Q5, Q6, Q7]

Others wanted the introduction of a hospital-based support team but were uncertain as to who should staff this team. Three obstetricians spoke about the

potential benefits of an external counselling service for other staff but hadn't themselves availed of that service. Others spoke about their own coping strategies, which were equally important to external supports. Table3.7 demonstrates the differing opinions on support after an IPD.

TABLE 3.7: SUPPORTING EACH OTHER: INCIDENTAL SUPPORT AND WHAT MIGHT WORK

Q1 ***" in my experience if it happens early then you are less likely to get into a downward spiral and the next thing you are kind of walking around the corridors getting slightly schizophrenic thinking that people are talking about you having done something badly"***
Q2 ***"We do know that a lot of doctors are alcoholics, and there are drugs involved, all sorts of drugs and that is a consequence of not knowing how to mind themselves after incidents or just stress so there is definitely a place for it" (When talking about need for support structures)***
Q3 **"*Some people can give a very good clinical evaluation but that might not mean they are empathetic. Very personality dependant."***
Q4 ***"the best support mechanism is to go to another colleague….going to a professional person who may be very well qualified and very well skilled to do the counselling around it wouldn't work for me as talking to someone who knows exactly what you are going through because it is such an awful lonely emotional journey.. I would certainly struggle to articulate just how fucking awful it is"***
Q5 ***"He (spouse) was very supportive…he was reminding me that I had done all I could and somethings are outside your control and we don't know why some things happen. He was trying to build me back up"***

Q6 ***" mostly I go home to my mother and debrief all my cases to her"***

Q7 ***" it is ok to fall apart and to be all over the place and it if that is what you need to do then it is your right to go home and do that in the comfort of your own home with your support structures around you"***

3.2.5 Discussion

Consonant with existing literature from the US, Ireland and Ghana on the impact of stillbirth (10, 12, 13, 135) and other serious adverse perinatal events (133, 138, 139, 141, 230, 240) on obstetricians and midwives, and building on our prior work on IPD (171), we identified that obstetricians are profoundly and negatively affected by IPD. Direct involvement with an IPD is upsetting and stressful, and sadness and shock were predominant emotions experienced by our participants. Despite the grief displayed by those in our study, the desire to provide high quality, compassionate care to the parents was always at the forefront of their minds and all recognised that regardless of their own personal fears and concerns, care of the parents was the priority. This feature is reflective of previous work on the impact of stillbirth on obstetricians (10, 13).

Self-blame and guilt were also commonplace. These responses are frequently identified in the published literature (12, 139). Over 30% of US obstetricians reported blaming themselves for a perinatal death even when no cause was found (12) and our findings echo this survey. While we were unable to pinpoint why obstetricians felt like this, these emotional responses are not unexpected, given

that they are usually the HCPs responsible for the intrapartum care received by the mother and baby and in addition are also tasked with breaking the news of the death to the parents. Our analysis clearly identified that this was a burden that weighed heavily on them.

The impact of intrapartum death on the obstetricians in our study was far reaching and extended beyond the hospital environment. They were frustrated at the way they were perceived by the media, and at the way IPD was sensationalised and inaccurately reported. Interestingly this is a theme that we were unable to identify in previous stillbirth research (13, 139). What has been previously reported is the general public's reaction to media reporting on perinatal deaths. Meaney et al, 2016 found that the Irish media had a substantial role in influencing public opinion when a perinatal death was reported on (60). In addition it has been suggested that the language used in the media can have far reaching consequences and can be detrimental to parents and HCPs (241). The Irish media regularly report on intrapartum deaths and other adverse obstetric events, and often suggest that a case was mismanaged, while openly naming the involved HCPs. It is therefore unsurprising that the obstetricians in our study were frustrated and felt victimised in popular media. The role played by the media in the reporting of intrapartum cases, and the impact on HCPs is certainly an area that warrants further research attention.

Our participants identified the need for appropriate support interventions to be made available in the aftermath of an IPD. They highlighted the importance of

collegial based support systems. This theme commonly emerges in the existing literature on physician burnout, well-being and job satisfaction(172, 242, 243). West et al, 2014 identified that a support intervention aimed at promoting well-being and reducing distress for US physicians run and facilitated by physicians improved both meaning and engagement at work and reduced depersonalisation in the longer term (242). The introduction of collegial based ongoing support systems such as this may be appropriate and acceptable to our group of obstetricians and may alleviate the distress caused by these adverse events.

Despite the need for supports such as these, obstetricians in our study felt unsupported and isolated in the aftermath of an IPD and had concerns that the lack of support shown to them by their colleagues was rooted in the ongoing " blame culture " that exists in Irish hospitals. This culture has previously been noted in work by Nuzum et al, 2014 on the impact of stillbirth on consultant obstetricians (13). This sense of "blame culture" is not a problem specific to Irish maternity hospitals but has also been identified in studies from Denmark (139) and the UK (244, 245). This culture has to change but to do so it will involve a close examination of the setup of the current healthcare system and the way medical error is dealt with, as well as an acceptance by both medical professionals and the public that not all adverse outcomes in labour are preventable.

One of the main strengths of this study is that it is the first study to qualitatively explore the specific impact that IPD has on obstetricians. The study focused on both consultant obstetricians and trainees and did not identify any major difference in

themes between the two groups. In addition, the obstetricians in our study had worked in many different maternity units and had encountered the IPDs in different maternity units, in Ireland and abroad, so it is likely that their responses are reflective of the wider obstetric medical population.

One limitation of this study is that the primary author is an obstetrician in training and it is possible that her interpretation of the data was influenced by her prior exposure to IPD. This is why a co-author also analysed the data. This co-author is a social scientist, with no prior exposure to IPD and her interpretation revealed similar themes to the primary author.

The second major limitation of this study is that the participants self-selected to the study. It is possible that they had a specific agenda or reason for participating and this may have influenced the content of their interviews.

The impact of intrapartum death on obstetric doctors is profound and long lasting. The emotions described by obstetricians including shock, sadness and guilt mirror those of bereaved parents (5, 7). Our study adds evidence that involvement in an unexpected intrapartum death is a uniquely traumatic event for obstetricians, and that the impact extends beyond the hospital setting. Acceptable and appropriate emotional support interventions for obstetricians to access in the aftermath of an intrapartum death need to be introduced but more research is required to ascertain what form these interventions should take.

Obstetricians who are directly involved in a serious adverse event such as an IPD are also victims of this event and this is something that needs to be acknowledged; by the public, by the healthcare system, by the media and by the doctors themselves. Leaders in the specialty need to play a role in recognising this impact and spearhead the development of effective emotional support interventions for all obstetricians.

Chapter 4

The impact of adverse events on clinical practice

Paper 5: **The perceived effect of serious adverse perinatal events on clinical practice. Can it be objectively measured?**

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4.1 The perceived effect of serious adverse perinatal events on clinical practice. Can it be objectively measured? (Paper 5)

4.1.1 Abstract

Background: Obstetrics involves a high degree of clinical risk. While serious adverse events resulting in substantial maternal or neonatal morbidity or mortality are relatively rare it has been shown that exposure to such an event can have a predominantly negative personal and professional impact on the healthcare professionals who are involved. There is little in the published literature to show an objective change in clinical practice as a result of an adverse event.

Objectives: The aim of this study was to identify if it was feasible to design a study that could objectively demonstrate if a change in labour ward clinical activity occurred in the 28 days following a serious adverse perinatal event. If this proved possible, the second aim was to identify if these changes could be attributed to the preceding adverse event.

Study Design: This study was conducted in a large tertiary teaching hospital in Ireland. This was a retrospective observational study conducted using data from a 25-month period from August 2013 to September 2015.

Six of the most serious adverse perinatal events that occurred over that time period were identified from the hospital's clinical risk register. Various outcome variables in the form of aggregate data on all deliveries that occurred in CUMH for the 28 days preceding and succeeding the events were collected by the lead author. The medical records for each severe adverse perinatal event were reviewed and the

clinical case details recorded. Based on these clinical details individual hypotheses were created for each event. Data was analysed using IBM-SPSS.

Results: Aggregate data relating to 6180 deliveries was collected and analysed. Data analysis revealed some statistically significant changes in clinical activity in the 28 days following five of the six adverse events. These changes in clinical activity did not, however, always match what we had expected from our original hypotheses.

Conclusion: This novel study aimed to identify if it was possible to objectively demonstrate this practice change. We identified some statistically significant changes in clinical activity in the 28 days following five of the six adverse events but were unable to definitively conclude if the change in activity was a direct result of each event.

4.1.2 Introduction

The specialty of obstetrics is concerned with the safe provision of care to women and babies during pregnancy, labour and the postpartum period (1, 2). As a specialty it can involve a high degree of clinical risk, and obstetricians, under guidance from their relevant countries' training bodies are both medically and surgically skilled to deal with an increasingly complex mix of patients and clinical cases (1, 2). One of the responsibilities of these training bodies is to set evidence based standards and guidelines that all obstetricians are encouraged, where possible, to adhere to (1, 2). In Ireland, midwives play an equally important role and for most expectant mothers they are the most appropriate health care providers to

attend them during pregnancy, labour, birth and the postnatal period. They have their own set of guidelines and standards under the auspices of the Nursing and Midwifery Board of Ireland (246).

Sometimes and despite best medical practice, serious adverse events in obstetrics and midwifery do occur (3, 90, 247). While serious adverse events resulting in substantial maternal or neonatal morbidity or mortality are relatively rare (3, 74), it has been shown that irrespective of their rarity, exposure to a such an event can have a predominantly negative personal and professional impact on the healthcare professionals who are involved (139, 141, 171, 248-250). It has also been speculated that exposure to patient complaints, medical litigation, patient death or other unanticipated adverse events can lead to an alteration in clinical practice, and in turn a deviation from the accepted clinical guidelines. The published literature would support this speculation to a degree. International evidence from Australia (251), the United Kingdom (UK)(252) and the United States (US)(90) as well as a number of other countries (253, 254) suggests that there is a subjective practice change in response to the events mentioned above. This research has shown that being the subject of a complaint or a medico-legal case is associated with a self-reported change in clinical practice (251, 252).

There is little in the published literature to show an objective change in clinical practice as a result of an adverse event. We were able to identify just one paper (Choudhry et al, 2006) which objectively showed an alteration to medical physicians prescribing patterns as a result of exposure to an adverse event (253).

In our maternity unit, staff have expressed views that there is a change in clinical activity following adverse events. The aims of this study, therefore, were firstly to identify if it was feasible to design a study that could objectively demonstrate if a change in labour ward clinical activity occurred in the 28 days following a serious adverse perinatal event. If this proved feasible then the secondary aim was to identify if these changes could be attributed to the preceding adverse event.

4.1.2 Methods

This study was conducted in Cork University Maternity Hospital (CUMH) in the Republic of Ireland. CUMH is a large tertiary referral university teaching hospital with between 8000 and 9000 births per annum. The labour ward is comprised of ten individual labour rooms, a 5-bed "induction of labour" room and a 3-bed high dependency unit. Adjacent to the labour ward is the obstetric operating theatre where both elective and emergency operative obstetric deliveries and cases are conducted. The Labour ward is staffed by a rotating roster of 28 midwives, with between 12 and 16 midwives covering each 12-hour shift. The medical staff at CUMH comprises 28 resident obstetricians and 17 consultant obstetricians. Each 24-hour labour ward shift is covered by one consultant obstetrician, who is on call from home and three resident obstetricians of differing skill level. These obstetricians are also responsible for covering the emergency obstetric theatre. In CUMH, midwives provide one-to-one care for each labouring woman and the obstetrician on duty is called when there is a problem with the labour. All normal vaginal deliveries are conducted by a midwife and the obstetricians conduct any Caesarean sections or operative vaginal deliveries (which includes both ventouse and forceps deliveries)

Since 1954 when the Maternity and Infant Care Scheme came into operation, women who are ordinarily resident in Ireland are entitled to free maternity care(26). Under this scheme, a woman may be cared for by a team of obstetricians and midwives and in general will only have an obstetrician present at the delivery in the event of a complication. For an added fee, women may also choose to pay for the services of a particular consultant obstetrician and in general that obstetrician is present at their delivery, irrespective of the mode of delivery.

This was a retrospective observational study conducted using data from a 25-month period from August 2013 to September 2015.

Six of the most serious adverse perinatal events that occurred over that time period were identified from the hospital's clinical risk register. The events met the inclusion criteria for the study if an intrapartum event resulted in severe maternal or neonatal morbidity or mortality, defined as neonatal hypoxic ischaemic encephalopathy requiring therapeutic hypothermia, fetal or neonatal death, post-partum hysterectomy or maternal death. The cases were well spread out over the study time period with at least 2-3 months between each case. During this time period there were no other events identified from the clinical risk register that met the same level of severity of these six. Four of the cases impacted on the neonate while two were associated with substantial maternal morbidity. The events are listed in Table 4.1. The specific clinical details are not disclosed as consent was not obtained for each patient to report their case details.

TABLE 4.1. DESCRIPTION OF THE ADVERSE PERINATAL EVENTS

Event Number	Event Description
1 (fetal)	An early neonatal death following a grade 1 caesarean section for a pathological cardiotocograph
5 (fetal)	A neonate with hypoxic ischaemic encephalopathy requiring therapeutic hypothermia following on from a spontaneous vaginal delivery.
3 (fetal)	A shoulder dystocia with neonate requiring therapeutic hypothermia
4 (fetal)	A difficult instrumental categorised by difficulty in completing the delivery from station +3, fetal abdominal dystocia and a neonate requiring therapeutic hypothermia
2 (maternal)	A shoulder dystocia, massive postpartum haemorrhage and peripartum hysterectomy. A uterine rupture was identified at laparotomy
6 (maternal)	A grade 2 caesarean section for suspected intrapartum chorioamnionitis at 35 weeks of gestational age, complicated by a massive postpartum haemorrhage and a peripartum hysterectomy

Grouped into fetal and maternal, the numbering is reflective of the order in which the cases occurred chronologically

Manual paper-based data recording was in operation in CUMH for the duration of the study period. Specific clinical details pertaining to each birth in the hospital were logged in either the labour ward register or the obstetric theatre operating register by one of the midwives present at delivery. Details routinely recorded in these registers included gestational age at delivery, infant sex, infant weight, the staff members present at the delivery, whether the labour commenced spontaneously or was induced, reason for induction, mode of delivery and indication for delivery if not a spontaneous vaginal delivery.

Aggregate data on all deliveries that occurred in CUMH for the 28 days preceding and succeeding the events were collected by the lead author. Given the volume of

deliveries in each 28-day period, it was not possible to record individual patient level data and this is why aggregate data was used. Outcome variables collected are listed in Table 4.2.

TABLE 4.2: OUTCOME VARIABLES COLLECTED BY LEAD AUTHOR

Number of Spontaneous Vaginal Deliveries (SVDs)
Number of Operative Vaginal Deliveries (OVDs)
Number of Caesarean Sections (CS)
Type of CS (Elective, emergency; if emergency, were they designated Category 1 or did they occur in the 2nd stage of labour?)
Number of " trial of instrumental deliveries" conducted in the obstetric operating theatre and whether they were successful or not
Location of delivery (labour ward, obstetric operating theatre)
Seniority of physicians present at the delivery (if any)
Consultant obstetrician presence on labour ward (they are not always present)
Consultant obstetrician presence at complicated deliveries (Stage 2 CS)
Number of labours that were induced (IOL)
Number of nulliparous women induced
Number of multiparous women induced
Number of IOLs where a "large for dates" fetus was the reason for induction
Gestational age of the fetus at IOL

The medical records for each severe adverse perinatal event were reviewed and the clinical case details recorded by the lead author (KMcN). Based on these clinical details two authors (KMcN and KOD) then created individual hypotheses for each event. For example, for event 1 we hypothesised that the Caesarean section rate

would increase in the 28 days succeeding the event, when compared with the 28 days preceding the adverse event. The hypotheses for each adverse event are presented in the results section.

All data analysis was conducted by the lead author using IBM SPSS statistics version 22. As all data were categorical, the chi- squared test for goodness of fit was used to compare each outcome variable preceding the event with those succeeding the event. The significance level was set to a p value of <0.05. Given that there were different healthcare professionals involved in each case, the data were analysed with respect to each event in isolation.

4.1.4 Results

Aggregate data relating to 6180 deliveries was collected and analysed.

Perinatal Event 1 — An early neonatal death following a grade 1 caesarean section for a pathological cardiotocograph recording

Based on this clinical scenario we hypothesised that both obstetricians and midwives would be more likely to intervene where there was a suspicion of a pathological CTG in subsequent cases. We anticipated that this would manifest as an increase in the interventional procedure rate in labour (OVDs and CS), an increase in physician presence at normal deliveries and a higher presence of senior physicians on the labour ward as measured by a greater number of consultant obstetricians at complex deliveries.

The overall, elective and emergency CS rates were similar before and after the event. The OVD rate was significantly higher in the 28 days after the event than the 28 days before the event (19.5% vs 15.3%, p = 0.002). There was no difference in the number of obstetricians who attended the deliveries before and after the event. While the numbers were too small for statistical analysis, there did appear to be an increased number of consultant obstetricians at second stage caesarean section. Table 4.3 gives a detailed breakdown of these results.

TABLE 4.3: EVENT 1 — NEONATAL DEATH FOLLOWING CATEGORY 1 CAESAREAN SECTION FOR A PATHOLOGICAL CARDIOTOCOGRAPH

Variable Collected	Pre-Event	Post-Event	Chi- squared, significance
Total Deliveries	602	713	
CS Rate	193/602 (32.1%)	226/713 (31.7%)	χ^2 (1, N=713) = .53, p = .82
Elective CS/ total deliveries	99/602 (16.4%)	117/713 (16.4%)	χ^2 (1, N=713)=.000,p=.995
OVDs	92/602 (15.3)	139/713 (19.5)	χ^2 (1,N =713)=9.68,p=.002
SVDs total	317 (52.6)	348 (48.8)	χ^2 (1,N =713)=4.33,p=.03
Obstetrician present at SVD	65/317 (20.5%)	61/348 (17.5%)	χ^2(1,N=348) =1.89, p =0.17
Total second stage CS (ST2)	8	10	
Consultant presence at second stage CS	1/8	7/10	

Perinatal Event 2 — A shoulder dystocia, massive postpartum haemorrhage and peripartum hysterectomy. A uterine rupture was identified at laparotomy

Our hypothesis in this case was based on the shoulder dystocia being the catalyst for this event and on midwives and obstetricians changing their practice to try and avoid shoulder dystocia. We hypothesised that there would be a change in the IOL rate in pregnancies prior to 40 weeks of gestational age or for babies suspected of being large for gestational age. We anticipated that the numbers of CS and OVDs would change and that more OVDs would be conducted in an operating theatre setting. We also speculated that the rate of CS in the second stage of labour without a prior trial of instrumental delivery would increase, that consultant obstetricians would be more likely to be present for complex deliveries such as second stage CS (ST2 CS), and that either Resident or consultant obstetricians would be more likely to be called to attend SVDs.

Table 4.4 gives a detailed breakdown of the results pertaining to this particular adverse event.

No significant change in IOL rate, for any reason, was noted when comparing the 28 days before the event with the 28 days after the event. There was, however, a statistically significant overall increase in CS rate in the 28 days following the adverse event (29% vs 34.4%, P=0.004). There was also a statistically significant fall in the operative vaginal delivery rate following this adverse event (22.2% vs 18%. P=0.013). There was a trend towards more of these instrumental deliveries being conducted in the operating theatre but this did not reach statistical significance. Interestingly the percentage of SVDs where a doctor was present for the delivery

increased from 21.7% pre-event to 28.5% post-event (p=0.006). We were unable to comment on any potential change in the numbers of second stage CS being carried out or on the presence of attending obstetricians at complex deliveries as our numbers were too small.

