

**National and International review of
literature on models of care
across selected jurisdictions
to inform the development of a
National Strategy for Maternity Services
in Ireland**

by

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Number of Births



Maternal age 35+



24% of women who gave birth in 2012 in Ireland were born outside of Ireland



85% of pregnant women in the Netherlands started antenatal care with the community midwife

6% of women in Canada received their antenatal care from a midwife



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Data sources: see end of document

1. Introduction

Having a baby is one of the most important events in life and the provision of high-quality obstetric and maternity care is a goal of every healthcare system in the world. Since 1954, all pregnant women resident in Ireland are entitled to receive public maternity care under the Maternity and Infant Scheme. This system has evolved over the last 50 years to become more hospital-based and today more than 99% of births take place in the 19 maternity hospitals throughout the country. About 70,000 babies are born each year and there is an imperative to ensure the maternity system plays its part in providing the best possible start in life for each one of them, as well as enabling the best possible experience for mothers.

The present scoping review presents an analysis of selected jurisdictions in respect of their maternity systems, including obstetrics and gynaecology and neonatal services, and highlights similarities and differences in the models of care provided in Ireland. The countries included are Australia, Canada, New Zealand, the United Kingdom (UK)^{*} and the Netherlands. Findings from these countries are highlighted in respect of areas of commonality and divergence with the Irish system. With the exception of the Netherlands, each country has published a national strategic approach to their maternity services since 2008 and can therefore provide some insights to guide such a development in Ireland.

This review takes place in the context of significant demographic and epidemiological changes in Ireland, service delivery challenges and an increasing evidence base to inform decision-making in developing optimum approaches to care. The number of births each year increased significantly from the early 2000s and while there has been a slight decrease in the last two years, this created significant pressures on the maternity system, particularly in the context of substantial financial constraint. In addition, there has been an increase in clinical activity, as well as an increase in medical advances, particularly in areas of pre-conceptual care and fertility treatments (ESRI, 2013a). Mothers in Ireland are older now than they have ever been and almost one-third of women giving birth are now aged 35 years or older (ESRI, 2013a) – the highest proportion across all countries included in this review. This brings with it additional challenges. In 2012, almost 1 in every 4 mothers who gave birth in Ireland were born outside the country and there is a growing literature drawing attention to the importance of ensuring their needs are fully met.

The prevalence of obesity in Ireland, similar to elsewhere, has increased exponentially and Laythe and Turner (2013) report that in Ireland, 16% of women were obese 9 months after the birth of their first child. These findings are reflected in other countries. For example, a study in England found that nearly one-fifth of women booking in for antenatal care were obese (Centre for Maternal and Child Enquiries, 2010a). Pregnant women who are obese face higher risks compared to those who are of normal weight. The risks have been calculated by Bautista-Castaño *et al* (2013), who found that such women were more than twice as likely to acquire both gestational diabetes mellitus and gestational hypertension, and were more than three times as likely to have preeclampsia than women of normal weight. They are also more than twice as likely to have a caesarean section (O'Dwyer *et al*, 2013). Lifestyle issues, such as alcohol and smoking, have consequences for the wellbeing of both the mother and the infant, and the *Growing Up in Ireland* study found that almost 20% of women smoked at some time during their pregnancy (Williams *et al*, 2010). These are all significant threats to the wellbeing of the mother and baby, and place additional pressures on the maternity system.

* The United Kingdom (UK) as a whole is sometimes referred to and other times its constituent parts – England, Scotland, Wales and Northern Ireland – are referenced.

These changes have taken place in parallel with increases in the level of interventions, including substantial increases in caesarean sections and other forms of instrumental deliveries. While some increases may be explained, in part by the demographic and epidemiological changes outlined above, many concerns have been raised. These interventions can result in additional complications for mothers and babies, and have a significant cost to the health services. There is also, in parallel, a vibrant literature that views childbirth as a normal physiological event as opposed to 'only normal in retrospect'. Consequent on that, there is a growing emphasis on taking account of women's experiences, of the type of care they want and of the way in which they want to be treated. This has been acknowledged in strategic developments internationally, particularly in the UK and New Zealand, but more recently in Australia which has underpinned its *National Maternity Services Plan* with 'a wellness paradigm'. Within the plan (Commonwealth of Australia, 2011, p. 25), it states that:

'This wellness paradigm for pregnancy and childbirth acknowledges that pregnant women are predominantly well because pregnancy and birth are normal physiological life events. Clinical decisions about medical intervention should be informed by this understanding.'

This review also takes place in the context of a number of reports (KPMG, 2008) and investigations into serious incidents and adverse events within the maternity services in Ireland (Harding Clarke, 2006; HSE, 2008) and elsewhere (Garling, 2008; Douglas *et al*, 2001). The information presented in these provides a deep and considered insight into maternity services and in doing so highlights weaknesses within the system that require redress. Common areas of concern within these reports in Ireland include variation in clinical and corporate governance; failure to adhere to clinical guidelines; poor safety standards; poor communication; lack of service user participation; workforce issues; and poor data systems in place. In response to similar concerns, many jurisdictions have commenced a more strategic approach to developing and implementing safer systems that are of high quality for the purpose of ensuring good outcomes.

Other countries are also grappling with workforce challenges, particularly in rural and remote areas. This is especially the case for Canada and Australia, where service configuration and different models of care have been identified as mechanisms for creating sustainable maternity services. These different models include a shift towards midwife-led care for women at low risk of complications and this is coherent with developments that have taken place previously in New Zealand and the UK. This shift is also coherent with the literature that identifies positive outcomes for this group of women, including lower levels of interventions and higher satisfaction rates, without any compromise to the safety of the mother or infant. It is also clear, however, that there are as many permutations and possibilities in terms of models of care as there are jurisdictions and there is no single approach that is common across all. For women at higher risk, the availability of obstetricians and gynaecologists, as well as other specialist services, is critical to high-quality care and the safety of mothers and babies.

Differences outlined above impact on the organisation and delivery of services and further consideration is key to the main characteristics of the maternity systems across jurisdictions considered in this review.

Structure of report

This report is presented in 12 chapters. *Chapter 2* presents an overview of the methodology used to conduct this review; *Chapter 3* on the main characteristics of maternity, obstetrics and gynaecology, and neonatal systems across different jurisdictions; *Chapter 4* on obstetric risk and outcomes; *Chapter 5* on safety and quality; *Chapter 6* on staffing and training; *Chapter 7* on person-centred care; *Chapter 8* on costs; *Chapter 9* on information; *Chapter 10* on governance of maternity services, including obstetrics and gynaecology; *Chapter 11* on strategic approaches and responses across

jurisdictions (including an analysis of the plans from the 7 jurisdictions under review); and *Chapter 12* on areas for consideration in developing a National Strategy for Maternity Services in Ireland. The report concludes with a comprehensive list of *References* used to inform this international review of literature across jurisdictions. The *Appendix* provides additional statistics and sources of information.

2. Methodology

This review was carried out between June and August 2014 and the approach adopted drew on a scoping review methodology. This approach was selected as the most suitable method for this study because, by definition, it is used *'to map rapidly the key concepts underpinning a research area and the main sources and types of evidence available, and can be undertaken as stand-alone projects in their own right, especially where an area is complex or has not been reviewed comprehensively before'* (Mays *et al*, 2001, p. 194).

The review was used to map the extent, range and nature of research activity as it related to maternity services, including obstetrics and gynaecology and neonatology. The purpose of the review was to highlight key areas for consideration in the development of a maternity strategy rather than focusing in detail on any one area. The review was guided by those areas outlined in the Request for Tender, with a particular focus on models of care as they impacted on:

- a. patient safety;
- b. patient-centredness;
- c. quality assurance;
- d. accessibility;
- e. cost;
- f. training and staffing implications;
- g. governance.

The review followed the main steps outlined by Arksey and O'Malley (2003), including (*see Table 1*):

1. identifying the key questions, which were broad in nature;
2. identifying topic-relevant studies, Government reports and other grey literature through a search that focused on a set of indicative countries (New Zealand, Australia, Canada, United Kingdom, the Netherlands and Ireland);
3. selecting studies using a set of inclusion criteria;
4. reviewing the sorted and sifted data through the identification of key themes;
5. analysing the results through thematic analysis and reporting findings descriptively and numerically.

Table 1: Broad approach to the identification of peer-review and grey literature

Broad area	Indicative areas included
<p>Peer-reviewed literature Searches run on PubMed, EBSCO host and the Social Science Information Gateway in respect of the following search terms: maternity, gynaecology, gynecology, obstetrics, gyn*, maternal, mater*, maternity strategy, pregnancy.</p> <p>Secondary sources were also identified from references in papers and documents.</p>	<p>Safe, safety, adverse events, Patient centre*, woman centre*, vulnerable, immigrant, disability, inequalities, satisfaction, experiences</p> <p>Quality, quality assurance, continuous quality, standards</p> <p>Access, accessibility, utilisation, utilise, use</p> <p>Workforce, obstetrician, obstetric-led, midwives, midwife-led, midwife, staff, skill-mix, professional development, continuous professional development</p> <p>Accountability, governance, structure</p>
<p>Grey literature searches were conducted using the Worldwide Web through the use of search engines 'Visvismo', 'Altavista', and 'Goggle'.</p>	<p>New Zealand, Australia, Canada, United Kingdom, the Netherlands and Ireland</p>
<p>Databases/websites with directed searches, to government websites, statistical agencies and professional organisations within each country.</p>	<p>Cochrane Library, NIVEL, government websites, WHO, OECD, Euro-Peristat, Royal College of Obstetricians and Gynaecologists across jurisdictions, Midwifery representative bodies across jurisdictions</p>

Main exclusions

Main focus on clinical treatment; written in a non-English language.

Main inclusions

If relevant to strategic development and models of care; provides information on one of the selected countries; written in English; predominantly published since 2008.

Total included in review

In total, some 400 papers and reports are included in this review and these are mainly drawn from the jurisdictions under examination.

The report is intended to provide the reader with an overview of key issues arising in the current literature relevant to models of care. While drawing on systematic reviews of the literature to highlight findings emerging, this review is limited by the time and scale of the areas included. Due to these limitations, this analysis of literature is not a systematic review in itself and the focus has been on breadth rather than depth. Where in-depth information on any single issue is required, a more detailed examination of that area should be conducted.

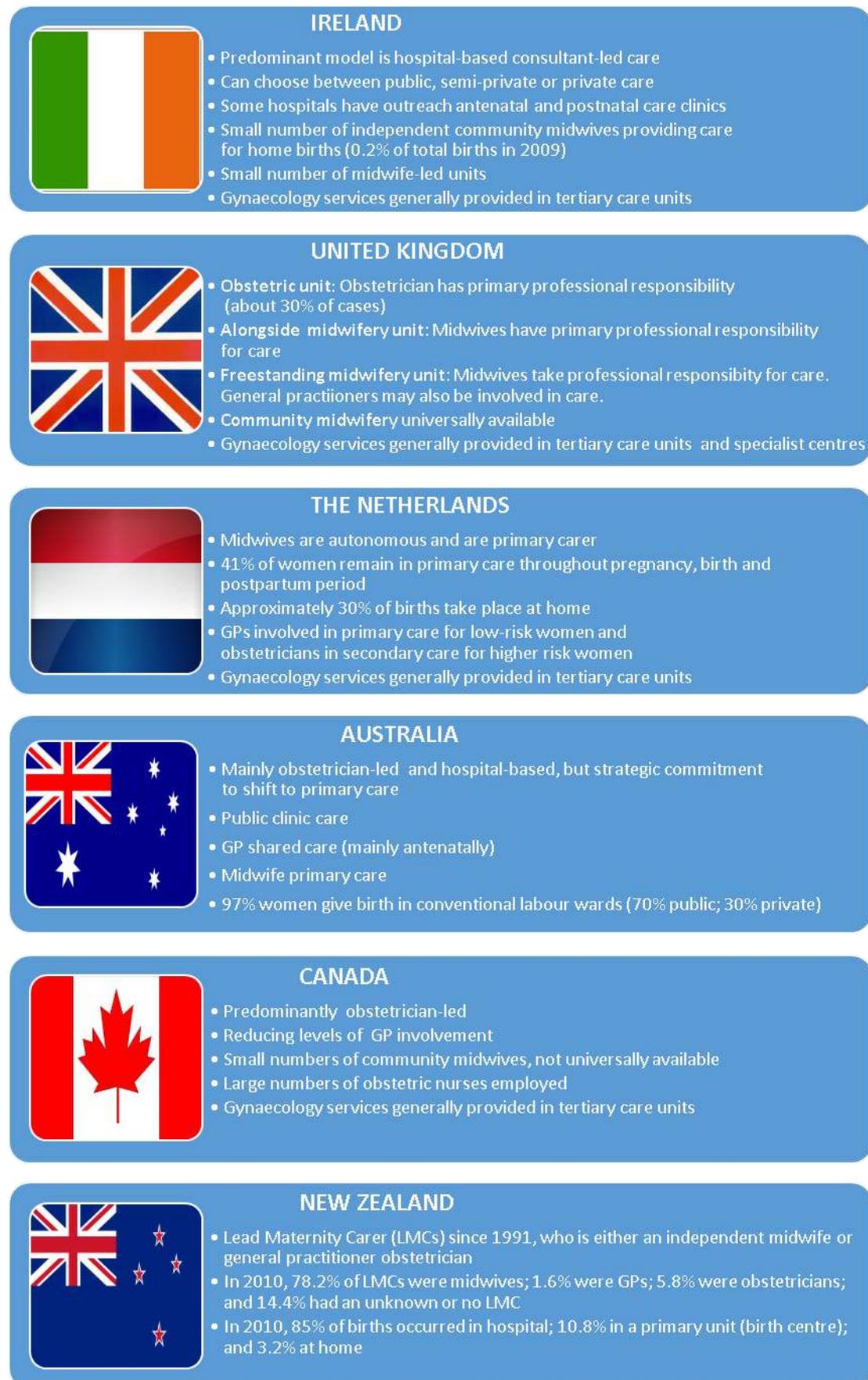
3. Main characteristics of maternity, obstetrics and gynaecology, and neonatal systems across jurisdictions

All jurisdictions included in this review offer publicly funded care during the antenatal, intranatal and postnatal period. In the Netherlands, for example, insurers are legally required to provide a standard benefits package that includes general practitioners, hospitals and midwives and maternity care (Klazinga, 2008). In some countries, particularly Ireland and Australia, private care is a feature for a significant proportion of women. In Ireland, for example, the percentage of women booking private obstetrician care in 2010 was 24%, although this represented a decrease from 33% over the 6-year period from 2003 (Lutomski *et al*, 2014). Different legislative approaches have been used to position both place of birth and the main carer, with the Nurses Amendment Act introduced in New Zealand in 1991 being particularly influential in introducing the concept of Lead Maternity Carer. In 2010, 78% of lead maternity carers were midwives and about 14% of births (birth centre: 10.8%; home: 3.2%) took place out of hospital. The jurisdiction with the highest number of births taking place at home is the Netherlands (30%), with all others reporting less than 3% (Begley *et al*, 2011). Ireland has one of the lowest percentages of home births, at 0.2% (176 home births attended by independent domiciliary midwives in 2012 – ESRI, 2013a).

While the Netherlands is the only jurisdiction to have a significant number of home births, there are a number of different approaches to the provision of care, including birth centres (Australia, Canada), midwife-led units (New Zealand, Ireland) standalone units and alongside units (UK), although the extent to which these are available is determined by the system within which the service takes place. In Ireland, for example, there are only a handful of midwife-led units, while in the UK 99% of women have access to both an obstetric-led unit and a midwife-led unit within a 60-minute drive of their home. While almost all births in Australia currently take place in hospital, there is a strategic commitment to increasing the number of midwife-led units and birth centres in order to support choice for women.

There are two main professionals involved in the care of women – midwives and obstetricians. In some jurisdictions, obstetricians have overall professional responsibility even in situations where the care is provided by midwives and this is the case in Ireland, where, as HIQA (2013) notes, the care is predominantly consultant-led and hospital-based. In the Netherlands, Canada and New Zealand, midwives are autonomous and only refer to an obstetrician in the case of complications arising. In New Zealand, midwives work in group practices and this approach to care is being emulated in Australia in an approach to care called ‘caseload care’. This type of care is characterised by midwives arranged in formally recognised group practices of four midwives, with a named midwife who provides leadership in midwifery care. This midwifery model is not limited to care deemed to be at low risk, but is only available on a limited geographic basis (Tracy *et al*, 2014). Key characteristics relevant to each jurisdiction are presented in Figure 1.

Figure 1: Key characteristics of maternity systems across jurisdictions



Organisation of care across the maternity care pathway

Pre-conceptual care

Pre-conceptual care may refer to a range of interventions, from the use of folic acid to public health interventions to reduce the levels of smoking, alcohol and obesity before getting pregnant. Agha *et al* (2014), in a systematic review of behavioural interventions in pregnancy to reduce gestational weight gain (GWG) pre-conceptually, found that they may be effective in reducing GWG in obese women without co-morbid conditions, but not overweight or morbidly obese women.

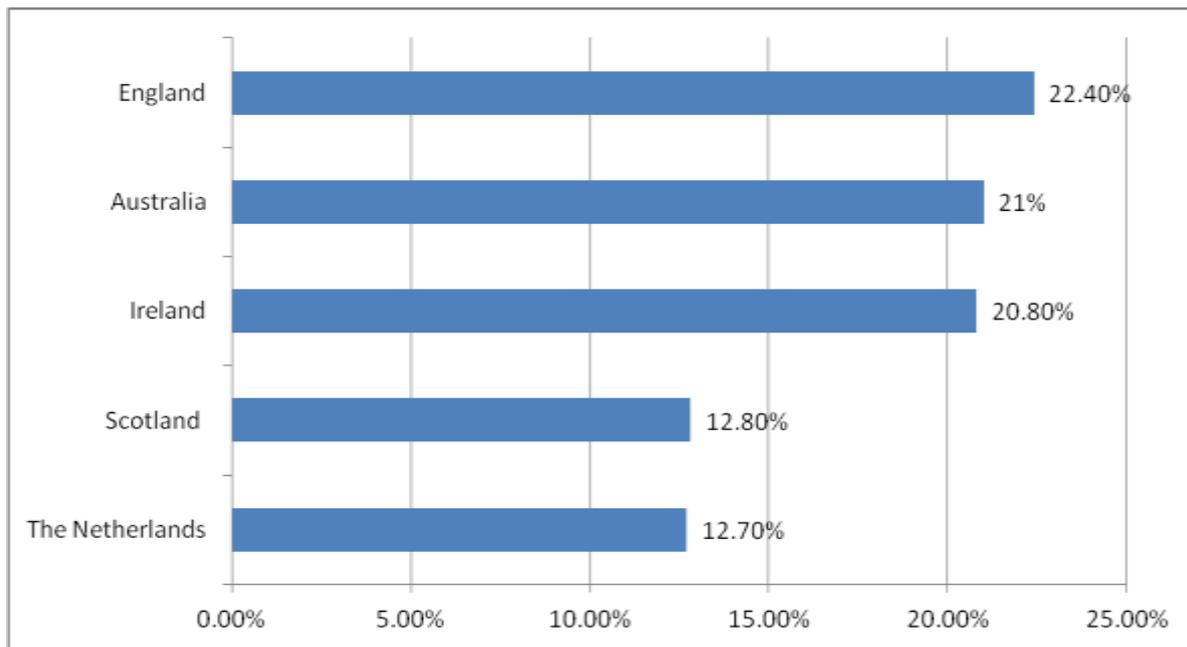
Within the pre-conceptual period, however, there is a strong focus on interventions to treat infertility and for this group of women, irrespective of the country in which it is provided, this care is provided by medical specialists. Infertility is an important health issue worldwide and it is estimated to affect an approximately 9% of couples (Boivin *et al*, 2007). The current use of assisted reproductive technology (ART) is not considered to be sustainable and increasingly there are political decisions in some countries to limit funding and therefore accessibility to treatment (Ombeleta, 2007). It has been estimated that the need for assisted reproduction services (ARS, including in-vitro fertilisation and/or intra-cytoplasmic sperm injection) seems to be 1,500 cycles per annum per million population.

It has been noted that the aim of infertility treatment is not only to achieve a successful pregnancy, but to offer the parents a healthy and normal child, a twin pregnancy being regarded as an adverse outcome (Land and Evers, 2003). In 2011, there were 66,347 treatment cycles undertaken in Australia and New Zealand. Of these, 23.1% resulted in a clinical pregnancy and 17.5% in a live delivery (i.e. the birth of at least one liveborn baby). There were 12,623 babies (including 12,443 liveborn) born following ART treatment (National Perinatal Epidemiology and Statistics Unit, 2011). A population-based survey in the UK noted that more women of higher social status and education reported fertility problems, but there was no clear trend in help-seeking, investigations or treatments for infertility by social status and education level (Morris *et al*, 2011). Hampton *et al* (2013) highlights the potential to increase fertility-awareness knowledge, attitudes and practices of women seeking fertility assistance through educational interventions.

Early pregnancy care

There is a general consensus that care in pregnancy should be early, ideally in the first trimester, and the timing of the first antenatal visit has become the accepted standard for antenatal care (DCYA, 2012). While it is difficult to collect data about the first antenatal visit, it has been estimated that between 2% and 36% of women begin care after the first trimester (Euro-Peristat, 2013). An analysis of the findings in respect of women who present for their first antenatal visit has been conducted by Euro-Peristat (2013) and shows that in the context of European countries included in this review, the Netherlands has the lowest level of starting antenatal care in the second or third trimester of pregnancy (*see Figure 2*). The national core maternity indicators for Australia were used to identify the level for Australia (Australian Institute for Health and Welfare and National Perinatal Epidemiology and Statistics Unit, 2013).

Figure 2: Distribution of initiation of antenatal care after the first trimester of pregnancy



Data in graph drawn from *European Perinatal Health Report (2013)* (2010 data) for European countries and for Australia from the 2011 report: *Australia's Mothers and Babies 2009: Perinatal Statistics*.

Experiences of crisis pregnancy

It is estimated that approximately half of all pregnancies across the world are unplanned and reducing the number of unplanned or unwanted pregnancies is a global challenge. A recent study on women's experiences of birth in the UK showed that while a large proportion of women (74%) indicated their pregnancy was planned (Redshaw and Heikkila, 2010), about one in four pregnancies were not. The *Irish Contraception and Crisis Pregnancy Study 2010* (McBride *et al*, 2010) reported that approximately 1 in every 8 pregnancies (or 13% of all pregnancies) experienced by adults surveyed could be considered 'a crisis pregnancy'. The findings show that the most common reasons why pregnancy was viewed as a crisis in 2010 was 'not planned' and 'too young'. Ireland differs from other jurisdictions included in this review since the options for not continuing with an unwanted pregnancy are more limited than elsewhere, although a substantial number of women travel to the UK to have a termination of pregnancy. The HSE Crisis Pregnancy Programme (McBride *et al*, 2010) noted that since 2001, the number of women giving Irish addresses at UK abortion clinics has declined by 40%, from 6,673 in 2001 to 3,983 in 2012 – a rate of 4.0 per 1,000 women aged 15-44 in 2012. The Netherlands has also been identified as a place where Irish women go to have an abortion, although the exact numbers are not yet available. Services for women, pre- and post-termination of pregnancy, are available in other jurisdictions including the Netherlands, the UK and Australia.

Early miscarriage

The *National Miscarriage Misdiagnosis Review* was published in 2011 (HSE, 2011) and highlighted difficulties arising in the use of ultrasound to diagnose miscarriage. Recommendations were made across a number of areas, including development of guidance, facilities and equipment, service provision, education, training and accreditation, and support for patients. A report on the implementation of the recommendations (HSE, 2012) presented an overview of compliance with the recommendations made in the 2011 report. Almost all 19 hospital sites were found to be compliant with the recommendations made in the review, including in respect of development of guidance, facilities and equipment, service provision, education, training and accreditation, and support for

patients. The Early Pregnancy Services Project resulted in national clinical guidelines on ultrasound diagnosis of early pregnancy loss and the management of miscarriage.

Antenatal care

The provision of care in the antenatal period differs across jurisdictions according to the main professional providing the service. In the Netherlands, most primary care midwives work in group practices and they are the primary care provider and gatekeeper (although some GPs may provide part of the care during pregnancy and childbirth). This is similar to the situation in New Zealand, where in 2010, 72% of Lead Maternity Carers (LMCs) were midwives. Brown *et al* (2014) identify four broad approaches in Australia, as follows:

- **Public clinic care:** Antenatal care provided by rostered doctors and midwives at a public health hospital.
- **Midwife clinic care:** Similar to public clinic care, but all visits in pregnancy are with midwives unless referral to a specialist obstetrician is indicated.
- **GP shared antenatal care:** Provided to women by a local community-based GP, with scheduled visits to a public health clinic at key points in the pregnancy.
- **GP primary care:** Where all antenatal care is provided by community-based medical practitioners (mainly GPs).
- **Midwife primary care:** Antenatal care is provided by a designated midwife/midwife team as lead care providers, with referral to a hospital-based obstetrician only if necessary.

In the Netherlands, 84.7% of women start their antenatal care with a visit to the community midwife, with the remainder entering antenatal care in secondary or tertiary care due to their high-risk medical and/or obstetric history (Schölmerich *et al*, 2014). Only 0.4% of women are looked after by GPs. De Jonge *et al* (2013) reported that in 2008, one-third of women are referred to obstetrician-led secondary or tertiary care because of risk factors or complications arising. Antenatal care provision in Ireland differs from most other jurisdictions in that almost all antenatal care is under the care of doctors and the level differs according to whether the women opt for public or private care. Those opting for private care have their care provided by a chosen consultant obstetrician; those in a semi-private situation are cared for by a non-consultant qualified obstetrician, while those opting for public care have their antenatal care provided by a team of doctors (including GPs, in a 'shared care' arrangement) led by a consultant (Begley *et al*, 2011). Some hospitals do provide 'outreach' antenatal clinics, but there is no national community midwifery service available.

Canada has a range of different approaches to the provision of care, including the following identified by Martin and Kasperski (2009):

- **Uniprofessional (soft-call):** On-call most of time, attend birth unless signed out.
- **Uniprofessional (hard-call):** Have set on-call time (i.e. day, week or month).
- **Shared on-call:** Call shared between family doctor and midwives, with obstetrician back-up.
- **Late prenatal and intrapartum care:** Receive referral for late prenatal and intrapartum care.
- **Labourist:** Provide intrapartum care only.
- **Multiprofessional team:** Work in clinic with other maternity care providers and allied health professionals, and consult when necessary.
- **Interprofessional:** Work in clinic with other maternity care providers and allied health professionals, and have regular team meetings.

Intrapartum care

Similar to the antenatal period, there are differences in the provision of intrapartum care according to the place of birth, although, as noted earlier, the vast majority of births in each jurisdiction take place in a hospital-based environment. In the Netherlands, more than half of women (52%) were still under the care of their community midwife at the onset of labour, as De Jonge *et al* (2013) report. They also report that while only 3% of multiparous women were referred during labour from primary to secondary care, more than half of primiparous women (57%) were referred, mainly, it was noted, for non-urgent reasons. Support for home births is provided at the level of the system in the Netherlands, where, in the case of an emergency at home, more than 80% of women are in hospital within 45 minutes from the moment a midwife calls an ambulance.

The situation in the Netherlands contrasts with that of Australia, where almost all women are cared for in hospital by midwives during labour, with physicians being ultimately responsible for care and who are generally called to attend births (Malott *et al*, 2009). In 2009, 96.9% of births took place in tertiary maternity hospitals where there are specialist obstetric, anaesthetic and paediatric staff and facilities on-site, available at all times. Only 2.2% took place in a primary maternity unit (birth centre) where there are midwifery services on-site and available at all times, but no medical staff or specialist facilities (Grigg *et al*, 2014). Grigg *et al* note that recent changes to funding arrangements have led the way for more midwife involvement, although they do not have admitting privileges in hospitals. In Ireland, intrapartum care is provided for all women during labour by a team of qualified and student midwives under the supervision of the obstetrician on-call (if attending semi-privately) or the obstetrician (or designated replacement, if attending privately). Begley *et al* (2011) note that management of labour in Ireland is typified by the use of various forms of '*active management of labour*'.

In Canada, intrapartum care is generally supported by obstetric nurses, with the primary maternity care needs of women being met by family physicians and specialists. However, there are significant challenges in maintaining the involvement of family practitioners in maternity care. The percentage of women who received maternity care services in hospitals in 2003-2004 from obstetricians was 81.9%; from family physicians was 14%; and from midwives was 3.3%. More recent figures show that the numbers of nurses (n=13,801) providing care during labour and postnatally within the Canadian maternity system far outweighs the number of midwives (n=700) (Society of Obstetricians and Gynaecologists of Canada, 2008). The Royal College of Physicians and Surgeons of Canada (2010) reports that these nurses care for women and attend almost every birth in Canada, the only exception being births where two midwives are present, although it is also noted that only in occasional circumstances are nurses the *only* healthcare provider present and only when there is no physician or midwife available. Obstetricians in Canada attend over 80% of all births, which the Royal College suggests is an inefficient use of the high-level skills and training of these professionals. In the most remote areas, however, the percentage of women who received services from obstetricians was 47%, family physicians 40% and midwives 11.5% (Martin and Kasperski, 2009). Munro *et al* (2013) report that midwives in Canada are autonomous practitioners and practise in solo or group settings in the community. In 2011, they provided care for approximately 10% of the 43,000 annual deliveries that took place in one province, British Columbia.

In the UK, New Zealand and the Netherlands, midwives are autonomous practitioners and many practise in groups. In 2012 in England, about half (51.5%) of the 671,255 births that took place in hospital took place in a Consultant ward, with the remainder taking place in a Consultant midwife/GP ward (34.2%), midwife ward/other (14%) or GP ward (0.4%) (Health and Social Care Information Centre, 2013). The place of birth was unknown for 11.8%. About 2.8% of births in England took place at home.

Postnatal care

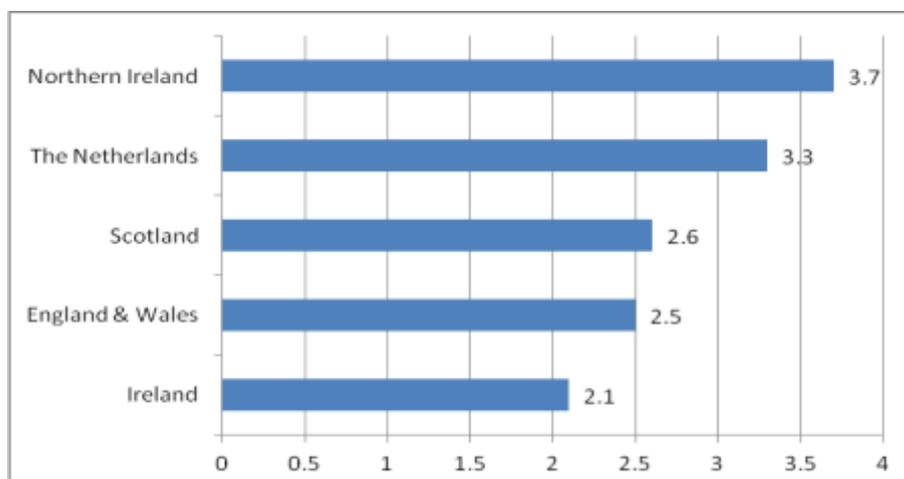
The provision of postnatal care is less diverse than the care provided either antenatally or during labour. Most postnatal care is provided by midwives (UK, the Netherlands, Canada, New Zealand), maternity care assistants (the Netherlands) and public health nurses (Ireland). Family planning services are usually provided by midwives in the Netherlands, New Zealand, UK and Canada (in the latter, midwives have the authority to prescribe from a limited pharmacopeia – Malott *et al*, 2009). In Ireland, women attend their GP at 6 weeks for a check-up of themselves and their baby, while in the Netherlands, the mother may see the midwife for up to 6 weeks. In the UK, midwives can provide care up to 28 days postnatally, although in most cases the care is provided by Health Visitors from the early postpartum period.

Psaila *et al* (2014) conducted a study in Australia on the effectiveness of transition of care from maternity services to child and family health nurse services for women and families. Only 36% of midwives rated the process for transition of care for the majority of women and/or babies as 'effective' or 'extremely effective', while the transition process for women and/or babies identified with at-risk factors for poor physical or mental health outcomes was only rated slightly better, at 40.4%. Comments to explain these negative findings included insufficient or missing individualised data, doubling up of service provision, lack of feedback to midwives from the Child and Family Health (CFH) Service, staffing issues, and system issues of time lag, difficulty in contacting CFH nurse and being actively prevented from contacting CFH nurses if directly concerned about a family.

Neonatal services

There are a number of areas where additional care is required in the perinatal period. These include preterm birth, low birth weight, low Apgar score at birth, resuscitation required and perinatal death, and consequently, the availability of specialised neonatal services are required. Euro-Peristat (2013, p. 98) notes that while about 1%-1.5% of all births are very preterm, these infants account for one-third to one-half of all neonatal deaths; between 5%-10% of survivors develop cerebral palsy, and babies without severe disabilities face risks of developmental, cognitive and behavioural difficulties in childhood at least twice as high as babies born at or closer to term. Figure 3 presents the annual neonatal mortality rate for a number of countries in Europe, including Ireland. (Note that the annual neonatal mortality rate is defined as the number of deaths during the neonatal period (up to 28 completed days after birth) after live birth at or after 22 completed weeks of gestation in 2010, expressed per 1,000 live births that year.) Findings show that Northern Ireland and the Netherlands have higher mortality rates than other countries and this has been identified as a source of concern.

Figure 3: Annual neonatal mortality rate by selected European countries



Data for all countries sourced from Figure 7.4 "Early and late neonatal mortality rates per 1000 live births in 2010", Euro-Peristat 2013 report.

The availability of maternity units with on-site neonatal intensive care (called Level III units) is associated with lower mortality for infants. Euro-Peristat collate data on the percentage of very preterm babies born in the most specialised units as defined by national classifications of levels of care. In 2010, the percentage varied from 65.8 in the Netherlands to 55.0% in Scotland, although data are not available for a number of countries, including Ireland. This area, however, has been subject to recent review by the Health Service Executive (HSE): findings from the review of paediatric and neonatology services by the Clinical Strategy and Programmes Directorate, HSE (2013) draw attention to the limited availability of services in this area and make recommendations for the expansion of a neonatal retrieval service and for the development of a national plan for the delivery of neonatal services. The Directorate notes that the numbers of neonatologists dedicated to providing neonatology services is below what one would expect internationally and recommends the need to put in place a consultant-delivered neonatology service, as well as ensuring appropriately trained nurses and allied health professionals.

Multidisciplinary working

While the models of care across jurisdictions differ over a number of areas, there is some agreement, both within the literature and strategic approaches to maternity systems, that multidisciplinary teamwork is necessary for a safe and high-quality service. Multidisciplinary working, however, can take many forms and a range of terminology, often used to highlight different elements at different levels within the system, has emerged. Examples of terms used are multiprofessional, interprofessional, transdisciplinary, interdisciplinary, interagency and multi-agency (Ndoro, 2014). While each of these is defined by different elements, common issues emerge, particularly in respect of barriers and potential mechanisms that support team-working.

Many authors have focused on the concerns about inconsistent and fragmented health services, where information and knowledge are not shared in a timely way and can result in problems in the provision of care (Psaila *et al*, 2014). Several barriers to effective teamwork have been identified. At the level of the individual, these include excessive caseload, low attendance at meetings, lack of leadership, poor communication, role ambiguity and failure to consider patients' holistic needs (Taylor *et al*, 2013). Teamwork in maternity care services, however, is critical and poor interprofessional and interagency teamwork, along with problems with communication, is consistently implicated in reports on poor maternal outcomes. According to DuPree *et al* (2009, p. 534):

'Failures of communication have been shown to contribute to over 70% of adverse perinatal outcomes.'

These difficulties have been identified in the Irish context and HIQA's (2013, p. 71) investigation into the death of Savita Halappanavar notes:

'Effective multi-disciplinary and multi-professional team working is an essential component of reliable, safe care and the contemporaneous transfer of information between individual professionals and teams – both documented in the notes and verbally – is essential.'

Freeth *et al* (2009, p. 100) identify the elements shown in Figure 4 as important in supporting good teamwork.

Figure 4: Elements required to support good teamwork



Source: Freeth *et al* (2009, p. 100)

System supports

There is, however, a growing awareness that while teamwork and good communication are required at the individual level, there are system-level issues that can support or create barriers to working together. Consequently, commitments to teamwork and collaborative approaches to care are to the fore in maternity care discussions and this is the case across several countries. Schölmerich *et al* (2014) note that the current public debate in the Netherlands emphasizes the need for improved coordination in midwifery and obstetrics, especially between primary and secondary care, and in that context they identified a number of challenges in respect of:

- fragmented organisational structures;
- different perspectives on antenatal health;
- inadequate interprofessional communications.

Schölmerich *et al* (2014) note that there are two main perspectives on how a more coordinated approach can be adopted and these include an organisational design perspective and a relational coordination approach:

- The **organisational design perspective** argues that it is possible to achieve optimal coordination with the right structures, including rules and protocols.
- The **relational coordination perspective** highlights the importance of interprofessional communications within these organisational structures.

Organisational design issues arose in the context of the Savita Halappanavar case, where HIQA (2013) drew attention to the need for:

- operational transfer policies for access to intensive care units (ICU)/high dependency units within the hospital;
- operational policies for the clinical handover of care to intensive care units/high dependency units;
- acceptance policies to be in place, where ICU beds are not available on-site, with an alternative site for access to an ICU bed.

International approaches

Multidisciplinary approaches to the delivery of care can be enhanced by adopting a collaborative approach across professionals and in Canada and Australia such arrangements have been identified as a potential solution to mitigating workforce shortages, as well as improving quality of maternity care for women (Peterson *et al*, 2007). In the Canadian context, it has been noted that a collaborative approach requires maternity providers from different disciplines (and specialties within disciplines) to move from the predominant model of practice centred on referral between providers to one characterised by multidisciplinary collaboration (*ibid*, 2007, p. 880). Such an approach, however, requires commitment, interpersonal skills and teamwork (Waldman *et al*, 2012) and this has been found to be challenging, particularly in rural areas (Peterson, 2007) due to disciplinary differences between care provider groups, including skill sets, professional orientation and funding models. Munro *et al* (2013) note that these interprofessional tensions are exacerbated in geographically isolated rural communities because of:

- physicians' and nurses' negative perceptions of midwifery and homebirth;
- inequities in payment between physicians and midwives;
- differences in scopes of practice;
- confusion about roles and responsibilities;
- a lack of formal structures for supporting shared care practice.

Successful interprofessional collaboration, Munro *et al* (2013) suggest, depend on '[strong, mutually respectful relationships between the care providers and a clear understanding of team members' roles and responsibilities](#)'.

Australia has already gone some way towards meeting these challenges and the Australian National Health and Medical Research Council (2010) has produced national guidance in this area for the purpose of assisting maternity service professionals to put in place and maintain collaborative arrangements at local level. Such an approach, the Council suggests, will ensure that women receive access to appropriate expertise and treatment as the need arises. The following definition of collaboration in maternity care is used to underpin the guidelines (*ibid*, p. 1):

['In maternity care, collaboration is a dynamic process of facilitating communication, trust and pathways that enable health professionals to provide safe, woman-centred care. Collaborative maternity care enables women to be active participants in their care. Collaboration includes clearly defined roles and responsibilities for everyone involved in the woman's care, especially for the person the woman sees as her maternity care coordinator.'](#)

This collaborative approach to maternity care is particularly important for those women and babies whose care requires linkages to specialist services. The same Australian guidelines mentioned above also highlight a number of areas that need to be considered by maternity care providers and hospitals in each care context, including:

- roles and responsibilities;
- shared documentation;

- transfer plans;
- care pathways;
- access to hospitals;
- credentialing/clinical privileging (as appropriate);
- hospital bookings;
- admission status;
- postnatal care;
- competition.

Gynaecology services

While obstetricians can also practise as gynaecologists, in general, these two areas – gynaecological services and those relating to maternity services – are dealt with separately in both the peer-reviewed literature and in strategy. Consequently, while some attention is paid to this area in this review, a detailed analysis has not been undertaken due to the significant differences in issues arising, focus for development and approach to services. Some consideration was given in the KPMG (2008) report to models of care and these were identified as follows:

- **Specialist Primary Care Teams:** Where women access services via their GP in the first instance, and if clinically indicated and urgent secondary care is required, the GP should refer to a specialist primary care team, otherwise known as a Community Gynaecology Team. This team should include community gynaecologists, continence advisors, physiotherapists and specialist nurses.
- **Secondary Care Gynaecology Team:** These teams should provide the investigation and treatment of referrals from primary care or emergency admissions that require complex medical and surgical care. They will provide services to women with benign and acute gynaecological conditions in either community-based settings or as day cases, which should lead to a reduction in the number of in-patient beds required.

In-patient gynaecology services

These services are provided in the acute general hospital, which would ensure there are sufficient obstetric consultants on-site to provide 24-hour consultant cover on the labour ward and will enable Registrars to have access to both obstetrics and gynaecology patients.

Sub-specialisations

These models of care appear standard across different jurisdictions, although in contrast with maternity services (where the pathway from pre-conceptual care to postnatal care are generally dealt with in an all-encompassing way), where gynaecology services are reported on, they tend to focus on the organisation and structuring of services according to the specific area under examination. These include, for example, gynaecological oncology services (Mills, 2004), breast cancer screening services (NHS, 2011) and sexually transmitted diseases (Romanowski *et al*, 2013). In general, there is no single approach to the delivery of services and differences are highlighted depending on the specialty involved. In respect of the gynaecological oncology services, for example, the following elements were identified:

- gynaecological oncology treatment services;
- gynaecological oncology networks, including linked rural clinics;
- gynaecological oncology psychosocial support services;
- gynaecological oncology information services.

The following sub-specialisations were identified in the Australian context:

- fertility and endocrinology;
- urogynaecology;
- gynaecological oncology;
- colposcopy;
- sexually transmitted diseases;
- pelvic pain;
- family planning;
- hormone replacement;
- well-woman services.

These sub-specialisations within the field of gynaecology typify the approach used to service structuring and delivery.

Some consideration has been given to the delivery of services for women in the UK and Penfold (2013) highlights one initiative that provides a 'one-stop' rapid-access service in one area. She reports that procedures such as hysteroscopy, sterilisations and ablations can now be carried out in an out-patient setting and 'leave within one to two hours with a clear plan of care' (Penfold, 2013, p. 8). The service enables clients to be seen more quickly and have all their gynaecological needs addressed there. Other services provided at the same site include a rapid-access clinic, menstrual disorder clinic and colposcopy clinic. The purpose is to ensure patients are seen in the right clinic, at the right time, by the right consultant, whereas previously they often had to see more than one consultant or attend separate clinic appointments.

Cervical screening

In the UK, a cervical screening programme has been in place for several years. In 2011, the screening turnaround times showed that 98.6% of results are available for women within 2 weeks. The UK also tests for the Human Papillomavirus as part of a second line screening programme. The National Cancer Screening Service (NCSS) in Ireland was established by the Minister for Health and Children in January 2007. Similarly, in Australia the national Cervical Screening Programme has been in place since 1991 and its delivery is currently under review; the core aim of the programme is to have access to a cervical screening programme that is acceptable, effective, efficient and based on current evidence.

Workforce challenges

KPMG reported in 2008 that in addition to increasing sub-specialisation, there have been major changes in the types and indications for surgical intervention in many of the benign gynaecological diseases (e.g. menstrual disorders, incontinence, infertility). Since that time, a number of developments have taken place and Turner (2011a) notes that these have created additional challenges for the obstetrics and gynaecological workforce in Ireland. These changes include the increasing sub-specialisation identified in the KPMG report (including gynaecological oncology, urogynaecology, colposcopy, endoscopic surgery and infertility) and the introduction of new services, with a consequent change in gynaecological practices. This is particularly the case in respect of the expansion in the colposcopy services as a result of the national cervical screening programme and a reduction of women requiring laparoscopic sterilisation and hysterectomy for dysfunctional uterine bleeding.

Workforce changes have been identified in the New Zealand situation, where it was noted that the country has one of the highest expatriation rates in the OECD, a rate McDonald *et al* (2012) note is exceeded only by Ireland. Challenges in New Zealand relate to the retention of medical staff in this area and demographic and experiential characteristics. In 2010, 50% of specialists and registrars working in obstetrics and gynaecology in New Zealand were international medical graduates (Medical Council of New Zealand, 2011). This creates particular challenges in respect of the area of the sustainability of the workforce. The Australian Medical Workforce Advisory Committee (2013) noted several challenges encountered when modelling the obstetrics and gynaecology services because of the unique nature of the specialty, where Practitioners may opt to work in either obstetrics or gynaecology, or both. The Committee reported that few worked in obstetrics alone, although the proportion who had stopped doing obstetrics to focus exclusively on gynaecology had increased over the previous few years.

Women's experiences of care

One area that has received some attention in Australia in respect of the organisation and structuring of the workforce relates to gynaecological cancers. Approximately 3,800 women are diagnosed with gynaecological cancers each year (King *et al*, 2008) and although this is about one-third of the incidence for breast-cancer, gynaecological cancers have a higher mortality rate. A report on patient experiences showed that while patients were satisfied with the overall treatment in the acute phase of treatment, in some hospitals, they were caused considerable distress by being located in maternity wards, mixed gender wards or other inappropriate wards (King *et al*, 2008).

Difficulties for women were also identified when they went home from hospital due to a lack of coordination with GPs, poor psychosocial or psychosexual support. These problems were exacerbated for women living in rural areas. The findings in respect of the Gynaecological Cancer Workforce show that gynaecological oncologists have a central role in shaping the treatment and care of women, with medical oncologists and radiation oncologists also playing central roles in developing and implementing treatment plans. Nurses in jobs ranging from gynaecological cancer coordinators to surgical and ward nurses also carry out essential roles in caring for gynaecological cancer patients and psychosocial support staff (social workers, counsellors and psychologists) are a central part of the overall team. King *et al* (2008) note that while some nursing and allied health staff probably develop highly specific skills in gynaecological cancer care through long experience, these skills are not formally certified or recognised.

Summary

This chapter has presented an overview of the main characteristics of maternity, obstetrics and gynaecology, and neonatal systems across jurisdictions. The findings show that there are many different models and characteristics of care in the antenatal, intranatal and postnatal periods, and these differ according to the place of birth and the main care provider. Across jurisdictions, almost all births are in hospital, although in the Netherlands about 30% of births take place at home, and in New Zealand about 11% take place in out-of-home settings. In Ireland and Canada, care is predominantly medically-led and hospital-based, and while this is also the case in Australia, there is a strategic commitment there to a more diverse model of care.

4. Obstetric risk and outcomes

From the beginning of the 20th century, birth shifted from the home into hospital settings, and across all jurisdictions included in this review the vast majority of births now take place in hospitals. In recent years, there has been a growing literature around the culture of risk that surrounds childbirth (Coxon *et al*, 2012) while, at the same time, giving birth has never been safer for either mothers or infants. This has led to a dichotomy in the literature where, for some, there is a focus on increased risk of poorer outcomes for some women and infants; on maternal mortality and on a wide range of morbidities; on adverse events and ‘near misses’; and on reducing liability and negligence through an increase in interventions such as caesarean section and instrumental vaginal deliveries. On the other hand, there are concerns about the ‘pathologising’ of pregnancy and birth, where birth is viewed as normal ‘only in retrospect’; on the increasing ‘technocratic culture’; and on the psychological and physical impacts on women when interventions take place (De Vries *et al*, 2009; Newnham, 2010; Coxon *et al*, 2012). The relative balance between these two viewpoints underpins the structuring of maternity systems within different jurisdictions and consequently the predominant model of care. Some consideration is now given to obstetric risk, interventions and outcomes.

Low Risk

Childbirth has become a vastly safer process in developed countries and this is the case in all countries included in this review. The majority of births that take place do so without a need for intervention and most women are at very low risk of mortality, morbidity, adverse events or near misses. This is highlighted in findings from the recently published Birthplace in England national prospective cohort study, which was undertaken to compare perinatal outcomes, maternal outcomes and interventions by planned place of birth at the start of care in labour (Hollowell *et al*, 2011). The authors identified almost 80% (n=64,538) of its 81,695 cohort as ‘low-risk’. Using a composite primary outcome measure of perinatal mortality and intrapartum-related neonatal morbidities, the findings showed there were 250 primary outcome events (including, for example, stillbirth after start of care in labour, early neonatal death, neonatal encephalopathy, meconium aspiration syndrome, brachial plexus injury, fractured humerus or fractured clavicle), giving an overall weighted incidence of 4.3 per 1,000 births. Consequently, it is clear that the vast majority of women and infants are at low risk of mortality or morbidity during the course of pregnancy, labour or childbirth. This finding is similar to that reported in the Netherlands, where 85% of pregnant women begin their prenatal care with a midwife (Schölmerich *et al*, 2014).

An Australian study by Roberts *et al* (2009) found that 12.5 per 1,000 women from a population of more than a half million (n=500,603) suffered severe adverse outcomes. While this means that 1 in 80 women giving birth in Australia suffered a severe adverse outcome during childbirth, again, it highlights the much higher proportion of women who do not.

The number of litigation claims is also low relative to the number of women who give birth. A report by the NHS Litigation Authority (2012), which analysed 10 years of maternity claims with an incident date between 1st April 2000 and 31st March 2010, identified 5,087 claims with a total value of £3.1 billion. During the same period from 2000 to 2009 inclusive, there were 5.5 million births in England and less than 0.1% of these births had become the subject of a claim.

The correct identification of low risk, however, is critical to ensuring the safety of mothers and babies and in some countries, such as the Netherlands, there is a carefully worked out ‘Obstetric Indications list’ that distinguishes between ‘physiological’ and ‘pathological’ pregnancies and births,

with women in the first category being reimbursed only for care provided by midwives and GPs (De Vries *et al*, 2009). This provides a system incentive to ensure low-risk women are looked after in appropriate settings.

The findings from a case series analysis of adverse outcomes in maternity care in the Netherlands for women with a low-risk profile was carried out by Martijn *et al* (2013). Issues associated with these incidents are presented in Figure 5.

Figure 5: Issues associated with adverse outcomes in a study conducted in the Netherlands



Source: Martijn *et al* (2013)

While the vast majority of women and infants are at low risk of complications, there are, nevertheless, some women who are at higher risk due to pre-existing conditions or problems that arise during pregnancy, labour and childbirth and the postnatal period. Some consideration is now given to the extent to which these arise across different jurisdictions.

Maternal mortality

Traditionally, risk has been measured through maternal and perinatal mortality, although both are increasingly rare. A maternal death represents the worst and most tragic outcome from any pregnancy and there have been a number of reports on maternal deaths in the Irish (HSE, 2008; Maternal Death Enquiry Ireland, 2012; HIQA, 2013) and international context (Perinatal and Maternal Mortality Review Committee, 2010; Centre for Maternal and Child Enquiries, 2012). According to the UN Maternal Mortality Estimation Interagency Group (which consists of representatives from the World Health Organization (WHO), United Nations Children's Fund (UNICEF), United Nations Population Fund (UNFPA), United Nations Population Division and the World Bank), the maternal mortality ratio refers to:

'deaths of women while pregnant or within 42 days of the end of the pregnancy from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes' (WHO, 2014).

The report of the Maternal Death Enquiry Ireland (2012) group, which reviewed the 25 maternal deaths that occurred in Ireland over the triennium 2009-2011 using the CMACE maternal death classification system, found that:

- 6 were classified as direct maternal deaths (defined as: Deaths resulting from obstetric complications of the pregnant state (pregnancy, labour and puerperium), from interventions, omissions, incorrect treatment or from a chain of events resulting from any of the above), which included deaths from Pulmonary embolism (3); Amniotic Fluid Embolism (1); Uterine Rupture with no known, uterine scar (1); and Multi-organ Failure secondary to HELLP (1).
- 13 as indirect maternal deaths (defined as: Deaths resulting from previous existing disease, or disease that developed during pregnancy and which was not the result of direct obstetric causes, but which was aggravated by the physiological effects of pregnancy). These deaths resulted from Cardiovascular disease (5); Suicide (2); H1N1 Influenza (2); Epilepsy (2); Chronic obstructive pulmonary disease (1); and Bleeding oesophageal varices (1).
- 6 were attributed to coincidental causes (defined as: Deaths from unrelated causes which happen to occur in pregnancy or the puerperium). These deaths were as a result of Metastatic cancer (2); Road traffic accident (1); CNS lymphoma (1); and Substance abuse (2).

Definitional differences as well as differences in ways of collecting data in different countries combine to make international comparisons difficult and these challenges are well recognised. Taking these caveats into account, a recent publication by the World Health Organization presented trends in estimates of maternal mortality ratio (MMR, maternal deaths per 100,000 live births) over the period 1990-2013 for every country in the world (WHO, 2014). The estimates were computed to ensure comparability and WHO notes that the findings may differ from the national data, '*which may use alternative rigorous methods*' (WHO, 2014, p. 8). The findings for each country included in this review are provided in Table 2; they are based on small numbers of incidents and, consequently, each death has a large impact on the findings.

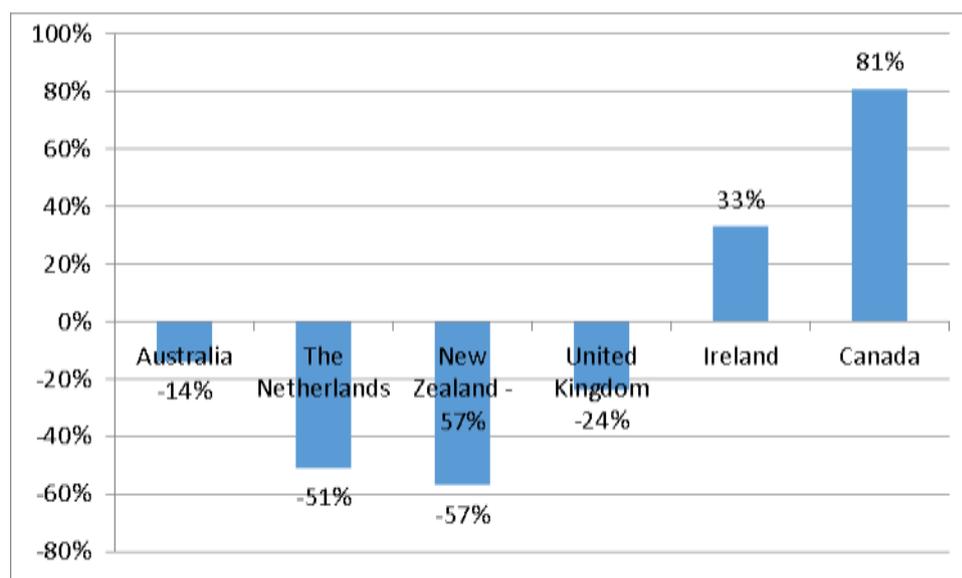
Table 2: WHO estimated maternal mortality ratio

Country	Maternal Mortality Ratio (per 100,000 live birth)
Canada	11
Ireland	9
United Kingdom	8
New Zealand	8
The Netherlands	6
Australia	6

Note: For Canada, vital registration data were available for analysis only up to 2009. Recent hospital surveillance data for Canada excluding Quebec indicate a decline of maternal deaths per 100,000 deliveries, from 8.8 in 2007-2009 to 6.1 in 2009-2011.

WHO has also calculated the change in maternal mortality ratio (MMR, maternal deaths per 100,000 live births) between 1990 and 2013 (*see Figure 6*). The findings for the countries under review show that Ireland and Canada have an increasing MMR, while all other countries in this review are decreasing, representing lower levels of maternal mortality in 2013 compared with 2003. Again, findings are based on relatively small numbers, but suggest either a worsening of the situation for Ireland or, more likely, changes in the reporting of maternal mortality.

Figure 6: Changes in the maternal mortality ratio (MMR) over period 1990-2013



Note: Negative values indicate a decreasing MMR from 1990 to 2013, while positive values indicate an increasing MMR.

Differences have also been identified in respect of maternal age and ethnicity. A 2007 study in Australia by Sullivan *et al* (2007) reported that while the maternal mortality rate (MMR) in Australia at that time was 8.4 maternal deaths per 100,000 confinements, women aged 40 years and older (23.7 deaths per 100,000 confinements) and indigenous people (21.5 deaths per 100,000 confinements) had higher rates.

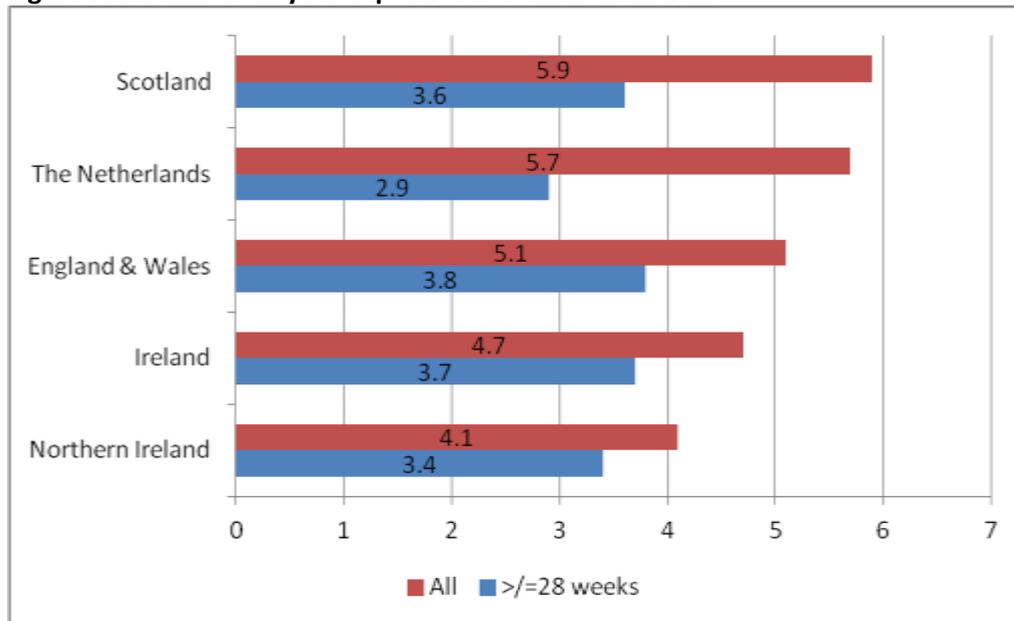
Fetal mortality rates

Half of all deaths in the perinatal period are fetal deaths and these are also referred to as stillbirths. While between 30 and 50% of fetal deaths are unexplained, multiple causes of fetal death have been identified. These include: congenital anomalies, fetal growth retardation, abruption associated with placental pathologies, preterm birth, and other maternal complications of pregnancy, as well as infections (European Perinatal Health Report, 2013; p126). The fetal mortality rate is defined as:

the number of fetal deaths at or after 22 completed weeks of gestation in a given year, expressed per 1000 live births and stillbirths that same year.

Differences in policies and practices related to terminations of pregnancy at or after 22 weeks of gestation also affect fetal mortality rates and comparisons are therefore particularly complex in the Irish situation. Figure 7 presents the findings on fetal mortality rates in the European countries under review in this report.

Figure 7: Fetal mortality rates per 1000 total births in 2010



Data is taken for all countries from Figure 7.1 "Fetal mortality rates per 1000 total births in 2010", Euro-Peristat 2013 report.

The data show that Ireland, with 4.7 fetal deaths per 1000 total births in 2010, compares favourably with other European countries in this review. Scotland at 5.9 per 1000 total births has the highest rate followed by The Netherlands at 5.7 and England and Wales at 5.1 per 1000 total births. In contrast with the findings for the annual neonatal mortality rate (See Figure 3), the data for Northern Ireland show the lowest levels. Mortality, however, provides a very limited overview of infant needs and there are a number of additional areas, including survival rates, that need to be considered.

The Vermont Oxford Neonatal Network (VON) is the largest international external reference centre for very low birth weight (VLBW) infants and it collates information from several countries, including Ireland and Northern Ireland, for the purpose of evaluating the effectiveness and efficiency of clinical care for newborn infants and their families (Murphy *et al*, 2010). The findings, using data from 2004, show that survival, severe intraventricular haemorrhage and chronic lung disease (CLD) in Ireland compare favourably with international standards.

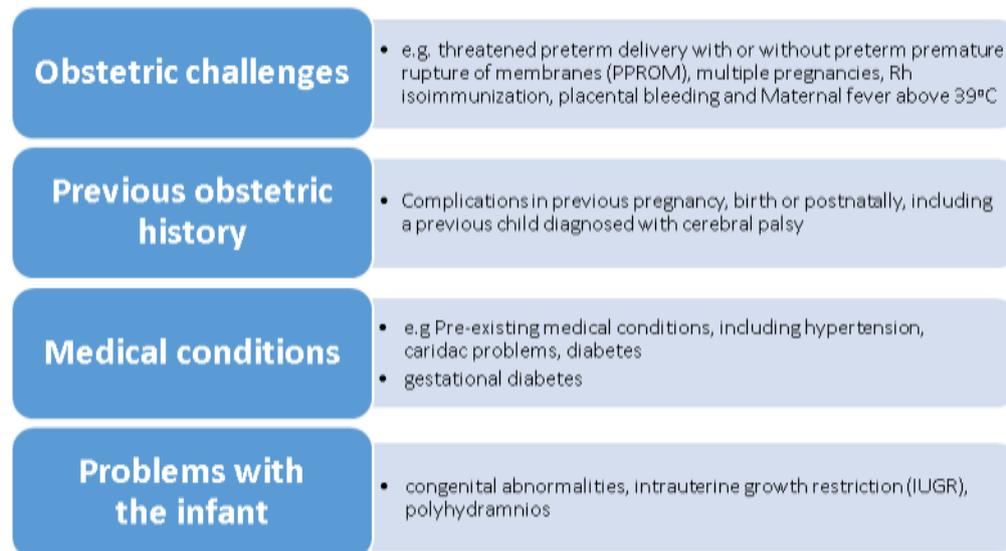
Rates of nosocomial infection in neonatal units in Ireland, however, were double those in the overall VON group and this was identified as a significant cause for concern (Murphy *et al*, 2010).

The mortality rates in VLBW infants varied from 4% to 19%. For both Northern Ireland and the Republic of Ireland, survival without morbidity remained constant, at approximately 50%. The authors suggested that auditing and benchmarking of data are critical for implementation and evaluation of quality initiatives, both locally and nationally.

High-risk pregnancies

Increasingly, there is a concern with measuring morbidity since, as Roberts *et al* (2009) suggest, maternal mortality is too rare in high-income countries to be used as a marker of the quality of maternity care. There is a strong association between high-risk pregnancies and adverse events, as seen in Figure 8, compiled from examples identified by Talic *et al* (2011):

Figure 8: Examples of high-risk pregnancies



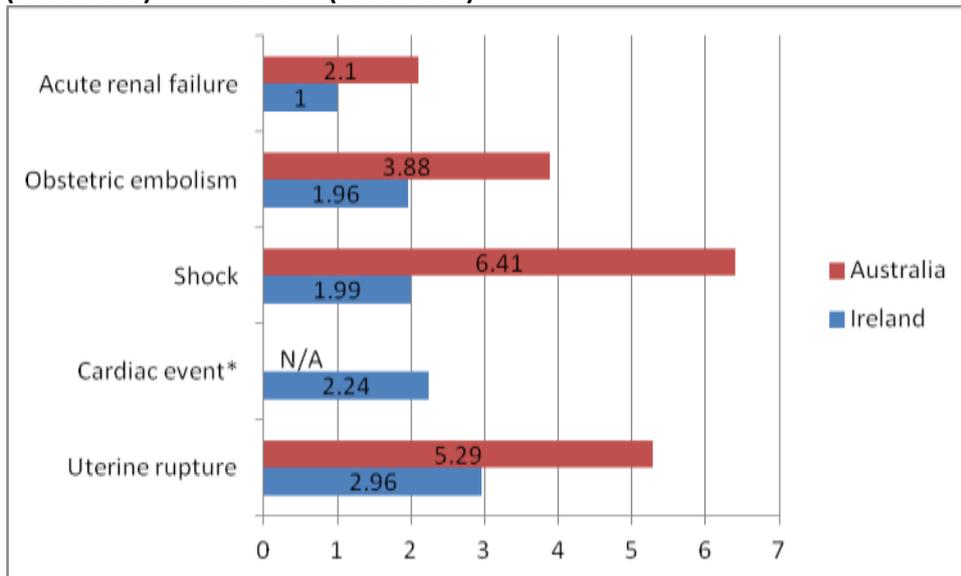
Source: Talic *et al* (2011)

Many of these areas have been identified in the Irish context in an analysis of the Hospital In-Patient Enquiry (HIPE) dataset by Lutomski *et al* (2014), who identified the prevalence rates of heart disease (e.g. chronic rheumatic heart disease, ischemic heart disease and pre-existing/gestational-induced hypertensive diseases) in women who delivered in Ireland between 2005-2010. The prevalence of diabetes mellitus, for example, was found to be about 2% (1.4% in private patients and 2.3% in public patients) and placental disorders 1%.

The relationship between pre-existing conditions and adverse outcomes has been studied in the Australian context by Roberts *et al* (2009) and in the Irish context by Lutomski *et al.* (2012a) who have conducted a comparative analysis between the Republic of Ireland and Australia. Lutomski *et al.* (2012a), analysed HIPE data from 2005-2009 and identified 330,955 childbirth hospitalisations. Some 1.3% of these (4,438) reported at least one indicator of severe maternal mortality, 7.4% reported two indicators (332) and 1.7% reported three or more indicators.