TABLE 4.4: EVENT 2 - SHOULDER DYSTOCIA, MASSIVE POSTPARTUM HAEMORRHAGE AND PERIPARTUM HYSTERECTOMY

Variable Collected	Pre-Event	Post-Event	Chi- Squared, significance
Total Deliveries	604 (%)	590 (%)	
CS Rate	175/604 (29)	203/590 (34.4)	$\chi^2(1,N=590) = 8.37, p = .004$
Stage 2 CS/ total deliveries	2/604 (0.3)	5/590 (0.8)	N/A
Stage 2 CS/ total CS	2/175 (1.1)	5/203	N/A
Stage 2 Cs no trial/ total ST2	2/2	3/5	N/A
Consultant present at ST2CS	1/2	3/5	N/A
OVD rate	134/604 (22.2)	106/590 (18)	$\chi^2(1,N=590) = 6.12, p=.013$
Trial of OVD	11/604 (1.8)	15/590 (2.5)	$\chi^2(1,N=590) = 1.84, p = .17$
SVDs total	295	281	
SVD rate	295/604 (48.8)	281/590 (47.6)	$\chi^2(1, N=590) = 0.03, p = .85$
Drs present at SVD	64/295 (21.7)	80/281 (28.5)	$\chi^2(1,N=281) = 7.58, p = .006$
IOL Rate Overall	226/604 (37.4)	202/590 (34.2)	$\chi^2(1,N=590) = 2.52, p=.112$
IOL Primips/ total IOLS	101/ 226 (44.7)	90/ 202 (44.6)	$\chi^2(1,N=202) = .002, p = .967$
IOL Multips/ total IOLS	125/ 226 (55.3)	112/ 202 (55.4)	$\chi^2(1,N=202) = .002, p = .967$
IOL LFDs/ total IOLS	9/ 226 (4)	8/ 202 (4)	$\chi^2(1,N=202) = .001, p=.977$
IOL prior to 40 weeks GA	110/ 226 (48.7)	103/ 202 (51)	$\chi^2(1, N=202) = .42, p = .51$

Perinatal Event 3 — A shoulder dystocia with neonate requiring therapeutic hypothermia

Our hypotheses were again based on the shoulder dystocia being the catalyst for a potential change in clinical activity. Our hypotheses were the same here as for perinatal event 2. Detailed results are provided in Table 3. Interestingly and in direct contrast to the case above the percentage of SVDs attended by a doctor fell (did not reach statistical significance), while the number of inductions for a large for dates infant increased.

TABLE 4.5: EVENT 3 - A SHOULDER DYSTOCIA WITH NEONATE REQUIRING THERAPEUTIC HYPOTHERMIA

Variable	Pre-index Case	Post Index Case	Chi- Squared, significance
Total Deliveries	606 (%)	636 (%)	
CS Rate	156/606 (25.7)	211/636 (33.2)	$\chi^2(1,N=636) = 18.61$, $p<0.0001$
Emergency CS	62/606 (10.2)	98/636 (15.4)	$\chi^2 (1,N=636) = .18.8, p<0.0001$
Elective CS	94/606 (15.5)	113/606 (17.8)	$\chi^2(1,N=211) = 4.02$, $p = 0.04$
Stage 2 CS/ total deliveries	7/606 (1.2)	6/636 (0.9)	N/A
Stage 2 CS/ total CS	7/156	6/211	N/A
Stage 2 Cs no trial/ total ST2 deliveries	5/7	4/6	N/A
Consultant present at ST2CS	5/7	4/6	N/A
Trial of OVD	14/606 (2.3)	11/636 (1.7)	$\chi^2 (1,N=636) = .921, p=0.337$
SVDs total	319	318	
SVD rate	319/606 (52.6)	318/636 (50)	$\chi^2(1,N=636) = 1.72, p = 0.18$
Drs present at SVD	74/319 (23.2)	68/318 (21.4)	$\chi^2(1,N=318) = .589$, $p = 0.443$
IOL Rate Overall	216/606 (35.6)	209/636 (32.9)	$\chi^2(1,N=636) = 2.08$, $p = 0.14$
IOL LFDs	5/216 (2.3)	15/209 (7.2)	$\chi^2(1,N=209) = 22.12$, $P<0.0001$
IOL prior to 40 weeks GA	112/216 (51.9)	98/209 (46.9)	$\chi^2(1,N=209) = .066, p = 0.79$

Perinatal event 4 — A difficult instrumental categorised by difficulty in completing the delivery from station +3, fetal abdominal dystocia and a neonate requiring therapeutic hypothermia

Our hypotheses were based on the instrumental delivery being the catalyst for a potential change in clinical practice in this scenario. We suspected that there would be a change in the modes of delivery following the adverse event and in particular that the CS rate would increase and the OVD rate would decrease. We also anticipated an increase in the number of stage 2 CS without a prior trial of instrumental delivery. We questioned whether the induction rate would increase after the event and in particular due to a suspicion of a macrosomic fetus. The detailed results are presented in table 4.6.

Overall, there was no difference in mode of delivery pre and post the adverse event. While the numbers of second stage caesareans were too small to analyse directly, there also appeared to be no change in the number of second stage caesareans without a prior trial of OVD. The overall induction of labour rate fell significantly after exposure to the event, as did the IOL rates for suspected macrosomia and inductions prior to 40 weeks of gestational age.

TABLE 4.6: EVENT 4- A DIFFICULT INSTRUMENTAL CATEGORISED BY DIFFICULTY IN COMPLETING THE DELIVERY FROM STATION +3, FETAL ABDOMINAL DYSTOCIA AND A NEONATE REQUIRING THERAPEUTIC HYPOTHERMIA

Variable	Pre-index Case	Post Index Case	Chi- Squared, significance
Total Deliveries	597 (%)	636 (%)	
CS Rate	187/597 (31.3)	198/636 (31.1)	$\chi^2(1,N=636)=.008,p= .927$
Stage 2 CS/ total deliveries	6/597 (0.7)	5/636 (0.8)	$\chi^2(1,N=636)=.068, p=.794$
Stage 2 CS/ total CS	6/187 (3.2)	5/198 (2.5)	$\chi^2(1,N=198)=.001, p=.982$
Stage 2 Cs no trial/ total ST2	2/6	3/5	
Trial of OVD	15/597 (2.5)	11/636 (1.7)	$\chi^2(1,N=636)=1.54,p=.213$
Elective CS	101/187 (54)	110/198 (55.6)	$\chi^2(1,N=198)=.193,p=.661$
SVDs total	288	316	
SVD rate	288/597 (48.2)	316/636 (49.7)	$\chi^2(1,N=636)=.562,p=.453$
Drs present at SVD	60/288 (20.8)	83/187 (19.9)	$\chi^2(1,N=316)=.143,p=.705$
IOL Rate Overall	233/597 (39)	187/636 (29.4)	$\chi^2(1,N=636)=63.2,p<.0001$
IOL Primips	105/233 (45.1)	83/187 (44.4)	$\chi^2(1,N=187)=.039,p=.844$
IOL Multips	128/233 (54.9)	104/187 (55.6)	$\chi^2(1,N=187)=.039,p=.844$
IOL LFDs	15/233 (6.4)	5/187 (2.7)	$\chi^2(1,N=187)=4.33,p=.037$
IOL prior to 40 weeks GA	133/233 (57.1)	91/187 (48.7)	$\chi^2(1,N=187)=5.43,p=.020$

Perinatal Event 5 — A neonate with hypoxic ischaemic encephalopathy requiring therapeutic hypothermia following on from a spontaneous vaginal delivery.

In this case we hypothesised that midwives would be more likely to request obstetric presence at delivery and that overall the intervention rate would increase, manifested by more OVDs and CS. The results are presented below in table 5. While the obstetrician presence at SVDs increased in the 28 days after the event it did not reach significance (19.1% vs 23.4%, P=0.55). A detailed breakdown of results is presented in Table 4.7.

TABLE 4.7: EVENT 5 — A NEONATE WITH HYPOXIC ISCHAEMIC ENCEPHALOPATHY REQUIRING THERAPEUTIC HYPOTHERMIA FOLLOWING ON FROM A SPONTANEOUS VAGINAL DELIVERY

Variable	Pre-index Case	Post Index Case	Chi- Squared, significance
Total Deliveries	598 (%)	598 (%)	
CS Rate	192/598(32.1)	191/598 (31.9)	$\chi^2(1, N=598)=.007, p = .933$
Emergency CS	93/192 (48.4)	89/191 (46.6)	$\chi^2(1, N=191)=.249, p=.618$
Elective CS	99/192 (51.6)	102/191 (53.4)	$\chi^2(1, N=191)=.249, p=.618$
SVDs total	309	303	
SVD rate	309/598 (51.7)	303/598 (50.7)	$\chi^2(1, N=598)=.255, p=.614$
Drs present at SVD	59/309 (19.1)	71/303 (23.4)	$\chi^2(1, N=303)=3.68, p= .055$
OVDs	97/598 (16.2)	104/598 (17.4)	$\chi^2(1, N=598)=.625, p=.429$
IOL Rate Overall	217/598 (36.6)	205/598 (34.3)	$\chi^2(1, N=598) =.991, P=.320$
IOL prior to 40 weeks GA	101/217 (46.5)	104/205 (50.5)	$\chi^2(1, N=205) =1.47, p=.224$

Perinatal Event 6 — A grade 2 caesarean section for suspected intrapartum chorioamnionitis at 35 weeks of gestational age, complicated by a massive postpartum haemorrhage and a peripartum hysterectomy

Our hypothesis in this case was based on the CS being the trigger for a potential change to clinical practice. Our hypothesis here was that obstetricians and midwives would try to avoid intervention in labour. We anticipated a reduction in the intervention rate (e.g. CS or OVDs), and we suspected that doctors were more likely to be present at deliveries after the event. The results are presented in table 4.8. There was a statistically significant fall in the OVD rate, an increase in the SVD rate, but no change in the CS rate after the event. Table 4.8 shows these findings in detail.

TABLE 4.8: EVENT 6 — A GRADE 2 CAESAREAN SECTION FOR SUSPECTED INTRAPARTUM CHORIOAMNIONITIS AT 35 WEEKS OF GESTATIONAL AGE, COMPLICATED BY A MASSIVE POSTPARTUM HAEMORRHAGE AND A PERIPARTUM HYSTERECTOMY

Variable	Pre-index Case	Post Index Case	Chi- Squared, significance
Total Deliveries	653 (%)	636 (%)	
SVD rate	298/653 (45.6)	326 (51.3)	$\chi^2(1, N=636)=8.21, p=.004$
CS rate	209/653 (32)	198/636 (31.1)	$\chi^2(1, N=636)=.220, p=.639$
OVD Rate	146/653 (22.4)	112/636 (17.6)	$\chi^2(1, N=636)=8.39, p=.004$
Drs at SVDs	60/298 (20.1)	56/326 (17.2)	$\chi^2(1, N= 326)=1.73, p=.188$
Emergency Cs	107/209 (51.2)	99/198 (50)	$\chi^2(1, N=198)=.114, p=.736$
Elective CS	102/209 (48.8)	99/198 (50)	$\chi^2(1, N=198)=.114, p=.736$

4.1.5 Discussion

To the best of our knowledge this is the first study of its kind which aimed to objectively show a change in obstetric and midwifery practice on the labour ward as a result of exposure to a serious adverse perinatal event. We collected aggregate data pertaining to six of the most serious adverse perinatal events that occurred over a 25-month period in our large maternity unit. Data analysis revealed some statistically significant changes in clinical activity in the 28 days following five of the six adverse events. These changes in clinical activity did not, however, always match what we had expected from our original hypotheses.

This study has a number of limitations that prevent us from conclusively attributing the changes we saw in clinical practice to the preceding adverse event. The use of aggregate data is the first limitation. At the time of data collection, details pertaining to labour ward clinical activity were all recorded manually in labour ward registers. Given the volume of data that we needed to collect and the resources

that would have been required to do so, it was not, therefore, possible to collect individual patient data and as such some of the nuances of each of the 6180 deliveries were lost. If individual patient level data was used we may have been able to examine the specifics of each delivery in detail and develop a clearer idea if the management truly did differ from prescribed hospital and national practice guidelines. In addition, similar to the study by Choudhry et al 2006, we would have been able to match each delivery to an individual or group of physicians and midwives who had been exposed to the adverse perinatal event, and again this would allow us to conclusively identify if their practice had changed as a result of this exposure (253).

A second limitation of this study was in relation to the reasons given for induction of labour in both the pre-and post-adverse event cohorts. Not all induction reasons were recorded in the labour ward and theatre Registers, and there were reasons recorded for inductions of labour that did not comply with national induction of labour policies. It is therefore possible that more inductions were conducted for infants suspected of being large for gestational age than we were able to analyse and this may have impacted our results.

Another limitation of this study is that approximately one third of patients who use the maternity services in Cork pay for their care privately, and therefore an attending obstetrician is present in the labour room for their delivery, regardless of whether it is a normal risk delivery or not. This obviously may have impacted on one of our outcome variables; the presence of an obstetrician at a delivery and again

may have altered our findings. It is also possible that it may have had no bearing on our results as the private practice rate in our hospital has remained static over the last 5 years.

Lastly, it is difficult to monitor attending obstetrician presence on the labour ward from retrospective aggregate data. The best we could do was document whether Obstetricians were present at the most complex labour ward and theatre deliveries, stage 2 of labour Caesarean sections, and use this as a proxy for their presence or absence. Although individually the numbers were too small to analyse, consistently it did appear that there was a higher presence of attending obstetricians at these deliveries in the 28 days after each adverse event than the preceding 28 days.

Since this study data was collected and analysed Cork University Maternity Hospital has started to record all patient data on an Electronic Health Record (EHR)(255). One of the benefits of the EHR is it allows individual patient level data to be accessed and analysed easily, so if this study was to be repeated it would remove a number of the difficulties and limitations we originally faced.

In conclusion, obstetrics and midwifery are high-risk professions, and there is a perception that changes in clinical practice occur as a result of exposure to serious adverse events. This novel study aimed to identify if it was possible to objectively demonstrate this practice change. We identified some statistically significant changes in clinical activity in the 28 days following five of the six adverse events. This was an interesting finding as these alterations in clinical activity were not the

result of a newly introduced clinical guideline, nor was the same obstetrician or midwife involved in all cases. Most of the existing literature focusing on the professional impact of adverse events on HCPs uses qualitative methodology and is based on the individual clinician's subjective assessment of whether their practice has changed or not (90, 226, 252-254, 256). Our findings may provide some objective evidence to support what is already known.

We do, however, have to be cautious when interpreting these results. The changes in clinical activity did not always match what we had expected from our original hypotheses. It is possible that the number of limitations encountered while conducting this study impacted on these findings or in fact that no real change in clinical activity occurred. It is important that further research is designed to investigate this. This research should examine data at an individual patient or clinician level in order to definitely refute or confirm our findings. If further studies concur with our findings, that there are real changes in clinical practice following an adverse event, then this will further strengthen the evidence that healthcare professionals are both personally and professionally impacted by adverse events.

Chapter 5

Pre-existing support structures

Paper 6: **An evaluation of interventions to support obstetricians when dealing with burnout; a systematic review**

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Under review in Archives of Gynecology and Obstetrics

5.1 An evaluation of interventions to support obstetricians when dealing with burnout; a systematic review

5.1.1 Abstract

Background: The purpose of this review was to identify all interventions that have been introduced and evaluated in supporting obstetricians to tackle burnout and compassion fatigue and to analyse the findings to ascertain if any type of intervention has proven beneficial

Methods: A search of PubMed, EMBASE, EBSCO (including CINAHL, PsychInfo and Social Sciences Full text), Scopus, the Cochrane Library, OpenGrey, Clinicaltrials.gov and Education Resources Information Centre (ERIC) was conducted. 8748 studies were screened for inclusion with 15 full text articles being reviewed. Three cohort studies involving 60 Obstetricians were identified. Studies were excluded if the support strategy was targeted at patients or other health care professionals, or if it was a description or review of a support strategy as opposed to an evaluation.

Results: Two studies used Balint training workshops as their intervention whereas the third study utilised reflective writing workshops as its intervention Forty-two participants received Balint training while 18 participants received the reflective writing workshop. There were substantial differences between the studies in terms of outcomes and scales used to measure them and, therefore, we were unable to perform any meaningful synthesis. With respect to pooling the results of the three studies there was not enough statistical data provided in any of the studies to allow estimation of 95% Confidence Intervals for effect size between pre-and post-intervention data in each individual study.

Conclusion: it is clear that effective support systems aimed specifically at helping obstetricians deal with burnout and compassion fatigue are lacking in the published literature. High-quality, large scale, preferably randomised controlled research, with appropriate participant numbers is needed to identify the type of interventions that will be most effective for obstetricians.

5.1.2 Background

Workplace adversity, which refers to any difficult or unpleasant situation at work, presents a common challenge to both the medical and nursing professions (170, 177, 257, 258). An increasingly high-risk patient population, reducing staff numbers, excessive workload, high public expectation as well as organizational barriers within the healthcare system, in addition to a suboptimal work-life balance, has contributed to increasing levels of burnout, stress and dissatisfaction at work (150, 151, 154-156, 170, 258-260). It is acknowledged that when staff are unhappy and feel unsupported in the workplace, patient care suffers as a result (189, 261-264).

There is an increasing body of research focusing on burnout, compassion fatigue and staff resilience in the medical and nursing literature (147, 151, 154, 156, 168, 258, 265-274). Burnout as a syndrome was first described in 1974 (146, 147). Its symptomatology includes decreased effectiveness at work as well as cynicism and emotional exhaustion (146, 147). It is situation-specific, with work, and in particular exposure to workplace adversity, being a fixed component of burnout and while it has similar features to a depressive disorder, it is a unique entity in its own right (148, 149). Burnout can effect individuals from all occupations but is particularly

prevalent in those who work intensively with people, for example teachers, police and healthcare professionals (147). In the United States, it has been recognized that healthcare professionals are more likely to experience burnout than the general workforce and it is now estimated that burnout affects 1 in 2 doctors (150). It is also acknowledged that when doctors are experiencing burnout the time they spend clinically assessing patients reduces, the number of self-reported medical errors increases and mortality rates in hospitalised patients are increased (155). Evidence has also shown that affected physicians can show impaired clinical judgment, poor professional conduct and that their empathy levels reduce (156, 157). It is also reported that they are more likely to retire early and this can affect the sustainability of certain medical disciplines (156, 157).

The definition of compassion fatigue is more complicated (158). Compassion refers to "the emotion one experiences when feeling concern for another's suffering and desiring to enhance that person's welfare"(159). There are numerous reasons why people enter the medical and nursing professions, some of these are extrinsic (salary, professional status) while others are intrinsic (intellectual challenge, altruism, and a desire to provide compassion to others) (160, 161). Following sustained exposure to patients who are suffering and without regular self-care, professionals can experience a blunting or an indifference towards the suffering of others and their level of compassion fades (162, 163). Compassion fatigue, therefore, is a normal human response to recurrent exposure to traumatizing events that occur to other people (164, 165). Professionals experiencing compassion fatigue can become physically and mentally exhausted, with "nothing

left to give", can experience feelings of worthlessness and depressed mood and can emotionally detach themselves from their patients (165, 166). Another of the hallmark symptoms of compassion fatigue is a readiness to blame others and blame the system for errors or difficulties encountered in the workplace (166). Some authors recognise compassion fatigue as a completely separate entity to burnout while others acknowledge that one can progress to the other (162, 167). Regardless of the definition, the effects are similar to burnout with poor professional performance and poor clinical judgment being commonplace in professionals who experience it (162, 168). Compassion fatigue, while not as well researched as burnout, has been demonstrated in oncologists, emergency department nurses, paediatricians, paediatric nurses, surgeons and hospice workers (158, 162, 165, 168). It is likely that it is prevalent in most, if not all medical and surgical specialties.

Counteracting burnout and compassion fatigue, by providing supports and tools for professionals to help them to maintain their resilience and recover faster in the face of workplace adversity is garnering much attention in the general medical, surgical and nursing literature (189, 274, 275). Resilience is a term used to describe a set of characteristics or personal traits in individuals who despite being confronted regularly with adverse events or ongoing negative stressors in the workplace, adapt well to change, maintain a positive outlook to life and demonstrate a high level of emotional intelligence with respect to their situational stressors (177). Once they leave their place of work they are able to psychologically disconnect from their work demands. Individuals possessing these qualities are likely to recover quickly from the emotional sequelae and pattern of negative thinking that can follow on

from serious and difficult events in the workplace (276). In short, they cope with workplace adversity well. However, personal resilience can be influenced both by interactions with others and by the general workplace environment (258).