They calculated the five-year severe maternal morbidity incidence rate as 1.3 cases per 100 deliveries over that period, with the most frequently diagnosed severe morbidity indicators being blood transfusion, evacuation of haematoma, and dilation and curettage with general anaesthesia. A number of maternal characteristics (e.g. maternal age, marital status, medical card status, multiple gestation) and health service characteristics (e.g. mode of delivery, length of hospital stay, admission to intensive care) were considered. The findings show that Ireland compared favourably on the most common five diagnostic indicators (Figure 9), although in terms of procedural indicators, Ireland had higher rates of intervention. The incidence of all events were lower in Ireland than in Australia, e.g. acute renal failure in Australia was 2.1 per 10,000 deliveries compared with 1 per 10,000 in Ireland; and the rate of uterine rupture in Australia at 5.29 was almost twice that of Ireland (2.96). The rate of interventions, however, were higher in Ireland with a rate of 112.61 for blood transfusion in Ireland compared with 94.1 in Australia; evacuation of haematoma 7.22 in Ireland compared with 6.11 in Australia; and dilation and curettage with general anaesthesia at 3.99 in Ireland compared with 3.10 in Australia.

Figure 9: Comparison of severe morbidity incidence during childbirth hospitalisation in Ireland (2005-2009) and Australia (1999-2004).



*Cardiac event includes cardiac arrest, failure or infarction. No data was available for Australia for this variable.

The National Perinatal Epidemiology Centre (2013) identified a rate of severe maternal morbidity in 3.8 cases per 1,000 maternities or 1 in 263 maternities using anonymised data collected from 19 of 20 maternity units in Ireland in 2011.

Admission to intensive care unit

Crozier and Wallace (2011), in a study that took place in an Australian tertiary referral hospital, conducted a retrospective audit of obstetric ICU admissions over two years. They identified obstetric haemorrhage as the most common admission diagnosis, followed by hypertensive spectrum disorders. The median length of stay was 35 hours and they concluded that critically ill obstetric patients can be managed successfully in a general ICU with obstetric input. They identified the following diagnosis for women admitted to ICU:

- intrapartum haemorrhage (27%);
- antepartum haemorrhage (3.5%);
- hypertensive disorders (16.6%);
- infection sepsis (14.2%);
- pre-existing disease (9.3%);
- trauma (4.6%);
- thrombosis (2.3%);
- anaesthetic complications (2.3%);
- pre-partum cardiomyopathy (3.1%);
- amniotic fluid embolism (0.8%);
- other (16.3%).

The Directorate of Clinical Strategy and Programmes, HSE (2013), in a document outlining pathways for critically ill woman in obstetrics, identified four levels of care, as follows:

- Level 0: Patients whose needs can be met through normal ward care.
- Level 1: Patients at risk of their condition deteriorating and needing a higher level of observation, or those recently relocated from higher levels of care.
- Level 2: Patients requiring invasive monitoring/intervention that includes support for a single failing organ system (excluding advanced respiratory support).

- Level 3: Patients requiring advanced respiratory support, mechanical ventilation alone or basic respiratory support, along with support of at least one additional organ.

Increased risks due to socio-demographic factors

Since the publication of 'The Black Report' on health inequalities in the UK in the 1980s (Department of Health and Social Security, 1980), variations in outcomes have been identified across many areas and the association between higher levels of mortality and morbidity with lower socio-economic status are now clearly established. Socio-economic deprivation is linked with higher rates of teenage pregnancy and in the UK, teenage motherhood is eight times as common among those from 'manual' social backgrounds compared with those from 'managerial' and 'professional' backgrounds (Parekh *et al*, 2010). Socio-economic deprivation is also linked with high-risk behaviours such as smoking during pregnancy (Williams *et al*, 2010). Poorer outcomes in terms of low birth weight and increased perinatal and infant mortality have also been identified in lower socio-economic groups, while protective factors, such as breastfeeding, are also relevant in lower levels of this group (DCYA, 2012). These issues are common across all jurisdictions, and a commitment to reducing the differences between groups has been identified as a core focus in a number of different countries.

There are complex challenges in providing high-quality care to diverse and vulnerable populations, particularly in situations where there are multiple social and health problems. Such issues require additional time and effort by caregivers to ensure issues such as family violence, limited English language proficiency, unemployment, single parenthood and low health literacy are dealt with in a careful and considered way (Brown *et al*, 2014).

Immigrant population

Increasing global migration has led to an increase in the number of immigrant women giving birth. An examination of obstetric outcomes in England (Heslehurst *et al*, 2012) noted that previous research identified disparities in obstetric outcomes between groups, particularly for African-American and Hispanic women. These included differences in rates of preterm labour, preeclampsia, gestational diabetes, pregnancy induced hypertension and increased caesarean section rate. The Centre for Maternal and Child Enquiries (2010b) reported that Pakistani women had the highest risk of pregnancy-related mortality compared to other South Asian women. Other studies have examined the impact of perinatal health disparities, including disparities in caesarean births, and differences have been reported between migrant and non-migrant women, with some literature suggesting that non-medical factors may be implicated (Merry *et al*, 2013). Frequently postulated risk factors for higher levels of caesarean section included language/communication barriers, low SES, poor maternal health, Gestational Diabetes/high body mass index, feto-pelvic disproportion and inadequate prenatal care. Suggested protective factors included preference for a vaginal birth, a healthier lifestyle, younger mothers and the use of fewer interventions during childbirth.

These findings have an implication for the Irish context, where the Maternal Death Enquiry Ireland (2012) report noted that while 75.4% of maternities in Ireland in 2010 were women of Irish nationality, 40% of all maternal deaths identified in the triennium 2009-2011 occurred in women who were not born in Ireland (5/6 direct deaths, 4/13 indirect deaths and 1/6 coincidental deaths).

A systematic and comparative review of studies in five countries on *Immigrant and non-immigrant women's experiences of maternity care* has recently been published (Small *et al*, 2014). The countries included in the review were Australia, Canada, Sweden, the UK and USA, and findings suggest that while the needs and expectations of women were 'remarkably similar' (*ibid*, p. 2) across all countries identified, additional challenges were identified for immigrant women. These challenges included communication difficulties, insufficient access to interpreters when needed, lack of familiarity with how care is provided, and not receiving adequate information about what options for care exist. In addition, several studies included in this review reported that immigrant women felt that they were not welcomed or were made to feel anxious when they came to hospital in labour. Some studies identified particular cultural issues that immigrant women felt were not well understood during their maternity care.

These challenges are similar to those identified in Ireland, where an increase in immigration in the 2000s led to a corresponding increase in the cultural diversity of the maternity population. Lyons *et al* (2008), in a qualitative research study with maternity service providers working with ethnic minority women in Dublin, identified four broad areas of challenge: communication difficulties, knowledge and use of services, cultural differences and an 'us and them' attitude. Key issues identified included inadequacy of interpretation services, childcare issues, coping with labour, identification as being different from the general population, and racism. The authors concluded that much needed to be done to ensure a responsive and adaptive maternity services for these women.

Ethnic minority population

In the UK, the rate of maternal mortality in the years 2000–2002 for women from ethnic groups other than 'White' was three times higher than for 'White' women, while the rate for refugee women was seven times higher (Confidential Enquiry into Maternal and Child Health, 2004). Refugee women are at particular risk. An evaluation of the health status of 59 pregnant refugees reported, for example, vaccine-preventable infections, low pregnancy weight gain, anaemia and female genital

mutilation which prevented pelvic examination. While the factors hindering access to services, as well as challenges in the provision of quality care, are likely to have contributed to this situation, the underlying causes have not been systematically and comprehensively investigated (Jentsch *et al*, 2007).

In the Irish context, differences between the Traveller community and the general population have been identified in respect of fertility, infant mortality and access to services, as reported in the All-Ireland Traveller Health Study (AITHS) (All-Ireland Traveller Health Study Team, 2010). In 2008, the fertility rate for Travellers in the Republic of Ireland was found to be 2.7 per 1,000 population, compared with the general public at 2.1 per 1,000. (Similar differences have been identified in respect of the Maori population in New Zealand and the Aboriginal and Torres Strait Islanders in Australia (AITHS, 2010). While the maternal age profile of Traveller mothers has not changed since 1987, the highest group of mothers in 2008 was in the 20-24 year-old age group, which is considerably younger than the general population where the average maternal age in 2008 was 31 years (ESRI, 2013a). (Again, these differences are comparable with other ethnic minority groups, such as Australian aboriginals and New Zealand Maori.)

As part of the AITHS (2010) study on Traveller health, infant mortality rates were also calculated and the findings show that for Traveller infants is the rate is 14.1 per 1,000 live births, compared with 3.9 per 1,000 of the general population. This means that infants in the Traveller community are 3.6 times more likely to die before their first birthday than infants in the general population. These differences between the Traveller population and the general public are greater now than in the 1980s when Barry and Daly (1998) conducted their research.

Reid and Taylor (2007), in an examination of Traveller women's experiences of maternity care in the Republic of Ireland, found that some issues arose in respect of majority norm expectations such as breastfeeding, husband participation and 'rooming in' (i.e. keeping the infant with them all the time), all of which were considered culturally unacceptable by Traveller women. The authors noted that direct discrimination (e.g. barriers created by GP services) and indirect discrimination (e.g. arising from dysfunctional communication and control of information, poor housing and lack of public transport) were creating inequity of access to care of this minority population.

Similar type issues have been identified more recently in an Australian study (Parker *et al*, 2014) relating to Aboriginal and Torres Strait Islander women, who were identified as having additional needs to mainstream Australian women. Women in that study reported high rates of stressful life events in pregnancy, low levels of choice in place of birth and model of care, and limited options to carry out cultural practices. They were also less likely to report being treated with kindness, understanding and respect by maternity care staff compared to women answering a similar mainstream survey. The authors made a number of recommendations to improve services, including:

- the need to enhance the cultural competence of maternity services;
- increase access to continuity of midwifery care models;
- facilitate more choices in care;
- work with the strengths of Aboriginal and Torres Strait Islander women, families and communities, and engage women in the design and delivery of care.

In Australia, the *National Maternity Services Plan* (Commonwealth of Australia, 2011) draws particular attention to this group of women and a number of specific recommendations relate to Aboriginal and/or Torres Strait Islander women.

Women with disabilities

While large-scale studies have not been carried out, it has been estimated that almost 1 in 10 women giving birth in the UK (9.4%) have one or more limiting, long-standing illnesses that may cause disability, affecting pregnancy, birth and early parenting (Šumilo *et al*, 2012). Findings from a questionnaire survey of 24,155 women, of whom 6.14% (n=1,482) were self-reported as disabled, found that while this group was not homogeneous, women with disabilities were as likely to access healthcare early on in their pregnancy as other women (Redshaw *et al*, 2013). They were also, however, more likely to have antenatal checks and ultrasound scans, to be delivered by caesarean section, to have longer stays in hospital and were less likely to breastfeed. Malouf *et al* (2014), in a systematic review of healthcare interventions to improve outcomes for women with disability during pregnancy, birth and postnatal, were able to identify only three studies of sufficient quality for inclusion in their review. They noted an urgent need to test and evaluate the efficacy of feasible interventions, in addition to further developing study designs for the evaluation of healthcare interventions targeting women with disability, their families and healthcare professionals.

Based on their findings, however, Malouf *et al* (2014) recommend that since women with a disability were less likely to breastfeed in comparison with women with no disability (69% compared to 79%), consideration should be given to a breastfeeding support programme. They also noted that women with mental health disabilities were more critical about the support they received and about communications with the staff providing care during their pregnancy (*see below*) and, again, this is an area where interventions to improve staff communication skills could be developed and evaluated in future controlled design studies.

A Swedish study of pregnancy and birth outcomes of women with intellectual disability concluded that such women have a higher risk of adverse pregnancy outcome and should be considered a risk group (Höglund *et al*, 2012). Caregivers need to be aware of this and provide better tailored pre- and intrapartum care and support.

Begley *et al* (2009a) conducted a review of the Irish and international literature on the challenges facing women with disabilities in accessing health services during pregnancy, childbirth and early motherhood. They concluded that adverse societal attitudes may lead to barriers for women with physical, sensory and intellectual disabilities in accessing suitable services in pregnancy, childbirth or motherhood. Barriers for women with *physical disabilities* related to location, difficulties in transport and the physical environment, lack of provision of information, communication difficulties and negative attitudes from staff. Facilitators included improving access to buildings and services, provision of sensitive antenatal education classes and improved health professionals' knowledge of and attitudes towards disability. Challenges for women with *sensory impairments* included difficulties in orientation to the healthcare setting, communication and health education, and a lack of respect and support from some health professionals. Facilitators for such women were identified in a small number of areas, including the use of telephone amplifiers and/or pictorial signage; Braille; audible, visual and tactile systems in waiting rooms; information provided in an appropriate language and format; extended consultation times; and disability awareness training.

Mental health

Pregnancy and birth are major life-changing events for the expectant parents and the family, and perinatal mental health morbidity is a significant public health issue that not only directly affects the mother and baby, but also the wider family (Geia *et al*, 2013). A US study by Witt *et al* (2010), using self-report in a study of 3,051 pregnant women, estimated the prevalence rate of 'fair' or 'poor' antepartum mental health as 7.8%. They noted that women with low social support, in poor health

or with a history of poor mental health are at increased risk. Geia *et al* (2013) also noted that this was a significant problem for Aboriginal and Torres Strait people in Australia.

The postnatal period is also a point of risk and opportunity in terms of mental health, with high prevalence rates of depression and anxiety identified (Cornsweet Barber, 2009). Post-traumatic stress disorder (defined as an anxiety disorder that can develop following confrontation with a traumatic stressor) following childbirth has increased over the last decade and more attention is being paid to the notion of childbirth as a traumatic event (Stramrood *et al*, 2011). According to Cornsweet Barber (2009), approximately, 1%-2% of women suffer from post-traumatic stress disorder postnatally, with subjective distress in labour and obstetrical emergencies being the most important risk factors. A Dutch study, however, reported a prevalence of 1% of women suffering from post-traumatic stress disorder, with no differences between home and hospital deliveries after controlling for complications and interventions (Stramrood *et al*, 2011). Emergency caesarean section, severe labour pain and poor coping skills were associated with more post-traumatic stress symptoms (Stramrood *et al*, 2011).

Other risk factors associated with postnatal stress include infant complications, low support during labour and delivery, psychological difficulties in pregnancy, previous traumatic experiences and obstetrical emergencies (Anderson *et al*, 2012). The provision of services and support requires collaboration among primary care, maternity care, social services, mental health and a variety of community and informal support services (Cornsweet Barber, 2009).

The prevalence of postnatal depression is well documented, with one meta-analysis of 59 studies reporting a prevalence of 13% (O'Hara and Swain, 1996), with prevalence rates from Ireland reported to range from 11.4% to 28.6% (Leahy-Warren, 2012). Infants of mothers who have postnatal depression are particularly vulnerable due to impaired maternal–infant interactions and significant cognitive and emotional development (Beck, 1998).

Begley *et al* (2009a) identified a number of barriers in the Irish context for women with mental health difficulties. They noted that these appeared to be considerably greater for such women (or perhaps were better documented) than for women with other disabilities (such as physical or sensory, *see above*). Barriers to access were found in relation to:

- Availability of appropriate care due to poor links between maternity and mental health services.
- Accessibility, in relation to women's mental state, since they may lack motivation to attend clinics or may even, rarely, deny the pregnancy totally.
- Accommodation, where the women's considerable needs included lack of knowledge of the existence of mental difficulties in pregnancy and the postnatal period, and of the services available to them; lack of knowledge of maternity care professionals about mental health issues; and poor screening practices.
- Acceptability, centred mainly around a reluctance to disclose their illness and distress, due to society's and their family's stigmatisation of mental health problems; fear of being judged a 'bad mother'; losing custody of their child; taking medication that might affect the fetus or baby while breastfeeding or impair their ability to care for their children; lack of trust in healthcare providers; and the feeling that they are continually having to prove themselves to the authorities.
- Affordability, since many are from low-income families and cannot afford to pay for costs of childcare and transport, which may prevent them from accessing healthcare services.

In this study by Begley *et al* (2009a), few facilitators to improve access for women with mental health difficulties were identified, but some were found in relation to:

- availability, by providing health professionals with training and education to improve communication acceptability and decrease negativity;
- through supportive partnerships between women and healthcare providers;
- providing education for women about mental illness and the services available to them, and to provide support groups;
- improvements in communication between professionals in maternity services and those in mental healthcare;
- introducing tele- or web-based support for women;
- providing designated perinatal multidisciplinary teams in the community, including psychologists and social workers, and specialist mother-and-baby psychiatric units.

Increased risks due to lifestyle factors

It is clear from the research literature that mothers and infants in vulnerable populations are at higher risk, including those subject to physical and mental health issues as well as adverse socio-economic situations.

Obesity

Risk factors have been identified in respect of mothers' pre-conceptual and antenatal behaviours. Layte and Turner (2013) report high levels of obesity in the Irish maternal population, with almost 16% of women measured as being obese 9 months after the birth of their first child. This risk increased according to the number of children and to income, with women in the lowest income group being 42% more likely to be obese than women in the highest income groups. In the UK, the Centre for Maternal and Child Enquiries (2010a) found that the UK prevalence of women with a known BMI ≥ 35 (Class II and Class III obesity) at any point in pregnancy, who give birth $\geq 24+0$ weeks' gestation, is 4.99%. The prevalence of women with a pregnancy BMI ≥ 40 (Class III obesity) in the UK is 2.01%, while super-morbid obesity (BMI ≥ 50) affects 0.19% of all women giving birth.

According to the Australasian Maternity Outcomes Surveillance System (AMOSS), the prevalence of obesity has risen dramatically in Australia and has increasingly become an important public health concern. A reported 35% of Australian women between the ages of 25-35 (equating to 57,983 of women who gave birth) are either overweight or obese.

While caution should be applied in interpreting these data due to differences in collating the statistics, they nevertheless point to increasing rates of obesity across several jurisdictions.

Irrespective of prevalence, however, maternal obesity has emerged as an important risk factor in obstetrics and it is associated with an increase in a range of complications. These include an increased risk during pregnancy and a higher prevalence of adverse outcomes compared to women with a healthy BMI. According to the study by the Centre for Maternal and Child Enquiries (2010a), risks include:

- increasing levels of fetal abnormality;
- hypertensive disorders;
- gestational diabetes mellitus;
- induction of labour;
- caesarean section;
- postpartum haemorrhage;
- stillbirth, large for gestational age;
- neonatal unit admissions.

A recent study by Fyfe *et al* (2012) found that nulliparous obese women have a twofold increase in risk of major postpartum haemorrhage compared to women with a normal body mass index (BMI), regardless of mode of delivery. In response to concerns about obesity levels in pregnant women in Ireland, the HSE (2013a) has issued a comprehensive *Clinical Practice Guideline* on obesity and pregnancy.

While interventions to reduce levels of obesity have been identified, an assessment of the evidence-practice gap in the multidisciplinary management of overweight and obesity in pregnancy in New Zealand found that few of the staff were fully compliant with referral guidelines or in the provision of advice in line with recommendations (Wilkinson and Stapleton, 2012). In a follow-on study, Wilkinson *et al* (2013) found that while lack of guideline knowledge provided a barrier to best-practice care, an interplay between staff confidence and personal characteristics (including dissatisfaction with their own weight and body image) in delivering care needs to be acknowledged in any further education and training programmes.

Alcohol use

Many women continue to consume alcohol during pregnancy and a recent Australian study reported that only 41% of women abstained from alcohol throughout each trimester (O'Leary *et al*, 2009). In Ireland, 81% of women were reported to consume alcohol during the peri-conceptual period, with 71% reporting low intake, 9.9% moderate intake and 0.2% high intake. Factors associated with high consumption included maternal age of less than 25 years and illicit drug use. High consumption was associated with very preterm birth (<32 weeks' gestation) (Mullally *et al*, 2011). The *Growing Up in Ireland: Infant Cohort* study found that almost 1 in 5 women (19.7%) consumed alcohol at some time during pregnancy, including 10.1% in first trimester, 14.1% in second trimester and 13.8% in third trimester (Williams *et al*, 2010). This compares with findings from a Canadian study, which showed that about 10.8% of women drank alcohol at some point during their pregnancies (Public Health Agency of Canada, 2013). This suggests there is much to be done in respect of this area in the Irish situation.

Smoking

According to the Centers for Disease Control (CDC, 2007), smoking before and during pregnancy is the single most preventable cause of illness and death among mothers and infants (O'Leary *et al*, 2009). Women who quit smoking before or early in pregnancy can significantly reduce the risk for several adverse outcomes. The CDC report notes that:

- Compared with women who do not smoke, women who smoke prior to pregnancy are:
 - about twice as likely to experience a delay in conception;
 - have approximately 30% higher odds of being infertile;
 - twice as likely to experience premature rupture of membranes, placental abruption and placenta previa during pregnancy.
- Babies born to women who smoke during pregnancy have:
 - about 30% higher odds of being born prematurely;
 - are more likely to be born with low birth weight (less than 2,500 grams or 5.5 pounds), increasing their risk for illness or death;
 - are 1.4 to 3.0 times more likely to die of Sudden Infant Death Syndrome (SIDS).

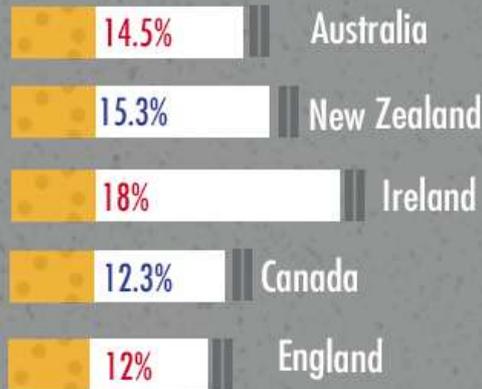
The maternal smoking rates in Ireland fell by 12% in one year after the smoke-free legislation was introduced in March 2004, according to a study by Kabir *et al* (2009). The same study reported a 25% reduction in overall preterm birth risks after the smoke-free legislation. A follow-on study by Kabir *et*

al (2013) found a significant reduction in small for gestational age birth rates both immediately and sustained over the post-ban period.

Summary

In summary, there is a philosophical dichotomy within the literature where, on the one hand, pregnancy and childbirth are constructed as a normal physiological process and, on the other, as one where they are risky and can only be viewed as 'normal' in retrospect. While the vast majority of pregnancies and births are low risk, there is a voluminous literature on groups where there are increased risks of adverse events, including mortalities and morbidities. These include women at higher risk due to their socio-demographic (e.g. ethnicity, immigration) and socio-economic circumstances (e.g. lower income); lifestyle choices (obesity, smoking, alcohol use); mental health problems (including post-traumatic stress disorder, postnatal depression); and disabilities (although this group is not homogeneous).

Smoking in Pregnancy



Alcohol in pregnancy

Canada
10.7% at some time
during pregnancy



Ireland
20% at some time
during pregnancy

Obesity

16% of women obese 9
months after the birth
of their 1st child

Fertility

Ireland reported the
highest total fertility rate of
the 27 EU countries in **2012**



Inequalities



In **New Zealand** the risk of
maternal death for women
living in most deprived areas
is **2.5** times that of those
living in the least deprived
areas

In **Ireland** the infant
mortality rate for the
Traveller population is
3.5 times higher than
the national average



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5. Quality and safety

This chapter presents an overview of quality and safety across jurisdictions and this insight leads on to further discussion in subsequent chapters on staffing and training (including workforce and access), person-centred care, costs, information, and governance of maternity services (including leadership and accountability). These components and how they interrelate are illustrated in Figure 10. The different models of care are examined for each component.

Figure 10: Components of quality and safety



Strategic commitments to the creation, implementation and maintenance of maternity services that are of high quality have been made across each jurisdiction included in this analysis and with the exception of Canada, each includes a reference to ‘quality and safety’ in the vision and/or aim for their maternity system. These references reflect the multidimensional nature of quality and different jurisdictions highlight different aspects of the construct. References relate to **responding to needs** (e.g. **Australia** ‘maternity care ... reflecting the needs of each woman within a safe and sustainable quality system ... access to high-quality...’; **Northern Ireland** ‘providing high-quality, safe ... services to ensure the best outcome for women and babies’); **programme delivery** (**New Zealand** ‘safe and high quality maternity services throughout New Zealand’); **improving performance** (e.g. **England** ‘to improve performance against quality and safety indicators’); and focusing on **the experience of the mother** (e.g. **Wales** ‘For every mother ... pregnancy and childbirth will be a safe and positive experience’).

The maternity system itself plays a critical role in whether the environment within which it is provided has in place the necessary structures, processes and supports for a high-quality service to be delivered. The US report on *Crossing the Quality Chasm* (Institute of Medicine, 2001) found that healthcare delivery systems are often poorly organised to meet the challenges at hand and that delivery of care can be overcomplex, uncoordinated, lacking a multidisciplinary infrastructure, wasteful of resources and fails to build on the strengths of all health professionals. The report identified six aims for improvement and these are built around the need for healthcare to be:

1. **Safe:** Avoiding injuries to patients from the care that is intended to help them.
2. **Effective:** Providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit.
3. **Patient-centred:** Providing care that is respectful of and responsive to individual patient preferences, needs and values, and ensuring that patient values guide all clinical decisions.
4. **Timely:** Reducing waits and sometimes harmful delays for both those who receive and those who give care.
5. **Efficient:** Avoiding waste, including waste of equipment, supplies, ideas and energy.
6. **Equitable:** Providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location and socio-economic status.

Problems arising in any one of these areas can lead to a construction of a service that is not of high quality and consequently, each element plays a role in creating a system that meets the needs and requirements of all stakeholders.

Safety culture

In Ireland, the *National Standards for Safer Better Healthcare*, published by the Health Information and Quality Authority (HIQA, 2012), incorporate safety as a key dimension under a broad understanding of quality. This is explicit in the following dimensions identified by HIQA where 'safe' care is considered one element of quality:

- person-centred care and support;
- effective care and support;
- safe care and support;
- better health and wellbeing.

In addition to quality dimensions, HIQA also identify capacity and capability themes as leadership, governance and management, use of resources and use of information.

The inclusion of safety as an element of quality is also presented by the UK Care Quality Commission (CQC), an independent body established to regulate services provided by healthcare providers in the UK. The CQC has identified quality care as that which '*provides patient safety, takes into account patient experiences and empowers patients through offering choices and better information*' (Ndoro, 2014, p. 724). In the context of maternity services, there can be some tension between patient safety and patient experience, since, perhaps more than other areas of the health services, what is considered the safest approach by professionals may not always equate with the client's preference and optimal experience for mothers (Care Quality Commission, 2013).

Studies have shown that, despite decades of scientific advances and the best intentions of well-qualified practitioners, healthcare-related harm is still a regrettably common occurrence. Within this, obstetric care is considered a high-risk area (Freeth *et al*, 2009) where unpredictable events and high-risk situations are the norm, thus making them particularly vulnerable to medical errors (DuPree *et al*, 2009). Such errors are defined as mistakes made in the process of care that result, or have the potential to result in, harm to patients (*ibid*). Mistakes include the failure of a planned action to be completed or the use of a wrong plan to achieve an aim arising from the result of an action that is taken (commission) or an action that should be taken but is not (omission). HIQA (2013, p. 169) has written that healthcare will never be without risk and has advised that:

'organisations balance the concept of (a) having an open and just culture that requires full disclosure of mistakes, errors, near misses and patient safety concerns, in order that system-based analysis can take place to identify learning against (b) the importance of holding to

account those whose competencies and performance have fallen below what reasonably might be expected of them’.

This is supported by DuPree *et al* (2009), who note that the components of a safety culture in obstetrics are a **just culture** (where there is trust between management and front-line staff and where staff feel safe expressing concerns about safety and quality issues), a **reporting culture** (where members of the healthcare team must feel comfortable relating or reporting their errors and near misses, and where they are assured their reporting of events is tied into a responsive system that will take action) and a **learning culture** (where heightened staff awareness, and reporting and data collection of adverse events can be turned into lessons learnt). Where the culture is a just one, staff will feel safe expressing concerns about safety and quality issues. This was identified as problematic in the Harding Clarke (2006, p. 156) report into the *Lourdes Hospital Inquiry*, where it was noted that:

‘We tried to understand why the midwives, who formed the largest group of health professionals involved and who were principled women of training and intelligence, did not take their concerns further.’

Much has been written about the importance of promoting, supporting and maintaining a safety culture, which in Ireland is a requirement by policy (HIQA, 2010), by law (Health Act 2007; Medical Practitioners Act 2007; Nurses and Midwives Act 2011) and by profession (Nursing and Midwifery Board; Medical Council, Ireland).

The report investigating the death of Savita Halappanavar by HIQA (2013, p. 54) notes that:

‘A positive safety culture includes open communication with patients, strong clinical leadership and professional accountability, effective multidisciplinary teamwork, appropriate behaviour, evidence-based practice, adherence to policies and guidelines, and clinical audit. This must be delivered by a fully trained, competent workforce, accountable for their individual and collective practice, supported and managed within a strong corporate and clinical governance system.’

Achieving a safety culture, however, has proven to be complex, although there is much agreement that a comprehensive and multi-strand approach is required. DuPree *et al* (2009), for example, write that preventable injury in medicine is most often the result of many contributing factors and local triggers, not a single action or event. This model is often referred to as the ‘Swiss Cheese model of organisational accidents’ because of the ways in which ‘errors need to breach multiple defences and errors line up and pass through “weaknesses” or “holes” in the defence’ – a focus on one element only is unlikely to achieve a safe culture. This is highlighted in the findings of a UK study of healthcare professionals’ views about safety where multiple challenges in achieving safety of care in maternity services were identified (Smith *et al*, 2009). These included:

- an increasing social and medical complexity of the pregnant population;
- low staffing levels;
- inappropriate skill mix;
- low staff morale;
- inadequate training and education;
- medicalisation of birth;
- poor management;
- lack of resources;
- reconfiguration.

Smith *et al* (2009) proposed a number of solutions, including more staff, better teamwork and skill mix, improved training, more one-to-one care, caseloading, better management, more resources, better guidelines and learning from incidents.

Risk, safety and models of care

Buitendijk (2011, p. 193) has identified two broad conceptual models of pregnancy and childbirth. The first views pregnancy and the birth of a baby as a biomedical process and the most important outcomes are a physically healthy baby and a physically healthy mother. The second conceptualisation views pregnancy and childbirth as a psychosocial process and a major life event, where the woman's psychological wellbeing is not only an important outcome, but an actual determinant of the physical and psychological wellbeing of the baby. Within the first model, there is an almost exclusive focus on the risks of pathology and illness inherent to every pregnancy, while in the second, the focus is on pregnancy and birth as primarily normal and part of life.

There is also agreement that women as a group need both models of care and that in those situations where pregnancy and birth are complicated, interventions are required. These two models of care are often positioned within a professional dichotomy that views the first conceptualisation as a predominantly (male) medical one and the second as a predominantly (female) midwife-led one.

Key differences in the philosophy underpinning these two models of pregnancy and childbirth have been presented by Grigg *et al* (2014) and summarised here in Table 3.

Table 3: Comparison of key features of medical and midwifery models of pregnancy and childbirth

Medical/technocratic model	Midwifery/holistic/social model
Doctor-centred	Woman-centred
Obstetrics: Experts in pathology	Midwifery: Experts in normal physiology
Body–mind dualism	Holistic: Integrating approach
Pregnancy is a medical condition, inherently pathological	Pregnancy is a normal human state, inherently healthy
Birth is only normal in retrospect and requires hospitalisation and medical supervision	Birth is a normal physiological, social and cultural process, where the environment is key
Technology dominant	Technology cautious
Risk selection is not possible, but risk is central	Risk selection is possible and appropriate
Statistical/biological approach	Individual/psycho-social approach
Biomedical focus	Psycho-social focus
Medical knowledge is privileged and exclusionary	Experiential and emotional knowledge valued
Intervention	Observation
Outcome: Aims at live, healthy mother and baby	Outcome: Aims at live, healthy mother and baby, and satisfaction of individual needs of mother/couple

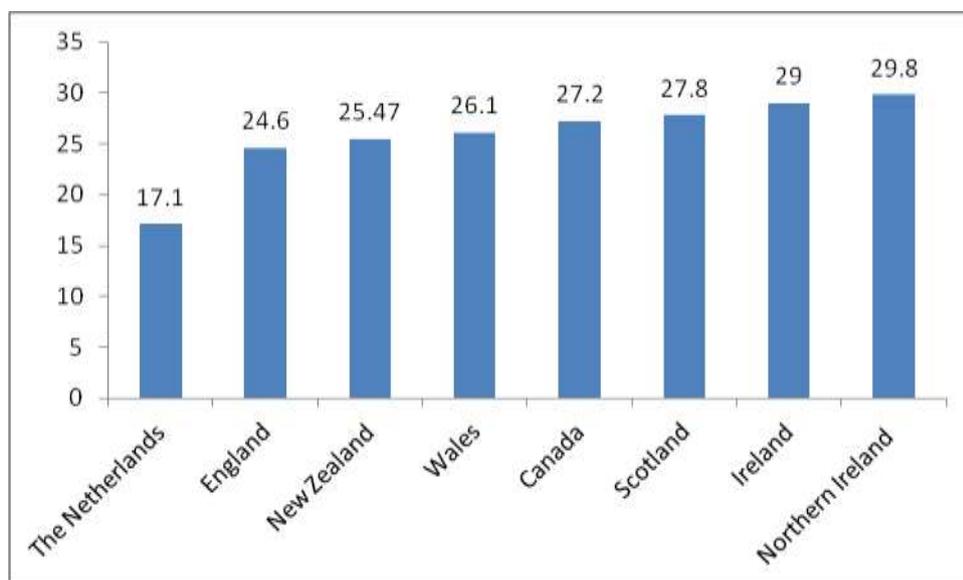
Increase in interventions

While the majority of women have normal, uncomplicated pregnancies and births, and therefore are of low risk, many concerns have been raised about the increasing 'pathologising' of childbirth and authors draw attention to the substantial increases in obstetric interventions, which many women readily accept or even request in search of a 'safe birth' (Reibel, 2004; Matthews and Scott, 2008; Reiger, 2011). Escuriet *et al* (2014) suggest that there has been a transformation of a physiological event (underpinned by a wellness paradigm) into a medical and surgical process, and support to women (both those with or without obstetric risk) is increasingly provided in a highly technological environment, with a concurrent increase in the number and type of interventions taking place.

Some of the concerns are exemplified by the increasing rates of interventions during childbirth, where it has been demonstrated that in addition to maternal and fetal characteristics and medical complications, the levels are also influenced by organisational factors related to the place of birth (Hollowell *et al*, 2011, Begley *et al*, 2011), the type of maternity unit (Coulm *et al*, 2012), funding

model (Kozhimannil *et al*, 2013; Lutomski *et al*, 2014) and service provider (Sandall *et al*, 2013; Bai *et al*, 2008). The rates of caesarean section are highlighted as a cause for concern across many jurisdictions and while the 1985 World Health Organization report concluded that there is no justification for any geographic region to have a caesarean rate of more than 10%-15%, all countries included in this present review have higher levels. In Ireland, Turner (2011b) reported the mean rates per hospital of elective caesarean section in 2009 as 12.9%, with a further 13% emergency caesarean section rate, giving a total delivery rate in State-funded maternity hospitals in Ireland of 26.7% (+/- 4.2). The most recent report on perinatal statistics from the Economic and Social Research Institute shows that caesarean section rates in Ireland for 2012 accounted for 29% of total live births (ESRI, 2013a). A comparison between the different countries under review in terms of caesarean section rates is presented in Figure 11, where differences can be seen by country, with the Netherlands having substantially lower levels than elsewhere.

Figure 11: Caesarean section rates, by country



Data for The Netherlands, England, Wales, Scotland and Northern Ireland refer to 2010; Source Euro-peristat. Data for Canada refers to 2012 from [Canadian Institute for Health Information \(CIHI\)](http://www.cihi.ca/hirpt/search.jspa?language=en&healthIndicatorSelection=Csec.). <http://www.cihi.ca/hirpt/search.jspa?language=en&healthIndicatorSelection=Csec.>; Data for New Zealand refers to 2012 and is available from OECD (2014), "Caesarean sections", *Health: Key Tables from OECD*, No. 53. DOI: [10.1787/caesar-section-table-2014-1-en](https://doi.org/10.1787/caesar-section-table-2014-1-en)

In the Irish context, Brick and Layte (2011) explored levels and trends in caesarean section rates for singleton births in Ireland over the period 1999-2007 and highlighted a number of possible influences, as follows:

- **Clinical indicators** (e.g. abnormal labour, fetal distress, breech presentation).
- **Maternal characteristics** (e.g. increase in multiple births, increase in maternal age, increase in maternal weight and decreasing number of previous births).
- **Delivery characteristics** (e.g. changes in obstetrics practice including induction of labour, increases in the use of caesarean section for breech presentation).
- **Non-clinical factors** (e.g. maternal request, litigation and defensive practice).

Variation in interventions

Lutomski *et al* (2014), however, in a retrospective cohort study on childbirth hospitalisation occurring between 2005 and 2010, found statistically significant differences in the rate of elective caesarean delivery, emergency caesarean delivery, operative vaginal delivery and episiotomy

between women who had public health cover and those with private insurance. The authors concluded that irrespective of obstetric risk factors, women who opted for private maternity care were more likely to have an obstetric intervention. This finding has also been identified in the Australian context, where private maternity care is a feature of the overall system of maternity care (Einarsdóttir *et al*, 2012).

Geographic variations in interventions have been subject to consideration in a number of jurisdictions, including Canada and Ireland, and the findings show that there are wide variations not only between countries but also between regions and provinces in the respective countries. In Ireland, for example, Lutomski *et al* (2012b), using a nationally representative hospital discharge data, conducted a retrospective cohort study to explore regional variation in obstetrical intervention across four major regions (Dublin Mid Leinster; Dublin Northeast; South; West) within the Republic of Ireland. Chalmers *et al* (2012) examined provincial and territorial variations in rates of routine interventions used during labour and birth from a nationally representative sample of 6,244 eligible Canadian women included in the 2011 *Maternity Experiences Survey*. Results for Ireland and Canada are shown in Table 4.

Table 4: Differences in rates by region in Ireland and province in Canada according to the highest and lowest incidence of obstetrical interventions

Obstetrical intervention	Ireland (region) Lowest %	Ireland (region) Highest %	Canada (province) Lowest %	Canada (province) Highest %
Total induction	23.3	31.3	21.6	52.2
Vacuum	13.2	18.1	1.8	10.7
Forceps	2.7	5.80	0	5.3
Episiotomy	18.5	27.4	5.4	20.4

As seen in Table 4, more than half of the women in one province of Canada were induced, compared with 1 in 5 in another province. In Ireland, almost one-third of women (31.3%) were induced in one region, while 10% fewer (23.3%) were induced in another. In one Canadian province, the episiotomy rate was only 5.4%, while in one region in Ireland the rate was 27.4% – a five-fold difference in interventions. Authors of both studies concluded that interventions are influenced by a range of factors other than maternal and fetal need.

The evidence of increasing rates of interventions, coupled with extensive variation, has led to questions being raised about the necessity for all these interventions. In an audit of a small number of caesarean sections (n=192) conducted in one area in France, Vendittelli *et al* (2014) found that only two-thirds (65.6) were considered ‘appropriate’; the remainder were considered inappropriate and were due to maternal preference (12%) and provider preference (22.4%). There is thus a growing literature on the influence of the care setting and the care provider in relation to the extent to which interventions take place.

Midwife-led models of care

In a comparison of systems of maternity service delivery across the UK, the Netherlands and Australia, Reibel (2004) notes that while the World Health Organization states that midwives are the most appropriate primary carers during pregnancy and childbirth, a dominant model of care has displaced them. She highlights differences in educational preparation, noting that midwives are educated to understand and support normal physiological birth and assess and respond to deviations (wellness model), while obstetricians are educated to assess risk and address concerns through active clinical management (which, she notes, is an illness model). She suggests that while this has been the pattern in the UK and Australia, it has not happened to the same extent in the Netherlands. In drawing attention to the dichotomy between obstetric and midwifery care, she notes that it is not just about clinical expertise (Reibel, 2004, p.330):

'It also incorporates issues of philosophy, legislative control, power relations, risk and cultural conditioning and has had far-reaching consequences for women as their input into the circumstances and modalities of childbearing has been undermined.'

This view is supported by Sandall *et al* (2013), who suggest that the differences between midwife-led care and other types of care often include variations in philosophy, the relationship between the care provider and the pregnant women, use of interventions during labour, care setting (home, home from home or acute setting), as well as in the goals and issues around control, power relations and cultural conditioning.

Consequently, within the literature, while there is agreement that obstetric (as well as midwifery) care is essential for those women who have complex medical care needs, there is a growing literature highlighting the importance of adopting alternative approaches to care. This shift is underpinned by an understanding that pregnancy and childbirth is a normal physiological process and that pregnant women are predominantly well. This has been termed 'a wellness paradigm' and in Australia's *National Maternity Services Plan 2010* (Commonwealth of Australia, 2011), this philosophy has been set out in policy as follows:

'This wellness paradigm for pregnancy and childbirth acknowledges that pregnant women are predominantly well because pregnancy and birth are normal physiological life events. Clinical decisions about medical intervention should be informed by this understanding.'

Other terminology refers to the 'humanisation of childbirth', which it is suggested is an alternative model to the medical and technological models and which is characterised by key characteristics such as personalisation, recognition of women's rights, human caring, women's advocacy and companionship, and a balance between medical care and comfort, safety, and humanity (Behruzi *et al*, 2014). These different understandings are operationalised across different models of care and consideration is given below to different approaches.

Midwife-led care has been defined by the Royal College of Obstetricians and Gynaecologists (2001) as care where:

'the midwife is the lead professional in the planning, organisation and delivery of care given to a woman from initial booking to the postnatal period'.

According to Sandall *et al* (2013), central to midwife-led care, however, is working in partnership with the woman as the lead professional with responsibility for each of the following:

- assessment of her needs;
- planning her care;
- referral to other professionals;
- ensuring provision of maternity services.

Findings on the safety and effectiveness of midwife-led care

Sandall *et al* (2013), in a Cochrane systematic review of the literature on midwife-led continuity of care models, included 13 trials involving 16,242 women. Women who had midwife-led continuity models of care were:

- less likely to experience regional analgesia, episiotomy and instrumental birth;
- more likely to experience no intrapartum analgesia/anaesthesia, spontaneous vaginal birth, attendance at birth by a known midwife and a longer mean length of labour (hours);
- there were no differences between groups for caesarean births and no differences in fetal loss/neonatal death of at least 24 weeks.

Women who were randomised to receive midwife-led continuity models of care were:

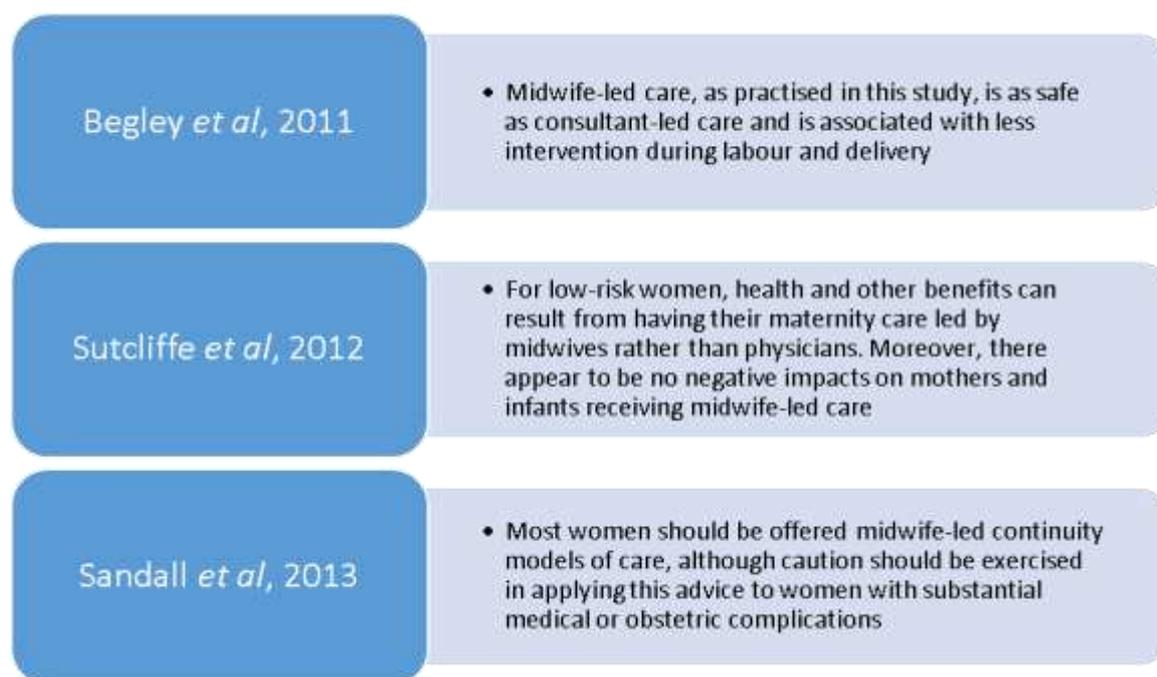
- less likely to experience preterm birth and fetal loss before 24 weeks' gestation;
- the majority of included studies reported a higher rate of maternal satisfaction in the midwife-led continuity care model. Similarly, there was a trend towards a cost-saving effect for midwife-led continuity care compared to other care models.

The trials included in the Sandall *et al* (2013) systematic review are drawn from many different jurisdictions, including Ireland where Begley *et al* (2011) conducted an unblinded, pragmatic randomised trial, funded by the Health Service Executive (HSE Dublin North-East). The trial included 1,653 consenting women who were centrally randomised on a 2:1 ratio to midwife-led unit or consultant-led unit and 'intention-to-treat' analysis was used to compare 9 key neonatal and maternal outcomes. The findings show that no significant difference between the midwife-led unit and the consultant-led unit in the 7 key outcome areas (caesarean birth, induction, episiotomy, instrumental birth, Apgar scores <8, postpartum haemorrhage or breastfeeding initiation). Women in the midwife-led unit were significantly less likely to have continuous electronic fetal monitoring or augmentation of labour. The authors concluded that midwife-led care, as practised in the study, is as safe as consultant-led care and is associated with less intervention during labour and delivery.

Sutcliffe *et al* (2012) conducted a systematic review of reviews comparing midwife-led and doctor-led maternity care and included three meta-analytic reviews. The results showed that midwife-led care for low-risk women was found to be better for a range of maternal outcomes, reduced the number of procedures in labour and increased satisfaction with care. The authors found no evidence of adverse outcomes associated with midwife-led care.

The conclusions of these three studies are summarised in Figure 12.

Figure 12: Conclusions drawn on midwife-led care



Findings from the Sandall *et al* (2013) systematic review have been highlighted in a recent publication by Renfrew *et al* (2014) in *The Lancet*, where it was noted:

‘Midwifery’s contribution to the survival, health and wellbeing of childbearing women and newborn infants is demonstrated in the analysis of systematic reviews, case studies and modelling of deaths averted that was done for this [The Lancet] Series. Midwifery is a vital solution to the challenges of providing high-quality maternal and newborn care for all women and newborn infants, in all countries.’

As noted earlier, midwife-led care is the predominant model adopted in the Netherlands, New Zealand and the UK, and where midwives are available, in Canada. In addition, there is a strategic commitment within the Australian *National Maternity Services Plan* to make midwife-led care more accessible to a wider range of women and over a larger geographic area.

Summary on quality and safety

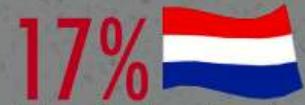
In summary, there are many concerns about safety in obstetrics care and philosophic understandings of pregnancy and childbirth inform how safety is positioned within the predominant model of care implemented. Concerns have been raised about the increase and variation in interventions across jurisdictions, regions, funding models and types of care, with caesarean section rates being identified as a particular cause for concern. In parallel, there has been a growing literature comparing midwife-led with medically-led care, culminating in a recent Cochrane systematic review of literature that included some 13 trials (including an Irish trial) and a systematic review of a meta-analysis comparing midwife-led and doctor-led care. There is a consistency in the findings of these reviews, showing lower levels of interventions and higher satisfaction with care without any corresponding increase in adverse outcomes for mothers or infants.

Giving Birth



27% Caesarean Section 2010

Ireland



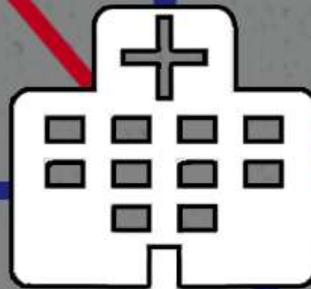
17%
The Netherlands



65% of multiple live births were delivered by caesarean section in 2012 in Ireland

In Ireland, **55%** of mothers spent  days or less in hospital (2012)

Between 2001-2010 multiple births increased from **2.8%** in Canada to **3.2%** 



67% of infants were born out-of-office hours 



In England 99% of women live within a 60-minute drive of a midwife-led unit and an obstetric unit



RESEARCH MATTERS LTD

Data sources: see end of document

Access

Access is a complex and multidimensional concept that does not easily lend itself to measurement. Different dimensions have been identified, including both the potential to obtain care and the actual receipt of care, and this is highlighted by Harris (2013) who identifies four concepts as follows: (a) opportunity for access; (b) realised access; (utilisation); (c) equity; and (d) outcomes. While terms such as access, availability and acceptability are often used interchangeably, Begley *et al* (2009) note that a commonality in all definitions of 'access' is that the concept is dependent on the person's ability and willingness to enter into the healthcare services. They draw on the application of the five dimensions of access proposed by Penchansky and Thomas (1981) to women's needs, as follows:

- **Availability**, which refers to the relationship between the extent and type of services available to address women's needs;
- **Accessibility**, referring to the relationship between the location of the women and the location of the services;
- **Accommodation**, which is the relationship between the service providers and the organisation of resources to accommodate women;
- **Affordability**, referring to the women's ability to afford the services;
- **Acceptability**, which refers to the relationship established between health service providers and the women.

Challenges encountered in any of these five component dimensions will impact significantly on women in three distinctive ways:

- a decrease in the utilisation of services;
- dissatisfaction with the services and care received;
- inequality in service provision.

In the context of maternity services, there is general agreement that women and families require access to the appropriate professional to attend to *'however simple or complex the need at all stages of pregnancy, during labour and postnatally'* (Department of Health/Partnerships for Children, Families and Maternity, 2007, p. 23). Maternal choices on the place of birth, type of care provided and main service provider are all key issues in terms of access and these are considered in the section below, 'Models of Care'.

Across jurisdictions, attention has been paid to strategic developments to support improved access, with the Australian plan outlining the most comprehensive approach. First, it presents 'access' as a broad priority area and then sets out four key areas where access will be increased: (1) for women and their families in accessing *'information that supports their needs'*; (2) to local maternity care by *'expanding the range of models of care'*; (3) increasing access in *'rural'* areas; and (4) increasing access in *'remote'* areas. Other countries' plans focus on different elements. Northern Ireland, for example, identifies the importance of location (*'locally accessible care'*) and this was also the case for Canada, where the services would be delivered *'regardless of where they live'*. New Zealand highlights access to *'consistent' and 'comprehensive' care ('all women have access to a nationally consistent, comprehensive range of maternity services')*, while also drawing attention to *'financial barriers' ('to ensure there are no financial barriers to access for eligible women')*. Scotland's plan focuses on the timing of care as well as utilisation, noting *'early direct access and uptake'*.

Delays in access

The HIQA (2013) report identified a number of missed opportunities and delays in the care of Savita Halappanavar, resulting in disastrous consequences, and it is clear that appropriate timing is extremely important in maternity care. This area has been examined by Pacagnella *et al* (2014), who

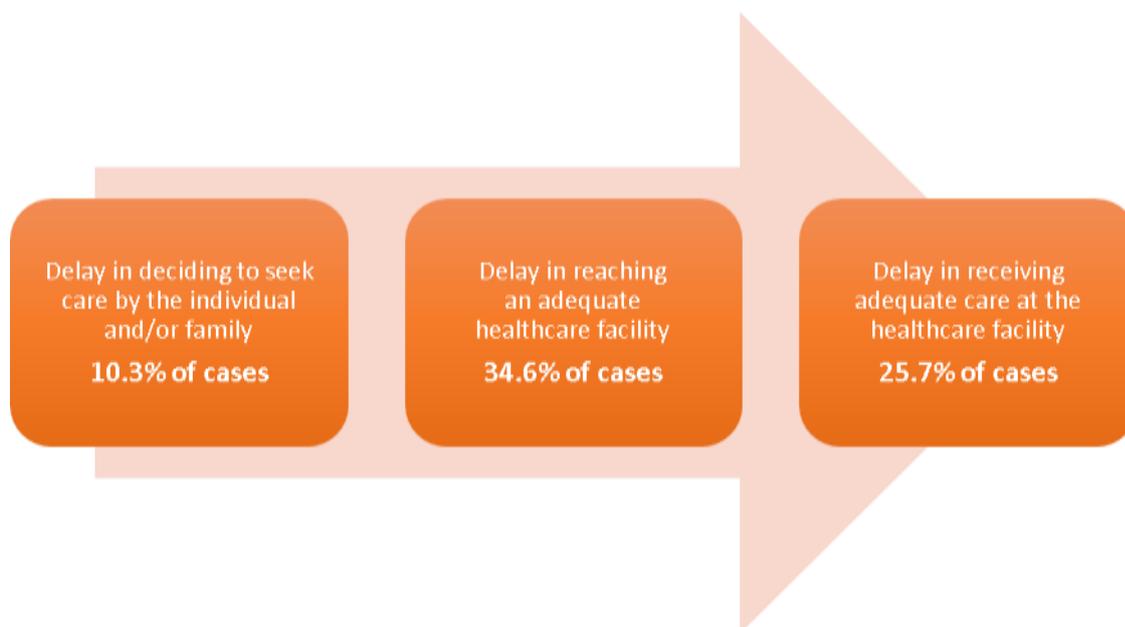
reviewed 82,144 live births to identify potentially the role of timing delays in life-threatening conditions (PLTC), maternal death (MD) and maternal near-miss (MNM) cases. They drew on the work of Thaddeus and Maine's 'three delays model' to evaluate the circumstances surrounding access to appropriate emergency obstetrics care, as follows:

- Phase 1: Delay in deciding to seek care by the individual and/or family.
- Phase 2: Delay in reaching an adequate healthcare facility.
- Phase 3: Delay in receiving adequate care at the healthcare facility.

The findings of Pacagnella *et al* (2014) show that of the 9,555 cases with obstetrical complications where sub-standard care was identified, at least one form of delay was observed in just over half of the cases (53.8%; n = 4,687). Delays relating to **user factors** (10.3% of cases) included delay in seeking health services, refusal to treatment, unsafe abortion; delays in **health service accessibility** (34.6%) included difficulty in gaining access to antenatal care, problems with transportation, absent or inadequate antenatal care, geographical difficulty in gaining access to health services; delays in accessing **quality of care** (25.7%) included an absence of blood production, lack of medication, difficulty in communicating between hospital and regulatory centre, lack of trained staff, delay in case referral/transfer, delay in diagnosis, delay in starting treatment and improper patient management.

These findings suggest a statistically significant association between frequency of delay and severity of outcome. Short- and long-term consequences for women were identified as surgery, emergency care, infertility, psychological effects, disability and even death. These events, understandably, also led to an increase in longer lengths of hospital stay, resulting in increased costs (*see Figure 13*).

Figure 13: Percentage of cases of obstetrical complications with identifiable delays



Note: Categories are not mutually exclusive and more than one type of delay could occur in any individual case.

Geographic location

Across jurisdictions, challenges were identified in respect of access to maternity services, although there are differences in the relative attention paid to them. While access to a range of models of care has been identified as a priority in a number of strategic approaches, the vastness of Australia and Canada, coupled with low population density, has created particular challenges in the provision of services in remote areas where populations are dispersed. In the UK and Ireland, there is a strong

focus on access for vulnerable or 'hard to reach' groups, particularly ethnic minority groups (e.g. Travellers) and immigrants, both of whom have additional needs (see Chapter 4).

Distance from services

Pilkington *et al* (2012) note that despite national policies to promote user choice in many European countries, current trends in the closure of small maternity units has led to a number of difficulties since, based on the findings of their study conducted in France, about one-third of women choose their maternity unit based on proximity. They further noted that when the distance between first and second closest maternity unit was greater than 30 kilometres, over 85% of women chose the one closest to them. Similar findings have been identified in other countries, including Canada, where Kornelsen *et al* (2011) noted that over the past 15 years there has been a wave of closures of small maternity units with consequences for women who need to travel long distances to access care, particularly at the time of birth. Reasons for closing such units have been identified as (Kornelsen *et al*, 2011):

- perceived fiscal economies of scale;
- difficulties overcoming challenges to recruitment and retention of skilled practitioners in rural areas;
- concerns about the safety of small rural services.

In a Canadian study, Grzybowski *et al* (2011) examined distances from maternity services (measured in number of minutes from services) and reported adverse maternal and perinatal outcomes. These included statistically significant increases in admissions to Neonatal Intensive Care Units and increased perinatal mortality for newborns whose mothers resided further than 4 hours away from services. Maternal stress has also been highlighted as problematic and Kornelsen *et al* (2011) reported that parturient (in labour) women who had to travel more than one hour to access services were 7.4 times more likely to experience moderate or severe stress when compared to women who had local access to maternity services.

Grzybowski *et al* (2011) draw attention to the introduction of the recently published Rural Birth Index, which provides a metric for systematically quantifying need for maternity services in rural community populations and defining the appropriate service level for a given population.

The international comparative study of maternity systems conducted by Malatest International for New Zealand's Ministry of Health (Rowland *et al*, 2013) noted, however, that clinical outcomes for women in remote settings were improved by better communication, improved outreach antenatal care and tele-medicine links.

Models of care

Access to different models of care is a feature of a number of strategic plans for jurisdictions included in this review and this is particularly the case with the Australian plan, as well as those of Scotland, Wales, Northern Ireland and England. There is a wide range of potential ways in which maternity services can be structured through different models of care, with a continuum from home birth through to highly specialised tertiary care centres.

Access and continuity of care

Irrespective of the model of care adopted, there is agreement that continuity of care is an important element of many different aspects of maternity services delivery, including quality and safety (Hoope-Bender, 2014; Tracy *et al*, 2013). Reid *et al* (2002, in Psaila *et al*, 2014) describe continuity as '*the degree to which a series of discrete events are experienced as coherent, connected and consistent with the patient's needs over time*'. Continuity has two core elements:

- that care is experienced as smooth and coordinated by the client;
- that care is provided over time.

There are three dimensions to continuity of care (Haggerty *et al*, 2003) and these are now considered in relation to maternity services (Psaila *et al*, 2014):

- **Informational continuity** – refers to the use of a patient’s previous history, knowledge of the patient’s values, preferences and social context, as well as physical condition, to inform current care planning.
- **Relational continuity** – focuses on the relationship between the clinician and client, which, when developed over time, provides a framework for more consistent care.
- **Management continuity** – refers to coordination of patient care, how it is organised and provided via timely and consistent service, appropriate to the needs of the individual.

Within the literature, continuity of care is associated with midwifery care. Policy documents, such as *Maternity Matters: Choice, access and continuity of care in a safe service* (Department of Health/Partnerships for Children, Families and Maternity, 2007) note that the elements of continuity of midwifery care include:

- having the time to talk, engage and build a relationship with women and their partners in order to understand and help meet their needs throughout pregnancy and afterwards;
- ensuring that women and their families are aware of arrangements for ongoing midwifery support and coordination, should the familiar midwife be unavailable;
- ensuring continuity of care and handover when a woman chooses to give birth outside her area;
- providing individual support to women throughout their labour and birth.

Good communication is a critical element within continuity of care and this has been the subject to some review, particularly in the UK. Studies of women’s views of maternity care suggest that good communication – that includes the provision of appropriate and accessible information as well as listening to women’s preferences and concerns – is central in determining whether women are satisfied with the care they receive (Rowe *et al*, 2002).

Malott *et al* (2009) suggest that in midwifery practice, continuity of care is understood to mean the provision of care throughout the antenatal, intrapartum and postpartum periods by the same midwife or a small group (less than 5) of midwives. In the UK, this type of approach is sometimes referred to as Team Midwifery, where midwives share a caseload (Royal College of Midwives, 2013). Similar types of approach are also in place in New Zealand, the Netherlands and Canada, where continuity of care is considered an important component of care (Rowland *et al*, 2013). In Australia and sometimes in the UK, women may see different midwives during their pregnancy since antenatal and postnatal care may be provided by midwives in the community and intrapartum care may be provided by hospital-based midwives whom the woman has not met prior to the onset of labour.

The intrapartum period is an area of concern because the scope for error is high in a situation where there are many professionals involved (e.g. obstetricians, midwives, anaesthetists, health support workers and other professionals) and where there are two patients (mother and unborn baby); such situations can be highly susceptible to patient safety incidents (Edozien, 2011). In the UK, concerns have led to the development of guidelines and policies, care pathways, the establishment of labour ward forums to review policy and operations, and the introduction of incident reporting (NHS Litigation Authority, 2012). Edozien (2011), however, argues that while such approaches are helpful, there is also a need to target staff behaviour and thinking; he highlights the introduction of the Structured Multidisciplinary Intershift Handover (SMITH), which encompasses pre-handover behaviour, debriefing, transfer of clinical information, safety scan, documentation and post-handover

behaviours. Such an approach operates at a system level and can incorporate the use of the ISBAR communication tool (Identify, Situation, Background, Assessment and Recommendation), which is part of the National Early Warning Score development in Ireland (National Clinical Effectiveness Committee, 2013).

The provision of continuity of care in the intrapartum period has been subject to review by Hooper-Bender (2014). Positive effects were identified in relation to:

- the length of labour;
- the use of pain drugs;
- Apgar scores;
- number of unassisted vaginal births;
- women's satisfaction.

Arising from the above, it is clear that there are positive outcomes arising from a model of care that incorporates continuity of care and this has been considered in the Australian plan, which highlights the multifaceted approach required. It notes that while a flexible workforce and integrated services are required, other elements must also be embedded within the system, including:

- effective consultation and referral pathways;
- effective clinical networks;
- collaborative interdisciplinary professional relationships;
- sound information-sharing and communication channels.

These elements emerge consistently in the literature and it is clear that while there are positive outcomes arising from a model of care that incorporates continuity of care, it is equally clear that the structuring and organisation of services can have a significant impact on the care provided.

Settings for care for women deemed to be at low risk

Settings for care can differ according to the jurisdiction under examination and can range from hospital-based with consultant-led care to birth at home led by a midwife. Within this spectrum, a variety of different options are available, including midwife-led units alongside or within larger units and birth centres. While it is often not possible to differentiate the effect of the midwife-led care from the setting for that care, the findings relating to the experiences of low-risk women are consistent across a range of studies on midwife-led care in a variety of different settings.

Debates on the safety of planned home birth have been underway since the 1970s and continue today in the literature, policy and practice across the developed world. A number of recent reviews, including a Cochrane systematic review of the literature, have been conducted. These reviews have been used to inform policy development in countries such as Australia and the UK. The Department of Health, Western Australia (2011), for example, conducted a review of the evidence on outcomes and safety of planned home births. The outcomes examined included characteristics of women electing to have a home birth, maternal satisfaction, antenatal referrals to hospital care, intrapartum and postpartum transfers to hospital, interventions in labour and neonatal outcomes, the latter including perinatal mortality which is noted by the Department to be the most important outcome.

The Australian review (Department of Health [Western Australia], 2011) concluded that planned home birth with a qualified home-birth practitioner is a safe alternative for women determined to be at low-risk pregnancy of complications by established screening criteria. However, for women who are not determined to be at low risk, especially at the onset of labour, there appears to be an excess neonatal morbidity and mortality associated with actual home birth.

Birth centre

A recently published study by McFarlane *et al* (2014), focusing on birth centres in England, continues to support the findings about midwife-led care for women who are considered at low-risk (McFarlane *et al*, 2014). They examined the outcomes for women and infants provided with care in a midwifery unit in London and found that the women were *more likely* to attend antenatal classes there and find them useful; more likely to go into spontaneous labour; and more likely to be able to choose their position for birth. They were *less likely* to be induced; less likely to use pharmacological methods of pain relief (including pethidine); and less likely to have continuous fetal monitoring.

Irish context

Outcomes in respect of midwife-led units were also the subject of examination in Ireland by Begley *et al* (2011) through a randomised trial of women without risk factors for labour or delivery, which compared women's outcomes in midwife-led units with consultant-led care in hospital. Outcomes compared included the rate of interventions, maternal satisfaction and neonatal and maternal outcomes across a range of areas.

The results show that there were lower levels of electronic fetal heart monitoring and labour was less likely to be augmented, without any statistically significant difference in adverse neonatal or maternal outcomes, such as low Apgar scores, resuscitation, admission to Special Care Baby Units, caesarean section, instrumental birth or postpartum haemorrhage. The authors concluded that midwife-led care, in an alongside midwife-led unit, is as safe as consultant-led care and is associated with less intervention.

Byrne *et al* (2011), in a study conducted with 501 women in one large Dublin maternity hospital, reported that:

- 352 women (70.3%) wanted shared antenatal care between their family doctor and either a hospital doctor or midwife;
- 228 women (45.5%) preferred to have their baby delivered in a doctor-led unit;
- 215 women (42.9%) preferred a midwife-led unit, although it was noted that of the 215 women, only a little more than half (55%; n=118) met criteria for suitability;
- there was minimal demand for home births (1.6% of sample).