It is increasingly recognized that the provision of support strategies for staff members by healthcare organisations can help to ensure that morale within the organisation is high and this in turn can promote productivity and reduce unnecessary absenteeism (147, 172). The types of support tools described in the literature available to the general medical and nursing professions are numerous, and include; mindfulness based stress reduction (MBSR) initiatives (173-176), workplace based support networks (177-179), debriefing (180, 181), the provision of dedicated support teams for on-the-spot care following serious adverse events (182-184), referral to an employee assistance program (185), web-based self-management tools (186), undergraduate and postgraduate education programmes (187, 188) and Schwartz Rounds (189-193). They have not all been shown to be effective, nor have they all been formally evaluated (185).

Obstetrics is a high-risk specialty (90, 247). While the majority of clinical outcomes in this field are positive, serious adverse events such as antenatal intra-uterine death, intrapartum fetal death and maternal death do still occur (3, 74, 141). These can occasionally be secondary to medical error but also continue to occur even with best medical practice (115, 117). Even when the fault is not their own, obstetricians often blame themselves for these adverse events and their psychological well-being can suffer as a result (138, 170, 171). While the needs of the parents remain the

priority, it is now acknowledged that obstetricians involved in serious adverse events are sometimes the second or silent victims (170, 277, 278). While there is evidence describing the intense impact that these events have on the health and well-being of obstetricians, there is also evidence to suggest that this impact is sometimes forgotten (10, 12, 13, 138, 139, 141, 169-171).

Rationale

Burnout and compassion fatigue are becoming increasingly more recognised in obstetrics (138, 279) but the literature is lacking with respect to targeted support interventions for this discipline. In order to develop a comprehensive set of appropriate support tools in maternity hospitals it is necessary to know what is currently being utilised to support obstetricians when dealing with the effects of workplace adversity within the maternity services. We chose to limit this review to evaluating interventions targeted specifically at obstetricians as there are other reviews published which focus on other maternity professionals such as midwives (280) and we were unable to identify any existing reviews that focused solely on obstetricians.

Aims

The aims of this review were to identify all interventions that have been introduced and evaluated in supporting obstetricians to tackle burnout and compassion fatigue in the workplace and to analyse the findings to ascertain if any type of intervention has proven beneficial. No particular study type was required to meet these objectives, thus allowing for a larger number of studies to potentially be included.

The research questions addressed in this review, therefore, are: (1) What interventions are available to support obstetricians in tackling burnout and/or compassion fatigue and (2) Do these interventions impact on levels of burnout and/or compassion fatigue?

5.1.3 Methods

This review was conducted and reported as per the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guideline (281).

Protocol

Prior to commencement of the electronic reference search, a protocol was developed, detailing the reviews objectives, search terms, and inclusion and exclusion criteria. This protocol was devised and agreed upon by two authors (KMcN, KOD) and is available as supplementary material (Chapter 5 Supplementary Material).

Search strategy, information sources, inclusion and exclusion criteria and study selection

Our search was designed to locate studies that implemented and evaluated a particular support strategy or intervention directed specifically at obstetricians, either consultants or residents/trainees. Studies were excluded if the support strategy was targeted at patients or other health care professionals, or if it was a description or review of a support strategy as opposed to an evaluation. No limitation in terms of publication date or language was imposed. The first search was conducted in November 2016 by two of the authors (KMcN and ISLC), and for

completeness a second search was completed in March 2018 to ensure all up to date studies were identified. The full list of search terms is presented in the supplementary material. This search was kept deliberately broad to maximise the chances of obtaining all suitable studies. Both authors read the titles and abstracts independently and full-text papers of potentially appropriate studies were then obtained. There was no disagreement between authors as to which full-text papers to obtain.

The databases searched included Medline (PubMed), EMBASE, EBSCO (including CINAHL, PsychInfo and Social Sciences Full text), Scopus, the Cochrane Library, OpenGrey, Clinicaltrials.gov and Education Resources Information Centre (ERIC). The reference lists of any potentially suitable papers were also reviewed to ensure all appropriate studies were identified and included in this review.

Data collection process

Following the identification of studies for inclusion in this review, each paper was read thoroughly and the key findings were documented in a data extraction sheet. Data extracted from each applicable study included (1) available demographics of study participants (job title and description, age, duration of employment, type of hospital/ work environment), (2) intervention design and duration, (3) methodology (data collection descriptions, data analysis technique) and (4) type of outcome measures.

Risk of bias in individual studies

All studies identified for inclusion in this review were observational and following review of both the ROBINS-I tool (282) and of the ROB 2.0 tool, (283) it was apparent that neither of these were suitable for assessing the quality and risk of bias in any of these studies. A quality assessment of the original studies was therefore, assessed using the Critical Appraisal Skills Programme checklists (CASP) (284). The results of this quality assessment did not exclude any study from being included in this review. These results are presented in Table 5.1. The studies' aims, methods, outcome measures, patient characteristics and quality varied, and so quantitative synthesis was not possible.

TABLE 5.1: QUALITY ASSESSMENT OF THE ORIGINAL STUDIES

Study Name	Allen 2017	Ghetti 2009	Winkel 2010
Aims were clearly stated	Yes	Yes	Yes
Research Design was appropriate	Unclear	Unclear	Unclear
Recruitment strategy was appropriate	Yes	Yes	Yes
Data collection method was appropriate	Yes	Yes	Yes
Ethical Issues were addressed	Yes	Yes	Yes
Data analysis sufficiently rigorous	Yes	Yes	Yes
Findings were clearly stated	Yes	Yes	Yes

Summary measures

We planned to perform a meta-analysis, but study heterogeneity made this impractical. Two of the three studies measured the same outcomes but, their measurement tools varied, thereby precluding a valid statistical analysis. Therefore, we carried out a narrative synthesis broadly categorising studies by intervention and presenting detailed results by outcomes of interest. This is discussed more in the results below but it was also, therefore, not possible to calculate 95% confidence intervals for effect size for any of the included studies.

5.1.4 Results

The database search provided 8,748 citations. Once duplicates were removed there were 8,735 citations for review. In total 8,720 studies fell outside the scope of this review and were in general related to a completely different area of medicine. This left fifteen studies that were considered potentially relevant and the full text was obtained. Of these, eleven were excluded on the basis that they were not an evaluation of a support intervention while one was excluded as it was not an intervention targeted at burnout or compassion fatigue. In the end three studies remained and were included in this review (16, 285, 286). A flow diagram demonstrating this process is presented in figure 5.1.

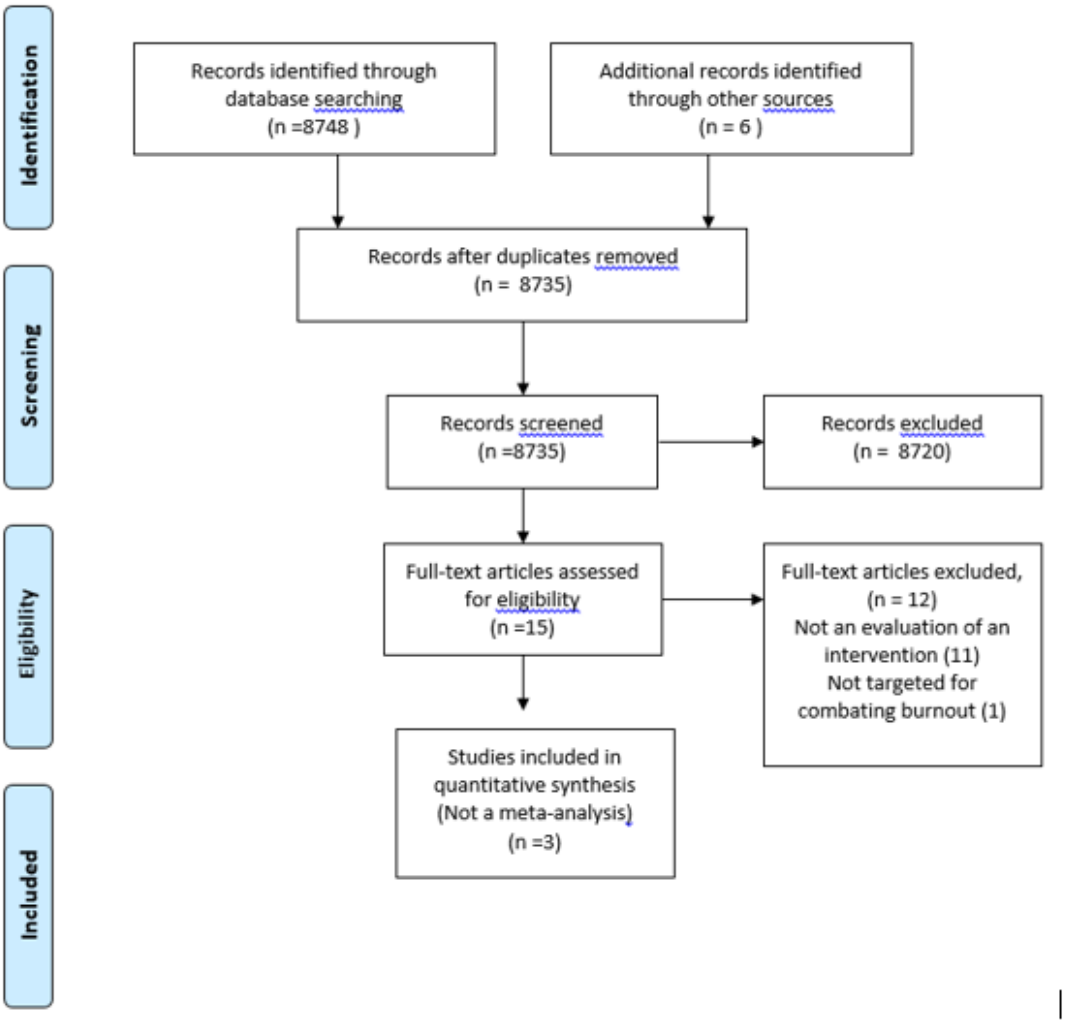

Figure 5.1 PRISMA Flow Diagram

Study Characteristics and Intervention Descriptions

This review included three cohort studies involving an overall participant sample size of 60 obstetricians; four consultant obstetricians and 56 trainee obstetricians. The characteristics of these studies are presented in table 5.2. The interventions were delivered over a period of six months (Allen et al, 2017) to a year (Ghetti et al, 2009 and Winkel et al, 2010). Intervals between the delivery of the interventions

varied; with two studies (Allen and Ghetti) having intervals of one month between workshops and an interval of approximately six weeks for Winkel et al.

Two studies (Allen et al, 2017, and Ghetti et al, 2009) used Balint training workshops as their intervention whereas the third study utilised reflective writing workshops as its intervention (Winkel et al, 2010). Overall, forty-two participants received Balint training while 18 participants received the reflective writing workshop.

Balint training or Balint Groups have been used extensively in family medicine since the 1950s. They are case-centered discussion groups, where one volunteer gives a detailed account of a specific patient encounter. Rather than focusing primarily on the clinical aspects of the particular case in question, emphasis is instead placed upon the emotions and attitudes aroused in the participants by the particular case. The participants are asked to reflect on the case and consider how they would have reacted in a similar situation. The sessions are designed to provide training in understanding the complexities of the doctor-patient relationship, to help develop empathy and they have also been shown to be of some benefit in reducing burnout in the general medical field (287).

Reflective writing is a process by which doctors are encouraged to think about a particular clinical case or story and acknowledge the emotions and feelings that are triggered by this particular case. It may help doctors to find meaning in their work. Teaching reflective writing has been shown to be of benefit to medical educators

but it has not been evaluated in mainstream teaching programmes as its use has been confined to external seminars (288).

In terms of study design, all three were cohort studies. Two of the studies (Allen et al, 2017 and Ghetti et al, 2009) did not use a control or a comparator group. The third study (Winkel et al, 2010), which was also a cohort study stratified participants into 'participants' if they had attended two or more of the reflective workshops and 'non-participants' if they had attended one or less of the workshops.

Participants in the Allen workshop (n=25) completed the Professional Quality of Life (Pro-Qol) scale for measuring compassion fatigue and compassion satisfaction at enrollment into the study and again at 3 months and 6 months, while the participants from the Ghetti and Winkel studies (n= 35) completed the Maslach Burnout Inventory (MBI). The MBI is a validated scale specifically designed for use when assessing levels of burnout and is divided into three subscales; emotional exhaustion, depersonalisation and personal accomplishment.

The participants in the Ghetti et al, 2009 study (n=17) completed their questionnaires at enrollment into the study and again at 12 months while those in the Winkel et al, 2010 study completed their questionnaires again at enrollment and after they completed the last intervention workshop session.

For each of the three studies recruitment of participants was via self-selection. The sample sizes were small and only one study attempted to stratify participants into an intervention arm and a control arm when examining outcomes. Unfortunately,

the sample size was so small that the authors of this study (Winkel et al, 2010) were unable to perform any quantitative analysis to compare the two groups. As such the potential for bias in each of the individual studies is high.

TABLE 5.2: CHARACTERISTICS OF INCLUDED STUDIES

Study	Allen 2017	Ghetti 2009	Winkel 2010
Study Design	Cohort	Cohort	Cohort
Setting	Australia, large metropolitan hospital	US, large Obs/Gynae residency programme	US, academic teaching hospital
Participants	N=25 4 Attendings 21 residents	N=17 All residents	N=18 All residents
Interventions	Balint Group	Balint Group	Reflective Writing Programme
Comparator	Nil	Nil	Nil
Outcomes	Levels of BO, STS and CS at baseline and then at 3 months and 6 months *ProQol tool*	Level of BO, assessment of behavioral medicine skills and empathy at baseline and again at 12 months. *Maslach Burnout Inventory*	Level of BO, feasibility of whether the workshops worked and were effective or not. *Maslach Burnout Inventory*
Effectiveness	Statistically significant improvement from baseline in all three subscales.	Non-significant change in scores on MBI (fewer participants in high burnout category) >70% had moderate to severe BO at both time points	Non-significant trend towards higher burnout levels

US: United States of America
BO: Burnout
STS: Secondary Traumatic Stress
CS: Compassion Satisfaction
MBI: Maslach Burnout Inventory
ProQol: Professional Quality of Life

Synthesis of Results

As discussed in the methods, given the inherent differences between the three studies identified we were unable to perform any meaningful synthesis. In addition, with respect to pooling the results of the three studies there was not enough statistical data provided in any of the studies to allow estimation of 95% Confidence Intervals for effect size between pre-and post-intervention data in each individual study.

Results of Individual Studies

Allen et al, 2017 investigated the use of Balint training on Obstetricians and used the ProQol scale to collect their data. While Ghetti et al, 2009 also attempted to investigate the effects of Balint training on obstetricians they chose the MBI to collect their data. Winkel et al, 2010 investigated the feasibility of introducing a reflective writing workshop into the obstetrics and gynaecology curriculum while also trying to assess the impact that this had on levels of burnout. They also used the MBI to collect their quantitative data.

Allen et al, 2017 reported that at baseline 70% of their participants had medium levels of burnout, while 44% had medium levels of secondary traumatic stress. No participant had low levels of compassion satisfaction. Following implementation of their Balint training intervention they reported a statistically significant reduction in the median burnout scores amongst participants at 6-months (23, IQR 20-26) compared to baseline (26, IQR 21-28, p=0.010). They also reported a statistically significant reduction in secondary traumatic stress at 6-months (20, IQR 16-21)

when compared with baseline (22, IQR 20-26, p=0.008) and they reported a significant improvement in compassion satisfaction scores (37, IQR 24-39 Vs. 40 IQR 36-41, p=0.035).

Ghetti et al, 2009 also evaluated the use of Balint training as a tool to combat burnout in obstetricians. At baseline they reported that 13/17 participants had high burnout scores in the emotional exhaustion subscale, 15 had high scores in the depersonalisation subscale while 9 had high burnout scores in the personal accomplishment subscale. While at 12 months, the number of participants with high burnout scores in each subscale decreased this was not statistically significant. They reported that the majority of their participants (>70%) had moderate to severe burnout at both baseline and after the intervention.

Winkel et al, 2010 investigated the use of a reflective writing workshop and again used the Maslach Burnout Inventory to measure burnout levels pre and post the intervention. While the participants advised on a subjective questionnaire that the reflective writing workshops were enjoyable this did not appear to translate to the overall burnout scores. They reported that over the course of the study period there was a trend towards higher scores in the subscales of the MBI. They were unable to perform any statistical analysis on their findings due to their participant sample size.

5.1.5 Discussion

This review, aimed at evaluating the effectiveness of currently available interventions to support obstetricians when dealing with burnout and compassion fatigue in the workplace, has identified a gap in the published literature. Our search strategy, which was focused on finding papers specifically describing the implementation and evaluation of support tools or interventions for obstetricians, revealed 8,748 paper titles. Ultimately just three descriptive studies that met our inclusion criteria were identified (16, 285, 286).

Summary of Evidence

Of these three studies, two evaluated the impact of a series of Balint training workshops while the third evaluated the use of a series of reflective writing workshops on burnout and compassion fatigue in obstetric doctors. The intervention type and scales used to collect data were not consistent and in addition to this, the limited statistical data provided in the three original papers made it difficult to pool the data and obtain a conclusive understanding of whether these interventions help to reduce burnout and compassion fatigue in obstetricians. This lack of statistical interpretation of the results is an acknowledged limitation of our review.

Limitations

The results of the studies by Allen et al, 2017 and Ghetti et al, 2009 pointed towards a non-statistically significant improvement in burnout scores amongst participants after implementation of their support interventions, while the study by Winkel et al,

2010 showed contradictory results. There were limitations in all of these studies that may have biased their findings therefore, it is difficult to conclude whether either Balint training or a reflective writing workshop has the potential to reduce burnout and compassion fatigue in obstetricians. The number of participants in each study was small; they all used self-selection as a recruitment tool, and the lack of a non-participant control group meant that we were unable to make inferences with respect to the validity of the results. It is possible that the self-selection seen in all three studies biased the results as those who participated in the research may have been more accepting of the interventions under investigation before the studies began.

While our review identified just three studies that attempted to evaluate support interventions for obstetricians to use for tackling burnout and compassion fatigue , there is research from other medical specialties that indicates that the provision of both organisational and individualised support systems for healthcare professionals is necessary and can improve health and wellbeing (172). A recently published systematic review by West et al, (2016) focusing on interventions to prevent and reduce physician burnout, identified 15 randomised controlled trials and 37 cohort studies that evaluated support systems for doctors (172). This review synthesised the results of studies, which included 3,630 doctors from a range of different disciplines including general medicine, surgery, oncology, paediatrics and obstetrics/gynaecology. Two of the studies we have discussed in our review were also included in this larger systematic review (Ghetti et al, 2009 and Winkel et al, 2010). The support systems evaluated (West et al, 2016) were a mixture of

organisational changes (shorter shifts, changes to clinical work processes) and strategies focused on the individual doctor (MBSR based, stress management and self-care skills, and communication skills training). Although when all results were pooled together as measured on pre- and post- intervention validated scales, West et al highlighted a significant improvement in burnout, emotional exhaustion and depersonalisation. A potential criticism of the West review, however, is the fact that different interventions were pooled together into a composite and it can be argued that this is not an effective way of evaluating each individual intervention for any benefit. West et al also acknowledged that it is not known if these interventions were beneficial in the long term, as few studies have evaluated long-term post intervention effects (172). Most of these studies investigated the impact of their interventions months after the intervention was introduced as opposed to years later. As West et al was unable to conclude what type of intervention benefited doctors more, it is therefore difficult to say which one, if any, would suit obstetricians and gynaecologists.

5.1.6 Conclusions

The presence of burnout and compassion fatigue is increasingly recognised in obstetrics and gynaecology (138, 279). The short- and long-term outcomes of these syndromes impact not just on the professionals themselves but also on patients, healthcare systems and future recruitment, as well as institutions (189, 261, 263). Based on the findings of our review it is clear that effective support systems aimed specifically at helping obstetricians deal with burnout and compassion fatigue are lacking in the published literature. While support interventions may be available in

maternity units and hospitals around the world they do not appear to have been formally evaluated. High-quality, large scale, preferably randomized controlled research, with appropriate participant numbers is needed to identify the type of interventions that will be most effective for obstetricians. Long term impact and feasibility of any intervention introduced must also be investigated. Each medical and surgical specialty has its own challenges and complexities, and as such what works for one specialty may not work for others. It is therefore, we believe, necessary to target interventions at specific specialties. It is hoped that this review will stimulate research into the evaluation of either existing or novel support interventions and ultimately result in the development and provision of a tailored package of support interventions for use by obstetricians in maternity hospitals.