Sandall (2012) notes that while most pregnancies among low-risk women are normal and most births do not require any medical intervention, it is never possible to predict with certainty that a complication will not occur. Consequently, in many countries, giving birth in hospital is viewed as the safest option for all women.

The recent *Birthplace National Prospective Cohort Study* in England (Hollowell *et al*, 2011) compared the safety of births planned in four settings and identified the following places of birth:

- home;
- freestanding midwifery units (FMUs);
- alongside midwifery units (AMUs);
- obstetric units (OUs).

It has been noted that this study, which focused on healthy women with straightforward pregnancies who meet the NICE intrapartum care guideline criteria for a 'low risk birth', provides 'a genuine breakthrough in a debate on place of birth' (Buekens and Keirse, 2012), with the prospective design and large sample size considered particularly important.

In total, the cohort consisted of 79,774 eligible women, of which 64,538 (81%) were classified as 'low risk'. The findings by Hollowell *et al* (2011) are as follows:

- The incidence of adverse perinatal outcomes was low in all settings and there were no statistically significant differences between settings in the incidence of the primary outcome for multiparous women. However, adverse perinatal outcomes were more common in the planned home birth group for nulliparous women, leading to suggestions (by Buekens and Keirse, 2012) that first-time mothers should not be encouraged to give birth at home.
- Instrumental and operative deliveries and other interventions were less frequent in planned home, FMU and AMU births. Women in these three settings were significantly more likely to have a 'normal birth' (defined as 'a spontaneous vaginal birth without induction of labour, an epidural or spinal anaesthetic or episiotomy'), compared with women in the planned OU group.
- Babies in the planned home and FMU groups were significantly more likely to be breastfed at least once relative to babies born in the planned OU group.
- Adverse maternal outcomes (e.g. third or fourth degree perineal trauma, blood transfusion or admission to a higher level of care) tended to occur less frequently in the planned home and FMU groups, and blood transfusions were given less frequently in the planned FMU group relative to planned OU births. However, event rates for these outcomes were low and not all of these differences were significant at the 1% level.
- Transfers during labour or immediately after birth occurred in over 20% of births in the three non-OU groups (home, FMU and AMU). Transfer rates were markedly higher in nulliparous women, however, and these rates varied from 36% in planned FMU births to 45% in planned home births, compared with rates of 9%-13% in multiparous women.

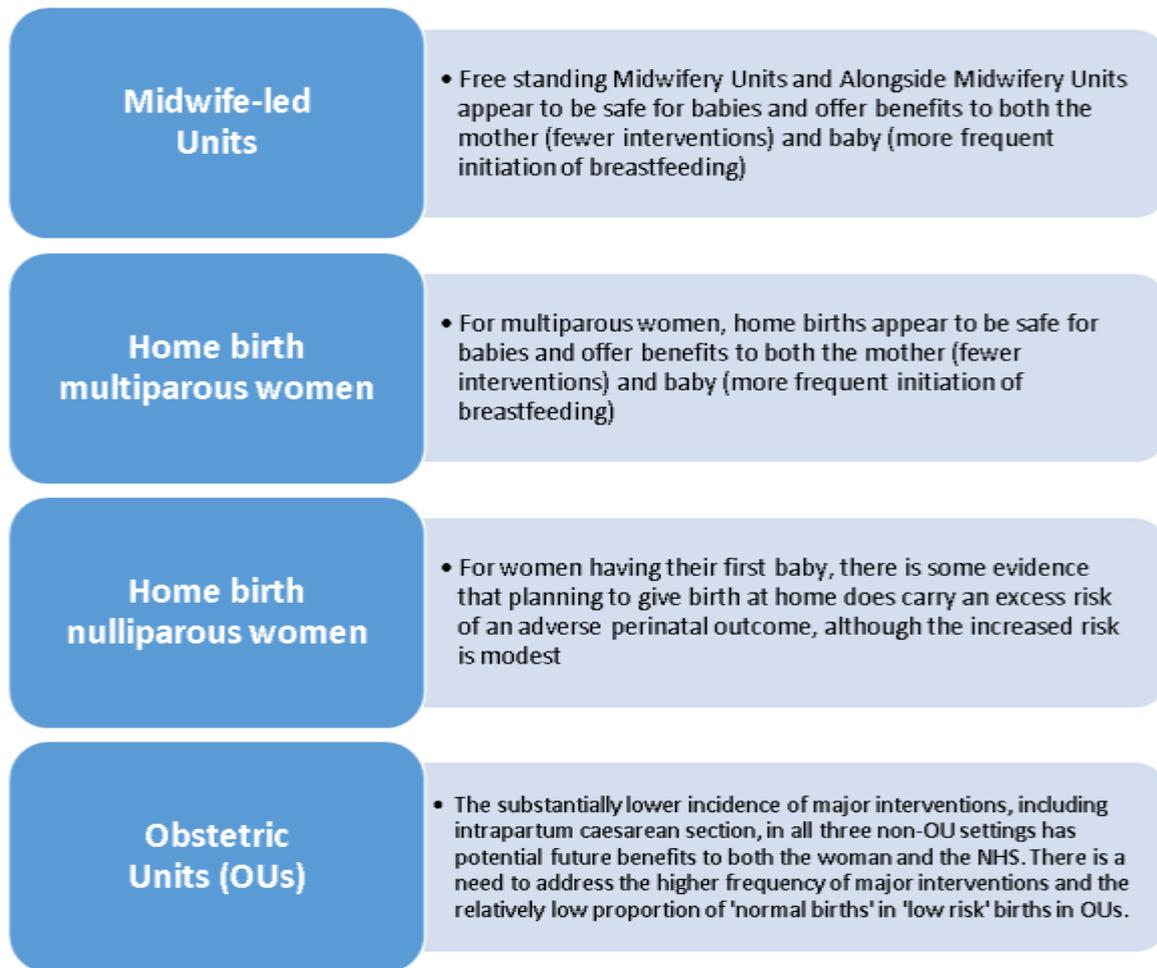
DOMINO schemes

A small number of maternity hospitals in Ireland provide some out of hospital, midwife-led services, although the extent to which these have been subject to evaluation is not clear. The *2012 Annual Report* of the National Maternity Hospital Holles Street (2013), for example, notes that the community midwifery service in Dublin has been in place for 13 years and midwives from the hospital have been present for 418 homebirths. DOMINO care includes Community Midwifery Antenatal Care, in conjunction with the GP, and mothers giving birth to their baby in hospital with a Community Midwife caring for them and transfer home 6-12 hours following the birth. The *2012 Annual Report* notes that waiting lists are increasing for this service. Postnatal care is provided at home for up to 10 days. All this care is provided by the same team of Community Midwives. The *Annual Clinical Report 2012* for the Coombe Women & Infants University Hospital (2013) notes that a DOMINO scheme was introduced in that hospital in 2012.

Births for 'higher risk' women

Again, looking at the findings from the *Birthplace National Prospective Cohort Study* in England (Hollowell *et al*, 2011), comparisons for 'higher risk' women with planned births in obstetric units (OUs) are more difficult to interpret because the groups were not homogeneous in terms of risk. For example, induction of labour was recorded as a risk factor in almost half of the 'higher risk' women in the planned OU group. This both increases the risk of other interventions and, by definition, precludes a 'normal birth'. However, the authors drew attention to 5% of women in the three planned non-OU groups (home, FMU and AMU) who were classified as 'higher risk' and therefore, according to the National Institute for Health and Care Excellence's intrapartum care guidelines (NICE, 2007), should have been advised to give birth in an OU. The proportion of 'higher risk' women was 3% for planned FMU births, 4% for planned AMU births and 7% for planned home births. The findings for these women were consistent with an increased risk of an adverse perinatal outcome for 'higher risk' women (*see Figure 14*).

Figure 14: Conclusions drawn from Birthplaces study, which included 64,538 'low risk' births



It is clear that where access to different choices are to be created and made available, well-defined and robust arrangements must be in place to ensure safety and quality across the whole system.

Summary on access

In summary, access is a multidimensional concept that includes availability, accessibility, accommodation, affordability and acceptability. Three issues arise in the obstetrics literature on access and these are delays in care (due to user, health service accessibility and quality care), distance from services and access to different models of care. Findings from a recently published cohort study in the UK, which included 64,538 'low risk' births, provide a comprehensive insight into different care settings for women, including home, freestanding midwifery units, alongside midwifery units and obstetric units. The study concluded that freestanding midwifery units and alongside midwifery units appear to be safe for mothers and babies, and have other additional benefits for both parties over and above obstetric units. Home birth for multiparous women appears to be safe for mothers and babies, and offers benefits to both, while there is an increased risk (although modest) for primiparous women with planned home birth.

6. Staffing and training

‘A fully trained, competent workforce, accountable for their individual and collective practice, supported and managed within a strong corporate and clinical governance system, is required for a safe, high quality maternity service.’ (HIQA, 2013, p. 54)

There is an acknowledgement within the HIQA (2013) report, *Investigation into the safety, quality and standards of services provided by the Health Service Executive to patients, including pregnant women, at risk of clinical deterioration ...*, that there are increasing pressures in respect of the workforce and these have been highlighted by Turner (2011a) in the Irish context (see Figure 15).

Figure 15: Challenges in respect of the obstetrics and gynaecology workforce



Source: Turner (2011a)

Similar and additional pressures have been identified in respect of maternity services workforces elsewhere. In the UK, for example, a horizon-scanning exercise by the Centre For Workforce Intelligence (2013) examined the influences on the maternity workforce over the next 20 years and identified a range of factors that will impact on the numbers of personnel needed and the skills required. These included policy factors (e.g. public expenditure choices in healthcare), workforce membership (e.g. an ageing maternity workforce), demographic factors (e.g. increase and subsequent slowdown and decline in birth rates) and epidemiological issues (e.g. complex care arising from the rising prevalence of diseases such as diabetes, as well as rising average maternal age and increasing numbers of vulnerable mothers).

These challenges have also been highlighted in the Australian *National Maternity Services Plan 2010* (Commonwealth of Australia, 2011) and in the Royal College of Physicians and Surgeons of Canada (2010) *Objectives of Training in Obstetrics and Gynecology* in relation to contexts where recruitment and retention of maternity care staff in rural areas is particularly problematic. The impact of the European Working Time Directive has created particular challenges for countries in Europe, where it has been identified as having a direct impact on the availability of Junior and Senior medical staff, resulting in shorter medical training periods, with consequences for training and continuous professional development (Ap Dewi *et al*, 2011) and potential consequences for the clinical skills and experience of future consultants (Turner, 2011a).

Multidisciplinary workforce

There is some consensus across the jurisdictions under review that while midwives and obstetricians and gynaecologists are core professionals in the provision of maternity services, many others are involved in varying numbers and roles in the provision of care, from antenatal through intranatal and postnatal care. The UK's maternity plan, *Midwifery 2020* (Chief Nursing Officers of England, Northern Ireland, Scotland and Wales, 2010), for example, identifies members of the multidisciplinary team who will be providing care in the UK into the future as obstetricians, general practitioners, health visitors/public health practitioners and maternity support workers/maternity care assistants. Other countries under review highlight the role of allied health professionals, thus drawing attention to a broad range of professionals.

Secondary care settings

Within secondary care settings, medical specialists (particularly anaesthetists and neonatologists) are identified as critical. This has been highlighted in the report *Confidential Enquiries into Maternal Deaths in the United Kingdom* by the Centre for Maternal and Child Enquiries (2010b), where the provision of a dedicated obstetric anaesthesia service (with a clear line of communication to the supervising consultant and the timely involvement of the anaesthetic team in the management of the sick obstetric patient) was identified as crucial. The Association of Anaesthetists of Great Britain & Ireland and the Obstetric Anaesthetists Association (2013) recommend in their current *OAA/AAGBI Guidelines for Obstetric Anaesthetic Services 2013* that a duty anaesthetist be immediately available for the delivery suite 24 hours a day.

In addition to medical specialities, the findings from the HIQA (2013) report highlight the importance of ensuring robust arrangements, including high dependency and critical care units, are in place to ensure obstetric patients who deteriorate clinically are managed appropriately. HIQA noted that the following areas were required in order to provide a safe service to mothers and infants:

- on-call roster that ensures competent consultant cover on a 24/7 basis;
- 24/7 access to on-site diagnostics;
- 24/7 access to on-site ICU/HDU beds;
- 24/7 access to anaesthesia.

These areas have previously been considered in the KPMG (2008), where a number of predominantly medical personnel and secondary and tertiary care services that may be required were identified. KPMG identified a full range of medical and surgical specialities (e.g. urology, cardiology, endocrinology, genetics), as well as services such as radiology (including ultrasound, MRI, CT scanning), biochemistry, haematology, intensive care units and high dependency units. Various models for facilitating access to these personnel and services have been identified and these range from having them directly available, co-located or having a system in place to access them (KPMG, 2008). More recently, the availability of effective, responsive and accredited microbiological

services to support effective clinical management of infection, available on a 24 hours-7 days a week basis, was highlighted as a key issue (HIQA, 2013).

The UK have recommended specific ratios according to various medical, obstetrics and gynaecology specialities (HSE, 2014), as listed in Table 5.

Table 5: UK recommended specialist population ratios

Speciality	Sub-specialists	Specialist interest consultants
Gynaecological oncology	3 per million	5 per million
Reproductive medicine	2.5-3 per million	4 per million
Urogynaecology	1 per million	6-7 per million
Fetal and Maternal Medicine	1 per 353,333 population	1 to 103-110,417 population

Out-of-hours workforce

As noted earlier, 24-hour workforce cover is particularly problematic in the context of maternity services. Research studies from both Scotland and Ireland have shown that most births and emergency complications take place outside of office hours. Findings from a study carried out in Ireland (O'Donoghue *et al*, 2008) showed that more than two-thirds of infants (67%) were born out-of-office hours. The findings also showed that complications occurred more commonly outside of normal office hours, including:

- 83% of operative births due to failure to progress in labour;
- 77% of emergency caesareans performed for fetal distress.

The Scottish study (Pasupathy *et al*, 2010) found an increased risk of neonatal death among women delivering outside the hours of the normal working week. The availability of out-of-hours clinical services was also a feature in the HIQA (2013) report, where the availability of a range of services on a 24/7 basis was considered. These included:

- anaesthetic/intensivist expertise at consultant level;
- radiology services;
- laboratory services;
- consultant microbiologist;
- senior clinical decision-making at specialist registrar or consultant level;
- alternative arrangements for access to clinical services in the case when clinical expertise is not available on-site 24/7.

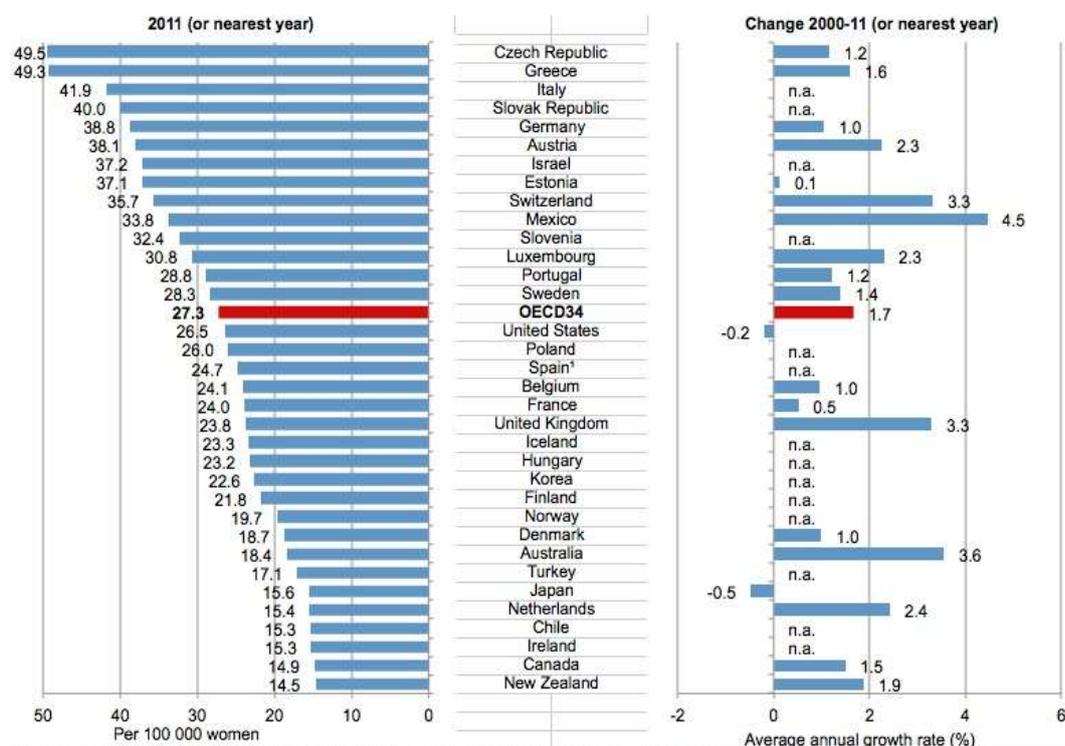
In the UK, several of the Royal Colleges (including Midwives; Obstetricians and Gynaecologists; Anaesthetists; and Paediatrics and Child Health) published a joint set of recommendations for maternity care. They recommend that in the event that complications develop, a consultant should be available within 30 minutes of being contacted. They also require that a Senior member of paediatric staff should be able to attend within 10 minutes of being contacted and a consultant paediatrician who has been assessed as competent in neonatal advanced life support within 30 minutes.

Although these specialisations and secondary care services are recommended, there is little evidence about the extent to which they are available in other jurisdictions. Some consideration, however, has been given to the proportion of obstetricians, gynaecologists and midwives available internationally and this area is now considered.

International comparisons

While the OECD (2013) report presents a comparison of the ratio of gynaecologists and obstetricians per 100,000 women, Turner (2011a) cautions on their use to benchmark countries because of different systems in place. The ratios show considerable differences across countries, varying from 14.5 per 100,000 women in New Zealand to 49.5 per 100,000 in the Czech Republic. There is little relationship, however, between the ratio of obstetricians and gynaecologists and the type of system in place, with the ratios for both Canada and Ireland (where care is predominantly medically-led) both reported as having the lowest ratios per 100,000 women (see Figure 16).

Figure 16: Gynaecologists and obstetricians per 100,000 women in 2011, and change between 2000 and 2011



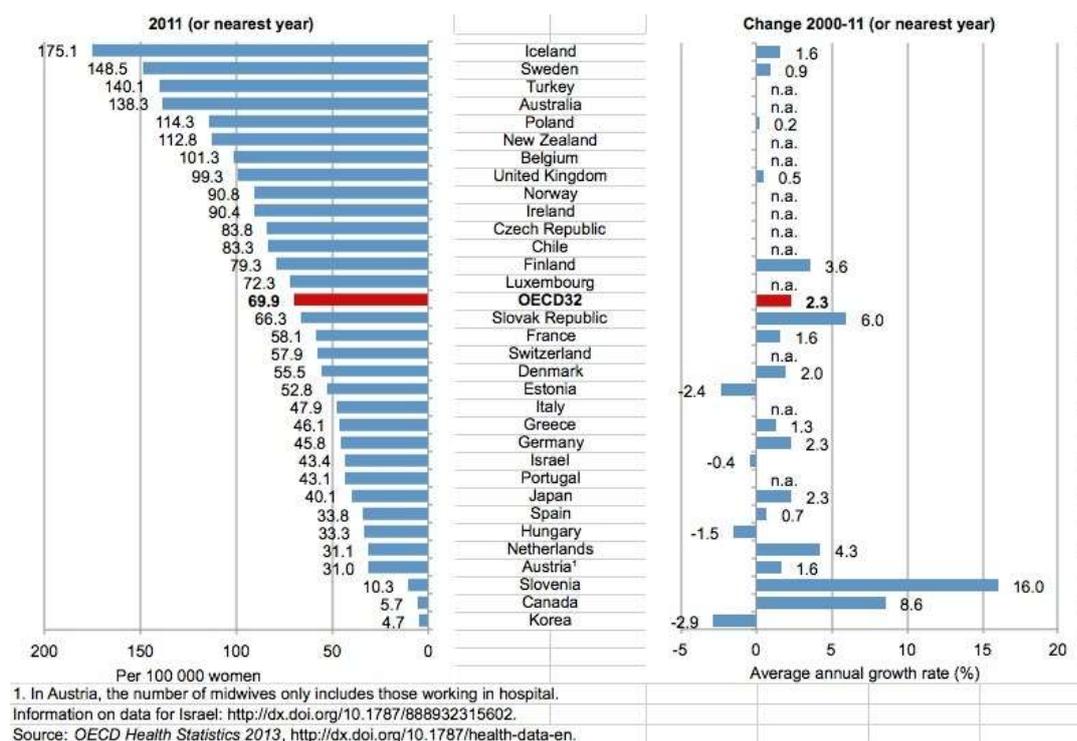
1. In Spain, the number of gynaecologists and obstetricians only includes those working in hospital.

Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>.

Source: OECD Health Statistics 2013, <http://dx.doi.org/10.1787/health-data-en>.

The OECD average ratio of midwives per 100,000 women in 2011 was 69.9 and Ireland was above this, with a ratio of 83.9. Again, however, these international comparisons provide little insight into the structuring of the maternity system. The Netherlands, for example, a country where there is a strong commitment to midwife-led care, has one of the lower ratios, at 31.1 per 100,000 (see Figure 17).

Figure 17: Midwives per 100,000 women in 2011, and change between 2000 and 2011



Workforce shortages

Internationally, there is much debate about workforce shortages across maternity services. The Malatest International report *Comparative Study of Maternity Systems*, prepared for New Zealand's Ministry of Health (Rowland *et al*, 2013), reported that shortages in the maternity workforce is a worldwide issue, with many of the comparator countries in their report experiencing shortages, especially of midwives. Some countries are experiencing shortages across multiple professions. A Canadian 2010 report, for example, described the growing shortages of obstetricians, family physicians, midwives and nurses (Society of Obstetricians and Gynaecologists of Canada, 2008). It also highlighted shortages in human resources across a number of allied professions that provide services to the mother and child, including dietitians, ultrasound technicians, physiotherapists, social workers, anaesthesiologists and paediatricians. In general, however, where shortages are considered, the focus is on obstetricians, gynaecologists and midwives.

The UK's *State of Maternity Services report 2013* (Bonar, 2013) identified a shortage of 4,800 midwives in 2012, the last year for which figures were available, although it was noted that there has been a consistent improvement in shortfall, assessed at more than 6,000 in 2008. A similar type shortage was identified in respect of obstetricians, where it was noted that only 47% of Hospital Trusts were achieving the recommended standards in consultancy presence.

These findings are similar to New Zealand, where 'there is a national shortage and maldistribution of midwives and obstetricians' and where there are particular problems in 'rural and provincial areas' (Ministry of Health, 2008, p. 23). Some concerns were also noted in New Zealand about the growing reliance on overseas-trained midwives and obstetricians, which, it was suggested, is not considered to be sustainable over time. Turner (2011a) highlights this issue in the Irish context and notes that the recruitment of consultants from lesser developed countries is unethical and is not in compliance with the WHO recommendations on national medical recruitment (WHO, 2010). Rowland *et al* (2013) also report that while the Netherlands midwifery workforce faced severe shortages around

the turn of the century, initiatives such as reduced workload, increases in pay and increases in training capacity have all led to a sustainable workforce in that jurisdiction. The Australian *National Maternity Services Plan* notes that the midwifery workforce is reasonably well distributed on a per capita basis across regional and remote Australia and that access to midwifery care is affected by distance and by the needs of the Aboriginal and Torres Strait people (Australia Commonwealth, 2010).

In Ireland, Turner (2011a) notes that while it is mandatory that all 19 maternity units in Ireland have a consultant obstetrician on-call at short notice 24/7 all year, this is challenging and there is a high use of locum consultants. He suggests that there should be an increase in the number of permanent consultants, which could be funded by a reduction in locums. He also notes potential difficulties arising in the future in attracting Irish graduates to the service because of perceptions that the rotas are too onerous, service quality is inadequate or professional relationships are unhappy.

A 2014 survey of midwifery staff by the Irish Nurses and Midwives Organisation (INMO) concluded that the health service has a critical shortage of midwives in all of the 19 maternity hospitals/units (INMO, 2014). They further suggested that more than 621 midwives were needed to reach the recommended staffing level for safe and better care, and that the situation has been greatly exacerbated over the past 5 years due to the loss of 5,200 nursing and midwifery posts as a result of the ban on recruitment. These findings are based on the Birthrate Plus tool (Ball *et al*, 2014), which recommends a ratio of 29.5 hospital births to 1 midwife and in community settings a ratio of 35 births to 1 midwife. According to Ball *et al* (2014, p. 1):

'[Birthrate Plus®] is currently the only midwifery-specific national tool that gives the intelligence and insights needed to be able to model midwifery numbers, skill mix and deployment and to inform decision-making about safe and sustainable services.'

The Birthrate Plus tool applies a scoring system that categorises each birth according to a number of clinical indicators, which take account of numbers of births, dependency levels and clinical interventions, and allows for a systematic comparison of client dependency levels. The variables include:

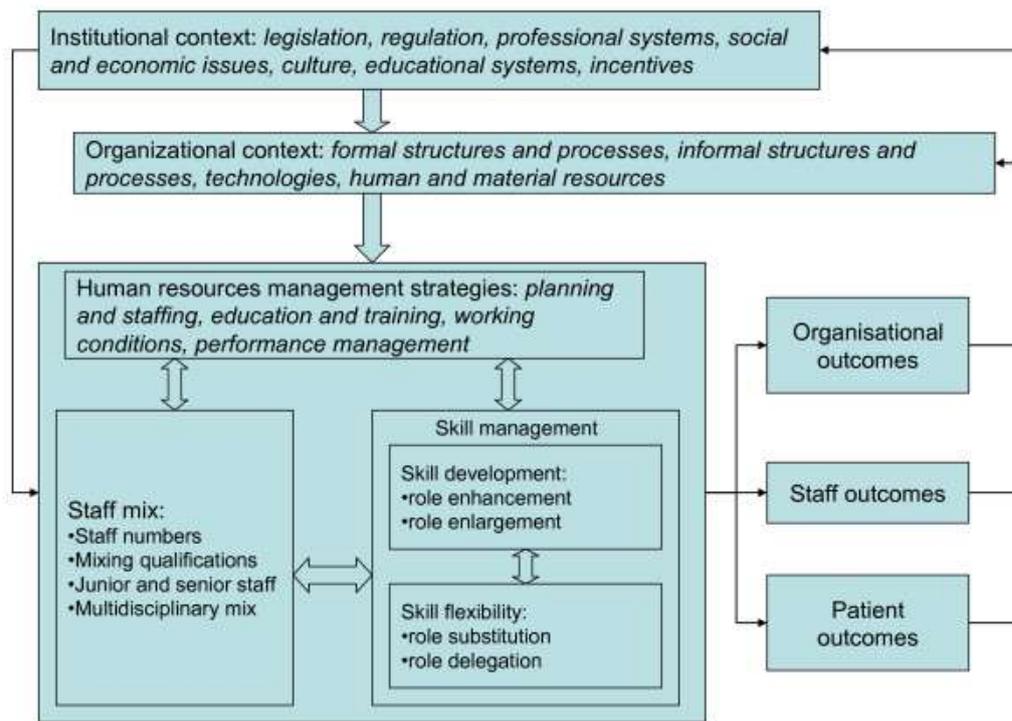
- active labour lasting more than 8 hours;
- intravenous infusion;
- induction of labour;
- epidural anaesthesia;
- high level of support in labour;
- perineal tears;
- forceps or caesarean delivery birth;
- multiple birth and/or neonatal complications.

Workforce planning

Workforce planning is a priority action in the health reform programme *Future Health – A Strategic Framework for Reform of the Health Service, 2012-2015* (Department of Health, 2012). In the context of maternity services, both the Holohan (2014) and HIQA (2013) reports make recommendations on the need for greater planning in the overall maternity workforce. The importance of taking a broad approach to workforce planning has been highlighted by a number of authors (Dubois and Singh, 2009; Carolan *et al*, 2009; Turner, 2011a; Sandall *et al*, 2011), where the impact of the organisation (Carolan *et al*, 2009) as well as the economic challenges and financial constraints facing healthcare systems (Turner, 2011a; Sandall, 2011) have been highlighted.

In support of this broader approach, Dubois and Singh (2009) developed a comprehensive framework for optimising human resources in healthcare that includes institutional, organisational and human resource management levels (see Figure 18). At an **institutional level**, they identify issues such as legislation, regulation, professional systems, social and economic issues, culture, educational systems and incentives. These, in turn, influence the **organisational context**, which includes formal structures and processes, informal structures and processes, technologies, human and material resources. The third level includes **human resources management** and key strategies identified include planning and staffing, education and training, working conditions and performance management.

Figure 18: Framework for optimising human resources in healthcare



Source: Dubois and Singh (2009). Copyright © 2009 Dubois and Singh; licensee BioMed Central Ltd.

Since 2001, there have been a number of reports relevant to the maternity services, although with a small number of exceptions (for example, Carolan *et al*, 2009), these have all focused on the medical manpower needs. These reports include the 2003 *Report of the National Task Force on Medical Staffing* (Department of Health, 2003), which recommended an increase from the 93 permanent consultants at that time to 191 by 2013. The Institute of Obstetricians and Gynaecologists (2006) recommended similar increases, up to 200. This issue was considered again in the FÁS report (Behan *et al*, 2009), where just over 140 consultants were identified in the obstetrics and gynaecology area; the authors concluded, however, that *'the estimated current annual output from the HST in this speciality would be sufficient to meet the average annual recruitment requirement'*.

These reports have drawn on different methodologies and approaches to identify the numbers of personnel required, including, for example, benchmarking, scenario planning (Behan *et al*, 2009) and staff surveys (INMO, 2014). Carolan *et al's* (2009) report identifies five commonly used workforce planning tools in nursing-related situations, including the professional judgement approach; nurse per occupied bed; acuity-quality; timed-task/activity approaches; and regression-based system. Crettenden *et al* (2014) in an Australian study identify a number of different workforce planning methodologies, including:

- planning models that focus on using demographic trends to assess future supply and demand, and that often adopt scenario modelling;
- linking health expenditure projections with workforce projections;
- modelling role extensions and substitution;
- needs-based models;
- multiprofessional models.

The report by Holohan (2014) on *Portlaoise Perinatal Deaths* notes that a workforce planning project is currently underway in the HSE. It is clear, however, that such a project will need to take a broad approach to the maternity service as outlined earlier, including a consideration of areas such as skills mix, role extension and task delegation. These issues are now considered.

Staff mix and skill management

‘More important than total numbers of staff is the skill mix, experience and deployment of available staff’ (Sandall *et al*, 2011, p. vii).

While there is a strong focus on workforce shortages, there is, in parallel, a growing literature on the importance of ensuring that the right staff are doing the right thing at the right time in the right place, which is the key to improving quality and safety in maternity services (Carolan *et al*, 2009; Sandall *et al*, 2011). According to Carolan *et al* (2009, p. 17), skill mix can be defined as ‘the method of achieving the “best” mix of staff and skills, required to deliver a defined level of care in a defined area of “organisational activity” and different approaches have been identified’.

Dubois and Singh (2009) identify different mechanisms through which ‘skill development’ and ‘skill flexibility’ can be achieved. Skill development can be achieved through role enhancement and role enlargement, which are defined as follows:

- **Role enhancement** involves extending practice scopes by encouraging the workforce to work across and beyond traditional professional divides in order to achieve more efficient workforce deployment.
- **Role enlargement** is the horizontal accrual and diversification of employees’ skills. Staff members are able to extend their activities and take on roles and functions at parallel levels.

Skill flexibility, they suggest, can be achieved through role substitution and role delegation, defined as follows:

- **Role substitution** involves extending practice scopes by encouraging the workforce to work across and beyond traditional professional divides in order to achieve more efficient workforce deployment. In contrast to role development, which occurs within dynamic disciplinary boundaries, role substitution entails competencies required to perform activities that are usually considered to be outside traditional practice scopes.
- **Role delegation** involves transferring certain responsibilities or tasks from one grade to another by breaking down traditional job demarcations.

Role development, expansion and task-shifting

Much of the literature on role development and expansion refers to the disciplines of nursing and midwifery. In Ireland, these professions have undergone significant change since the publication of the Commission on Nursing in 1998. Changes include the introduction and development of Clinical Specialist and Advanced Nursing Practitioner roles across a range of clinical areas, including midwifery. The report by Begley *et al* (2010) entitled *Evaluation of Clinical Nurse and Midwife Specialist and Advanced Nurse and Midwife Practitioner Roles in Ireland (SCAPE)* identified a number

of outcomes for which there was 'strong and 'very strong' evidence of the role that Clinical Midwife Specialists (CMSs) play in the health system, including:

- reduced morbidity;
- decreased waiting times;
- provided earlier access to care and treatment;
- decreased re-admission rates;
- increased evidence-based practice;
- increased use of clinical guidelines for multidisciplinary teams;
- increased continuity of care – CMSs spent significant time with service users, teaching, advising and explaining tests and results;
- increased patient/client satisfaction – CMSs were noted by service users to make a difference to their care;
- increased communication with patients/clients and families – CMSs spent significant time with service users, discussing their problems;
- promoted patient/client self-management;
- had significant MDT support for the role;
- provided clinical leadership;
- conducted clinical audit;
- conducted original research (53% of CMSs).