Chapter 6

New Support structures

Paper 7: **Interventions to improve wellbeing among obstetricians and midwives at Cork University Maternity Hospital**

S.O'Riordan, K.O'Donoghue, **K McNamara**

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Paper 8: **Applied drama techniques in obstetrics: development of a novel educational workshop to improve obstetrician awareness of compassion, communication and self-care around the time of stillbirth**

K McNamara, A Smyth, B Shine, M Cregan, L Prihodova, A O'Shaughnessy, A Martin, J MacDonald, P Kingston, C Fitzpatrick, K O'Donoghue

Under review in Acta Obstetricia et Gynecologica Scandinavica

6.1 Interventions to improve wellbeing among obstetricians and midwives at Cork University Maternity Hospital (Paper 7)

6.1.1 Abstract

Background: There is an increasing body of research demonstrating stress, burnout, and compassion fatigue among those working in obstetrics and gynaecology. The literature is lacking with respect to targeted interventions aimed at improving staff wellbeing.

Aims: To investigate whether healthcare professionals working in maternity services are experiencing impaired wellbeing and whether an intervention which increases support for staff is feasible to implement and effective at improving staff wellbeing.

Methods: This study was conducted in a tertiary university teaching maternity hospital in Cork. All doctors in training (DITs) (N=28) and midwives (N=69) working in the delivery suite were invited to participate. Wellbeing was assessed by measuring burnout, compassion fatigue and perceived stress using validated questionnaires. These were distributed pre-intervention and 6 months after implementation of the interventions. The support interventions consisted of posters promoting self-care, team bonding sessions and end of shift meetings.

Results: 64% NCHDs and 31% Midwives returned pre-intervention questionnaires. 13 midwives retuned post-intervention questionnaires. End of shift meetings were discontinued after 5 weeks due to low attendance. Pre-intervention analysis showed 87% and 82% of participants were experiencing emotional exhaustion and secondary traumatic stress respectively. There was a significant reduction in

burnout post-intervention. The end of shift meetings provided an opportunity for support and debriefing; however, the timing of these sessions impaired their long-term feasibility.

Conclusion: This sample of NCHDs and midwives are experiencing high levels of burnout and compassion fatigue. End of shift meetings for midwives and NCHD team bonding sessions may positively impact on wellbeing, but in their current format they are not feasible for long-term implementation. More work is needed to find suitable interventions.

6.1.2 Introduction

Healthcare professionals can suffer from stress due to the physical and psychological demands of their work (289). Burnout and compassion fatigue can result from exposure to occupational stress (290, 291).

Professional burnout is a work-related syndrome that occurs among professionals that work with people (290). The syndrome involves three symptoms: emotional exhaustion, depersonalisation and reduced personal accomplishment (290). Emotional exhaustion occurs when healthcare professionals can no longer engage with patients at a psychological level (290). Depersonalisation is the development of a negative and cynical attitude towards one's patients (290). Reduced personal accomplishment occurs when healthcare professionals become dissatisfied with their professional accomplishments and performance. (290).

Compassion fatigue, first defined by Figley in 1995, is defined as a state of psychological distress and reduced capacity for empathy in caregivers. (291-293). It is caused by emotionally demanding relationships with patients, usually those who have suffered trauma (291). The syndrome is similar to burnout, however it also includes the symptoms of secondary traumatic stress. Secondary traumatic stress manifests in symptoms such as intrusive images and avoidance (291). Reciprocally, compassion satisfaction is the positive aspect of working with people, it describes the positive feelings that comes from helping others (291).

Burnout levels of up to 90% have been reported among obstetricians, with a prevalence of 65% among midwives (294, 295). Secondary traumatic stress has a reported prevalence of 29% among midwives (296).

Burnout is an indicator of psychological distress among healthcare professionals. Associations have been identified between burnout and depression, anxiety, and suicidal ideation (295, 297, 298). Burnout and compassion fatigue are associated with suboptimal patient care, increase in reported medical errors, unprofessionalism and reduced work effort (299-302).

Obstetrics and Gynaecology is a high-risk specialty, and serious adverse events can occur and have a profound effect on the wellbeing of the healthcare professionals involved. (296, 303) Exposure to adverse events in addition to high levels of direct patient contact and the empathetic nature of the relationship with the patient

places those working in obstetrics and gynaecology at increased risk of burnout and compassion fatigue(289, 296, 304).

There is an increasing number of studies investigating strategies to improve wellbeing in the general medical and nursing literature, but it is still unclear which style of intervention may be most effective (305, 306). Support from colleagues and a safe forum to share traumatic experiences has been identified as key to midwives' ability to cope with traumatic experiences at work (296).

Organisational interventions which improve support for staff, may be effective at improving wellbeing among those working in maternity services, however, the literature is lacking (305). Gunusen *et al*. found that support groups among nurses resulted in a reduction in emotional exhaustion post-intervention; however, there was no significant difference between the control and intervention group (307). Peterson *et al*. found that reflecting peer-support group sessions provided an opportunity for colleagues to meet for discussion and to provide mutual support. This intervention showed favourable effects on burnout (308).

6.1.3 Aims and Objectives

The aim of this study was to investigate the impact of an organisational intervention that increases support for staff on the wellbeing of healthcare professionals working in obstetrics and gynaecology. To achieve this the specific objectives were, to investigate the levels of burnout, compassion fatigue and perceived stress among midwives and obstetrics and gynaecology doctors in trainings (DITs), to investigate

whether an intervention that increases staff support was effective at reducing burnout, compassion fatigue and perceived stress and to investigate whether it was feasible to establish support interventions for this cohort.

6.1.4 Methods

Study Design, Participants, and Setting: The study design was a pilot pre and post-interventional study. It was conducted in Cork University Maternity Hospital (CUMH), a large tertiary university teaching maternity hospital with 8200 deliveries per annum. As this was a pilot study, the sample size was limited by the number of midwives and obstetrics and gynaecology doctors who worked in the delivery suite. Convenience sampling of all midwives (n=69) and DITs (n=28) who worked in the delivery suite was used. All midwives and residents who worked in the delivery suite were eligible and were invited to participate in this study. Those who were not working in the hospital during the period in which the interventions were conducted were excluded from this study.

Study Measures: Wellbeing and staff distress was assessed by measuring burnout, compassion fatigue and perceived stress using the Maslach Burnout Inventory (MBI), the Professional Quality of Life Scale (ProQoL) and the Perceived Stress Scale was used to assess perceived stress. We developed an additional post-intervention survey which included a free text section to provide feedback on the interventions (supplementary material Chapter 6).

Interventions: The interventions were comprised of a pocket card and posters promoting self-care and resilience; team bonding sessions for the DITs; and "Recognise and Reflect", an end of shift staff meeting for the midwives.

The poster and card were designed and displayed around the delivery suite in areas regularly used by staff. Themes utilised in the poster and hand-out to promote self-care included; healthy habits; getting help from a friend or a professional; supporting colleagues; remembering what you did well; and acknowledging that healthcare professionals are human too. The poster is presented in the supplementary material.

"Recognise and Reflect" was a short work-focused discussion group led by a specialist registrar and senior labour ward midwives. It was held at the end of each day shift, Monday to Friday. All midwives who had worked that day in the delivery suite were invited to attend. During "Recognise and Reflect" midwives were encouraged to reflect on the previous shift, discuss the good aspects of the clinical day and identify any issues which arose, in a non-judgmental environment. Participants were encouraged to voice any ideas for improving clinical practice, and these ideas were documented and passed on to appropriate officials. One team bonding session was held for DITs. It consisted of a movie night and was led by a senior DIT.

Data Collection: Clinical midwife managers were asked to inform staff midwives of the study during daily handover meetings. The delivery suite was attended and

midwives were approached and a brief explanation of the study was done verbally. DITs were recruited by attending the regular weekly teaching sessions. Those who agreed to participate in the study were provided with a participant information cover sheet and a hard copy of the questionnaires. The post-intervention questionnaires were not distributed to the DITs. In the original project design, we had intended to survey the DITs post-intervention; however, given the lack of interest that ensued from the DITs with respect to the team bonding sessions these were discontinued after one session. We therefore chose to exclude DITs from the post-intervention follow up. Data was entered by the primary investigator into the statistical software IBM-SPSS 23.

Study Ethics: This project was formally approved by the Clinical Research Ethics Committee of the Cork Teaching Hospitals as part of the protocol "Perinatal Death and the Labour Ward. The Personal and Professional Impact on Healthcare Professionals and Maternity Services." (ECM 4 (III) 07/07/2015, ECM 3 (III) 08/12/15, ECM 6 qq 6/12/16). Participation in this study was voluntary, participants could withdraw from the study at any time. All data gathered was anonymous.

Data Analysis: Preliminary analysis was performed using descriptive statistics. Kolmogorov-Smirnov was used to test for violations of the assumption of normality within the data. Paired samples t-test and independent samples t-test were used to analyse the data. When data was not normally distributed a non-parametric equivalent test was used.

Timeline: This project was started in October 2015. Project design and planning was done from October 2016 to January 2017. Ethical approval was granted in December 2016. Pre-intervention data collection started February 2017 and continued for 4 weeks. The intervention started March 2017 and ran until August 2017. Post-interventional data collection ran from August 2017 until October 2017. Data analysis was carried out in October 2017 and November 2017.

6.1.5 Results

Eighteen DITs (64%) and 22 midwives (31%) responded to the pre-intervention questionnaire. Five midwives (7.2%) completed the full study, returning both the pre-intervention questionnaire and the post-intervention questionnaire. Only the midwives that completed the full study (n=5) were used to evaluate the impact of the intervention on wellbeing scores. Eight midwives (11.6%) returned a post-intervention questionnaire without having returned a pre-intervention questionnaire. Their responses were only included for analysis of feedback on the interventions.

Within the pre-intervention group, 87.5% of participants (n=35) were female. The median age of participants was 31 (range = 25 to 53). The median number of years of professional experience was 5 (range = 1 to 30). Of the five midwives who completed the full study, all were female. The median age was 37 (range = 27 to 40) and the median years' experience was 13.5 (range = 6 to 18). The pre-intervention

data was used to assess the levels of burnout, compassion fatigue and perceived stress (Figure 6.1). Above average levels of perceived stress were experienced by 79.5% of participants.

Effect of the intervention: A paired sample t-test was conducted to evaluate the impact the intervention had on the midwives' burnout, compassion fatigue and perceived stress scores. The results are displayed in Table 6.1. Despite a small sample size (n=5), there was a statistically significant decrease in the Professional Quality of Life burnout score from pre-intervention (*M* = 25.8, *SD* = 7.69) to post-intervention (*M* = 21.4*, SD* = 6.03), *t* = 0.431, *p* = 0.02 (two-tailed). The mean decrease in burnout scores was 4.4 points, with a 95% confidence interval ranging from 1.16 to 7.64. The Cohen's *d* was 0.64, indicating a medium effect size.

The DIT team bonding sessions were discontinued after one session. Eight DITs (27.6%) attended this session. The "Recognise and Reflect sessions" were discontinued after five weeks, in which time 20 sessions had been held. The average attendance rate at these sessions was 50% of the midwives who had been working that day. The head hygiene posters were displayed for 6 months.

Three themes emerged from the feedback on the "Recognise and Reflect" sessions; inopportune timing, an opportunity to support colleagues, and time to destress and debrief (Table 6.3). Feedback on the head hygiene poster was divided into two themes; a reminder think about your own mental health and that they were confusing (Table 6.4).

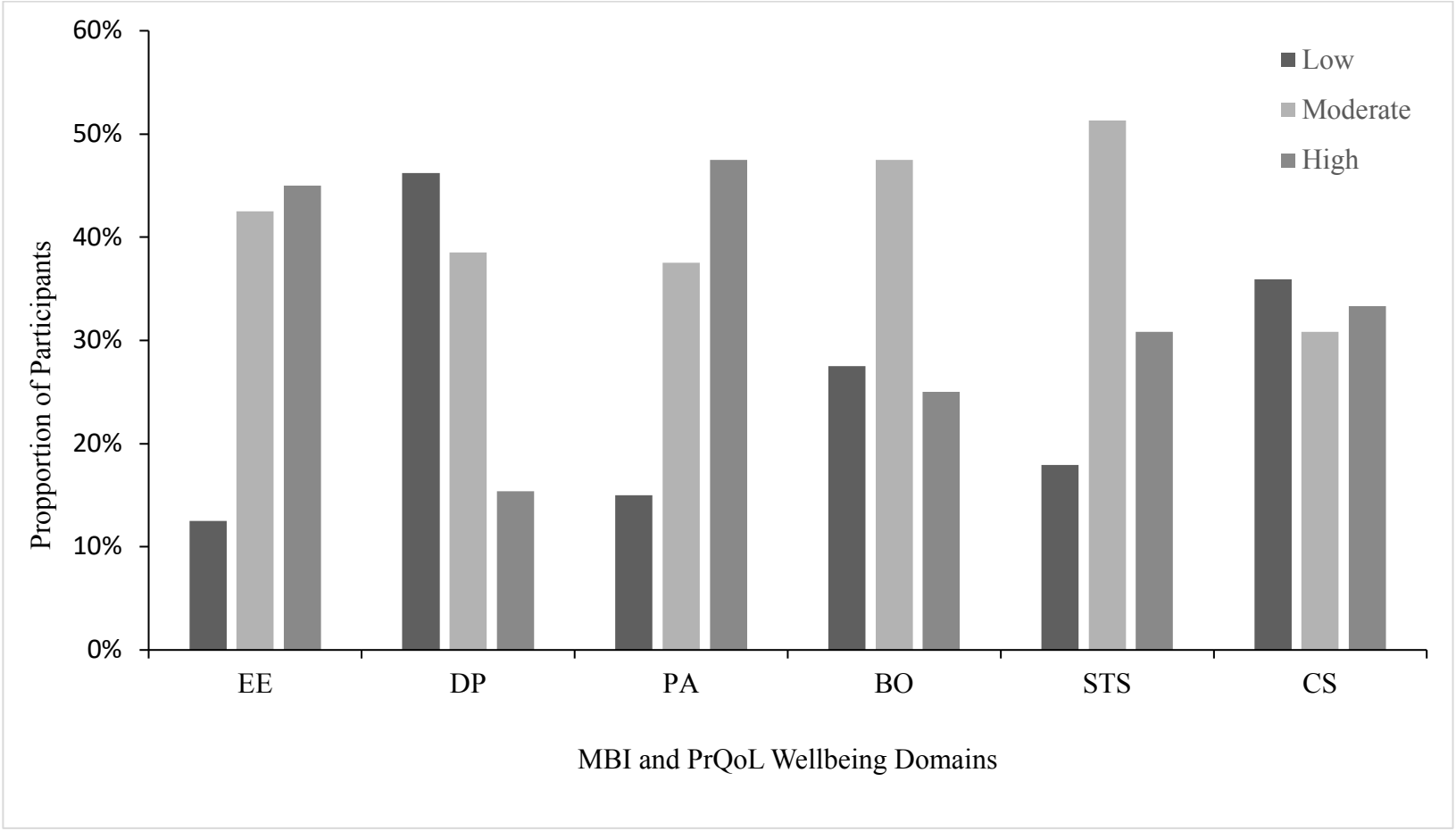

Figure 6.1: Proportion of participants scoring high, moderate or low for each domain of MBI's Burnout and ProQoL's Compassion Fatigue at baseline (n=40). EE = emotional exhaustion, DP = depersonalization, PA = personal accomplishment, BO = burnout, STS = secondary traumatic stress, CS = compassion satisfaction.

TABLE 6.1: MIDWIVES AND RESIDENTS PRE-INTERVENTION SCORES IN MBI'S BU, PROQOL COMPASSION FATIGUE AND PERCEIVED STRESS SCALE. M= MEAN, SD = STANDARD DEVIATION, DF = DEGREES AND FREEDOM, T = T VALUE, P = P VALUE.

Wellbeing Measure	Midwives		Residents					
	M	*SD*	*M*	*SD*	*df*	*t*	*p*	Cohen's *d*
Emotional exhaustion	26.05	9.79	26.83	7.43	38	0.281	0.78	0.09
Depersonalisation	5.52	4.86	10.05	4.61	37	2.97	0.005	0.98
Personal accomplishment	37.27	5.82	36.61	6.53	38	-0.338	0.74	0.11
Burnout	24.55	4.96	24.83	4.29	38	0.194	0.847	0.06
Secondary traumatic stress	21.57	4.58	24.44	5.6	37	1.764	0.086	0.58
Perceived stress	16.32	8.01	18.76	5.35	37	1.085	0.285	0.36

TABLE 6.2: PRE-INTERVENTION AND POST-INTERVENTION SCORES IN MBI'S BURNOUT, PROQOL'S COMPASSION FATIGUE AND PERCEIVED STRESS SCALE. M= MEAN, SD = STANDARD DEVIATION, DF = DEGREES AND FREEDOM, T = T VALUE, P = P VALUE.

	Pre-intervention		Post-intervention					
Wellbeing Measure	M	SD	M	SD	df	t	p	Cohen's d
Emotional Exhaustion	27.2	8.26	24.8	13.94	4	0.91	0.41	0.21
Depersonalisation	5.8	6.21	5.4	7.02	4	0.31	0.77	0.06
Personal Accomplishment	39.4	5.64	39.8	7.69	4	-0.13	0.9	0.03
Burnout	25.8	7.69	21.4	6.03	4	3.77	0.02	0.64
Secondary Traumatic Stress	18.8	4.71	18	5.34	4	0.78	0.48	0.16
Compassion Satisfaction	41.4	3.91	41	4.74	4	0.43	0.69	0.09
Perceived Stress	15.8	9.4	10.6	5.6	4	2.27	0.09	0.67

TABLE 6.3: FEEDBACK ON "RECOGNISE AND REFLECT"

Themes	Example Quotes
Inopportune timing	"Timing wise after a long shift people were exhausted and slow to talk! People had to get home to childminders etc" "I personally found at end of 12 hour shift most people are impatient to return home/exhausted/drained" "I work mainly night shift and when I come on at 8 when the sessions were on though I was interested in attending, I had to go to my allocated area of work to take handover" "…not available on my shifts. I usually work nights"
Opportunity to support colleagues	"…it gave us time to gather as a team to discuss the events from the day. Often when the LW is busy we wouldn't get an opportunity to all discuss what we went through that day" "Hear others concerns and offer suggestions and support to junior colleagues" "They were beneficial for team bonding, learning and colleague support" "Good to get feedback, good and bad – how else can we improve?"
Time to destress and debrief	"Yes good to express feelings of stress after incidents" "A safe environment to discuss issues of day" "A great opportunity to debrief and just sit together after a shift" "Good to have a quick debrief before home – felt I didn't carry it home with me if I had a bad day" "Feel like the day was finished" "Positives and negatives discussed while at work enabled me to switch off when I walked out the door"

TABLE 6.4: FEEDBACK ON "HEAD HYGIENE" POSTERS

Themes	Example Quotes
Reminder to think about your own mental health	"Made you think to mind yourself" "Gives you time to reflect and think of what you need to do to benefit your mental health" "Permission to think about your thoughts and feeling. A regular reminder to do so" "The 5 moments of head hygiene poster was a handy reminder to take a little break each day and mind my emotional wellbeing" "A gentle reminder of ways to cope with stressful situations" "Makes you think to care for yourself and co-workers. To be more mindful of how you are feeling and what those around you might be going through if they've had a tough day"
Confusement	"To be honest I didn't realise they weren't hand hygiene posters until it was pointed out!" "I found it confusing at first – as they seemed about hand hygiene" "Not initially very clear on what it was" "I personally found it confusing – I am not a visual learner"

6.1.6 Discussion

Almost 45% of midwives and obstetrics and gynaecology residents were experiencing high levels of emotional exhaustion, and 42.5% were experiencing moderate levels of emotional exhaustion. These findings reflect the literature, where it has been reported that almost 90% of obstetrics and gynaecology residents experience burnout (294). In this study, 31% of healthcare professionals were experiencing high levels of secondary traumatic stress. Beck *et al.* found

comparable results, reporting that 29% of Australian midwives were experiencing high to severe levels of secondary traumatic stress (296).

Although many participants were experiencing stress, burnout and compassion fatigue, many also felt a high sense of personal accomplishment and compassion satisfaction. A similar result was reported by Becker *et al.* (294). Hunter *et al.* found that midwife-mother relationships where midwives feel appreciated were personally and professionally sustaining (309). Increasing opportunities for healthcare professionals to receive positive feedback may increase the positive effects of patient encounters.