Begley *et al* (2010) also highlight that developments in the clinical career pathway of Midwifery (and Intellectual Disability Nursing) has not taken place at the same pace as some of the other disciplines of nursing. They recommend that urgent consideration be given to how these roles could be developed.

Sandall *et al* (2011) note that typically task-shifting studies examine situations where a nurse or midwife is responsible for providing similar tasks to a doctor. They identified two high-quality studies that showed positive impacts, including improved outcomes and cost saving, where midwives took on tasks previously performed by neonatal staff. However, in other areas (specifically, acute and primary care settings outside maternity care), they concluded that there is limited and inconclusive evidence that shifting tasks from doctors to nurses or midwives results in improved patient outcomes or reduced costs. On the other hand, Turner (2011a, p. 11) suggests that any task-shifting in the Irish maternity services context will require '*a more detailed analysis of staffing levels in other disciplines throughout the health services*'. He further notes that a reduction in the number of non-consultants working in obstetrics and gynaecology outside the national training scheme should result in a shift of work to consultants.

Dubois and Singh (2009) found that there is no literature available on the appropriate ratio for any grade on the healthcare team, although they identified several observational studies that support the view that a rich mix of qualified personnel, with advanced degrees or specialty certifications, is associated with better clinical outcomes.

Maternity support workers/Health Care Assistant

Some consideration has taken place in respect of health care assistants, who are part of the maternity workforce in the UK, Ireland and the Netherlands. The UK's *Midwifery 2020* (Chief Nursing Officers of England, Northern Ireland, Scotland and Wales, 2010) strategy identifies maternity support workers/maternity care assistants as key members of a multidisciplinary team providing maternity care in the future. This role was introduced to reduce the time midwives spent on administrative work and basic clinical work, and the NHS Employers (2007) report found that it has been effective in doing this, as well as resulting in overall savings to NHS Trusts. Maternity support

workers/health care assistants are now embedded in the maternity system in the UK and play an important role in improving the quality of care for women by:

- freeing up midwives' time;
- providing continuity of care;
- supporting the establishment of breastfeeding.

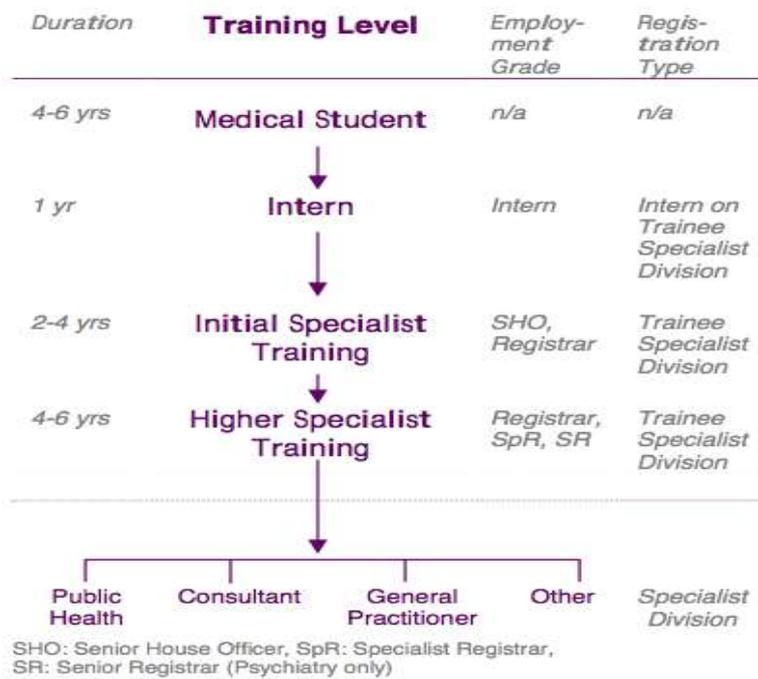
Sandall *et al* (2011) highlights the evidence from Cochrane reviews that show that for some interventions (e.g. providing support in labour) the involvement of maternity support workers/health care assistants can reduce intervention rates and improve maternal and neonatal outcomes. They also, however, noted that there were some concerns about quality and safety of care due to training, governance and delegation issues. In the Irish context, Carolan *et al* (2009, p. 40) suggests that further development of the role through training and education may lead to '*a more appropriate, effective and efficient use of this resource*'.

The Netherlands has a universal service for postpartum care provided by maternity home care assistants, known as *kraamverzorgenden* (de Vries, 2009). These are specially trained caregivers, who provide care in the postpartum period in areas ranging from household chores to offering instruction in baby care and feeding. Their involvement in postnatal care is considered to be one of the hallmarks of the Dutch system, although it is noted that there is a shortage of personnel and the average number of hours has been cut in recent years. Intrapartum care in the USA can be provided by Doulas, who are '*a person trained and experienced in childbirth who provides continuous physical, emotional and informational support to the mother before, during and just after birth*' (Kozhimannil *et al*, 2013, p. 1). Women providing this type of support do not usually have specialised training and their involvement is generally not reimbursed by health insurance.

Educational preparation and continuous development

Professional competence is a result of both educational preparation and continuous professional development and in Ireland, both these are heavily regulated for medical and midwifery personnel. At an undergraduate level, standards are based on those of the World Federation for Medical Education and the Association of Medical Schools in Europe, (2007). The introduction of graduate entry programmes became national policy following the introduction of the Fottrell Report on *Medical Education in Ireland*, which also made a number of other recommendations on medical education and training (Department of Health and Children, 2006). The extensiveness of the initial training is highlighted in Figure 19, which shows the length (11-14 years) and type of educational preparation required. This preparation often takes place outside of Ireland. There are common approaches across jurisdictions to facilitate this.

Figure 19: Educational preparation and training for medical specialists



Source: HSE, Medical Education and Training Unit (2010, p. 2)

An international study by Malott *et al* (2009) included an analysis of midwifery education across 7 countries (Canada, Australia, the Netherlands, New Zealand, Ireland, the UK and USA), including those examined in this review. The authors reported that all jurisdictions require midwives to be educated to Degree level for entry to practice, with all countries requiring an initial educational preparation of 3-4 years.

Professional competence

‘Professional competence has been defined as the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values and reflection in daily practice for the benefit of the individual and community being served’ (Epstein and Hundert, 2002, p. 226).

Increasingly, there is a focus, both nationally and internationally, on continuous professional development as a mechanism for supporting professional competence. This is the case for medical practitioners and midwives, both of whom are regulated under their respective regulatory bodies, which in Ireland are the Medical Council and the Nursing and Midwifery Board respectively. Professional Competence Schemes are the formal structures provided for under Part 11 of the Medical Practitioners Act 2007 to ensure that all doctors registered and working in Ireland maintain their education, knowledge and skills (competence) at an acceptable level. Since May 2011, all doctors are legally obliged to maintain their professional competence. In order to give effect to these new legal requirements, the Medical Council (2011) published *Rules for the Maintenance of Professional Competence* (S.I. No. 171 of 2011). The recent Nurses and Midwives Act 2011 places a similar requirement on nurses and midwives in Ireland and continuous professional development is now a statutory requirement. The Medical Council has identified the following eight domains of good professional practice to promote patient safety and quality of patient care:

1. Patient Safety and Quality of Patient Care.
2. Relating to Patients.
3. Communication and Interpersonal Skills.
4. Collaboration and Teamwork.
5. Management (including Self-management).
6. Scholarship.
7. Professionalism.
8. Clinical Skills.

It is clear, however, from reports conducted in Ireland, the UK and elsewhere that there are ongoing issues arising in respect of clinical competence and workforce capacity. Holohan (2014) made a recommendation on the development of a culture of lifelong learning for healthcare staff and drew particular attention to the area of fetal assessment, including the interpretation of cardiotocography (CTG), recommending that staff should engage in '*regular multidisciplinary training*' (Holohan, 2014, p. 58).

Summary

In conclusion, the key issues arising in respect of the obstetrics and gynaecology workforce relate to the importance of out-of-hours services across a range of areas; multidisciplinary teamwork; workforce shortages; and the necessity of adopting a broad approach to workforce planning. Professional competence and continuous professional development are also highlighted as areas of concern.

7. Person-centred care

Public policy has increasingly placed emphasis on patient-centred care and in the Irish context HIQA have identified ‘person-centred care and support’ as the first of eight themes in its *National Standards for Safer Better Healthcare* (HIQA, 2012). Person-centred care has been defined by McCormack *et al* (2010, p. 95) as:

‘an approach to practice that is established through the formation and fostering of therapeutic relationships between all care providers, patients and others significant to them. Person-centred care is underpinned by values of respect for persons, individual right to self-determination, mutual respect and understanding’.

The nine standards outlined by HIQA (2012, p. 5) are informed by a set of attributes of high-quality safe healthcare, where in addition to highlighting the importance of basing services on a properly recruited, trained, supported, accountable and evidence-informed workforce, they also position service users centrally. The following attributes have been identified by HIQA for service users and providers:

- service users are treated with kindness, consideration and respect and have the information they need to make decisions;
- service providers put service users’ needs and preferences at the centre of all their activities;
- service users have access to the right care and support at the right time;
- service providers take every opportunity to enable people who use services to increase control over their own health and wellbeing, and the factors that influence them.

These issues have also been considered in the Irish context in respect of maternity services, with the KPMG (2008) report noting that:

‘Women must be involved in planning maternity and gynaecology services. They must be well informed about all aspects of their care and have real influence in how services are developed and implemented. In simple terms, it’s about knowing and engaging with the communities we seek to serve.’

Humanisation of childbirth

The attributes outlined by HIQA (2012) are also consistent with the literature on maternity care in other jurisdictions, where there is an increasing acknowledgement of the importance of the psycho-social experiences of women giving birth and a growing emphasis on the need for the ‘humanisation of childbirth’. This model of care, proposed as an alternative to medical and technological approaches, has key characteristics such as personalisation, recognition of women’s rights, human caring, women’s advocacy and companionship, and a balance between medical care and comfort, safety, and humanity (Behruzi *et al*, 2014). In the context of maternity services, a focus on these areas is often referred to as ‘woman-centredness’ and, while definitions vary, some common themes have been identified by Jentsch *et al* (2007), who write that ‘a woman-centred approach usually involves a non-hierarchical type of communication that focuses on the needs of patients with the management of care shaped by the resulting cognitions’. Typically, these characteristics are features of woman-centred midwifery care, which has been defined by Newnham (2010, pp. 245-46) as:

‘Woman-centred midwifery care means that midwives and women work together in partnership honouring the decisions that women make about their bodies.’

Commitments to woman-centred and family-centred care are core features set out in the aim and visions of other jurisdictions under review, with the Welsh vision for maternity services having the strongest focus on women’s experience. Within its vision, the Welsh maternity plan pledges to

promote pregnancy and childbirth *'as an event of social and emotional significance where women and their families are treated with dignity and respect'*. In addition, the Welsh vision commits to ensuring *'a positive experience'* for every mother *'so that she, her partner and family can begin parenting feeling confident, capable and well supported'*. Other jurisdictions also include a reference to this area, with Australia starting its vision by noting that *'Maternity care will be woman-centred ...'* and England's plan includes as one of its four aims *'for mothers to report a good experience'*. Canada commits to *'family-centred'* care. In policy, therefore, commitments to person-centred care underpin strategic approaches to maternity services.

Choice and control

In addition to operating in partnership, other issues are also considered in the context of the provision of person-centred care and these include the importance of choice and control in the maternity pathway.

Choice

The concept of choice is an integral part of contemporary healthcare and current maternity policies advocate choice for childbearing women as a mechanism for providing a good quality experience and better outcomes. This is particularly the case in Australia and the UK, where consumer involvement and choice in relation to maternity services have been highlighted in recent policy documents (Parker *et al*, 2014). In the UK, for example, the NHS Commissioning Board (Tyler, 2012) draws attention to findings from a national survey of users of maternity services, conducted by the Care Quality Commission in 2013, which found that 83% of participants had a choice about where to have their baby (Care Quality Commission, 2013, p. 8). Other authors have suggested that despite a commitment in policy to choice, recent trends in closures of maternity units create a context in which user choice may be reduced and this is particularly the situation where there are large rural and remote areas (as in Australia and Canada) and where local maternity centres are being closed. Pilkington *et al* (2012), for example, in a study about women's choices on distances to maternity units in France, reported that about one-third of women choose their maternity unit on the basis of proximity and closures of smaller maternity units was problematic for this reason. (This issue is considered further in Chapter 5 under 'Access'.) The Australian maternity strategy notes that despite a wide range of maternity care models practiced, many Australian women also experience restricted birthing choices.

In the Irish context, KPMG (2008, p. 120) note that:

'We are proposing greater choice for women and are proposing the creation of MLUs [midwife-led units] adjacent to hospital-based obstetric units in our recommended model of care, as well as the option to have a home birth. We are also proposing a significant education and communication campaign both for service users and service providers on the range of choices available and the risks related to each.'

Jomeen and Martin (2008) report that choice is also about ensuring that women are promoted as active childbirth consumers and decision-makers, and this, they suggest, is a recognition that pregnancy and childbirth is both a physical and a psychological experience. According to Snowden *et al* (2011, p. 2), however, choice is more complex and less straightforward than policy assumes. They suggest that:

'Choice is an act, which requires intimate connections between reason and rationality, a weighing up of risks and benefits and an ordering of preferences based on their utility.'

The complexity of this area has also been considered by others. Jomeen and Martin (2008, p. 392), for example, note that while the findings to data suggest that high levels of satisfaction and personal

control are associated with positive outcomes, the evidence that alternative models of care actively promote these constructs is more limited. A shift in control from a paternalistic model of care (where the professional acts as an agent and the women has to trust that her agent has the skill and knowledge to protect her interests) to a more consumer-based approach raises some challenges. Coxon *et al* (2012, p. 509) suggest that a consumer-based approach, grounded in empowering clients to use the information supplied by doctors to make decisions, is based on assumptions that the women has the skill and ability to:

- judge her own interests and that these are congruent with the baby's interests;
- can ask the right question;
- can make the right decisions.

These assumptions, they suggest, create challenges in pregnancy and childbirth, where the right to self-determination and the influence of social and cultural norms (Behruzi *et al*, 2013) may be more complex than in other situations.

Control

Research from the field of nursing, midwifery and psychology has shown that a woman's sense of control during pregnancy and labour is one of the critical factor determining her wellbeing and satisfaction (Christiaens *et al*, 2010; Buitendijk, 2011; Larkin *et al*, 2012). Larkin *et al* (2012), reporting in the Irish context, found that midwives played a pivotal role in enabling or disempowering positive experiences and control was identified as an important element of childbirth experience. In an Irish study, McNelis (2013) identified key subthemes relating to women being in control, as follows:

- the woman dictated the pace;
- had an ability to cope with the pain of labour;
- had the knowledge to make decisions;
- expectations were met.

Others have noted that a greater sense of control is closely related to a greater sense of satisfaction about the birth, as well as feelings of fulfilment and emotional wellbeing, while a lack of control increases the probability of anxiety and results in a negative experience (Buitendijk, 2011). The area of pain relief in labour has received some attention in respect of control. McCrea and Wright (1999) define personal control in labour as:

- the woman's feeling of being in control as opposed to staff being in control;
- the woman's input into decision-making governing pain medication;
- the use of personal coping resources to cope with labour pain.

This issue of pain relief in labour has also been considered by Christiaens *et al* (2010). In a comparison of the experiences of pain acceptance and personal control in a cross-national comparison of Belgium and the Netherlands, they found that personal control in pain relief partially explains the country differences in coping with labour pain (more positive experiences for Dutch women than for Belgian women). McNelis (2013) also took account of this aspect of care in her research on women's experiences of care during labour in a midwife-led unit in the Republic of Ireland. Her findings suggest that in the midwife-led unit, where women were encouraged to make choices during their labour, they felt in control of the pain of their labour, which resulted in a positive experience for them.

The importance of control has also been acknowledged in policy and the maternity framework, endorsed by the Australian Health Ministers Advisory Council in 2008, is underpinned by a principle of ensuring services enable women to feel in control of their birthing experience, as well as being able to make informed and timely choices regarding their maternity care.

Service user experience

The experiences of healthcare system users are a fundamental component in understanding what is relevant and important to women and their families in all health services. With the exception of Ireland, all countries in this review conduct maternal satisfaction surveys (Rowland *et al*, 2013). In Canada, for example, the national *Maternity Experiences Survey* on women's experiences, perceptions, knowledge and practices before conception and during pregnancy, birth and the early months of parenthood was conducted by the Public Health Agency of Canada (2009) and analysed by Chalmers *et al* (2012). This is similar to England, where the National Perinatal Epidemiology Unit conducts regular national surveys on women's experience of maternity care (e.g. *Delivered with care: A national survey of women's experience of maternity care*, Redshaw and Heikkila, 2010). In Australia, various surveys have been conducted and some of these have explicitly focused on vulnerable populations, including Aboriginal and Torres Strait people (e.g. Parker *et al*, 2014).

Small *et al* (2014) conducted a systematic review of 34 studies, including general population studies (n=12) and those relating to immigrant women (n=22). The review included studies from Australia, Canada, Sweden, the UK and USA, and a summary of key areas of dissatisfaction arising in the provision of antenatal, intrapartum and postnatal care from women's perspectives were identified as follows:

- **Antenatal period:** Long waiting times; staff not taking time to attend to individual concerns and provide enough information; staff appearing rushed; and lack of continuity of care. More positive experiences were associated with seeing fewer caregivers; being treated as an individual; receiving adequate and consistent information; and having effective interactions with caregivers.
- **Intrapartum care:** Lack of sufficient information during labour; a perception that caregivers were not kind and understanding; caregivers being unhelpful; and not having an active say in making decisions. In the UK, women were more likely to report positive experiences when they received individualised care, were provided with enough information and explanations, and were cared for by kind and understanding staff.
- **Postpartum care:** In general, across all countries, women were less positive about their postpartum care than about the care they received in pregnancy or during labour and birth. Negative experiences were associated with their concerns and anxieties not being taken seriously; staff being rushed and too busy to spend time with them; staff not being sensitive and understanding; staff not providing enough advice and support about baby care, including about women's own health and recovery.

These findings are supported by Yelland *et al* (2012), who identified significant levels of 'discrimination' by all mothers in a study that drew on data collected in two States in Australia (accounting for 31% of all births in the country). The findings show high percentages of pregnant women reporting being treated with less courtesy than other people (19.8%); receiving poorer care from professionals (14.4%); being talked down to (21.2%); being treated with less respect than others (14.8%); and being insulted, stereotyped or ignored by health professionals (15.3%). Overall, 30.7% of the mothers surveyed stated that they perceived, and experienced, discrimination against them.

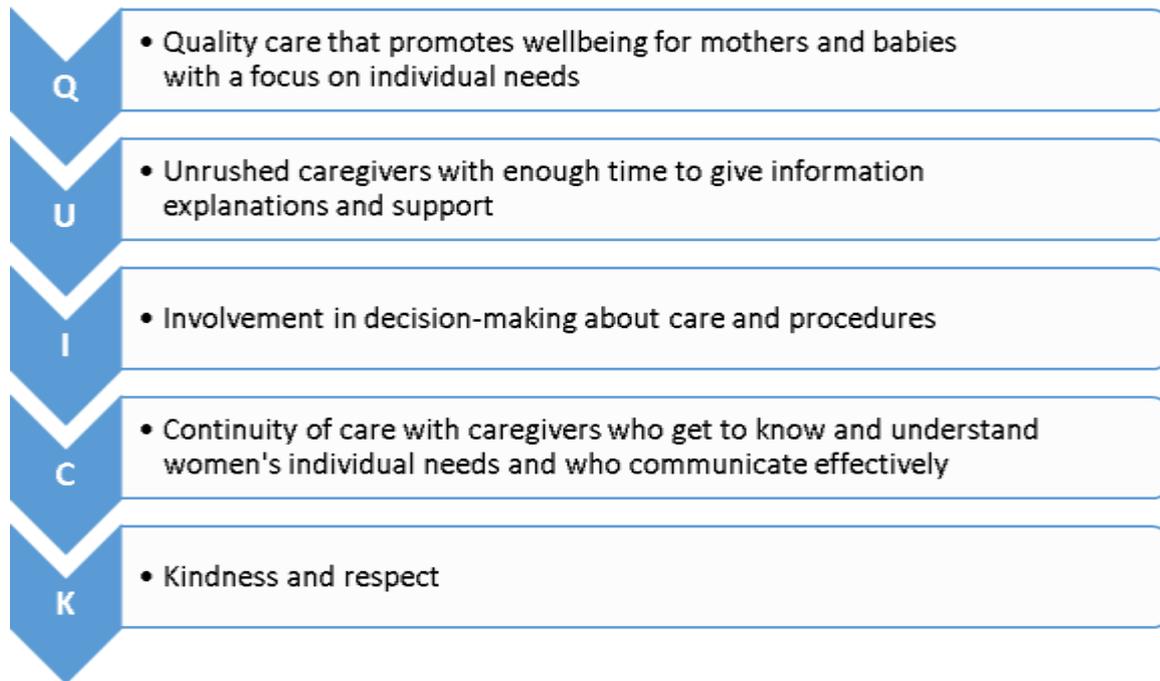
Some concerns have been raised about the experiences of vulnerable populations and the immigrant population formed a key focus for the review by Small *et al* (2014). While some studies identified no differences, others found immigrant women were less happy with their care than non-immigrant women in areas such as having few options in care and receiving inadequate information. Recommendations for immigrant women included:

- a need for education about improving health behaviours pre-conceptually (e.g. folic acid use);

- screening for postnatal depression;
- removal of language barriers to seeking care.

Drawing on the common themes emerging, Small *et al* (2014) developed the mnemonic ‘QUICK’ to captures the essence of what women want from their maternity care (see Figure 20).

Figure 20: What women want from their maternity care



Person-centredness and models of care

There is much consistency in the findings relating to women’s experiences and models of care. Studies conducted in Ireland, Australia, Canada, England and the Netherlands, as well as systematic reviews and meta-analyses of studies, all show that care provided by midwives results in a better experience for women. Sutcliffe *et al* (2012) conducted a meta-review that drew on three previous reviews conducted between 1995 and 2008, comparing midwife-led care during pregnancy and birth with physician-led care. Their findings showed that women were more satisfied with their experience of getting information and were more likely to experience attendance at birth by a known midwife. They were also less likely to have fetal monitoring and antenatal hospitalisation, and were more likely to breastfeed.

Table 6 presents the findings of a study by Grigg (2014) that compared the rationale for women attending a freestanding midwife-led primary-level unit with an obstetric-led tertiary-level maternity hospital.

Table 6: Comparison between midwife-led primary-level unit and obstetric-led tertiary-level maternity hospital

Influence	Freestanding, midwife-led, primary-level unit (PMU) %	Obstetric-led, tertiary-level maternity hospital (TMH) %
Closeness to home	47	20
Experiences of other women	34	16
Atmosphere or feel of the unit	55	12
Confidence in the hospital staff	39	59
General or early pregnancy health	39	14
Ease of getting there	49	18
Previous birth experience	37	39
Availability of a specialist	8	91

In the Irish context, Begley *et al* (2011) identified a number of aspects of maternal satisfaction as part of a randomised trial comparing care in a midwife-led unit (MLU) and a consultant-led unit (CLU). While no statistically significant differences were identified in respect of some areas (e.g. fetal monitoring received; how clean and tidy the facilities were ; care received during labour; support by staff during labour and birth; the length of postnatal stay), significant differences were identified in other areas, which included higher mean satisfaction scores for the statements regarding women’s feeling that they were with people who cared about them, their confidence in the staff, and how satisfied they were with care after birth.

Mothers’ views of their care also showed a statistically significant difference between the two groups in their satisfaction with pain relief (83% of women in MLU were ‘happy’ or ‘very happy’ compared to 68% in CLU) and whether they would recommend the care they had received to a friend (85% in MLU said this aspect performed ‘well’ or ‘somewhat well’ compared to 70% in CLU).

In Australia, a discourse analysis of women’s submissions to the *National review of maternity services 2008*, which preceded the development of a new approach to maternity services, identified strong support for a move away from obstetric-led services for all and towards primary maternity care with fewer interventions (McIntyre *et al*, 2011).

Summary

Public policy has increasingly placed emphasis on patient-centred care and this is common across jurisdictions. Attributes associated with person-centred care include kindness, users’ needs and preferences, access to care and increase person control over their own health. In terms of models of care, there is some consistency in the findings relating to models of care provided. Sutcliffe *et al* (2012) conducted a meta review that drew on three previous reviews conducted between 1995 and 2008, comparing midwife-led care during pregnancy and birth with physician-led care. Their findings showed that women in midwife-led care were more satisfied with their experience of getting information and were more likely to experience attendance at birth by a known midwife. Begley *et al* (2011) in the Irish context identified a number of aspects of maternal satisfaction as part of a randomised trial comparing midwife-led and consultant-led care. Statistically significant higher mean satisfaction scores were identified for the statements regarding women’s feeling that they were with people who cared about them, their confidence in the staff and how satisfied they were with care after birth.

8. Costs

Health planners and policy-makers face significant challenges in improving the efficiency of the maternity services to meet increases in demand for better quality and safety in the context of financial constraints on the system. In parallel with increasing costs, there have been significant increases in birth rates and higher rates of intervention, both of which result in higher economic costs.

Funding systems

Financial barriers can affect timely access to maternal health services (Comfort *et al*, 2013). While different funding models are used, the findings from this review show that, across each of the jurisdictions examined, a publicly funded maternity system, accessible to all women, is available. In the Netherlands and UK, women generally access care through the public system, while in Australia and Ireland, a proportion of women choose to pay privately for their care. The core elements of maternity care are free at the point of delivery in New Zealand, although women may be required to pay for some elements, such as antenatal education and ultrasound scans (Rowland *et al*, 2013).

A 2008 Australian report, *Improving maternity services in Australia* (Department of Health and Ageing, 2008), noted that, as with other areas of healthcare, maternity services in Australia are services that represent a mix of Commonwealth, State and Territory and private funding and delivery. While drawing attention to the limited information available about the cost of providing maternity care, total expenditure on maternity services across Australian governments, the authors noted, in 2004-2005 was \$1,672 million.

There are two broad issues arising in respect of costs and these are:

- the costs of providing services;
- the costs of negligence when things go wrong.

Costs of providing services

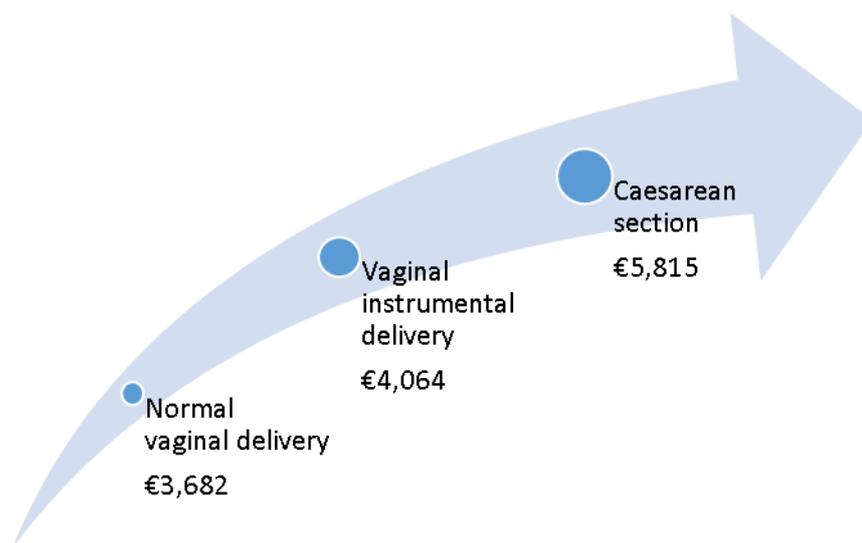
Estimating the costs of providing maternity services is problematic because of limited information (Ryan *et al*, 2013; Fahy *et al*, 2013; Mistry *et al*, 2013) and according to Fahy *et al* (2013) there is a dearth of studies on the economic costs of childbirth other than those associated with caesarean section. Their review of existing scientific studies in relation to the economic costs of alternative modes of childbirth delivery (n=30) identified different approaches to assessing these costs, including cohort studies, administrative data sources, hospital utilisation costs, decision modelling and cost-effective analysis. A recent Australian study by Tracy *et al* (2014) identified direct and indirect costs on birth outcomes at one tertiary teaching hospital. They included expenditure for actual and estimated direct and indirect costs from the cost centres for each hospital occasion of service over one financial year. **Direct costs** were collected for clinical midwifery and obstetric time; operating rooms; pathology; imaging; wards; allied health; pharmacy; depreciation; and direct 'on costs'. **Indirect costs** included similar areas while adopting a standard mechanism to attribute an average cost per ward per unit time, adjusted for complexity. Fahy *et al* (2013), however, suggest that the different approaches used make it difficult to compare findings.

While there are many challenges in calculating costs and, consequently, comparisons across jurisdictions should be interpreted with considerable caution, some jurisdictions have presented

data. In 2013, the Department of Health in England introduced a new payment system for maternity care, where rather than paying for each individual activity undertaken, the Department now pays a tariff for each of the three parts of the maternity care pathway, i.e. antenatal, birth and postnatal (House of Commons Committee of Public Accounts, 2014). In its report, the Committee notes that NHS maternity services are not in *'direct receipt of enough money to fund what is needed'* and that the true tariff should be much higher than it is. Underfunding, it was noted, is a consequence of funding being based on previous budgets and of employing thousands of midwives fewer than what is needed (2,300 full-time equivalent midwives employed). Jones (2013), in his *Guide to maternity costs*, reported that in 2012/2013, maternity units were paid £1,066 for a normal delivery, while a caesarean section with complications received £3,231.

The average cost of childbirth in one hospital in Spain was calculated to be €4,328, which included an average of 18.28 contacts between the mother or the newborn and the healthcare facilities (Comas *et al*, 2011). The costs according to different types of delivery were also calculated and the most important predictors of cost were delivery type and neonatal severity (*see Figure 21*).

Figure 21: Average cost of childbirth in one hospital in Spain



Higher cost areas

Fahy *et al*. (2013) in a review of thirty scientific studies relating to the economic costs of alternative modes of childbirth delivery highlight a number of deficiencies in the existing scientific literature. These deficiencies include an absence of an internationally acceptable childbirth cost and clinical outcome classification system that allows for comparisons across different delivery modes. They note that the majority of scientific studies in relation to the economic costs of childbirth are almost exclusively related to previous reviews of caesarean sections compared with vaginal births. In general, the findings show that caesarean sections are more costly than other modes of delivery, although Fahy *et al* (2013) draw attention to a small number of studies that show some evidence that in certain circumstances (e.g. breech delivery), caesarean sections may be less costly than planned vaginal labour. Findings from the UK based National Institute for Health and Care Excellence, (NICE), (2011a) show that even excluding additional costs (e.g. psychological trauma for women and their partners, and the re-assignment of staff and resources from other areas of clinical care), emergency sections are more expensive than planned ones (NICE, 2011a). In a study in hospitals in Catalonia, both the type of funding and volume of births attended by obstetricians was identified as having a significant effect on the incidence of caesarean section (Comas *et al*, 2011). This finding has also emerged in the Irish context, in a retrospective cohort study by Lutomski *et al* (2014) on childbirth hospitalisation occurring between 2005 and 2010. The authors found

statistically significant differences in the rate of elective caesarean delivery, emergency caesarean delivery, operative vaginal delivery and episiotomy between women who had public health cover and those with private insurance. They concluded that, irrespective of obstetric risk factors, women who opted for private maternity care were more likely to have an obstetric intervention.

Fahy *et al* (2013) report contrasting findings in the two studies considered in respect of planned induction of labour. A study conducted in the USA examining the economic and health consequences of a planned induction at 39 weeks' gestation found no cost saving, but did identify an increase in caesarean section. Alternatively, a study conducted with nulliparous women at 41 weeks did show some cost savings. In examining the costs associated with infant care, Fahy *et al.* (2013) noted that low birth weight and very low birth weight infants had longer hospital stays and accounted, therefore, for a higher proportion of total hospital costs. They also pointed to the demographic changes, which have additional associated costs including:

- women being older giving birth
- increases in the numbers of twin pregnancies with associated delivery complications;
- increases in the proportion of women being overweight or obese;

According to Morgan *et al* (2014), the costs arising from being obese result from increased health service usage and healthcare costs during pregnancy, as well as a greater likelihood of having some interventions at the time of birth. Other authors have drawn attention to the costs arising from unintended pregnancies; for example, a US study, using a variety of different data sources, found that government expenditures on unexpected pregnancies amounted to \$12.5 billion in 2008 (Sonfield and Kost, 2013).

The costs of running small maternity units are increasingly under scrutiny. High running costs have been identified as a rationale for closing small units in rural areas in France (Pilkington *et al*, 2012) and Canada (Grzybowski *et al*, 2011). In the UK context, Jones (2013, pp. 54-55) argues that small maternity units suffer from unavoidable higher costs due to '*economy of scale*' and the use of the Healthcare Research Group (HRG) prices compounds this because it excludes the inclusion of economy of scale in the calculations. He argues that this has created unjustified cost pressures in England and that this is compounded by the '*exceedingly poor costing of maternity service*'. Further, he notes that closing all smaller maternity units and increasing the size of larger ones to gain economy of scale would have '*obvious deleterious consequences for remote areas and small maternity units*'.

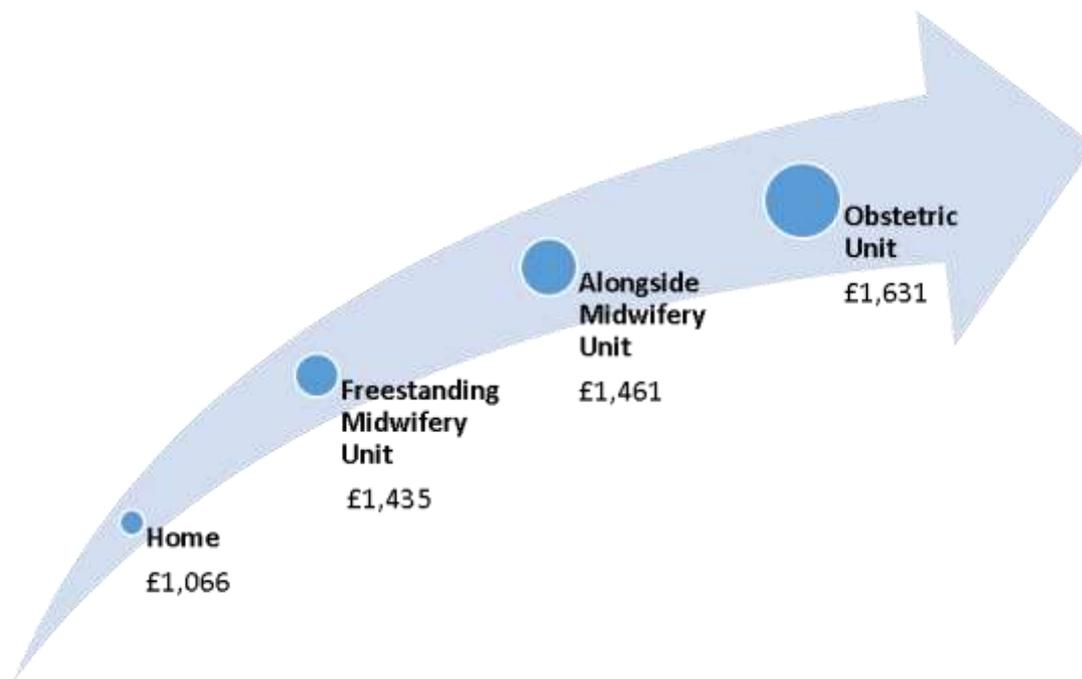
Infant costs

Sonfield and Kost (2013) calculated the cost of a publicly funded birth at \$12,613, including prenatal care, labour and delivery, postpartum care and one year of care for the infant. Understandably, since infants who are born at low birth weight and very low birth weight have higher average hospital stays (6.2 days – 68.1 days) compared with babies born at normal weight (i.e. over 2,500 grams), they are more likely to incur substantially higher costs (Fahy *et al*, 2013). Other authors have considered the costs associated with more high-risk situations. For example, Mistry *et al* (2013) examined the economic costs associated with stillbirth in the UK, arguing that, in contrast to complications such as prematurity and preeclampsia, the economic costs of stillbirth are poorly understood. They identified three situations in which additional costs may be accrued: those occurring at the time of initial management of the stillbirth, those incurred after the initial management has been completed and those occurring specifically in a subsequent pregnancy. They identified that costs immediately following the stillbirth ranged from £1,242 (core recommended investigations) to £1,804 (comprehensive investigation); and costs in the next pregnancy ranged from £2,147 (low-risk women with a previous healthy child) to £3,751 (women with a previous stillbirth of unknown cause).

Costs and models of care

There is an increasing literature on the costs of different models of care, although there continues to be some challenges in comparing costs. The UK has invested in the large-scale *Birthplace National Prospective Cohort Study* to look at clinical as well as cost outcomes according to place of birth. In a recent analysis of economic costs, Schroeder *et al* (2012) conducted a cost-effectiveness analysis from a health system perspective and included direct costs only to the NHS. They found that for women at low risk of complications before the onset of labour, the cost of intrapartum and after birth care, and associated related complications, was less for births planned at home, in a freestanding midwifery unit or in an alongside midwifery unit, compared with planned births in an obstetric unit. The costs identified are presented in Figure 22.

Figure 22: Costs associated with different settings for care in England



The model also showed that being multiparous or married was associated with reduced costs, while birth after 40 weeks' gestation, being overweight or obese, and maternal age of 30 or more were each associated with increased costs (Schroeder *et al*, 2012, p. 5).

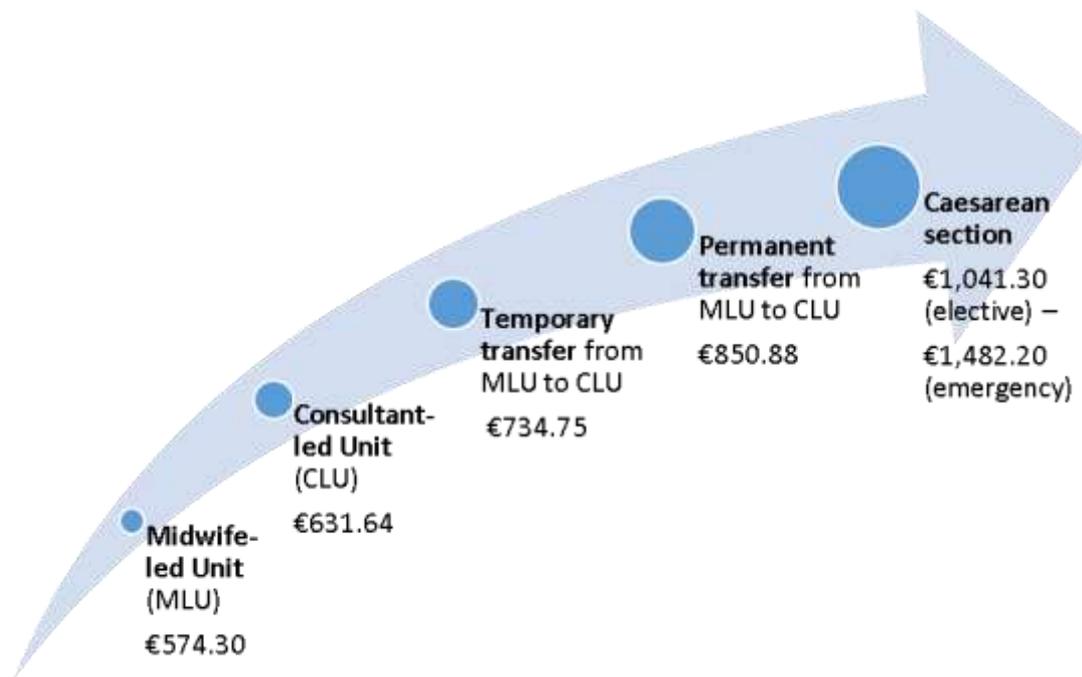
Ryan *et al* (2013), in an assessment of the cost-effectiveness of midwife-led care in the UK, reported that if the midwife-led services were expanded to 50% of all eligible women in the UK, this would result in cost savings. However, they note that firm conclusions could not be made due to the paucity of evidence available.

Tracy *et al* (2014), in a consideration of the costs of care for first-time low-risk mothers in one tertiary care hospital in Australia, concluded that caseload midwifery care resulted in a lower average cost of care per woman (\$3,903.78). This compared favourably with the cost for those receiving private obstetric care (\$5,279.23 per woman) and those receiving standard care (\$5,490.69 per woman). These statistically significant findings were related to the increased likelihood of women in the midwifery group having a spontaneous onset of labour and an unassisted vaginal birth.

Similar findings have been identified in the Irish context, where Begley *et al* (2009b) conducted a cost-effectiveness analysis as part of a randomised trial comparing costs and clinical outcomes for midwife-led and consultant-led care in a group of low-risk women. The cost of normal birth and the

costs of a birth in which complications arose was computed for both models of care. The findings show that the cost of a normal birth was €574.30 in the midwife-led unit (MLU) and €631.64 in the consultant-led unit (CLU), a difference of 10% or €57.34. The incremental cost (over and above the cost of a normal birth in the MLU) of a birth where temporary transfer to the CLU was required was €160.45; where permanent transfer was required, the cost increased a further €276.58; if an elective caesarean section was needed, a further €467 was incurred; and if an emergency caesarean section was needed, the cost rose by an additional €908 (see Figure 23).

Figure 23: Findings from an Irish randomised trial of midwife-led costs versus consultant-led costs



The conclusions drawn from this evaluation by Begley *et al* (2009b) are that midwife-led units/ midwife-led care is a cost-effective alternative method of delivering maternity services for healthy women without risk factors for labour and delivery.

These findings are coherent with the findings of Renfrew *et al* (2014) in their recent report in *The Lancet*, which summarised the evidence in respect of midwifery care. They concluded that while evidence from more settings is needed, the current evidence shows that midwifery care provided by midwives is cost-effective, affordable and sustainable. They also pointed out that the return on investment from the education and deployment of community-based midwives is similar to the cost per death averted for vaccination.

Negligence

There are additional costs in any healthcare setting to those associated with the provision of care and these are costs associated with negligence. The NHS Litigation Authority (2012) in its report on 10 years of maternity claims in the NHS, identified the three most frequent categories of claim as:

1. management of labour (14.05%);
2. caesarean section (13.24%);
3. cerebral palsy (10.65%).

Two of these categories, namely cerebral palsy and management of labour (along with cardiotocography (CTG) interpretation) were also the most expensive and together accounted for

70% of the total value of all the maternity claims. In the Irish context, Byrne (2014) reported that most complaints to the Nursing and Midwifery Board against midwives relate to a single episode of care, especially care during labour. The following areas were identified:

- failure to adequately monitor maternal and fetal condition;
- failure to recognise deviations from normal;
- failure to act or act appropriately on deviations from normal;
- failure to escalate concerns to appropriate level – midwifery and medical.

Costs of insurance cover and claims

Traditionally, the aims of the liability system were to deter harm and to compensate those who sustained injury. Major liability concerns include the tragedy of a perinatal death or a newborn with lifelong impairment, and of harm in a relatively young and healthy childbearing woman (Sakala *et al*, 2013a, p. e7).

The cost of providing insurance cover for maternity has also increased in recent years. In England, £480 million (almost one-fifth of the NHS Trusts' spending on maternity services) is for clinical negligence cover (House of Commons Committee of Public Accounts, 2014). This is the equivalent of £700 per birth. Maternity claims in England represent the highest value and second highest number of clinical negligence claims reported to the NHS Litigation Authority. In a report of an analysis of 10 years of maternity claims (from 1st April 2000 to 31st March 2010), the NHS Litigation Authority (2012) identified 5,087 maternity claims, calculated to be less than 0.1% of the 5.5 million births in England over the same period. The total spend on these claims amounted to £3.1 billion, which is higher than the annual spend on maternity care in NHS Trusts in England, which in 2011/12 amounted to £2.9 billion (Royal College of Midwives, 2013).

In Ireland, HIQA (2013, p. 152) reported that in 2011, the State Claims Agency reported that active obstetrics-related claims accounted for almost one-quarter of all claims (23%) submitted for that year. These cases represented 59% of the total cost of all medico-legal claims for 2011. In 2012, the specialty of obstetrics accounted for 10.1% of reported adverse events, while gynaecology accounted for 1.3% (State Claims Agency, 2012). In 2012, 5270 peri-natal adverse events were reported, representing 6.4% of all events types. Within this, post-partum haemorrhage (14.7%) and perineal tears (14.7%) accounted for almost thirty percent of the events reported.

In Wales, the amount paid out in litigation claims relating to obstetrics more than doubled between 2003-2004 and 2007-2008, when it totalled £28.4 million (Ap Dewi *et al*, 2011). This figure made up 66% of the value of all clinical negligence claims and represented 35 claims. The authors note that obstetrics claims are often very expensive due to the need to provide long-term care and the figures can increase dramatically with only one or two severe cases. In the case of Wales for 2007-2008, 6 claims from a total of 35 claims represented 85% of the total £28.4 million paid out in that year.

Policy interventions

A recent report by Sakala *et al* (2013a, p. e7) on *Maternity Care and Liability: Pressing Problems, Substantive Solutions* concludes that the best available research does not support widely held beliefs about maternity care and liability, including the economic impact of liability insurance premiums on maternity care clinicians, the existence of extensive defensive maternity care practice, and the impact of limiting the size of awards for non-economic damages in a malpractice lawsuit. In their analysis, Sakala *et al* identified policy interventions that are necessary to achieve a high-functioning liability system (see Figure 24).

Figure 24: Policy interventions needed to achieve a high-functioning liability system



Rosenbaum and Sage (2013, p. 4), while noting some limitations with Sakala *et al*'s (2013a) analysis, suggest nevertheless that if these interventions were implemented, they could:

- promote error prevention;
- preserve the relationship between health professionals and patients after injury;
- make the malpractice insurance market more accessible;
- emphasize system-level improvements;
- promote payment incentives that advance high-quality healthcare.

They also note that these reforms could be advanced collectively through regulation rather than being pursued individually through litigation.

Summary

Health planners and policy-makers face significant challenges in improving the efficiency of maternity services, while at the same time managing the additional requirements to improve quality and safety. An overview of funding systems across jurisdictions included in this review shows that a publicly funded maternity system, accessible to all women, is available, although in Australia and Ireland a proportion of women choose to pay privately for their care. While international comparisons are problematic because of different approaches, limited information and limited focus, two broad issues arise concerning costs – the cost of providing services and costs associated with negligence. In general, higher costs accrue with induction of labour, instrumental deliveries and birth by caesarean section compared with other modes of delivery. Additional costs were also associated with older women, increased risk of miscarriage, increased use of assisted reproduction technology, increases in the numbers of twin pregnancies and delivery complications, being overweight or obese, and being born at low birth weight or very low birth weight. In the context of models of care, a recent study found that for women at low risk of complications before the onset of labour, the cost of intrapartum and after birth care, and associated related complications, was less for births planned at home (£1,066), in a freestanding midwifery unit (£1,435), or in an alongside midwifery unit (£1,461) compared with planned births in an obstetric unit (£1,631).

Costs relating to negligence and to the additional costs associated with it, both in terms of insurance and in paying for claims, are high. A small number of policy interventions have been identified as necessary to achieve a high-functioning liability system and these include: promoting safe, high-quality maternity care with best evidence and minimise avoidable harm; minimising maternity professionals' liability-associated fear and disaffection; avoiding incentives for defensive maternity practice; fostering access to high-value liability insurance policies for all maternity caregivers; responding appropriately when women and newborns sustain injury; assisting families with responsibility for costly care of infants and women with long-term disabilities in a timely, efficient manner; and minimising legal and administrative costs.

9. Information

While there is general agreement that the use of evidence to inform decision-making is vital for good outcomes, the management of knowledge, including its generation, translation, transfer and exchange from relevant research, is problematic. Orton *et al* (2011), in a systematic review of decision-making processes, identified many barriers to decision-makers' use of research evidence, including the gulf between researchers and decision-makers; the culture of decision-making; competing influences on decision-making; and practical constraints. In the context of maternity services, similar and additional challenges arise. These barriers have been identified by Sakala and Corry (2008) in the context of the USA, as follows:

- lack of a set of robust maternity performance measures with buy-in of key stakeholders to use them for measuring, reporting, rewarding and improving performance;
- perverse incentives of payment systems;
- adverse effects of the malpractice system;
- primary reliance on specialists for providing maternity care to a predominantly healthy, low-risk population;
- limited reliance on best evidence in leading guidelines for maternity care;
- loss of core childbearing knowledge and skills among health professionals;
- limited attention to harms and iatrogenesis;
- challenge of translating research into practice;
- adverse effects of pressure from industry;
- inadequate informed consent processes and women's lack of preparation for making informed decisions;
- limitations of views put forth in media and popular discourse.

The consequences of these challenges are highlighted by Sakala and Corry (2008) who, in summarising the results of many systematic reviews that can be used to improve the quality and safety of maternity care, identified practices that are both overused and underused. Based on their findings, their recommendations are:

- **Prenatal:** In the prenatal period, there should be an increase in the use of prenatal vitamins, smoking cessation interventions in pregnancy, measures for preventing preterm birth, hands-to-belly maneuvers to turn fetuses to a head-first position before birth. There should be a reduction in the routine use of numerous prenatal tests and treatments.
- **Intrapartum:** There should be an increase in continuous labor support, use of tubs and other validated non-pharmacologic pain relief measures, application of the many available measures for promoting labor progress before carrying out cesarean section for 'failure to progress', measures that increase comfort and facilitate labor progress and in non-supine positions for giving birth, and access to vaginal birth after cesarean (VBAC) for most women with a previous cesarean. There should be a reduction in 'induction for convenience', rupturing membranes during labor, continuous electronic fetal monitoring and episiotomy. Epidurals, they note, should only be given if they are needed.
- **Postpartum:** There should be an increase in delayed cord clamping, early mother–baby skin-to-skin contact, in the implementation of strategies for both the establishment and duration of breastfeeding, and effective ways to treat postpartum depression.

Such changes, however, requires a strategic approach to knowledge management, defined by Dobbins *et al* (2010) as:

'the systematic processes and resources used by individuals and organisations to identify, capture, store, retrieve, share, adapt and (re)use tacit and explicit knowledge produced and/or needed by an organisation'.

Substantial reform is required to support this type of approach, including generating the right knowledge to support those involved in decision-making; building links between decision-makers and researchers; increasing capacity in the use of evidence; increasing awareness of and supporting the transfer of knowledge of evidence-based findings; and creating a culture that supports and encourages the use of evidence and enables innovation (Hanafin, 2014).

Measuring quality of care

Measuring the quality of maternity care has become increasingly important for both users and providers of the service. Several validated indicators have been identified for use in the maternity care sector and different systems are in place in different jurisdictions, increasingly drawn from administrative data systems. Information on maternity services is derived from national administrative health data (Knight *et al*, 2013). These public health surveillance systems have been defined by Halliday *et al* (2013, p. 153) as those that:

‘involve the ongoing systematic collection, analysis, interpretation and dissemination of data regarding a health-related event and facilitate the timely dissemination of results to appropriate decision-makers’.

Most high-income countries, including Ireland, have population health data relating to childbirth, such as the birth and hospital discharge datasets. The **Euro-Peristat Project** is co-financed by the Health Programme of the European Commission’s Directorate General for Health and consumers provide stakeholders with comparable data about the health and care of pregnant women and their babies in Europe. Euro-Peristat compiles population-based data at a national level from routine sources (e.g. administrative or health registers, hospital discharge reporting systems or routine surveys), with each indicator carefully developed and clearly defined so that variations in findings due to data collection systems and definitions is minimised. In total, 29 nine countries participate in Euro-Peristat and the current indicator list includes 10 core and 20 recommended indicators, grouped into 4 themes, as follows:

- Fetal, neonatal and child health.
- Maternal health.
- Population characteristics and risk factors.
- Health services.

A similar approach is available in Canada, where the **Canadian Perinatal Surveillance System (CPSS)** has been developed as part of Health Canada’s initiative to strengthen national health surveillance capacity. The CPSS also uses routine data to report on key aspects of maternal and infant health, and its mission is to contribute to improved health for pregnant women, mothers and infants throughout Canada.

Australia has developed a **Maternity Information Matrix (MIM)**, which according to the Australian Institute for Health and Welfare (2013) includes:

- 45 data collections, including perinatal collections, births and deaths, congenital anomalies and specialist collections;
- nearly 500 data items;
- meta data for each item, including definitions and descriptions;
- data collection overviews, with information about each collection.

Australia and New Zealand, through their joint **Neonatal Network**, report every 2-3 years on high-risk newborn babies (Chow, 2014). Eligibility for inclusion in the Network’s Register includes:

- born at less than 32 weeks’ gestation or weighed less than 1,500 grams at birth; or

- received assisted ventilation (mechanical ventilation), including intermittent positive pressure ventilation (IPPV) or continuous positive airways pressure (CPAP) or high flow for four or more consecutive hours, or died while receiving mechanical ventilation prior to four hours of age; or
- received major surgery (surgery that involved opening a body cavity) or received therapeutic hypothermia.

The Australian and New Zealand Neonatal Network's core dataset fulfils the following functions:

- provides information on neonatal outcomes, adjusted for case mix and disease severity, to participating neonatal units to assist with quality improvement;
- identifies trends and variations in morbidity or mortality;
- assists with the identification of areas of priority for research;
- enhances the ability to carry out multicentre studies and randomised controlled trials through collaboration;
- monitors the clinical indicators for perinatal care and improves clinical practice, while maintaining national standards of evidence-based care;
- monitors the use of new technologies, e.g. high flow/oxygen air usage by patient type and outcome;
- supports consistency in national data collections.

In England, the **UK Obstetric Surveillance System (UKOSS)** is a joint initiative between the National Perinatal Epidemiology Unit and the Royal College of Obstetricians and Gynaecologists. It was launched in February 2005 and has 100% participation of all 212 consultant-led maternity units in the UK. Its purpose is to provide a survey of a range of rare conditions in pregnancy (Nair *et al*, 2014)

The UKOSS model has been adopted in Australia and New Zealand, who have developed the **Australasian Maternity Outcomes Surveillance System (AMOSS)**. It conducts active, prospective surveillance of severe maternal conditions and captures more than 96% of all births in these two countries, with the aim of studying rare severe obstetric and maternal conditions affecting women. The objectives are to improve safety and quality of maternity care through developing evidence-based information on severe maternal morbidity for use in clinical care, service planning and patient information (Halliday *et al*, 2013).

Roberts *et al* (2008) note that the use of such data requires reliable identification of diagnoses and procedures, and they conducted a study to determine the accuracy and reliability of the reporting of these in respect of childbirth in the Australian context. Their findings suggested high levels of accuracy for reporting on childbirth, with the exception of the following two areas – augmentation and obstruction of labour, and failed instrumental delivery and manual removal. These findings are likely to be generalisable to other jurisdictions. Another study conducted in the Australian context evaluated the quality of the Australasian Maternity Outcomes Surveillance System (AMOSS), described above. They concluded that the system serves an important function, utilising data collected from reliable sources in an effective, efficient and timely way.

In Ireland, regular reports are published by the Economic and Social Research Institute (ESRI) on perinatal care and this provides a good understanding of the Irish situation.

Focus for measurement

Draycott *et al* (2010) reported that 290 maternity outcomes in 96 clinical categories had been selected by the Royal Colleges of Obstetricians and Gynaecologists in Canada, the UK, Australia and New Zealand. In an examination of the main areas used in obstetrics indicator sets and systems, Boulkedid *et al* (2013) suggest that, for the most part, they are focused on non-normal pregnancies and birth, with commonly used statistics focused on caesarean section rates and instrumental deliveries, maternal mortality and morbidity, low birth-weight infants and admissions to neonatal intensive care units. This type of approach is similar to the findings of Devane *et al* (2007) in respect of research studies evaluating maternity care. Their study focused on the identification of a core set of outcome measures with respondents from 28 countries (although 84.4% of respondents came from the UK, USA, Canada, Australia, Ireland and the Netherlands). Their findings suggest that most items agreed by the participants related to adverse outcomes rather than normal childbirth. This is a common issue across health services with outcomes that closely link with important aspects of the client experience, including compassion and expressions of caring much less common and more problematic to collate (Maben *et al*, 2012).

The issue of what should be measured has been studied recently by Boulkedid *et al* (2013), who drew attention to the unsuitability of monitoring quality of obstetrics care through the use of adverse outcomes, many of which are rare. Their Delphi study included a panel of French-speaking experts in obstetrics care tasked with selecting relevant and valid indicators that could be routinely monitored to guide the development of quality improvement programmes. Their final list of indicators, however, continue to include mainly negative events, with only a handful of positive indicators included in the 18 areas chosen by the panel, such as 'intact perineum', 'nuchal translucency measurement during the first trimester' and 'decision to breastfeed at discharge'. The areas measured are often chosen on the basis of feasibility and consequently they may not provide a comprehensive reflection of all the areas of relevance to clients. This point is highlighted by Heaman *et al* (2014), who, in the development of an instrument to measure quality in prenatal care, identified the main components as:

- information-sharing;
- anticipatory guidance;
- sufficient time;
- approachability;
- availability;
- support and respect.

Other authors have drawn attention to the need to collect data that reflect national policies and in the UK this includes a focus on inequalities in health outcomes. Murray *et al* (2010) identified a number of markers to cover a range of entry and in-system access metrics, including timely entry to maternity care, appropriate assessment and identification of needs of individuals, and referral and communication with other related health and social care needs. According to the authors, these indicators can offer an unobtrusive means of auditing the effectiveness of some of the processes intended to help women move through the maternity system during pregnancy, as well as monitoring progress on reducing social inequalities in access over time. Such metrics may be of interest to the Irish situation in view of the most recent national health strategy published by the Department of Health (2013), *Healthy Ireland – A Framework for Improved Health and Wellbeing, 2013-2025*.

In the Irish context, HIQA (2013, p. 20) identifies a number of deficits in the availability of data and information:

'The Authority [HIQA] is of the view that arrangements should be put in place nationally to build on the existing approaches to the collecting, analysing and reporting of maternal morbidity and mortality data at a local and national level, to improve coordination,

consistency and integration of all approaches, including other national data collection sources, to inform service delivery, improve efficiencies within the service and ensure patient safety nationally.'

Key issues highlighted include:

- an absence of an agreed national dataset of quality and safety measures for maternity services in Ireland;
- no consistent approach to reporting clinical outcomes.

Challenges in data quality

According to HIQA (2014, p. 3), in its *Catalogue of National Health and Social Care Data Collections*, health is information-intensive and it is estimated that 'up to 30% of the total health budget may be spent one way or another on handling information, collecting it, looking for it, storing it'. Consequently, it is important to have a system in place for ensuring good quality information is collected. HIQA draws attention in its 2014 report to the four key overarching objectives relating to health information, based on maximising health gain for the individual and population, as follows:

1. Information is used to deliver and monitor safe and high-quality care for everyone.
2. Information should be of the highest quality and where appropriate collected as close as possible to the point of care.
3. Information should be collected once and used many times, where possible.
4. Data collection should be 'fit for purpose' and cost-effective.

Much of the information is collected through statistical processes and Eurostat (2003) has defined the quality of statistics with reference to six criteria: relevance; accuracy; timeliness; accessibility and clarity of information; comparability; and coherence. These are similar to, although less extensive than, those outlined by HIQA (2014, p. 11), which highlights the following dimensions of data quality:

- **Accessibility:** Accessibility is the ease with which data can be accessed, the awareness of data users of what data is being collected and knowing where it is located.
- **Accuracy:** Accuracy of data refers to how closely the data correctly captures what it was designed to capture.
- **Coherence:** Coherence refers to the internal consistency of the data which can be promoted through the use of standard data concepts, classifications and target populations.
- **Comparability:** Comparability of data refers to the extent to which data is consistent between organisations and over time allowing comparisons to be made.
- **Completeness:** Completeness of data refers to the extent to which the data collected matches the dataset that was developed to describe a specific entity.
- **Interpretability:** Interpretability of data refers to the ease with which the user can understand the data.
- **Relevance:** Relevance of data refers to the extent to which the data meets the needs of users.
- **Reliability:** Reliability of data refers to the extent to which data is collected consistently over time and by different organisations, either manually or electronically.
- **Timeliness:** Timeliness of data refers to the extent to which data is collected within a reasonable time period.
- **Usability:** Usability of data refers to the extent to which data can be accessed and understood.
- **Validity:** Validity of data refers to data that has been collected in accordance with any rules or definitions that are applicable for that data.

Achieving high quality on each of these dimensions is problematic. In the Irish context, a number of authors have written about these difficulties (HIQA, 2010, 2012 and 2013; Hanafin and Brooks, 2009; McFeely and Dunne, 2014). Challenges identified include lack of availability of some data, variability in the quality of the data available and a lack of harmonisation of key demographic variables. These challenges arise in the context of reporting on maternal and infant health, and the most recent *European Perinatal Health Report* (Euro-Peristat, 2013) highlights a number of gaps in information from Ireland compared with other European countries. Challenges have also been identified in other countries and Knight *et al* (2013) report on several areas of concern in respect of maternity care systems. Their paper highlights how statistics on maternity care in English hospitals are affected by the completeness and consistency of data on method of delivery, a variable that is required for the construction of several other indicators (e.g. caesarean section rate, the rate of third and fourth degree perineal tears among women delivering vaginally).

Real-time monitoring

In addition to issues of data quality, challenges also arise from the volume of data available, the capacity of decision-makers to analyse and interpret the findings, and the gap between the event taking place and the length of time taken to report the findings. In response to these challenges, many maternity services use 'dashboard monitoring' to provide continuous information on clinical performance and governance in everyday practice (Boulkedid *et al*, 2013). The Royal College of Nursing (2012) notes that the purpose of dashboards is to engage staff and empower them through information to improve quality. Dashboards, they suggest, are not an end in themselves and are best understood as a means to:

- promote appreciative inquiry;
- contribute to learning and development;
- foster the ownership of treatment and care of patients;
- support local quality improvement initiatives;
- improve nursing knowledge.

These purposes also apply in the Irish context, where a recent report evaluating the development and implementation of a Nursing and Midwifery Metrics System in one area of Ireland identified positive results (Cusack *et al*, 2014). The system was implemented in the HSE Dublin North Healthcare services and provides information on metrics that support real-time data to monitor nursing and midwifery care and promote a culture of patient safety. The findings from the evaluation suggest that experiences of using the metrics system were positive and related to the ease of use, visual presentation of information and speed of access to results/timeliness of information. Greater efficiency in time and feedback meant it was possible to integrate the findings into the ward activity and this was particularly helpful in ensuring the data had relevance.

In the UK, the Royal College of Obstetricians and Gynaecologists (RCOG) published the *Maternity Dashboard Clinical Performance and Governance Score Card* in 2008. This provides an example of an approach that can be used to monitor various aspects of clinical governance contemporaneously, so that corrective action can be taken when there is deviation from expected performance. The RCOG's Maternity Dashboard includes four broad categories: clinical activity; workforce; clinical outcomes and risk incidents/complaints; and patient satisfaction survey. Advantages of the tool were identified as:

- improving the overall quality of care by informing the healthcare providers about their performance;
- stimulating comparisons between other maternity units;
- identifying areas for further improvement.

Arulkumaran *et al* (2008) noted that it is important to modify the RCOG's Maternity Dashboard to suit local needs in order to overcome perceptions of it being '*just another paper exercise*'.

Similar advantages were also highlighted by Boulkedid *et al* (2013), who suggested that all maternity units should consider using a dashboard to plan and improve their services. They identified continuous monitoring tools such as the 'CUSUM chart', used in France to monitor a broad range of indicators and which, the authors suggest, can help to detect unwanted changes in quality indicator rates rapidly. The importance of this type of approach was highlighted in the report by HIQA (2013, p. 20), when it drew attention to the absence of a national laboratory-based alert system that enabled '*real-time analysis of data from local laboratory information systems*'.

Use of clinical review

Since the publication of the seminal *To Err is Human: Building a Safer Health System* report by the Institute of Medicine in 1999 (Kohn *et al*, 2000) – which found that errors cause between 44,000 and 98,000 deaths every year in American hospitals and over one million injuries – there has been an awareness of the need to ensure that those working within the healthcare system have opportunities to learn from incidents that take place. In order for this to happen, however, DuPree *et al* (2009) note that members of the healthcare team must feel comfortable relating or reporting their errors and near misses, and must also be assured that their reporting of events is linked to a system that will report and take action. Challenges in achieving this have been identified, however, and Ap Dewi *et al* (2011) reported that '*the culture in some trusts might not be conducive to learning from such incidents; for example, staff in five trusts told us that they do not get timely and comprehensive feedback following incidents*'.

This may also be an issue in the Irish context, where as part of its investigation, HIQA (2013) requested the HSE to provide details of how the recommendations of the report on the death of Tania McCabe and her infant son Zach at Our Lady of Lourdes Hospital, Drogheda, had been implemented at each of the 19 public maternity hospitals. Only 5 of the 19 hospitals/units provided a detailed status update for all 27 recommendations, while 6 of the 19 maternity hospitals/units either reported their status against a different investigation, had no comment or reported that evidence for implementation did not exist. HIQA suggested that this was not acceptable.