Despite a small sample size, a significant decrease in ProQoL's burnout was demonstrated post-intervention. Reductions in emotional exhaustion, depersonalisation, secondary traumatic stress, and perceived stress were also noted, but none of these reached significance. Due to the small sample size and poor response rate post-intervention, we cannot conclude that this intervention is an effective strategy to improve wellbeing, but the reduction in ProQoL's burnout does suggest that this intervention may be of benefit.

Having been discontinued after 5 weeks due to low attendance, we can conclude that "Recognise and Reflect" sessions were not feasible for long-term implementation. When studying the feedback, it became clear that having these sessions take place at the end of a 12-hour shift had rendered them impractical for the long-term. Midwives reported being eager to return home and feeling "*exhausted and slow to talk*". This likely affected engagement and attendance.

Within the literature, healthcare professionals have reported not having enough time to spend with families (310). Limiting the time commitment out of rostered hours needs to be considered when designing future interventions. Due to lack of interest only one NCHD team bonding session was held, despite repeated efforts to organise subsequent sessions. No written feedback was obtained from the NCHDs; however, as these sessions were also held outside of rostered working hours, it is likely the low interest was again due to the timing of these sessions

Despite "Recognise and Reflect" sessions being discontinued, the feedback demonstrated that they were mostly viewed as a positive experience. Midwives reported that "Recognise and Reflect" had facilitated an opportunity to support colleagues and debrief after a stressful day. Comparable findings have been reported by other studies investigating the impact of peer-support group style interventions (308, 311). As noted, increasing staff appreciation may benefit their wellbeing. One midwife reported that "Recognise and Reflect" sessions provided an opportunity to get positive feedback. She also noted that receiving both good and bad feedback is necessary for professional improvement

Strengths and Limitations: The strengths of this study include its prospective study design. It is one of few studies investigating the impact of an organisational intervention on burnout, compassion fatigue and stress among those working in maternity services. Validated questionnaires were used. It also assessed the feasibility of an intervention when applied globally, as opposed to when only applied to a group that volunteer to participate in a study.

This study has several limitations. The small sample size and poor response rate post-intervention significantly limits the ability to conclude on improvements in wellbeing following the intervention. The poor response rate warrants further discussion. Although participants were anonymized, it may reflect the sensitive nature of the questions in the survey. Another possible contributing factor was that surveys were distributed while the midwives were at work, and professional commitments were prioritised over completing the surveys. These explanations do not explain the lower response rate post-intervention. It is possible that the declining response rate may have been due to a decreased interest in the study following discontinuation of the "Recognise and Reflect" sessions. Further research investigating barriers to midwives completing surveys is needed. Another limitation was excluding the NCHDs from post-intervention data collection. It was felt that as no substantial intervention had been performed on this group, post-intervention follow up would not contribute to this study.

This study is subject to responder bias. It is likely that the midwives who responded to the post-intervention questionnaire were those who attended "Recognise and Reflect" sessions and found them helpful. Midwives who did not attend any sessions or did not find them helpful were probably less likely to respond to the post-intervention questionnaire. This may have resulted in type 1 error when assessing the impact of the intervention on burnout, compassion fatigue and perceived stress. Furthermore, the positive feedback on the intervention may not be representative of the views of all the midwives working in the labour ward. As

this study was not controlled, we cannot conclude that the improvement in burnout was due to the intervention and not due to a confounding factor.

6.1.7 Conclusion

Healthcare professionals working in Cork University Maternity Hospital are experiencing impaired wellbeing. This is evident through the high levels of burnout, compassion fatigue and perceived stress we identified in our cohort. This is not a surprising finding and is reflective of the wider obstetric community at large where up to 90% of obstetricians and 65% of midwives have experienced burnout. In their current format "Recognise and Reflect" and team bonding sessions are not feasible for long-term implementation in CUMH. However, in a modified format they may have the potential to improve staff wellbeing in our unit. It would, however, also be interesting to trial the use of a similar intervention in a different maternity hospital or unit. If it proved effective in another unit it would allow for learning and perhaps some modification to enable it to be run successfully in our unit. The ideal intervention, however, may be hard to find.

This study has highlighted the unsurprisingly high levels of burnout in CUMH and that appropriate and acceptable interventions are needed to improve the wellbeing of staff in CUMH. It is hoped that this study will guide future research in this area.

6.2 Applied Drama Techniques in Obstetrics; Development of a Novel Educational Workshop to Improve Obstetrician Awareness of Compassion, Communication and Self-Care around the Time of Stillbirth (Paper 8)

6.2.1 Abstract

Introduction

Obstetricians have described feeling shocked, sad, and isolated in the aftermath of a stillbirth. Existing research shows that few receive adequate training in how to care for parents in the aftermath of a stillbirth, or on their own self-care skills. We developed a new innovative workshop for obstetricians, in collaboration with the drama department from the Irish National theatre, which uses applied drama to teach obstetricians skills in communication, self-care and self-efficacy in breaking bad news. The aim of this study was to evaluate this new workshop.

Methods

Senior trainees in Obstetrics and Gynaecology (n=74) were invited to attend and complete a post-workshop evaluation questionnaire. Five point Likert scales were used to assess participant's feedback on the workshop. A paired-sample t-test with a significance level set at 0.05 was used to test for self-reported changes in the skills and attributes of the trainees following the workshop.

Results

39/59 (66%) trainees who attended completed the evaluation questionnaires. Most had received no prior formal training in stillbirth management (34/39, 87.2%). Following the workshop, there was a statistically significant improvement in trainee's level of confidence in breaking bad news, communicating clearly with the family when breaking bad news, communicating empathetically with the family

when breaking bad news recognising the emotional needs of the family, recognising their own emotional responses and supporting their colleagues. Trainees were overall positive about the course content and would recommend the workshop to a colleague.

Discussion

This study evaluated the impact that a novel educational workshop had on improving obstetricians' awareness of compassion, communication and self-care around the time of stillbirth. We identified a subjective improvement in some of the key skills that obstetricians must have when caring and communicating with bereaved parents. We recommend that this training should be incorporated into the core postgraduate curriculum in Obstetrics.

6.2.2 Introduction

The death of a baby during pregnancy, labour or the neonatal period is profoundly upsetting for parents and families and the involved healthcare professionals (4, 5, 8, 10, 13, 104, 126, 127, 171, 312). Obstetricians have described feeling shocked, sad, isolated, afraid, angry and traumatised in the aftermath of a stillbirth (9, 13, 171, 312). Research from Nuzum et al, 2014, has shown that for some consultant obstetricians, stillbirth is considered the worst outcome of pregnancy for parents (13). Gold et al, 2008, identified that up to 1 in 10 consultant obstetricians had contemplated leaving obstetrics as a direct response to the emotional burden they experienced while caring for bereaved families (12). Obstetricians have been able to recall the minutiae of some of the stillbirths they have been involved with in

vivid detail, and this has brought up some particularly painful memories for some (13, 312). There is evidence to suggest that obstetricians are unable to leave work in the workplace and dwell on the specifics of the stillbirth after they have left the workplace (13). Others have advised they find it difficult to speak about these events, with colleagues or with family members (13).

Despite the considerable impact that involvement in a stillbirth has on obstetricians, existing research shows that few if any at all receive adequate training in how to care for parents in the aftermath of a stillbirth, or training in self-care skills (89) (13, 136).

Further, there is some evidence to suggest that obstetricians who have received adequate education in stillbirth care are less likely to report feeling guilty and afraid of litigation in the aftermath of their involvement with a stillbirth (137) . In contrast, when untrained in the area of stillbirth management this can impact negatively on the care that obstetricians give to bereaved parents. A recent Italian cross-sectional study of 750 healthcare professionals, including both obstetricians and midwives working in the maternity services has shown that international guidelines for stillbirth care in Italy are largely ignored (137), and that maternity healthcare professionals (HCPs) in Italy are undertrained in the management of stillbirth. More than half of HCPs in this study felt inadequate in their care of bereaved parents, while others reported that they failed to provide any support to parents who had experienced a stillbirth.

In Ireland, the importance of empathy and compassion in bereavement care has been highlighted in the recently published Maternity Strategy by the Department of Health, the Health Information and Quality Authority (HIQA) National Standards for Safer Better Maternity Services and the Health Service Executive's (HSE) National Standards for Bereavement Care in the maternity services (96, 109, 313). There has also been increasing concern expressed by national professional training bodies about the effects of traumatic work-related experiences on clinicians (314).

Directly inspired by personal advice given to one author (CF) by Oscar Laureate, the late Sir Alec Guinness – "*Doctors need to be like actors. They need to see the world through the eyes of their patients – like actors see the world through the eyes of their characters. They need to say their lines with great sincerity. They also need to be able to switch off afterwards"* - and the outreach work of Ireland's national theatre, the Abbey Theatre (designed by author PK), the Royal College of Physicians of Ireland were approached (by CF and PK) to develop an innovative educational intervention for trainees in Obstetrics and Gynaecology, in collaboration with the Institute of Obstetricians and Gynaecologists (the national training body for all obstetricians and gynaecologists in Ireland)and patient support groups *Féileacáin* and *Patient Focus.* The intervention was entitled 'Bereavement in the Maternity Services: An Approach to Caring and Coping for Clinicians - using Applied Drama Techniques'.

Féileacáin is a not-for-profit organisation in Ireland, that provides support to parents who are affected by the death of a baby either in pregnancy or shortly

after. Until July 2018, Patient Focus was one of the country's leading patient advocacy services - before its merging with another national advocacy service.

The aim of this current study was to evaluate this new workshop. We will report on the impact this workshop had on participants with respect to communication skills, recognition of emotional needs of the bereaved family, recognition of participant's own needs when caring for bereaved families, self-efficacy in breaking bad news and whether or not participants developed any new skills that can be translated to the clinical environment. The results of this study will be used to further refine training in this area and to recommend whether this workshop is ultimately beneficial to trainees and whether it is appropriate for it to be included as part of the core curriculum in postgraduate obstetrics and gynaecology training in Ireland.

6.2.3 Methods

In order to develop this educational intervention, it was important that the views of parents and obstetricians who had experienced a stillbirth were included. Invitations were sent to parents who had been involved in a late pregnancy stillbirth in the preceding 5 years to be interviewed and narrate the experience of loss. Parents were identified and contacted by the two partner support organisations. Obstetricians who had been involved in caring for families who experienced a stillbirth over the same time period were also invited for interview to share their experiences. Interviews were conducted by an experienced bereavement and loss midwife and were transcribed verbatim.

Using the blended, anonymised narratives of both parents (n=12) and obstetricians (n=6), performance specialists from The Abbey Theatre in association with educational specialists and consultant trainers in the Royal College of Physicians of Ireland (RCPI) developed a series of applied drama workshops for trainees in Obstetrics and Gynaecology. Through the use of applied drama techniques, the emotional experiences of stillbirth were explored. The specific learning aims and objectives of the workshops, as laid out on the RCPI website are presented in Table 6.5.

Five workshops were held between January and May 2018. Each workshop was six hours in duration and included a number of writing, acting, role-playing and reflective activities. While the aims and objectives were the same for each workshop, the exact content of each workshop differed and was influenced by the participants' level of interaction, and following reflection by the facilitators on any previous workshops.

TABLE 6.5: WORKSHOP LEARNING AIMS AND OBJECTIVES

During the workshop trainees will:	Following this workshop, the trainee will be able to:
• Learn physical and vocal skills to increase self-awareness and support a sense of authenticity and presence • Gain understanding of the importance of self-awareness in communication • Increase their understanding the connection between self-awareness, presence, authenticity and compassion • Apply a practical understanding of self-awareness to achieve authenticity in communication • Explore the role of language in empathy • Use language precisely • Learn to balance compassion and resilience • Reconcile any tension between the clinical and the humane	• Demonstrate a sense of presence when needed to break tragic news • Connect to parents who have experienced stillbirth • Explore their own emotional responses to better respond to grieving parents • Choose language, stance and gesture appropriate to the situation • Demonstrate an increased awareness of how you say what you say to parents who have experienced stillbirth • Actively listen and appropriately respond to communicate compassionately with parents • Build the rigour and resilience to keep caring with each new encounter • Reconcile the philosophical and practical paradox of being authentic and caring repeatedly

Sample

All RCPI higher specialist trainees (HST) in Obstetrics and Gynaecology (n=74) as well as registrars in stand- alone posts were invited to attend and complete the post-workshop evaluation questionnaires. It should be noted that although these were pilot workshops they were included as a mandatory component of the RCPI's core HST obstetrics and gynaecology curriculum from July 2017 to July 2018.

Data Collection

A specific anonymised questionnaire was designed. For the most part, 5 point Likert scales were used to assess participant's feedback. Basic demographics were also obtained. Some free text questions were also included to allow for maximum feedback on the workshops. The full questionnaire is attached in the supplementary material.

Data Analysis

Descriptive statistics were used to present the self-reported change in knowledge and attitudes that occurred as a result of attending the workshop. A paired-samples t-test with a significance level set at 0.05 was used to test for self-reported changes in the skills and attributes of the trainees following the workshop. A t-test was chosen as although it is usually used for parametric data it is a robust enough test that it will tolerate deviations from the norm and can, therefore, also be used for some types of non- parametric data, such as Likert scale data.

Internal Consistency for each of the Likert Scales was checked using Cronbach Alpha, with a coefficient score of greater than 0.7 indicating good internal consistency. The First Likert scale which assessed trainees' prior confidence with breaking bad news, communicating with bereaved families, recognising their own and the families' emotional needs, as well as their perceived abilities to support colleagues showed good internal consistency with a Cronbach alpha coefficient reported as 0.83. The second Likert scale assessed trainees perceived confidence in all the same areas after attending the workshop. In this case the Cronbach alpha coefficient score was 0.903

again indicating good internal consistency. The third and fourth scales were based on the workshop content. The third scale asked trainees whether the content of the workshop met their needs for caring for bereaved parents and the fourth was an overall assessment rating of the workshop practicalities. The Cronbach alpha for the third and fourth scales were 0.82 and 0.938 respectively.

6.2.4 Results

In total, over the courses of the five workshops, 59 trainees participated. Of those who attended 39/59 (66%) trainees completed the workshop evaluation questionnaires. Most (25/39, 64.1%) had been working in obstetrics for between 5 and 10 years. Of the 39 trainees who attended, 30 were female and the majority had received no prior formal training in the management of either antenatal stillbirth (31/38, 79.5%) or intrapartum stillbirth (34/38, 87.2%). This was despite almost three quarters of trainees (29/38, 74.4%) having had direct involvement with one or more stillbirths. Of those who had received training, they cited medical school education and attendance at an Irish Hospice Foundation Course called "Breaking Bad News" in their respective maternity units as their only training in this area (315) . A full breakdown of trainee demographics is presented in Table 6.6.

TABLE 6.6: BASIC DEMOGRAPHICS OF PARTICIPATING TRAINEES

	N= 39 (%)
Sex	
• Male	8 (20.5)
• Female	30 (76.9)
• Not answered	1 (2.6)
Years in obstetrics	
• <5	9 (23.1)
• 5-10	25 (64.1)
• >10	4 (10.3)
• Not answered	1 (2.6)
Training in stillbirth management	
• Yes	7 (17.9)
• No	31 (79.5)
• Not answered	1 (2.6)
Training in intrapartum death management	
• Yes	4 (10.3)
• No	34 (87.2)
• Not answered	1 (2.6)

A paired-sample t-test was conducted to evaluate whether or not attendance at the workshop improved trainees' confidence in the following key skills and attributes with respective to stillbirth management; 1) breaking bad news, 2) communicating clearly with the family when breaking bad news, 3) communicating empathetically with the family when breaking bad news, 4) recognising the emotional needs of the family, 5) recognising their own emotional responses and 6) supporting their colleagues. Consistently, there was a statistically significant improvement in trainee's level of confidence in all of the above skills after they had attended the

workshop. The individual t-statistic for each skill or attribute is presented in Table 6.7. Communication skills and awareness of their own emotional responses where the areas that appeared to improve the most.

TABLE 6.7: PRE AND POST WORKSHOP IMPROVEMENT IN CONFIDENCE IN KEY SKILLS IN STILLBIRTH MANAGEMENT

Skill	Pre and post workshop mean scores	Paired Samples t- Test			
		Mean	95% CI	t value (df)	significance
Breaking bad news	2.67, 2.95	0.282	0.086 – 0.478	2.913 (38)	0.006
Communicating clearly	2.59, 3.05	0.462	0.240 – 0.683	4.224 (38)	<0.001
Communicating empathetically	2.85, 3.18	0.333	0.162 – 0.505	3.929 (38)	<0.001
Emotional needs of family	2.72, 3.00	0.282	0.072 – 0.492	2.723 (38)	.010
Emotional responses of self	2.62, 3.05	0.436	0.215 – 0.656	4.001 (38)	<0.001
Supporting colleagues	2.74, 3.08	0.333	0.146 – 0.520	3.606 (38)	0.001

We also asked trainees whether the workshop adequately covered a set of specific attributes needed when caring for families who experienced a stillbirth. These attributes were as follows; 1) self-awareness, 2) authenticity, 3) their own emotional responses, 4) the role of verbal communication, 5) the role of non-verbal communication, 6) active listening, 7) building of rapport, and 8) building resilience. Trainees were asked to rank each attribute on a Likert scale from 1 to 5, where 1 was covered in too little detail, and 5 was covered in too much detail. Trainees

were overall very positive about the course content and most reported that each of these attributes were covered either 'just right' or 'a lot' within the workshop. A detailed breakdown of these findings is presented in Table 6.8.

TABLE 6.8: WORKSHOP COVERAGE OF KEY ATTRIBUTES FOR MANAGING STILLBIRTH

Attribute	Trainee Responses N=39 (%)					
	Too little	Little	Just right	A lot	Too much	No answer
Self- Awareness	0	4 (10.3)	13 (33.3)	21 (53.8)	0	1 (2.6)
Authenticity	1 (2.6)	4 (10.3)	16 (41)	16 (41)	1 (2.6)	1 (2.6)
Own emotional responses	0	2 (5.1)	14 (35.9)	22 (56.4)	0	1 (2.6)
Role of verbal communication	0	3 (7.7)	13 (33.3)	21 (53.8)	1 (2.6)	1 (2.6)
Role of non-verbal communication	0	0	8 (20.5)	29 (74.4)	1 (2.6)	1 (2.6)
Active listening	0	4 (10.3)	14 (35.9)	18 (46.2)	2 (5.1)	1 (2.6)
Building of rapport	1 (2.6)	7 (17.9)	14 (35.9)	15 (38.5)	1 (2.6)	1 (2.6)
Building resilience	2 (5.1)	6 (15.4)	14 (35.9)	13 (33.3)	1 (2.6)	1 (2.6)

Trainees were asked to provide at least one positive comment and one point for improvement on the workshop. In general, the comments were all positive; only one person suggested that more time should be spent breaking bad news and that they found "a lot of the activities as time wasting as those were not relevant". Most of the other comments were similar in tone and were largely positive about the workshop, and the full list of comments is provided in the Supplementary Material. A sample of comments is provided in Table 6.9. When asked whether they would recommend the

workshop to a colleague, 35/39 (89.7%) of trainees said they would. Just one said they would not recommend the workshop and the remaining three did not answer the question.

TABLE 6.9: SOME OF THE COMMENTS FROM THE WORKSHOP PARTICIPANTS

"a welcome change from didactic lectures, a fresh approach"
"the workshop helps to put ourselves in the patient's position sometimes which makes us better clinicians"
"we should have this sort of training every year to help communicate our own difficulties and relieve stress"

6.2.5 Discussion

This study evaluated the impact that attendance at a novel educational workshop had on improving obstetricians' awareness of compassion, communication and self-care around the time of stillbirth. Following attendance at a day long workshop, trainees completed a post workshop feedback questionnaire. We found that the workshop was positively received with most trainees willing to recommend it to a colleague. Trainees were also happy with the course content and felt it met their a priori expectations of the workshop. Most importantly we identified a subjective improvement in some of the key skills that obstetricians must have when caring and communicating with parents who are bereaved. We also identified a subjective improvement in how trainees recognise their own emotional responses and support their colleagues in the aftermath of a perinatal death.

Repeatedly, in the published Irish literature obstetricians have commented on the lack of formal education and training they receive in caring for bereaved parents as well as in caring for themselves in the aftermath of a stillbirth (13, 171). In addition to this, multiple HSE and HIQA reviews into specific perinatal mortalities in Ireland, have identified poor communication skills as one of the key shortcomings in the care of bereaved parents (82, 83, 316) . The findings reported in our study are therefore of high importance. Adequate, appropriate and stimulating education and training in stillbirth care and self-care is clearly needed to improve patient care in Ireland, and this workshop may be the way to achieve this change.

One of the main strengths of this study is the fact that attendance at the workshop was mandatory for trainees on the RCPI higher specialist training scheme in Obstetrics and Gynaecology. This, therefore, reduces the likelihood of attender bias and increases the likelihood that trainees with varying levels of experience and interest in stillbirth will attend and give honest feedback.

There are some limitations to this study. Relying on subjective reporting of changes in confidence in the key skills required for effective stillbirth management does not offer definite proof that this suggested improvement will be translated into clinical practice. A study that objectively shows an improvement in communication, compassion and self-care would be difficult to design and implement. One potential way to show a translation into clinical practice may be to interview trainees a few months after the workshop and at that stage ask if they have put their skills into practice.

This study has clearly shown that it is an acceptable and appropriate way of training in the areas of stillbirth and self-care in Ireland. Obstetricians in in other countries, not just in Ireland, are affected by stillbirth (10, 12, 89). The impact of stillbirth does not discriminate based on where an obstetrician lives and works, and as such our findings may be transferable to obstetricians working outside of Ireland. Internationally, there is a marked deficit of studies that evaluate specific educational and self-care interventions for obstetricians to access. What is available, to date, has assessed the use of both Balint training and Reflective writing workshops to combat the problem of burnout in obstetrics and none of these intervention types have proven to be of benefit (16, 285, 286). Our study is, perhaps of even more importance as it is the first stand-alone study that we can identify that definitively shows an improvement in outcome measures.

In conclusion, this novel way of educating trainee obstetricians has merit and was very positively received. It was associated with a self-assessed improvement in communication and self-care skills and was very positively received. We recommend that this type of training should, therefore be incorporated on a more permanent basis into the core postgraduate curriculum in Obstetrics and Gynaecology.

Chapter 7

Discussion

This thesis is concerned with the personal and professional impact that serious adverse perinatal events such as intrapartum fetal death have on maternity healthcare professionals (HCPs). It also focuses on the support structures and strategies available for HCPs to access in the aftermath of an adverse event or to help prevent burnout and maintain good mental health in the workplace.

For the majority of expectant couples, pregnancy is a happy and exciting time. Irrespective of the type of maternity care they choose, most couples enter pregnancy with the expectation of taking home a well and healthy baby. This is not, however, a guaranteed outcome and unfortunately, sometimes despite best medical practice, serious adverse perinatal events occur.

As presented in the introduction of this thesis, much is now known and has been investigated about the impact that serious adverse perinatal events such as antenatal stillbirth have on both the parents and the maternity healthcare professionals (HCPs) who care for them. In direct contrast, and prior to the research and publication of several of the studies in this thesis, there was relatively little known about the specific personal and professional impact that some of the most serious adverse perinatal events such as intrapartum fetal death (IPD), had on maternity HCPs. There were no published studies focusing on how serious adverse perinatal events may impact on the clinical activity that occurs in a hospital. Research was also substantially lacking on how best to care for and support maternity HCPs in the aftermath of an intrapartum death or other serious adverse perinatal event.

In order to address the deficit in the published literature I undertook seven studies. These studies aimed to bridge the gap in the published literature by investigating and identifying the substantive personal and professional impact that serious adverse events such as intrapartum death have on maternity HCPs. In addition as part of this thesis I helped design and evaluate a number of support tools that could be accessed in the aftermath of a serious adverse perinatal event.

In this thesis the seven studies are presented as eight different papers. For the purposes of this discussion however, I have chosen to group similar papers together. Given the different aims, content and methods used in the studies, this will allow for easier interpretation of the main findings, strengths and limitations of my work. It will also allow for greater clarity when discussing the implications my work has for future research and clinical practice. The papers have been grouped according to the five main areas covered by this thesis. Papers 1 and 2 address the number and causes of intrapartum deaths in Ireland, and give the reader of this thesis insight into how common IPDs are in Ireland. Papers 3 and 4 focus largely on the human impact of Intrapartum death on HCPs. Paper 5 is an attempt to investigate how adverse events impact on the clinical practice of HCPs as a group within one hospital. Paper 6 systematically reviews the literature on what support structures are available to HCPs and Papers 7 and 8 focus on new support initiatives that I introduced while undertaking this research.

7.1 The Numbers

Prior to conducting any research into the impact of intrapartum death on healthcare professionals it was necessary to identify the scale of the problem. As the research included in this thesis was conducted in the Republic of Ireland, it was imperative that a detailed description and analysis of the rates, causes and contributing factors with respect to intrapartum fetal death in Ireland were identified.

The two papers included in this thesis formed part of the same study and for the purposes of this discussion I will largely focus on the results presented in Paper 1. Paper 1 is the first detailed descriptive analysis of intrapartum deaths and unexpected intrapartum event related neonatal deaths in the Republic of Ireland to be published in the international literature. The second paper was published as an invited commentary in the National Perinatal Epidemiology Centre's Annual Perinatal Mortality Report 2016. This commentary focused solely on intrapartum fetal deaths and did not include an analysis of neonatal deaths. The recommendations, strengths and limitations of both papers are, however, similar and for the purposes of this discussion it is not, therefore, necessary to recap individually the findings of both papers.

7.1.1 Main findings and how they relate to existing research

Utilising data stored in the best available national data set on stillbirth and neonatal death (91), the aims of this study were to identify the IPD rate in the ROI between 2011 and 2014; to describe both maternal, fetal and neonatal demographics pertaining to antenatal, intrapartum and postpartum care; to ascertain causation and most importantly to identify if any or all or none of these cases could have been prevented.

I identified that relative to rates in other high-income countries, Ireland has a comparably favourable IPD rate of 0.16 per 1000 births (206) (115). Since 2011 there have been 1,253 stillbirths in the ROI and intrapartum deaths make up 6.4% of all cases. Existing research has recognised that that in countries where women receive good quality intrapartum care that the proportion of intrapartum deaths is less than 10% of all stillbirths (145). While these findings suggest good overall maternity care in Ireland, in this study I identified a number of key pre-conceptual, antenatal and postnatal areas where a small change in clinical practice alongside improved public engagement could potentially make a real improvement to the Irish IPD rate. These are described in detail in the respective papers. In short these are all areas that are not solely Irish problems and are reflective of issues identified in previous international research. Maternal smoking, obesity, and late booking to pregnancy care have all been previously associated with all types of stillbirth, including intrapartum fetal death and other adverse pregnancy outcome (91, 115, 206-209). Suboptimal detection of fetal growth restriction has been identified in research from countries such as Norway and New Zealand as playing a large role in

stillbirth prevention (211, 220). Low rates of perinatal post-mortem examinations are worldwide issues.

When starting this study, however, I did not set out for it to be solely a descriptive study.

One of my primary aims was to ascertain causation for the IPDs and unexpected neonatal deaths and to identify if any of them could have been prevented. This was an aim I was unfortunately unable to fulfil.

7.1.2 Major limitations

The most striking limitation of this study was, as identified above, the inability to fulfil one of my primary aims; to ascertain causation and to identify whether any or all of these deaths could have been prevented. This was because the data, while being the best available national data, was taken from an audit dataset. In Ireland, at present, while we have confidential enquiries into maternal death, we do not have a similar practice with respect to stillbirth. This, therefore, prevented me proposing more substantive changes to clinical practice aimed at specific areas of care, instead of the relatively broad areas I focused on in the discussion of these papers. Confidential enquiries should be an integral component of quality assurance practices in our maternity service. They are designed to improve healthcare by identifying any areas for improvement in the care afforded to patients as well as any positive aspects of care, and provide recommendations to improve the future care of patients.

As they are an anonymised and transparent review process they may also importantly prove to be of some benefit to individual HCPs who have been involved in a particular death. Papers 3 and 4 of this thesis describe the profound impact these deaths have on HCPs, and also shed light on the fact that HCPs are often quick to blame themselves for these types of infant deaths. Being able to definitely and transparently assign causation, particularly where the death was unavoidable or was as a result of a number of different systematic failures or errors, may alleviate some of this substantial burden.

While I was able to use the data to identify risk factors for intrapartum death such as the relatively poor antenatal detection of fetal growth restriction, as well as high rates of maternal obesity and smoking and to document, for example, that eight infants died in labour secondary to intrapartum asphyxia it was not possible to conduct any in depth analysis of these cases. In addition to the data coming from an audit dataset, I did not have access to the mothers' or infants' individual maternity charts while undertaking this study. It proved, therefore, impossible to identify any substandard, or indeed any positive aspects of maternity care or to postulate whether alterations in antenatal or intrapartum care would have made a difference to the outcomes.

7.1.3 Implications for clinical practice, future research and recommendations

There is a lack of public confidence in the Irish maternity services at present and this is something that warrants change (37, 44, 317). One potential way of bringing about change is by developing a transparent, proven and validated review process into not just intrapartum deaths, but also unexpected neonatal deaths or

unexpected stillbirths. Confidential enquiries have been used extensively in the United Kingdom to investigate maternal death perinatal, fetal and infant death (CESDI, CMACH and MBRRACE)(3, 318-320). Consonant with calls from the NPEC over the last few years, I also recommend the development of a confidential enquiry process into perinatal deaths in Ireland (3, 206, 318, 319). As discussed early in this section, this type of process will allow anonymised, non-judgemental and more importantly an in depth root cause analysis of unexpected perinatal deaths in Ireland, something that I was unable to do with the national dataset from NPEC that was available to me. A confidential enquiry will further enable healthcare professionals to be clear and open with parents with respect to the care they received in pregnancy, as well as the reasons for the poor outcome. Ultimately this might improve the public perception of how these cases are dealt with by the maternity services. Ideally, in order to ensure maximum learning, improvements in clinical care and transparency with parents who use our maternity service, these enquiries should also be extended to those babies who are born with hypoxic ischaemic encephalopathy. This type of process has been ongoing in the UK since 2014 and hopes to reduce deaths secondary to intrapartum events by 50% by 2030 (201, 203). If we in Ireland could mirror these ambitions to reduce deaths secondary to intrapartum events, this would be a significant benefit for the parents and families who use our maternity services on a daily basis and for the staff who care for them.

Implementing the successful use of perinatal confidential enquiries into in the Irish setting may prove to be a challenge, particularly in the current financial

environment. Firstly, buy in is needed from government, health service managers and frontline clinicians. Those conducting the confidential enquiries will need adequate training, financial and time support. Lastly in order for confidential enquires to be truly successful and have a meaningful impact on healthcare, there needs to be a national commitment to the implementation of any recommendations that are made in these enquiries.

7.2 The Human Impact of Intrapartum Death on HCPs

As described in the first section of this discussion, IPD is not uncommon and it is therefore likely that most if not all maternity HCPs will experience one at one or more points in their careers. These next two papers that I will now discuss are concerned with the personal and professional impact of intrapartum fetal death on healthcare professionals (HCPs). The first paper (Paper 3), which utilises both quantitative and qualitative data analysis, is a survey paper. It documents the exposure individual midwives and obstetricians had to IPD, the debriefing and support they received after exposure to IPD as well as their views on education and training. The second paper (Paper 4), makes use of semi-structured interviews to provide a more in depth understanding of the substantive impact that IPD has on obstetricians, and as such builds on the data presented in the first paper.

7.2.1 Main findings and how they relate to existing research

In keeping with the wider body of medical literature pertaining to serious adverse events and to perinatal death has a whole, I identified that involvement with an IPD exerts an emotional toll on maternity HCPs, with feelings of sadness, guilt, isolation, self- blame and self-doubt being commonplace (10, 13, 133, 141, 170, 230) (10, 12,

13, 135) (133, 138, 139, 141, 230, 240). There was a sense that maternity HCPS are both undertrained and ill-equipped clinically and emotionally to deal with the most serious of outcomes on the labour ward. Irrespective of this, the desire to continue to provide compassionate good quality care was highly visible throughout the data in both studies. It was clear that HCPs placed a lot of pressure on themselves, and some were concerned that exposure to these events may lead to a real change in their clinical practice, or to them completely abandoning a particular medical or surgical procedure. This is an interesting finding, one that ties in somewhat with my research from Paper 5 of this thesis and will be discussed in more detail in turn. Other HCPs were concerned with how their involvement in these cases was being perceived by the general public and the media, another interesting finding and one I was unable to elicit from the previous literature.

One of the most striking findings from my research, which is reflected in both these papers was, however, the apparent lack of formal support that HCPs were afforded by their employer in the aftermath of these events. This was despite participants in both studies acknowledging the need for such appropriate support structures for them to access in the aftermath of an intrapartum death. Participants also highlighted the importance of these support systems being provided by their colleagues as opposed to hospital management or services external to the hospital setting. This fits with existing research from the general medical literature on burnout in doctors, where it has been demonstrated that support interventions aimed at promoting well-being and reducing distress for doctors in the US which

was run and facilitated by physicians improved both meaning and engagement at work and reduced depersonalisation in the longer term (242).

7.2.2. Major limitations

These two studies, to the best of my knowledge, represent the first papers ever published which specifically explore the impact of intrapartum fetal death on HCPs. The first paper (Paper 3) also includes views from consultant obstetricians, NCHDs and midwives, which is a positive. While midwives and obstetricians care for the same group of patients, their job descriptions are inherently different, and such they may have differing opinions and reactions to certain situations. Bearing this in mind a potential limitation of the second paper (Paper 4) is that it describes the experiences of obstetricians only. When I commenced this study, my intention was to also include the views of midwives. Unfortunately. and despite much proactive encouragement, I was unable to recruit enough midwives to reach data saturation and as such chose to eliminate their interviews from my end analysis. This research was conducted fully within Cork University Maternity Hospital, and I as an obstetrician have a close working relationship with all the labour ward midwives. As such, and despite the availability of a second researcher not as well known to them being available to undertake the interview, this may have been one potential reason why they chose not to participate. Another potential reason, as discussed in person with me by one individual midwife, may have been a reluctance to recount in detail painful memories of events that happened in the past.

Another limitation that must not be overlooked is that I am an obstetrician and I have first-hand experience of intrapartum fetal death, and I have witnessed close

colleagues and friends experience intrapartum death. It is entirely possible, in particular when analysing the qualitative data that subconsciously I attempted to colour the data with my own preconceived knowledge and opinions. In an attempt to control for this potential bias, I enlisted the services of a social scientist with no prior experience of intrapartum death. This co-author also analysed the data and her interpretation revealed similar themes to the mine.

7.2.3 Implications for clinical practice, future research and recommendations

The main findings of these studies are concerning. It is of paramount importance that HCPs in the Irish maternity services feel supported by their colleagues, management and the health service as a whole if they are to continue to provide the best care to pregnant women and families. It is of equal importance that HCPs are educated and trained to deal with the most serious of adverse events if they are they are to continue to provide the best care. In addition, as discussed in the introduction of this thesis, staff retention in the HSE is of concern. Unless staff feel valued and respected in the workplace they will not remain in that workplace. Unfortunately, the staff who participated in my research for the most part felt unsupported and undertrained to deal with the most serious of adverse events.

In this regard, I have some recommendations. Firstly, it is imperative that a more proactive approach is taken towards reducing burnout and providing support for all HCPs at all times, and not just those who are exposed to a serious adverse event. It is imperative that staff feel valued in their workplace. If HCPs are content and happy in their workplace and derive meaning from the work they do, the impact that serious adverse events have on them may potentially lessen somewhat.

National initiatives such as a government and health service management, dedication to and importantly provision of adequate safe staffing for clinical environments, as well as ensuring each HCP has adequate rest periods, in addition to appropriate resourcing of educational opportunities for HCPs may improve overall morale in the frontline service. Reversing the FEMPI cuts to frontline HCPs salaries may also play a small role in improving staff morale.

Acceptable and appropriate locally available emotional support interventions for staff to access in the aftermath of a serious adverse event need also to be introduced but, more research is required to ascertain what form these interventions should take. It is highly likely that a diverse number and type of interventions will need to be introduced as what works for one group of staff members may not work for another. To date research has acknowledged that a combination of both individual-focused and organisational support initiatives such as reduced workloads and shift duration, mindfulness classes, reflective writing, and yoga, can all benefit staff but there is little consensus on which is more beneficial (306).

Recently, at a local level in some maternity hospitals in Ireland, Schwartz rounds have been introduced. As previously discussed, Schwartz Centre Rounds® are multi-disciplinary meetings for HCPs aimed at exploring and discussing the human side of healthcare. Instead of focusing on the pathology and treatment of medical illness, the focus is on the emotional impact of medical conditions on patients and on the HCPs who care for them. HCPs who attend on a regular basis report reduced levels

of stress and isolation and are themselves more likely to be open to receiving and giving support (191, 193). Consideration should be given to the expansion of this tool to the rest of the maternity service.

Consideration should also be given to the role of an available in-house clinical psychologist for maternity healthcare professionals. Stress and self-care management are poorly taught in med school, and historically doctors and nurses are poor at voluntarily looking after their own health and well-being, and as such may be reluctant to attend (321). That poses the question as to whether a certain number of clinical psychology counselling sessions should be mandatory for all HCPs. I was unable, however, to identify any research looking specifically at the impact that attendance at counselling sessions has on healthcare professionals and for this reason I cannot definitively conclude that clinical psychology should be mandatory for all. I do, anticipate, however, that the provision of a clinical psychologist would be welcomed by the majority of HCPs and in fact as many as 63% of HCPs who completed my questionnaire in Paper 3 advised that they would be willing to participate in one-to-one counselling in the aftermath of an adverse event.

When designing ideal support systems for use in the maternity services, some direction could also be taken from private industry, which for the most part has begun to embrace the whole well-being at work concept (322). Simple measures such as the provision of breakout and social spaces, the provision of on-site fitness classes and gyms, the provision of easily available nutritious food, as well as the

active encouragement of staff to participate in healthy, social activities such as walking competitions may ultimately prove to be of equal importance as more formalised support structures (323).

Ultimately though, whatever support systems are chosen for implementation there need to be visible senior leaders who champion the support system to ensure its continued growth and success, and this was lacking from one of my attempts at a support system implementation.

Lastly, mandatory education sessions on self-care and training in adverse outcome management should be available for all HCPs both at undergraduate level and during their working life. Again, how these education sessions are provided is an area that warrants further investigation. Learning goals will differ relative to the level of training or indeed the job title a person holds and so more than one type of education platform is necessary.

7.3 The Impact of Adverse Events on Clinical Practice

I have discussed in detail the emotional impact that a serious adverse perinatal event such as an intrapartum fetal death has on maternity healthcare professionals. Paper 5 of my thesis focuses on the potential clinical practice change exposure to these events may have on HCPs.

In the general medical literature it has been speculated that exposure to patient complaints, medical litigation, patient death or other unanticipated adverse events can lead to an alteration in clinical practice (251) (252) (90) (253, 254). The

obstetricians and midwives who participated in my two earlier research studies were concerned that exposure to these events may lead to a real change in their clinical practice, or to them completely abandoning a particular medical or surgical procedure. There is nothing in the previously published obstetric or midwifery literature that supports or refutes this perception. The work I will now discuss aimed to identify if it was feasible to design such a study, that would demonstrate a change in clinical practice in a hospital as a result of exposure to a serious adverse event. If this proved feasible then the secondary aim was to identify if these changes could be attributed to that preceding adverse event.

7.3.1 Main findings and how they relate to existing research

The literature is lacking with respect to research into how adverse events might impact on clinical practice and as such I did not have anything to compare and contrast my own data to. I was able to identify one study from the general medical literature which objectively showed an alteration to medical physicians' prescribing patterns as a result of exposure to an adverse event (253). I could not, however, find any similar studies in the obstetric literature.

I collected aggregate data pertaining to six of the most serious adverse perinatal events that occurred over a 25-month period in our large maternity unit. Based on the clinical details of each case, I and my primary PhD supervisor, Dr O'Donoghue, created individual hypotheses for each event. Data analysis revealed some statistically significant changes in clinical activity in the 28 days following five of the six adverse events. In some cases, rates of CS changed, in others, rates of instrumental delivery and still in others the rate of induction of labour changed in

the aftermath of an adverse event. More senior doctors attended complex deliveries in the aftermath of an adverse event than in the 28 days preceding the event.

These changes in clinical activity did not, however, always match what we had expected from our original hypotheses. On reflection and after detailed analysis of the data and acknowledgement of the limitations of this study it prevented me from conclusively attributing the changes I saw in clinical practice to the preceding adverse event.

7.3.2 Major limitations

This study was one of the most difficult I completed while completing this thesis. There were a number of issues I encountered which ultimately substantially limited the interpretation of my results.

The first major limitation is the use of aggregate data. At the time I was conducting this study, most data in Cork University Maternity Hospital was paper based, and the details I needed to conduct this study were recorded either in the individual patient records or in the labour ward registers. Given the volume of data that was needed to collect and the resources that would have been required to do so, it was not, therefore, possible to collect individual patient data and as such some of the nuances of the deliveries were lost.

The second major limitation that I was unable to control for was the inherent difference in the way individual HCPs practice obstetrics and midwifery. While

evidence-based standards and guidelines exist that HCPs are encouraged, where possible, to adhere to, this is not always or even regularly the case, nor can it be the case. There are times in obstetrics and midwifery practice when the correct care for the patient will not come from a prescribed guideline or policy, and in fact guidelines will sometimes allow for the use of individual clinical acumen. For example, national guidelines exist pertaining to the induction of labour. These discuss the various indications and contraindications for induction of labour. It was evident from reading the reasons why certain women underwent induction in both the pre-and post-adverse event groups, that these guidelines were sometimes not being utilised. It is possible that the same issues were present with respect to Caesarean section and instrumental delivery and ultimately would have impacted on my findings.

7.3.3 Implications for clinical practice, future research and recommendations

As discussed here, there is a perception that changes in clinical practice occur as a result of HCP exposure to serious adverse events in obstetrics. This novel study aimed to identify if it was possible to objectively demonstrate this practice change. While I did show some changes in clinical practice after an adverse event in the hospital, this study had several inherent flaws limiting the ability to draw meaningful conclusions from these results.

Further research is necessary to either refute or concur with my findings. If subsequent work agreed with my findings i.e. that there are real changes in clinical practice following an adverse event, then it would further strengthen the evidence

that healthcare professionals are both personally and professionally impacted by serious adverse perinatal events.

On reflection if this study was to be repeated I have a couple of suggestions.

Firstly, any further research should be conducted in a unit that stores data electronically, as it would allow individual patient level data to be accessed and analysed easily. In late 2016 an electronic health record was introduced in CUMH and it would now be possible to repeat this study in our unit.

Secondly, I suggest that any further research examines data at an individual clinician level. This second suggestion might prove more difficult than the first, but would I believe remove a number of the difficulties and limitations I originally faced, as it would control for individual differences in clinical practice.

7.4 Pre- Existing Support Structures

The first five papers presented as part of this thesis discuss the burden of intrapartum death and other adverse events, both in terms of the number of deaths and the clinical and personal impact, on HCPs. I have documented, in detail, the apparent lack of formal support that HCPs in the cohort who participated in my research received. One of the other aims of my research was to develop some tools or initiatives for HCPs to access either in the aftermath of an adverse event, or and potentially more importantly, to utilise on a day to day basis should the need arise. It was, therefore, important to ascertain what was already available internationally for maternity HCPs to access and it was equally important to ascertain if it was of

proven benefit. In this regard I performed a systematic review of interventions to support obstetricians when dealing with burnout and compassion fatigue. I deliberately decided to focus on interventions for burnout as opposed to purely what support interventions were available for staff to access immediately after an adverse event. This approach I believed would yield a greater number of studies to include in my review, and also would provide with me substantively more information on all the various support systems and interventions that were in use around the world. In addition, it is of paramount importance that maternity HCPs have access to support systems on a day to day basis and not just in the aftermath of a crisis. Initially I had hoped to do this review investigating what was available for both obstetricians and midwives, however, when searching the literature I noted an existing mixed methods review examining interventions for midwives to access when dealing with burnout (280). Hence, my systematic review focuses on tools for obstetricians only.

7.4.1 Main findings and how they relate to existing research

My systematic review, which is presented in Chapter 5 of this thesis, identified a gap in the published literature. My initial search strategy, which was focused on finding papers specifically describing the implementation and evaluation of support tools or interventions for obstetricians, revealed 8,748 paper titles. Ultimately just three descriptive studies that met my inclusion criteria were identified (16, 285, 286). My inclusion criteria were quite broad and were designed to locate studies that implemented and evaluated a particular support strategy or intervention directed specifically at obstetricians, either consultants or trainees. Studies were

only excluded if the support strategy was targeted at patients or other health care professionals, or if it was a description or review of a support strategy as opposed to an evaluation. It was, therefore quite surprising that just these three studies were identified. The three cohort studies involved an overall participant sample size of 60 obstetricians; 4 consultant obstetricians and 56 trainee obstetricians. They evaluated two different interventions, Balint training and a series of reflective writing workshops, and delivered and assessed their interventions over different time periods. Ultimately there were inherent differences between the three studies identified and included in my review and I was unable to perform any meaningful synthesis on their findings. I was therefore unable to definitively conclude if any of these interventions were of benefit to obstetricians. Given that these were the only three studies I could identify examining existing support interventions for obstetricians to access to tackle burnout it was clear to me that there is a gap in the literature with respect to effective support interventions for obstetricians to access in the aftermath of a serious adverse event.

7.4.2 Major limitations

This systematic review itself had limitations, as did the individual included studies. The limitations of the individual studies are discussed in detail in chapter 5. One of the biggest limitations of my systematic review, however, was my inability to perform any statistical interpretation of the cumulative results. This was due to the small participant numbers, and the fact that the intervention type and scales used to collect data were not consistent.

Another acknowledged limitation is that I chose obstetricians as my sole target population. This was because there was a prior publication of a similar review focusing on midwives (280). This review which was a mixed-methods review of interventions for midwives in work related psychological distress, did however, present the same conclusions as my review; namely that effective support systems aimed specifically at helping maternity HCPs deal with burnout, workplace stress and adverse events are lacking in the published literature.

7.4.3 Implications for clinical practice, future research and recommendations

It is clear that effective support systems aimed specifically at helping obstetricians deal with burnout and compassion fatigue are lacking in the published literature. It is also clear from my other research that support systems are necessary and would be gratefully received by HCPs in the maternity services.

I am not suggesting that no support interventions exist to be utilized by maternity HCPs on a day to day basis. It is likely that a combination of both formal and informal support interventions are available in maternity hospitals around the world but they are not reported and do not appear to have been formally evaluated. Without evaluation it is not possible to judge if an intervention works or not. It is hoped that the results found in my review will stimulate research into the evaluation of either existing or novel support interventions and ultimately result in the development and provision of a tailored package of support interventions for use by obstetricians and also midwives in maternity hospitals.

7.5 New Support Structures

One of the overall aims of my research was to develop and evaluate a set of support systems for maternity HCPs to access in the aftermath of a serious adverse event. Researching the literature did not provide me with much guidance in terms of what effective support systems were already being used in maternity hospitals either nationally or internationally. In early 2017, I helped organise a workshop for obstetricians and midwives in CUMH. This workshop "staying well at work", which was facilitated by the Irish Hospice Foundation, addressed the issue of self-care in the workplace. Based on the feedback received from this workshop it became even more clear to me that formal support systems in hospitals such as CUMH were necessary to help staff navigate their own grief in the aftermath of an adverse event such as an intrapartum death. As part of this workshop the attendees discussed the development of potential support systems for HCPs to access in CUMH. One of the suggestions at this workshop was the development of a short work-focused discussion group that staff could attend at the end of their shifts. The idea was that staff who attended would be encouraged to reflect on the previous shift, discuss the good aspects of the clinical day and identify any issues which arose, in a non-judgmental environment. By cultivating a culture of open and non-judgemental discussion on a daily basis we hoped that this would carry through in the aftermath of a serious event and that HCPs in CUMH would have an existing forum at which to discuss difficult cases, should the need arise. Other suggestions for supports at this workshop were the development of a visual reminder for staff to care for their own mental health as well as developing 'bonding' sessions for the NCHDs in our hospital. These sessions would involve the NCHDs coming together

for a non-work related activity such as a movie night or sporting activity, in order for them to get to know each other better, and hence potentially develop better working relationships with each other. Paper 7 discusses and evaluates the interventions we developed in an attempt to improve the wellbeing of maternity staff in CUMH.

While this was being developed at a local level, I also became involved in a national initiative focusing on staff-care and wellbeing. As discussed in the introduction to this thesis there is now much acknowledgement of the effects of traumatic work-related experiences on doctors (314). In addition, In Ireland, over the last number of years, the importance of empathy and compassion in bereavement care has been highlighted in the recently published Maternity Strategy by the Department of Health, the Health Information and Quality Authority (HIQA) National Standards for Safer Better Maternity Services and the Health Service Executive's (HSE) National Standards for Bereavement Care in the maternity services (96, 109, 313). With this in mind the Royal College of Physicians of Ireland and the Institute of Obstetricians and Gynaecologists set about developing an innovative educational intervention for trainees in Obstetrics and Gynaecology, which focused on improving obstetricians' awareness of compassion, communication and self-care around the time of a stillbirth. Repeatedly in the numerous hospital reports into perinatal deaths, the way healthcare professionals communicate with parents following a stillbirth has been highly criticised and this is why we chose to focus these education workshops on stillbirth (84, 85). I was involved in evaluating this novel and innovative educational intervention. The details and results of which are presented in Paper 8.

7.5.1 Main findings and how they relate to existing research

These two studies examined and evaluated different support systems aimed at improving the largely negative response HCPs have to serious adverse events. One focused on supports being used at a local hospital level, while the other focused on a novel national educational workshop. Both studies used surveys to obtain their feedback.

The results of the studies were conflicting. While HCPs in CUMH were positive in their feedback regarding the support systems being trialled at a local level in CUMH, ultimately they did not feel that the majority were feasible for long term use. This was mainly because of a timing issue. In order to facilitate the attendance of as many delivery suite midwives as possible, the discussion groups called "Recognise and Reflect" were held just before staff changeover at the end of the day shift. This was not acceptable to most because they preferred to leave the hospital on time and were 'impatient to return home'. These sessions were eventually discontinued. In contrast, the results of the evaluation on the RCPI delivered national educational workshop were overwhelmingly positive and the NCHDs who attended strongly advocated that these workshops be continued. In addition, and encouragingly in evaluation of this new workshop, I identified a self-reported improvement in how trainees recognise their own emotional responses, and support their colleagues in the aftermath of a perinatal death.

7.5.2 Major limitations

These studies are two of only a handful of studies in the literature that investigate the impact of organisational interventions on burnout, compassion fatigue, and self-care on maternity HCPs. They are not, however, without limitations.

Firstly, the study based in CUMH was limited by a small sample size and poor response rate of participants following the introduction of the interventions. The poor response rate warrants further discussion. Although participants were anonymised, it may reflect the sensitive nature of the questions in the pre- and post-intervention survey. Another possible contributing factor was that surveys were distributed while the midwives were at work, and professional commitments were prioritised over completing the surveys. These explanations do not explain the lower response rate post-intervention. It is possible that the declining response rate may have been due to a decreased interest in the study following discontinuation of the "Recognise and Reflect" sessions. This study was also subject to responder bias. It is likely that the midwives who responded to the post-intervention questionnaire were those who attended "Recognise and Reflect" sessions and found them helpful. Midwives who did not attend any sessions or did not find them helpful were probably less likely to respond to the post-intervention questionnaire. Lastly this intervention did not receive adequate commitment from senior healthcare managers in the hospital and this may also have contributed to the failure of the intervention.

The major limitation of the study examining the effectiveness of the RCPI led educational workshop was that I had to rely on subjective reporting of changes in confidence in the key skills required for effective stillbirth management, as well as

self-care. This does not, therefore, offer definite proof that this suggested improvement could be translated into clinical practice. However, a study that objectively shows an improvement in communication, compassion and self-care would be difficult to design and implement. My study was at least an attempt at a structured evaluation of a new type of educational workshop.

7.5.3 Implications for clinical practice, future research and recommendations

These studies have identified a need for more research with respect to designing and implementing the ideal support systems or systems for HCPs working in the maternity services. It is clear that more than one approach is necessary as what works for one group of HCPs may not work for another.

With respect to the findings of my study conducted in CUMH, it may be interesting to trial the use of similar support interventions in a different maternity hospital or unit. This would ideally be in a maternity unit where there is a more support from both a nominated obstetric labour ward lead and also a clinically active CMM3, than is currently the case in CUMH. If it proved effective in another unit it would allow for learning and perhaps some modification to enable it to be run successfully in our unit.

While the results from the RCPI study were largely positive it was difficult to show translation of my findings into clinical practice. One potential way to show this may be to interview trainees a few months after the workshop and at that stage try to check if they have put their skills into practice. In general though, based on the positive outlook of the NCHDs who participated in this study, and pending more

detailed research I have to recommend that this type of training should be incorporated on a more permanent basis into the core postgraduate curriculum in Obstetrics and Gynaecology. Consideration should also be given towards developing this sort of programme for midwives in Ireland.

7.6 Conclusion

The purpose of this thesis was to investigate the impact that serious adverse events such as intrapartum death have on maternity healthcare professionals. Obstetrics and midwifery are high risk professions and sometimes even despite best medical practice serious adverse perinatal events occur (3) .While I have shown that the rate of intrapartum deaths in Ireland is comparably low when examined beside other high income countries(226), I have also shown that each one leaves a profound impact on the healthcare professionals who care for parents and families (171, 312). This acknowledgment of the substantial impact that IPD has on both the personal and professional lives of maternity healthcare professionals is both new and timely. While much has been discussed and documented in the last decade or so on the HCP response to perinatal death (9-12), the papers presented in this thesis represent the first time research has been conducted focused specifically on one of the most serious of adverse perinatal events, intrapartum death. It is timely as the findings from my research may serve as a reminder to healthcare professionals, hospital management, the media and the general public that those working in the maternity services are human and are not without feeling.

Similar to those in other areas of medicine, maternity healthcare professionals are experiencing high levels of burnout and compassion fatigue (17, 280, 324). This cannot be left to continue and go unchecked. Evidence suggests that when HCPs are unhappy in the workplace there is an association with suboptimal patient care, an increase in reported medical errors, unprofessionalism and reduced work effort (299-302).

Migration of staff from the Irish health service, including the maternity service is unsustainably high, and one of the proposed reasons for this is the high level of burnout experienced by Irish HCPs. Since 2008 it is estimated that at least 3,798 doctors have left Ireland to work abroad, many of whom report they do not intend on returning (37, 58).

Unless hospitals, hospital directors and healthcare policy makers start to recognise and act on the high levels of burnout by providing support systems and interventions for staff to access on an ongoing basis and in the aftermath of an adverse event, the status quo will be maintained, and ultimately the patients who rely on a functioning and effective healthcare team will suffer.

The research presented in this thesis represents some of a growing body of work focusing on the supports needed to improve staff wellbeing, and reduce burnout both in the longer term and in the aftermath of a perinatal adverse event. I have presented some suggestions and recommendations on how to develop these support systems for maternity HCPs to access at both a local and a national level. Support systems are necessary and need to be incorporated into the day to day

running of maternity services as soon as possible. It is the responsibility of each individual working in the maternity services, as well as hospital managers, clinical directors, and healthcare policy makers to ensure that this important area of staff wellbeing is given the attention it deserves.

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Chapter 3: Supplementary Material

Sample Questionnaire: The Impact of Intrapartum Death on Midwives

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

The Impact of Intrapartum Death on Midwives

Background

What is your current position

☐ staff midwife ☐ midwifery Manager 1 ☐ midwifery manager 2

How many years have you worked in Midwifery?

☐ <5 ☐ 5-10 ☐ >10

How many deliveries are there in your current hospital per annum? ☐

What is your gender? ☐ male ☐ female

1. Exposure to Intrapartum Death

Have you been directly involved in an intrapartum death or an intrapartum event-related neonatal death?
Have you delivered, or been present at a delivery where the baby died during or shortly after birth?

☐ yes - once ☐ yes – more than once ☐ no

If you have answered no, please move on to section 4.

What type of intrapartum death was this? (Tick all that apply)

☐ expected and unpreventable (e.g. lethal fetal abnormality)
☐ unexpected and largely unpreventable (e.g. placental abruption, cord prolapse, shoulder dystocia)
☐ unexpected and potentially preventable (e.g. hypoxic ischaemic encephalopathy, intrapartum sepsis)

A) Can you please describe what actually happened? B) Can you describe how this event impacted on you at the time it was happening, personally and professionally? *(When answering this section, please relate to the intrapartum death that has had the most impact on you.)*

2. Debriefing and support after Exposure to Intrapartum Death

When answering this section, please relate to the intrapartum death that has had the most impact on you.

Did you discuss this case in detail with anyone after the event?

☐ yes - informally ☐ yes - formally ☐ no

Who did you discuss this with?

☐ CMM ☐ midwife colleague ☐ B&L midwife Other

Were you offered any formal debriefing after the event?

☐ yes ☐ no ☐ I don't understand what debriefing is

In retrospect would formal debriefing be of benefit?

☐ yes ☐ no ☐ I don't understand what debriefing is

Who do you think should be involved in the formal debriefing process?

☐ master/clinical director ☐ team consultant ☐ consultant mentor
☐ bereavement and loss consultant ☐ bereavement and loss midwife ☐ senior NCHD
☐ member of clinical risk team ☐ occupational health physician ☐ hospital chaplain
☐ senior labour ward midwife ☐ consultant trainer ☐ other (please specify below)

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After an intrapartum death, if you were told to go home - would you? ☐ yes ☐ no

Please explain why or why not?

Were you involved in a clinical risk assessment meeting following the intrapartum death?

☐ yes ☐ no

What words best describe how you felt in the weeks following the intrapartum death? (Tick all that apply)

☐ upset	☐ irritated	☐ indifferent
☐ indignant	☐ discouraged	☐ guilty
☐ disillusioned	☐ uneasy	☐ alone
☐ fearful	☐ anxious	☐ restless
☐ worried	☐ heartbroken	☐ victimised
☐ offended	☐ wronged	☐ thankful
☐ energetic	☐ optimistic	☐ hopeful
☐ disinterested	☐ other	

How did the clinical risk review impact on you? Did you feel differently in the weeks following the review? Please explain

Do you feel supported, judged or blamed by your colleagues after an adverse event such as an intrapartum death? Please explain.

Have you used any professional support services following exposure to an intrapartum death, or any other adverse event?

☐ yes ☐ no if yes what?

What do you do to look after yourself after an adverse event such as an intrapartum death?

3. Other potential supports after intrapartum death

Numerous support strategies have been documented in the literature to help prevent doctor "burn-out" which can in time lead to "compassion fatigue", depression, anxiety as well as other psychosomatic symptoms in medical professionals. Very little of this has been trialed in midwifery. If the following support systems were available would you consider using them?

Professional one-to-one counselling services (external to hospital)

☐ yes ☐ no

Professional group counselling services (e.g. support groups, external to hospital)

☐ yes ☐ no

Mindfulness based interventions? (for example: yoga, massage, meditation)

☐ yes ☐ no

Meeting with a nominated support team immediately following an event? (This would ensure time to process what has happened, a non-judgmental discussion with a colleague or colleagues, in a quiet place away from patients and visitors)

☐ yes ☐ no

Are there any specific support structures you would like to see being developed for staff following an adverse event, such as an intrapartum death?

☐ yes ☐ no Please detail below.

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4. Education

Have you had any training in dealing with intrapartum death?

☐ yes ☐ no If yes, what?

How you received any formal instruction/education in the area of self-care following an adverse event?

☐ yes ☐ no If yes, what?

Would this be something of interest to you?

☐ yes ☐ no

Has your clinical practice changed following your involvement in an intrapartum death?

☐ yes ☐ no Please describe below.

Additional Comments

Have you any other ideas on how support for staff following an intrapartum death could be improved?

Topic Guide for semi-structured interview with doctors

Demographics

What is your job title? Description of day to day job? Why did you decide to become an Obstetrician/Midwife?

Describe what you enjoy most about your job? What is the hardest part of your job?

Intrapartum Death and Intrapartum event Related Neonatal Deaths

- Can you tell me about what comes to mind when you hear the term intrapartum death?
    - PROMPT: your hospital? Other hospitals? Media?

- Can you talk to me about an intrapartum death you have been involved with?
    - PROMPT: changes in practice? Psychological effect/ physical effect? One stands out more than others? Coping strategies?

- What is it like being in the hospital in the days following an intrapartum death?
    - PROMPT: what about during a systems review?

- Can you describe any available support structures at work following an intrapartum death?
    - PROMPT: formal/ informal/ why avail/ Why not?

- What is your opinion on the current media focus on maternity services?
    - PROMPT: influenced practice? Stillbirth vs Intrapartum death? Opinion re litigation?

- Describe the training you have received in stillbirth management
    - PROMPT: Intrapartum death management/ self-care? What you would like to see in terms of training?

- What advice would you give to a more junior colleague following an intrapartum death?

If time permits and are willing: Scenario

Consultant: You are the consultant covering the labour ward. It is 3 am. Your senior registrar rings you to say that a baby has just died following a forceps delivery for suspected fetal distress.

- What comes to mind on receiving that phone call?
- Same scenario except it is now a baby that you delivered.

NCHD: You are the registrar covering the labour ward. You get called to a primigravida, who is pushing with a non-reassuring cardiotocograph (NRCTG). You proceed to a forceps delivery and the baby is born without a pulse. Despite resuscitation the baby dies.

- What comes to mind on hearing this scenario?
- How do you think you would react in this situation?

Chapter 5: Supplementary Material

Protocol for Systematic Review

Research Question?

Evaluating the effectiveness of currently available interventions to support obstetricians when dealing with burnout

Background

Historically, healthcare professionals, and doctors in particular, have been slow to recognize the profound effect adverse medical events can have on their mental and physical health. There is now an increasing body of research looking specifically at burnout and compassion fatigue in the medical and nursing professions.

Obstetrics is a high-risk specialty and adverse events do happen, even when the best clinical care is practiced. To date very little research has focused specifically on the specialty of obstetrics and gynaecology, but what has been done has identified the largely negative impact that adverse events, like stillbirth, have on healthcare professionals.

It has also been suggested, that the lack of recognition and appropriate debriefing of junior staff by more senior colleagues, following an adverse event, may in part be

responsible for the development of maladaptive coping mechanisms. These maladaptive mechanisms may be partly to blame for burnout and other forms of emotional stress. It has been hypothesised that as a direct result of maladaptive coping mechanisms to stress, and lack of training in dealing with death/adverse events that healthcare professionals can experience compassion fatigue and that patients can suffer as a result.

It is important that aspects of undergraduate and postgraduate training of doctors and other healthcare professionals includes self-care and strategies to deal with the personal impact of adverse medical events and serious incidents at work. In the last number of years there has been an increased awareness amongst professional bodies of the emotional stressors and dilemmas facing medical staff. This awareness has led to the provision of support systems such as mindfulness courses in an attempt to improve the overall wellbeing of their members. While this is undoubtedly a start in the area of self-care training, it may not be appropriate for or be accepted by all. In direct contrast to this approach, workplace based “on the spot” support for healthcare professionals is becoming popular in the US medical system.

Objectives

To identify all interventions that have been introduced and evaluated in supporting obstetricians to tackle burnout and compassion fatigue and to analyse the findings to ascertain if any type of intervention has proven beneficial.

Methods

Population of interest: Obstetricians (Consultants, Attendings), Obstetric trainees (residents, registrars)

Intervention: Support systems (mindfulness training, debriefing; formal and informal, "on the spot" care from dedicated teams, employee assistance programs, external counselling, group counselling, time away from clinical environment, exercise programs, occupational health use, personal GP use, web-based self-management tools, undergraduate and post graduate education

Comparator; Intrapartum Stillbirth, Maternal Death, Intrapartum Event Related Neonatal Death, Burnout, Compassion Fatigue, Secondary Traumatic Stress, Workplace adversity

Outcome: Impact on burnout, compassion fatigue

Search Strategies:

1) Electronic databases – Medline (PubMed), EMBASE, EBSCO (including CINAHL, PsychInfo and Social Sciences Full text), Scopus, the Cochrane Library, Clinicaltrials.gov and Education Resources Information Centre (ERIC).
2) Grey literature – OpenGrey

Study inclusion criteria:

Primary studies or secondary analysis studies that include an attempt at appraising support strategies for obstetricians for tackling burnout or compassion fatigue

Search Terms

Evaluating the effectiveness of currently available interventions to support obstetricians when dealing with burnout and compassion fatigue.

1. Support strategies AND obstetricians AND adverse event
2. Support AND obstetricians AND adverse event
3. Obstetricians AND adverse events AND effects
4. Adverse events AND obstetricians
5. Mindfulness AND obstetrician AND adverse event
6. Mindfulness AND obstetrician
7. Compassion fatigue AND obstetrician
8. compassion fatigue AND prevention
9. Adverse events labour ward
10. Coping strategies AND obstetrics
11. Obstetricians AND Exercise
12. Supporting obstetricians
13. Burnout AND obstetricians AND support
14. Bereavement AND obstetrician
15. Obstetricians AND stress management
16. maintaining professionalism AND obstetrics
17. professionalism AND obstetrics
18. Intrapartum AND death AND Obstetrician
19. Intrapartum AND death AND support
20. Maternal death AND obstetrician
21. Mindfulness AND obstetrics
22. Adverse event AND psychological outcomes
23. Debriefing AND obstetrician AND burnout
24. Balint group AND obstetricians
25. Burnout AND obstetrics
26. Employee Assistance Programme AND obstetricians
27. Occupational health AND obstetricians

Chapter 6: Supplementary Material

Staff- wellbeing at Work Questionnaire

CUMH Staff Well-being at Work

Introduction

Thank you for participating in this research which aims to investigate staff well-being in the CUMH.

This is a questionnaire study that will take approximately 10-15 minutes to complete.

Some basic demographic detail is necessary to aid with analysis.

Over the previous 6 months a number of support tools were implemented in the labour ward. These have since been discontinued. However, we are still interested in your feedback on these support tools, as well as their impact on your well-being at work. This questionnaire is similar to the questionnaire you completed 6 months ago, with additional questions regarding your thoughts on the support tools and any suggestion you may have.

We will ask you to make your own unique code– this is to enable us to link the questionnaires to the one you filled out 6 months ago, while keeping your answers anonymous. The code will comprise of the first three letters of your mother's maiden name and the first 4 digits of your own date of birth. All information provided will be kept confidential.

Your participation is entirely voluntary and you can withdraw from participating at any time.

If you have any questions or concerns about this study please contact:

Karen McNamara (SpR/ Clinical Research Fellow)
Email: Karen.mcnamara@ucc.ie

OR
Dr Keelin O'Donoghue (Consultant Obstetrician/ Gynaecologist)

Code (1st 3 letters of mother's maiden name and 1st 4 digits of your date of birth):
Age:
Gender:
Position:
Number of years work experience:

CUMH Staff Well-being at Work

1. Did you attend the R&R&R sessions? If not, why not?

2. Did you find the R&R&R meetings beneficial? Please give reasons for your answer.

3. Did you find the ideas expressed in the “5 Moments of Head Hygiene” poster and card beneficial? Please give reasons for your answers.

4. Do you have any suggestions on other support tools that you would like to see being implemented in the labour ward?

Head Hygiene Poster

RCPI Survey following attendance at the Applied Drama Workshops

Evaluation of "An Approach to Caring and Coping" training workshop

You are invited to take part in an evaluation of the "An Approach to Caring and Coping" training workshop. This evaluation study is carried out as a collaboration between the Royal College of Physicians of Ireland (RCPI), University College Cork (UCC) and Féileacáin.

Why is this evaluation performed?

The RCPI continuously strives to improve the quality of training provided. Therefore, this evaluation is carried out in order to harness your feedback on the content, mode and perceived benefits of this training workshop. We are also interested in your opinion on any changes that could be made to the workshop.

What is expected as a part of the evaluation?

This evaluation consists of a short questionnaire with multiple option as well as open ended questions to assess your feedback on the workshop and on skills gained. We are also planning on conducting follow on interviews at a later stage. More details on this are on the last page of this questionnaire.

Is it anonymous?

Yes, the evaluation is completely anonymous, you are not asked to provide any identifiable information. All analyses will be performed after all trainees take part in the training. Furthermore, any findings from the study will be reported on aggregate level. Your participation is entirely voluntary and should you choose not to complete this form, it will not have any effect on your training.

How will the findings be used?

The findings from this evaluation will be fed back to the Education department of the RCPI for consideration of future course content and educational and support needs. It is also envisaged that the findings will be published in a peer reviewed journal or conferences.

Informed consent

The completion of the questionnaire is considered as your consent to participate in the evaluation.

Who should I contact if I have any questions?

If you have any questions or would like to get more information on this evaluation, please don't hesitate to contact Dr Lucia Prihodova, RCPI Research manager at research@rcpi.ie

Thank you for taking the time to read this information leaflet.

On behalf of the team,

Prof Chris Fitzpatrick and Dr Keelin O'Donoghue

1. How many years have you worked in Obstetrics?
a. <5 years b. 5-10 years c. >10 years
2. What is your sex?
a. Male b. Female c. I'd rather not say
3. Have you previously received any formal training on caring for families experiencing stillbirth?
a. Yes. Please explain: b. No
4. **Have you previously received any formal training on caring for families dealing with intrapartum death?**
a. Yes. Please explain:

b. No

5. Have you been directly involved in an intrapartum death or an intrapartum event-related neonatal death?

a. Yes, once

b. Yes, more than once

c. No

6. Have you been present at a delivery where the baby died during or shortly after birth?

a. Yes, once

b. Yes, more than once

c. No

7. What type of intrapartum death was this? (Tick all that apply)

a. Expected and unpreventable (e.g. Lethal fetal abnormality)

b. Unexpected and largely unpreventable (e.g. Placental abruption, cord prolapse, shoulder dystocia)

c. Unexpected and potentially preventable (e.g. Hypoxic ischaemic encephalopathy, intrapartum sepsis)

8. Have you had to diagnose stillbirth?

a. Yes, once

b. Yes, more than once

c. No

9. Have you had to manage stillbirth, including postnatal review?

a. Yes, once

b. Yes, more than once

c. No

10. What type of stillbirth was this? (Tick all that apply)

a. Expected and unpreventable

b. Unexpected

11. Prior to today's training workshop, how confident were you in following:

a. Breaking bad news

(1)	(2)	(3)	(4)	(5)
Not confident at all	Quite unconfident	Neither confident nor unconfident	Quite confident	Very confident

b. Communicating clearly with the family when breaking bad news

(1)	(2)	(3)	(4)	(5)
Not confident at all	Quite unconfident	Neither confident nor unconfident	Quite confident	Very confident

c. Communicating empathetically with the family when breaking bad news

(1)	(2)	(3)	(4)	(5)
Not confident at all	Quite unconfident	Neither confident nor unconfident	Quite confident	Very confident

d. Recognising the emotional needs of the family

(1)	(2)	(3)	(4)	(5)
Not confident at all	Quite unconfident	Neither confident nor unconfident	Quite confident	Very confident

e. Recognising your own emotional responses

(1)	(2)	(3)	(4)	(5)
Not confident at all	Quite unconfident	Neither confident nor unconfident	Quite confident	Very confident

f. Supporting your colleagues

(1)	(2)	(3)	(4)	(5)
Not confident at all	Quite unconfident	Neither confident nor unconfident	Quite confident	Very confident

12. Following today's training workshop, how confident are you in following:

a. Breaking tragic news

(1)	(2)	(3)	(4)	(5)
Not confident at all	Quite unconfident	Neither confident nor unconfident	Quite confident	Very confident

b. Communicating clearly with the family

(1)	(2)	(3)	(4)	(5)
Not confident at all	Quite unconfident	Neither confident nor unconfident	Quite confident	Very confident

c. Communicating empathetically with the family

(1)	(2)	(3)	(4)	(5)
Not confident at all	Quite unconfident	Neither confident nor unconfident	Quite confident	Very confident

d. Recognising the emotional needs of the family

(1)	(2)	(3)	(4)	(5)
Not confident at all	Quite unconfident	Neither confident nor unconfident	Quite confident	Very confident

e. Recognising your own emotional responses

(1)	(2)	(3)	(4)	(5)
Not confident at all	Quite unconfident	Neither confident nor unconfident	Quite confident	Very confident

f. Supporting your colleagues				
(1)	(2)	(3)	(4)	(5)
Not confident at all	Quite unconfident	Neither confident nor unconfident	Quite confident	Very confident
13. To what degree did today's training workshop cover the following attributes needed when caring for families experiencing stillbirth:				
a. Self-awareness				
(1)	(2)	(3)	(4)	(5)
Too little	Little	Just right	A lot	Too much
b. Authenticity				
(1)	(2)	(3)	(4)	(5)
Too little	Little	Just right	A lot	Too much
c. Your own emotional responses				
(1)	(2)	(3)	(4)	(5)
Too little	Little	Just right	A lot	Too much
d. The role of verbal communication				
(1)	(2)	(3)	(4)	(5)
Too little	Little	Just right	A lot	Too much
e. The role of nonverbal communication				
(1)	(2)	(3)	(4)	(5)
Too little	Little	Just right	A lot	Too much
f. Active listening				
(1)	(2)	(3)	(4)	(5)
Too little	Little	Just right	A lot	Too much
g. Building of rapport				
(1)	(2)	(3)	(4)	(5)
Too little	Little	Just right	A lot	Too much
h. Building of resilience				
(1)	(2)	(3)	(4)	(5)
Too little	Little	Just right	A lot	Too much

14. How would you rate the following aspects of the training workshop:

a. The mode of delivery (simulation)

(1)	(2)	(3)	(4)	(5)
Very poor	Poor	Average	Good	Very good

b. The length of the training

(1)	(2)	(3)	(4)	(5)
Very poor	Poor	Average	Good	Very good

c. The setting of the training

(1)	(2)	(3)	(4)	(5)
Very poor	Poor	Average	Good	Very good

d. The facilitators

(1)	(2)	(3)	(4)	(5)
Very poor	Poor	Average	Good	Very good

e. The stories used

(1)	(2)	(3)	(4)	(5)
Very poor	Poor	Average	Good	Very good

f. The relatability of the training to practice

(1)	(2)	(3)	(4)	(5)
Very poor	Poor	Average	Good	Very good

g. Ability to actively participate in the training

(1)	(2)	(3)	(4)	(5)
Very poor	Poor	Average	Good	Very good

h. Clarity of learning points

(1)	(2)	(3)	(4)	(5)
Very poor	Poor	Average	Good	Very good

15. Would you recommend todays' workshop to your colleague?

a. Yes

b. No

16. Please provide one positive comment and one point for improvement on the training workshop

Positive comments:

Points for improvement:

17. Do you have any other comments or feedback on the training workshop?

Thank you for your feedback.

If you were affected by any of the issues discussed at the workshop or this questionnaire, please contact RCPI Physician Wellbeing Programme at +353 1 863 9700 or wellbeing@rcpi.ie .

Feedback from RCPI Post Workshop Comments

January Workshop Written Feedback

Participant 1: Positive Comment - No PowerPoint. Points for Improvement: Need comfortable clothes for the day

Participant 2: Positive Comments - a welcome change from didactic lectures, a fresh approach. No points for improvement

Participant 3: Positive Comments - very good and active approach, number of participants and facilitators are just right. No points for improvement

Participant 4: No comments

Participant 5: Positive Comment - I reckon the workshop helps to put ourselves in the patients position sometimes which makes us better clinicians. No points for improvement

Participant 6: Positive Comment - not heavy in terms of content. Point for improvements - more focused on delivery of tragic news needed.

Participant 7 - positive comment - limited no of participants making everyone's participation more obvious. Points for improvement - don't stop, keep on doing such a course. Other comments - a lovely and new way of understanding different mechanisms of expressions and its impact which is long lasting and will try to use that in real life as well

Participant 8 - positive comment - Interactive and fun. No other comments

Participant 9 - no comments

February Workshop Written Feedback

Participant 1 - other comments - should do these days more often

Participant 2 - positive comment - the approach was so non- patronising and acknowledging of our experiences. Other comments - really enjoyable, definitely the best study day we have had.

Participant 3 - Positive comment - excellent day

Participant 4 - positive comment - excellent and entertaining at the same time, very eye opening

Participant 5 - positive comment - enjoyed the acting very much

Participant 6 - positive comment - excellent, enjoyable, alternative

Participant 7 - positive comment - excellent content, nice to have training not lecture based or (something) structure. Points for improvement - should also be done in (something) situations

Participant 8 - positive comment - friendly and non-intimidating, points for improvement - less focus on acting ability

Participant 9 - positive comment - different way of looking at things. Points for improvement - some very emotive language, topics when people may have experienced it personally - perhaps a (something) this was to be discussed

Participant 10 - comments - for facilitators to be aware that some doctors have experienced pregnancy loss/ stillbirth directly/personally. I.e. have had a bereavement (qs 13-16 missing- waiting for lucia to send on the rest so there may be more here)
Participant 11 - positive comments - very interactive, brought me out of my confidence zone. Points for improvement - at times explaining resilience

Participant 12 - no comments

March written feedback

Participant 1 - Positive comment - Phil and Jenny are fantastic teachers, they were encouraging and full of good tips. Points for improvement - there should be more than one day over the 5 years of HST. Other comments - brilliant day

Participant 2 - Positive Comments - active participation in learning by actions rather than didactic methods. Points for improvement - bring the activities more around to situational use i.e. summarise more. Other comments - thoroughly enjoyable

April Written Feedback

Participant 1 - positive comments - Phil and Jenny were enthusiastic, genuine and engaging. Other comments- thank you very enjoyable day.

Participant 2 - positive comments - good interaction. Point for improvements - more clear goals

Participant 3 - positive comments - really enjoyable interactive and helpful day, challenging in a good way, pushed out of comfort zone. Points for improvement - I think this type of workshop would be very useful for self-care/ peer support. I think we should have this sort of training every year to help communicate our own difficulties and relieve stress. Considering what is stressful and emotionally draining

job we have, there is not enough support for us. Other comments- more like this please, great day.

Participant 3 - positive comment - excellent and really interesting, engaging

Participant 4 - positive comment - active workshop, no boring presentations, easy to apply knowledge and skills. Points for improvement - inclusion of more anger scenarios, include ability to empathise with anger as a stage of grief. Other comments- thank you.

Participant 5 - positive comments- fun day with colleagues, debrief session with difficulties in our jobs. Points of improvement - there was a writing exercise and the point of this was unclear. More techniques in breaking bad news would be helpful

Participant 5 - it's a workshop with a difference - great trainers help us to explore our coping and caring qualities. Points for improvement - one page summary to take home. Other comments- keep it as part of the HST curriculum definitely.

Participant 6 - points for improvement - awareness of emotional impact of some of the scenarios and reliving or previous traumatic events

May workshop feedback

Participant 1 - very active and enjoyable, felt at ease despite feeling out of my comfort zone. Points for improvement - one or two short breaks to break up the day

Participant 2 - excellent facilitators, welcoming and supportive. Non-judgemental. Liked the variety of the exercises. Other comments - One of the best aspects of the day was being able to engage with my colleagues on a "fun" rather than "professional " basis. There is huge benefit in this

Participant 3 - Very enthusiastic, capable, engaging facilities. Far more enjoyable than I had expected. Points for improvement - I feel stillbirth is always the scenario for breaking bad news in Obstetrics whereas there are very many other equally challenging negative scenarios in O and G.

Participate 4 - points for improvement - It should be focused on speciality and especially on sessions on how to improve the breaking bad news skills. Other comments - I found a lot of the activities as time wasting as those were not relevant

Participant 5 - Facilitators encouraged active participation without making people feel too uncomfortable. Points for improvements - could be slightly shorter?? Harder to remain focused in afternoon. Other comments - surprisingly positive learning experience

Participant 6 - Positive- Very energetic lectures. Points for improvement- to listen/watch interviews with parents

Participant 7 - Very therapeutic to discern adverse events with my colleagues. Points to improve - I'm not sure how to apply this to my practice - some practical instruction would be great. Other comments - very different to what we usually do and hopefully represents a move to change the culture of "oh we did it too, it'll build character"