HIQA also asked each of the 19 public maternity hospitals/units whether they produced an annual clinical report. It was found that 8 of the 19 maternity hospitals/units do not produce any form of annual clinical report. HIQA recorded their concern at the absence of a national overview and structured assurance arrangements to monitor the safety and quality of maternity services in Ireland. Consequently, HIQA recommends that the HSE must develop, publish and implement a suite of national performance measures for maternity services, with a clear focus on patient outcomes. Furthermore, HIQA (2013, p. 109) suggested that:

'These indicators would form the basis of a national maternity "dashboard", which should be collected, analysed and appropriate action taken where variance exists locally. They should be published and reported on nationally on a regular basis. As part of this dashboard development, appropriate national benchmarks for performance must be developed and implemented.'

I-Mews

All patient safety adverse events directly related to service users' treatment or care in Ireland which did or could have resulted in an adverse outcome must be reported to the Clinical Indemnity Scheme (CIS) through the National Adverse Event Management System (formerly known as STARWeb). In addition, the HSE have a National Incident Management Team to whom all hospitals funded by them escalate high-risk serious clinical incidents in line with HSE policy. A Modified Early Obstetrics Warning System (MEOWS) was recommended in a HSE (2008) report of a maternal death that took place in Our Lady of Lourdes Hospital, Drogheda (Holohan, 2014) and since that time all HSE maternity hospitals/units have commenced the implementation of the Irish Maternity Early Warning System (I-MEWS). A joint *Clinical Practice Guideline* on the I-MEWS system was published in 2013 by the HSE/Institute of Obstetricians and Gynaecologists.

The availability of I-MEWS and the clinical practice guideline is, however, only one aspect of care and HIQA noted that while the I-MEWS chart is important, it is also critical that all clinical staff are trained in the recognition and management of a clinically deteriorating maternity patient and that *'they have a duty to perform and interpret the basic components of their role as would be expected with any patient'* (HIQA, 2013, p. 67).

Electronic health records

Hand-held records are widely used in the UK as a tool to facilitate communication between healthcare providers and pregnant women, and have been in use there since the early 1950s. More recently, the introduction of a patient electronic health record has been promoted and internationally some work has been done on evaluating its introduction, with Hawley *et al* (2014) identifying some 6,816 potentially relevant publications on the area published from 1985 to 2012. An electronic health record has been defined by Hawley *et al* (2014, p. 5) as:

'... a system that operates between hospital, community setting and patient. The record is accessible by hospital clinician, patient (or woman) and community clinician'.

Hawley *et al* (2014), using data from a systematic review of 43 papers, compared the findings on women's experiences of using a paper hand-held record (PHR) (defined as *'a paper record that is portable and hand-held by a person who can include patient, client or woman. The record can be known as notes, chart or card'*) with an electronic health record (EHR). The findings, presented in Table 7, highlight high levels of satisfaction by women in the use of both types of record.

Table 7: Women’s experiences of using PHR and EHR maternity records

Women’s experiences	Paper hand-held (PHR) maternity record	Electronic health record (EHR) maternity record
Perception	More ownership and feel more in control of pregnancy. More confidence, responsibility. Perceived as getting better care.	Positive impressions. 80% with record on USB felt safer and would use again.
Satisfaction	High levels of satisfaction, less anxious, communication improved.	Few concerns over confidentiality. High level of satisfaction using an Internet device.
Usability	Easy to use, prefer to carry own notes, improved availability to education, some findings hard to read because of hand-writing.	Electronic notes useful, easy to understand, assisted with education, remembering appointments.
Access	Generally did not lose record. Good access to information for partner, family and friends.	Improved partner involvement. Some issues with not being able to access record; and when data missing from record, expected to recall information.

In addition, Hawley *et al*'s (2014) study showed that from the point of view of clinicians, there were positive findings on the use of electronic health records (EHRs), but there were also some negative ones, which included:

- disinterest, confusion and a perception by midwives that EHRs were ‘not integral to their role’;
- time-consuming;
- privacy and confidentiality issues;
- restricted and lack of access to hospital or personal computer;
- frustration when information was not available;
- GPs reluctant to share information;
- GPs expected to fill in blanks or missing results.

Another area highlighted by Hawley *et al* (2014) relates to the use of EHRs to support integration of care and teamwork. While advantages were identified (e.g. the EHR has facilitated ease, timeliness of referrals, reminders and notifications, used to link specialist services to GPs), challenges were also mentioned (e.g. fragmentation in electronic systems, sensitive information not appropriate for the record). The authors conclude that while EHRs have been shown to be valuable in facilitating linkages between care providers and women, the literature to date has not been conclusive in determining the contribution of EHRs to the integration of maternity care.

Summary

While there is general agreement that the use of evidence to inform decision-making is vital for good outcomes, the management of knowledge (including its generation, translation, transfer and exchange from relevant research) is problematic. So too is measuring the quality of care and much attention has been paid to the use of indicators in the maternity care section, although different systems are in place in different jurisdictions. Examples include the Euro-Peristat Project in Europe, the Canadian Perinatal Surveillance System in Canada, the Australasian Maternity Outcomes Surveillance System in Australia and New Zealand, and the Perinatal Reports published by the Economic and Social Research Institute in Ireland. As highlighted in the Euro-Peristat report, there are many gaps in the data for Ireland. It is one of the only countries in this review where there is not a regular national maternal satisfaction survey.

Difficulties also arise with data quality and according to HIQA (2013, p. 3) '*up to 30% of the total health budget may be spent one way or another on handling information, collecting it, looking for it storing it*'. However, significant difficulties arise across a range of areas, including, for example, accuracy, coherence, comparability, completeness, relevance and reliability of the data. The recently published *European Perinatal Health Report* (Euro-Peristat, 2013) highlights a number of gaps in information from Ireland relative to other countries and this makes benchmarking and comparisons difficult.

The implementation of real-time monitoring through the use of dashboards can help to promote appreciative inquiry, contribute to learning and development, foster the ownership of treatment and care of patients, support local quality improvement initiatives and improve knowledge (Royal College of Nursing, 2012). Clinical review is also commonly used as a mechanism for identifying learning from critical incidents that take place and this is the case in most jurisdictions, including Ireland. The introduction of the Irish Maternity Early Warning System (I-MEWS) is currently underway, although as the *Portlaoise Perinatal Deaths* report by Holohan (2014) shows, these data must be interrogated and changes made when problems arise. Electronic health records are commonly used in a number of jurisdictions as a mechanism for improving communication and are currently recommended to be introduced in others, including Scotland and Australia.

10. Governance of maternity services, including obstetrics and gynaecology

While the quality of care provided by health organisations is everyone's responsibility, those at corporate level must ensure that staff delivering services are supported to cope with the demands being placed on them (Ham and Hartly, 2013). Recent reports on failures within maternity services in Ireland (HIQA, 2013; Holohan, 2014) raise questions about leadership and governance within the system, although these are not unique to either the Irish situation or to maternity services. Issues identified in the UK's recent Public Inquiry by Francis (2013), conducted into failings in one NHS Foundation Trust, have been previously noted in other reports. Francis identified '*an unhealthy and dangerous culture*' as a pervading cause of the failures that took place and this culture was characterised by bullying, target-driven priorities, disengagement by medical leaders, discouragement of feedback from trainees, low staff morale, isolation, lack of candour, acceptance of poor behaviours, reliance on external assessments and denial (Ham and Hartly, 2013).

Several jurisdictions have embarked on quality initiatives in respect of their maternity services and the multidimensional nature of quality and safety is reflected in the multiple components of systems put in place. Common elements include:

- the development of standards;
- the development and implementation of clinical guidance;
- national monitoring reports on clinical interventions and outcomes;
- data and information systems, including dashboards that can provide information at the point of service delivery.

Clinical governance provides a framework for improving services. Arulkumaran (2010) has outlined 7 pillars of support for clinical governance and how these can operate in the context of maternity services (see Figure 25).

Figure 25: The 7 pillars of clinical governance



The importance of adopting a comprehensive approach that includes each of the 7 pillars has been highlighted and Francis (2013) in his report of the Public Inquiry notes:

‘I have made a great many recommendations, no single one of which is on its own the solution to the many concerns identified.’

Standards and guidelines

The development and use of standards are commonly used to set out the key elements of a service around which quality and safety will be benchmarked and some work has taken place internationally on maternity services. The Royal Australian and New Zealand College of Obstetricians And Gynaecologists (2014), for example, have recently published an agreed set of *Standards of Maternity Care for Australia and New Zealand*. These standards are structured around the **organisation of maternity care** (including issues relating to choice for women, planning services for local communities, appropriate staffing, training and maintenance of professional competence in maternity units) and the **process of maternity care** across the timelines *pre-pregnancy care* (e.g. preparation for pregnancy, pre-pregnancy care for women with existing medical conditions), *care during pregnancy* (e.g. access to maternity services, antenatal screening, women with social needs), *care during birth* (intrapartum care) and *care in the puerperium and neonatal period* (e.g. neonatal care and assessment, promotion of healthy parent–infant relationships, transition to parenthood).

There is much overlap between these Australian/New Zealand standards and the *Standards of Care for Women's Health in Europe* developed by the European Board and College of Obstetrics & Gynaecology in 2011. Again, there is a focus in the European 16 standards on the **process of maternity care**, from pre-pregnancy through postnatal, neonatal and maternal care.

The *Safe Births* report by O’Neill *et al* (2008), however, make two recommendations regarding standards. The first concerns the national structures to support safety and the authors note that safety of maternity services should be set and monitored only by the Healthcare Commission (now, the Care Quality Commission) and, where appropriate, advice on standards should be sought from professional bodies and other interested organisations. The second recommendation highlights the complexity and length of some standards, and O’Neill *et al* note that standards and guidelines should be distilled into a smaller number that are critical to safety and that can be connected to data which teams can collect.

Quality and safety initiatives across jurisdictions

Several jurisdictions have embarked on quality initiatives in respect of their maternity services and the multidimensional nature of quality and safety is reflected in the multiple components of systems put in place.

New Zealand, for example, has embarked on a National Maternity Quality Initiative, which comprises:

- a national Maternity Quality and Safety Programme, including maternity standards and clinical indicators;
- revised Maternity Referral Guidelines, which set out processes for transfers of care, including in an emergency;
- standardised, electronic maternity information management to improve communication and sharing of health information among health practitioners;
- improved maternity information systems and analysis so there is better reporting and monitoring of maternity services.

The overall initiative is overseen by the National Maternity Monitoring Group (NMMG), whose first report in 2013 draws attention to general themes such as the content of the Maternity Quality and Safety Programme Strategic Plans and Annual Reports produced by each District Health Board. The NMMG notes that its role is to assess the implementation of the *New Zealand National Maternity Standards*, published by the Ministry of Health in 2011. These standards form the basis for improving the quality and safety of maternity care in New Zealand.

In England, commissioning of NHS services takes place by Government through a process of planning, agreeing and monitoring services, although it is recognised that securing services is much more complicated than securing goods and the diversity and intricacy of the services delivered by the NHS is unparalleled. The commissioning process has provided a structure within which the expectations around the provision of maternity services will be provided. A resource pack developed to support commissioners presents a range of different resources, including those to:

- **Support a better understanding of local need** through maternity needs assessment, listening to stakeholders and accessing local resources. They note that all maternity providers will produce their own ‘dashboards’ to monitor activity, outcomes and performance, and this ‘real-time data’ will help identify the challenges and opportunities at local level.
- **Benchmark performance** through comparing local services, both their outcomes and the way they are organised through the national Child and Maternal Health Observatory (ChiMat) data source, which provides information and intelligence to improve decision-making for high-quality, cost-effective services.
- **Local Supervising Authority Midwifery Reports**, which undertake an annual audit and review of all local maternity units. These reports give an insight into the quality and safety of local units.

- **Standards:** Use of the Royal College of Obstetricians and Gynaecologists standards, including *Standards of High Quality Women's Healthcare* and *Standards of Maternity Care*.
- **Clinical guidance:** National guidance through the National Institute for Health and Care Excellence (NICE), which has developed 9 sets of guidelines relating to birth and 29 relating to pregnancy, including intrapartum care (NICE, 2007), caesarean section (NICE, 2011a), antenatal care, perinatal mental health, diet, smoking and exercise (see <http://www.nice.org.uk/guidance/>)
- **Confidential Enquiries** on maternal mortality, produced every 3 years since the 1950s.

Clinical leadership

The Holohan (2014) report on the *Portlaoise Perinatal Deaths (2006-date)* highlighted a number of priority areas to be addressed in terms of clinical leadership, including creating mechanisms through which problems can be meaningfully escalated; creating a balance between responsibilities to support quality and safety; patient outcomes; working culture; financial issues; providing appropriate training and education for those aspiring to leadership positions; working with the third-level sector and professional bodies to support professional training pathways; ensuring intensive supports, including mentoring and coaching, for newly appointed leaders; and developing a framework to ensure that they are provided with a constructive and safe way to discuss and get feedback on their performance.

The *Strategy for Maternity Care in Northern Ireland, 2012-2018* (Department of Health, Social Services and Public Safety, 2012) notes that good clinical leadership, workforce development and use of technology are essential for a high-quality, sustainable maternity service. In particular, they note that clinical leadership is vital for quality improvement and innovation in maternity care.

In Ireland, clinical leaders need to be appropriately supported so that they can, in turn, support staff to meet the attributes outlined by the *National Standards for Safer Better Healthcare* (HIQA, 2012, p. 4), as follows:

- service users are treated with kindness, consideration and respect, and have the information they need to make decisions;
- service providers put service users' needs and preferences at the centre of all their activities;
- service users have access to the right care and support at the right time and there is clarity about who is responsible and accountable for the quality and safety of services;
- services are based on good evidence of what works best and strive for excellence by monitoring how they perform and making the necessary changes to improve the safety of service users, which is paramount, and steps are taken to anticipate and avoid things going wrong and to reduce the impact if they do;
- services are designed for reliability – minimising inconsistency, variation in provision and the likelihood of things going wrong;
- people working in the service are recruited, organised, developed and supported so that they have the skills, competencies and knowledge to enable the delivery of high-quality, safe and reliable care;
- accurate and timely information is used to promote effectiveness and drive improvements;
- service providers take every opportunity to enable people who use services to increase control over their own health and wellbeing, and the factors that influence them.

Summary

Several jurisdictions have embarked on quality initiatives in respect of their maternity services and the multidimensional nature of quality and safety is reflected in the way in which they are constructed. The 7 pillars of clinical governance provide some guidance on the areas to be taken into account (i.e. workplace, staff, guidelines, training, clinical audit, risk management and monitoring) and the importance of adopting a comprehensive approach has been highlighted recently by Francis (2013), who in commenting on the findings from an in-depth review of failures in one area in the UK noted:

'I have made a great many recommendations, no single one of which is on its own the solution to the many concerns identified.'

Some common elements incorporated into quality and safety developments across jurisdictions include:

- the development of standards;
- the development and implementation of clinical guidance;
- national monitoring reports on clinical interventions and outcomes;
- data and information systems, including dashboards that can provide information at the point of service delivery.

11. Strategic approaches to maternity services across jurisdictions

This chapter presents an analysis of the strategic approaches taken to maternity services by the 7 jurisdictions examined in this review. These jurisdictions are Australia, Canada, New Zealand, England, Wales, Northern Ireland and Scotland.* Each country has produced a document or plan focusing on the delivery of services for pregnant women and their families in the antenatal, intranatal and postnatal periods (see Table 8). While a small number of the plans make reference to the provision of fertility and gynaecological treatments, these references are relatively minor and are peripheral to the overall approaches adopted. For that reason, this issue is not considered in this chapter, which presents an analysis of the general structure and approach taken, together with the vision, aims and key elements presented within each plan.

Table 8: Strategic approaches or plans for maternity services by the 7 jurisdictions under review

Jurisdiction	Title of plan, author, year of publication and publisher
Australia	Commonwealth of Australia (2011) <i>National Maternity Services Plan 2010</i> . Canberra: Commonwealth of Australia.
Canada	Society of Obstetricians and Gynaecologists of Canada (2008) <i>A National Birthing Strategy for Canada: An inclusive, integrated and comprehensive pan-Canadian framework for sustainable family-centered maternity and newborn care</i> . Ottawa: Society of Obstetricians and Gynaecologists of Canada.
New Zealand	Ministry of Health (2011) <i>New Zealand National Maternity Standards: A set of standards to guide the planning, funding and monitoring of maternity services by the Ministry of Health and District Health Boards</i> . Wellington: Ministry of Health.
England	National Audit Office (2013) <i>Maternity Services in England</i> (Report by the Comptroller and Auditor General). London: HMSO.
Wales	Welsh Government (2011) <i>A Strategic Vision for Maternity Services in Wales</i> . Cardiff: Welsh Government.
Northern Ireland	Department of Health, Social Services and Public Safety [Northern Ireland] (2012) <i>A Strategy for Maternity Care in Northern Ireland, 2012-2018</i> . Belfast: Department of Health, Social Services and Public Safety.
Scotland	Maternity Services Action Group (MSAG) (2011) <i>A Refreshed Framework for Maternity Care in Scotland</i> . Edinburgh: Scottish Government.

* England, Scotland, Wales and Northern Ireland are sometimes referred to collectively as the United Kingdom (UK) throughout this report.

Overall structure of plans

Each of the plans examined are constructed differently, with some providing a vision statement and lists of aims, objectives, priorities and recommendations, while others present a list of objectives only. Although there are some inconsistencies in the terms used in the plans across jurisdictions, there are a number of commonalities in the meaning and focus within them. The plans are not even all referred to as 'a strategy' or 'a plan', but since they provide the most up-to-date information on the explicit strategic approach outlined by the jurisdiction for their maternity services, they have been included in the analysis. The New Zealand plan (which is the term we will use hereafter for consistency), for example, is presented as 'a set of standards', while the Scottish plan is called 'a refreshed framework'. The plan for England is based on a document published in 2007 called *Maternity Matters: Choice, access and continuity of care in a safe service* (published jointly by the Department of Health and Partnerships for Children, Families and Maternity), but the 2013 plan (*Maternity Services in England*) provides a more up-to-date analysis and overview of the implementation of the strategy and makes additional recommendations, and for those reasons is included here. The Northern Ireland plan and the Canadian plan are both called 'a strategy', the Welsh one 'a strategic vision' and the Australian one 'a plan'. Even given the differences, it is clear that the terminology from any one of these plans might be acceptable in the development of a similar type approach in Ireland for a National Strategy for Maternity Services.

Some of the plans are lengthy and provide considerable background and contextual information, while others are relatively short, although they may draw attention to key policy documents, legislation and literature reviews that present more detailed information. The Australia plan, for example, runs to 127 pages and provides an in-depth insight into the context for maternity care, a comprehensive action plan and a thorough examination of related Australian Government strategies, including national initiatives, rural initiatives and initiatives for their Aboriginal and Torres Strait Islander populations. The Northern Ireland plan also includes a comprehensive and detailed approach, and again, presents a number of appendices related to transforming maternity care as well as outlining maternity pathways. The plan for England is relatively short (40 pages), but, as noted above, it builds on a much more comprehensive document, *Maternity Matters* (2007). The Scottish plan is of a similar length to the English one (at 48 pages). The New Zealand plan runs to only 13 pages, but as already noted, it is presented as 'a standards' document and attention is drawn in it to the other elements of the Maternity Quality Initiative (made up of the Primary Maternity Services Notice 2007, Maternity Referral Guidelines, District Health Board Maternity Service specifications and other high-level guidelines and requirements); it is also noted that the standards are designed to complement, rather than duplicate, existing legal and policy requirements, including protection of consumers' rights, regulation of health practitioners, regulation of maternity services under legislation, reducing health disparities, and specification of primary, secondary and tertiary maternity services and facilities.

While there are considerable differences between these 7 plans, their inclusion in the analysis identifies a range of alternative approaches that can be adopted to developing a strategic plan for maternity services in Ireland.

Vision and aims

The purpose of this section is to identify common elements presented in the vision and overarching aims of different jurisdictions so that it can provide guidance in the drafting of a strategy in Ireland. In doing so, the analysis focuses only on those areas referred to as 'vision/goals' or 'aims' and, again, some challenges in doing so are highlighted. Scotland notes that its plan '*is designed to address all care from conception throughout pregnancy and during the postnatal phase*' (p. 4), but it does not

explicitly state either a vision or overarching aims. For that reason, it is **not** included in the analysis below. It does, however, identify principles which will be taken into account later in this section. While mindful of the differences in plans included in this analysis, for simplicity, the term used is 'vision and aims'. The visions and aims for each jurisdiction are presented in Table 9.

Table 9: Vision and aims outlined in the plans of the 7 jurisdictions under review

Jurisdiction	Vision and Aim(s)
Australia	5 year vision. Maternity care will be woman-centred, reflecting the needs of each woman within a safe and sustainable quality system. All Australian women will have access to high-quality, evidence-based, culturally competent maternity care in a range of settings close to where they live. Provision of such maternity care will contribute to closing the gap between the health outcomes of Aboriginal and Torres Strait Islander people and non-indigenous Australians. Appropriately trained and qualified maternity health professionals will be available to provide continuous maternity care to all women. (p. 3)
Canada	Shared Goal, Shared Vision. To ensure sustainable and appropriate family-centred maternity and newborn care through an inclusive, integrated and comprehensive pan-Canadian birthing strategy. (p. 13)
New Zealand	The New Zealand Maternity Standards provide guidance for the provision of equitable, safe and high-quality maternity services throughout New Zealand. They are underpinned by three short standards. (p. 2)
England	The Department of Health's main aims for maternity services are: <ul style="list-style-type: none"> • to improve performance against quality and safety indicators; • for mothers to report a good experience; • to encourage normality in births by reducing unnecessary interventions; • to promote public health with a focus on reducing inequalities; and • to improve diagnosis and services for women with pregnancy-related mental health problems. <p>The Department outlined its strategy for maternity services in 2007 in <i>Maternity Matters</i>. It intended to achieve its aims by: offering choice in where and how women have their baby; providing continuity of care; and ensuring an integrated service through networks and agreed care pathways. (p. 7)</p>
Northern Ireland	The aim of this Maternity Strategy is to provide high-quality, safe, sustainable and appropriate maternity services to ensure the best outcome for women and babies in Northern Ireland. In doing so, it is recognised that all health and social care staff and members of the public must work together if health and social care maternity outcomes are to be improved, not just for mother and baby, but for both parents and the wider family. This is because clinical treatment, emotional care and social factors are inextricably linked during a woman's pregnancy. It is also important to recognise that, for some members of society, disadvantage starts before birth and can increase over the course of their lifetime. (p. 3)
Wales	The Welsh Government's vision for maternity services in Wales is a service that promotes pregnancy and childbirth as an event of social and emotional significance, where women and their families are treated with dignity and respect. For every mother wherever they live and whatever their circumstances, pregnancy and childbirth will be a safe and positive experience so that she, her partner and family can begin parenting feeling confident, capable and well supported in giving their child a secure start in life. (p. 2)
Scotland	The aim of the Scottish 'refreshment' is to strengthen the contribution that NHS maternity care makes to improving maternal and infant health and reducing the unacceptable inequalities in maternal and infant health outcomes. (p. 3)

An analysis of the key areas emerging within the vision and overall aims of the various plans identified three common areas — quality and safety; reducing inequalities; and client experience. Each is now considered in more detail.

Quality and safety

With the exception of the Canadian plan, each of the others includes a reference to ‘quality and safety’ in their ‘vision and aims’, although they are variously constructed as:

- **Responding to needs**
(e.g. Australia: ‘maternity care ... reflecting the needs of each woman within a safe and sustainable quality system ... access to high-quality ...; Northern Ireland: ‘providing high-quality, safe ... services to ensure the best outcome for women and babies’).
- **Programme delivery**
(e.g. New Zealand: ‘safe and high quality maternity services throughout New Zealand’).
- **Improving performance**
(e.g. England: ‘to improve performance against quality and safety indicators’).
- **Experience of the mother**
(e.g. Wales: ‘for every mother ... pregnancy and childbirth will be a safe and positive experience’).

Reducing inequalities

Three jurisdictions include a specific reference to inequalities in their overall ‘vision and aims’. These are:

- Australia (*‘Provision of such maternity care will contribute to closing the gap between the health outcomes of Aboriginal and Torres Strait Islander people and non-indigenous Australians’*).
- England (*‘To promote public health with a focus on reducing inequalities’*).
- Northern Ireland (*‘It is important to recognise that, for some members of society, disadvantage starts before birth and can increase over the course of their lifetime’*).

New Zealand includes ‘equitable’ and Canada includes ‘inclusive’ within their visions, while Wales implicitly includes a reference to inequalities by writing ‘for every mother wherever they live and whatever their circumstances’.

Within the Canadian plan, there is a separate section called ‘An aboriginal birthing initiative for Canada’ and this section is prefaced by a consideration of the ‘unique additional considerations’ of this group. It highlights that ‘birthing must be returned to Aboriginal communities, mothers, babies and families will be healthier and stronger for it’.

Client experience

The Welsh vision for maternity services has the strongest focus on client experience across jurisdictions. Within the Welsh vision is their pledge to promote pregnancy and childbirth ‘as an event of social and emotional significance where women and their families are treated with dignity and respect’. In addition, the Welsh vision commits to ensuring ‘a positive experience’ for every mother ‘so that she, her partner and family can begin parenting feeling confident, capable and well supported’.

Other jurisdictions also include a reference to this area of client experience, with Australia starting its vision by noting that *'Maternity care will be woman-centred ...'*; England includes it as one of the four aims – *'for mothers to report a good experience'*; and Canada commits to *'family-centred'* care.

Normalisation of birth

Both England and New Zealand incorporate a focus on the normalisation of childbirth – *'that acknowledges pregnancy and childbirth as a normal life stage'* (New Zealand) and *'to encourage normality in births by reducing unnecessary interventions'* (England). While this is not feature of the Australian vision or aims, their principles are underpinned by a commitment to *'a wellness paradigm'* which it notes is that *'pregnant women are predominantly well because pregnancy and birth are normal physiological life events'*. Further, the Australian plan notes that *'clinical decisions about medical intervention should be informed by this understanding'* (p. 25).

A similar issue is highlighted in the Northern Ireland plan, where the overview section begins with the statement, *'Pregnancy is a normal physiological process, and for the vast majority of women is a safe event'* (p. 7).

Other areas

Australia includes a reference to *'evidence-based'* and *'appropriately trained and qualified maternity health professionals'* within the overall vision. The role of health professionals is also incorporated into the Northern Ireland plan, where it is noted that there is an imperative for professionals to *'work together'* as well as working *'with members of the public'*. Canada draws attention to the need for a *'sustainable'* maternity service, while England places an emphasis on *'encouraging normality in births by reducing unnecessary interventions'*. In addition, England also incorporates a key objective around mental health – *'to improve diagnosis and services for women with pregnancy-related health problems'*.

Priorities and actions

Each jurisdiction has used a different term to identify the main areas to be pursued in their strategic approach and there is no common terminology across the plans. Terms used include *'outcomes'* (Northern Ireland), *'priority areas'* (Australia), *'standards'* (New Zealand), *'leadership'* (Canada), *'aims'* (England), *'principles'* (Scotland) and *'themes'* (Wales).

In addition, some of what we will call here *'priorities'* are written as single words (e.g. Australia), while others are detailed and include processes (Canada) and actions (Scotland). The number of areas identified ranged from 3 (New Zealand) to 10 (Scotland), although additional information was presented under *'objectives'* (Northern Ireland), *'actions'* (Wales), *'action areas'* (Australia), *'activities'* (Scotland) and *'processes'* (England). Consequently, while each of the plans highlight areas to be developed, and while there is some overlap and at times interchangeability between these, there is no single or common approach adopted. While the different terms used make it difficult to make direct comparisons, the analysis presented below highlights common elements that have emerged and the term *'priorities'* is used for consistency here.

Again, different approaches are adopted to *'actions'* to be implemented and these range from not having any actions incorporated in the plan (e.g. Canada) to having examples of actions to be

included in a later plan (Wales) to having detailed actions with timelines, funding and responsibilities assigned (Australia).

Australia adopts three broad approaches:

1. Within the body of the plan, it presents an implementation plan according to each of the broad action areas with their associated priorities. Actions are presented for 'the initial year', 'the middle years' and 'the later years', along with 'signs of success'.
2. There is a separate section on implementation, which presents a governance structure, an overview of the key commitments according to where the responsibility lies and an implementation strategy, which presents the details of the implementation plan for the first year (and notes that an action in the first year will be to develop middle and later year actions). The details of the plan for the initial year identify the action, the organisation/structure responsible for implementation (e.g. Australian Government, States or Territories, Health Policy Priorities Principal Committee – Maternity Services Inter-Jurisdictional Committee), the source of funding for the action (e.g. Maternity Reform Budget Package, using existing resources) and 'signs of success' (e.g. *'the first 10 core maternity indicators are endorsed'*; *'national strategic framework for rural and remote health is published'*).
3. The third area presents an overview of each of the actions within 'related Australian Government strategies', including national initiatives, national maternity services initiatives, rural initiatives, rural maternal services initiatives, Aboriginal and Torres Strait Island people initiatives and Aboriginal and Torres Strait Islander maternal services initiatives. Key actions within each of these strategies are identified according to four priority areas (access, service delivery, workforce and infrastructure).

The plans of other jurisdictions take a less comprehensive approach to the actions to be implemented. The Canadian plan does not identify any specific actions to be implemented, but its guiding principles provide an insight into the areas that are likely to be subject to attention.

The Welsh plan presents examples of 'actions to include' rather than a comprehensive plan, with these examples having associated 'themes' (outcomes) along with potential indicative performance measures. In 2013, the Welsh Department of Health published a series of supplementary documents relating to:

- setting outcomes and performance measures;
- workforce;
- informatics;
- quality and safety;
- direct access to a midwife.

The Northern Ireland plan aligns its 6 'outcome' areas with 20 objectives that have been identified and gives examples of measures of performance. However, within the section on 'Implementation', the plan states that it is recommended that the outcome areas and objectives *'should be incorporated into an action plan'* which will provide an *'opportunity to document "time-bounded" actions relevant to the objective'*.

The New Zealand plan presents three 'standards' and under each standard there are audit criteria (which are similar to actions) and measurements. For example, Standard 3 states that *'All women have access to a nationally consistent, comprehensive range of maternity services that are funded and provided appropriately to ensure there are no financial barriers to access for eligible women'*. This standard has 5 associated audit criteria (e.g. *'primary, secondary and tertiary services are effectively linked with seamless transfer of clinical responsibility between levels of maternity care, and between maternity and other health services'*) and 2 associated measures (*'All DHBs report on*

implementation of the Maternity Referral Guidelines processes for transfer of clinical responsibility'; 'Local multidisciplinary clinical audit demonstrates effective linkages between services').

A similar approach is adopted in the Scottish plan, where each of the 10 'principles' are linked with 'activities' and 'continuous service improvement measures'.

Finally, the England plan presents a report on the implementation of the earlier strategy *Maternity Matters*, published in 2007, and the 2013 plan finishes with a set of recommendations based on the findings from this review.

The number of actions, the amount of detail, the focus for implementation and the strategic or operational level at which the action is to be implemented – all result in an understandable lack of consistency across different areas. For that reason, examples of actions relevant to specific areas identified under the principles and objectives are presented below as illustrative of the approaches used.

Priorities identified and examples of associated actions

Priorities were identified for quality and safety, access, woman-centredness and workforce in almost all 7 plans, although a different emphasis was placed according to the jurisdiction.

Quality and safety

Each of the 7 jurisdictions incorporated quality and safety into their plans as priorities, although there was not a consistent approach on how these were presented. The New Zealand plan, for example, written as 'a standard' states '*Maternity services provide safe, high-quality services*'. Northern Ireland, however, refers to safety only in terms of labour and birth, noting '*safe labour and birth (Intrapartum)*'. Rather than referring to quality, the Scottish plan focuses on effective care, noting '*safe and effective maternity care*' in their 'principles'. England and Scotland focus on the measurement of patient safety, with England stating to '*improve performance against quality and safety indicators*' and Scotland noting '*continuous quality improvement processes and measures*'. The Australian approach positions quality and safety within the context of the overall system ('*ensure all maternity care is provided within a safety and quality system*') and within service delivery ('*ensure Australian maternity services provide high-quality, evidence-based maternity care*'). Canada also stresses the importance of an organisational approach, highlighting the creation of 'a framework' to coordinate programmes ('*enabling the creation of a national framework for the coordination of provincial and territorial patient safety programmes*'), while also drawing attention to the importance of national standardised practice guidelines ('*supporting the development of national, standardized practice guidelines for all maternity providers*'), again, suggesting a dual approach at system and delivery levels.

Key areas arising in respect of quality and safety include:

Risk and risk assessment, including social risk; use of safety tools; communication, including client and multidisciplinary team communication and providing information to support; managing risk across different models of care (ensuring client decisions are informed by 'balanced' description of benefits and risks); provision of both consultant-led and midwife-led units; referral and linkages across the system; use of evidence; making provision for service provision for at-risk clients and complex cases; reviewing mortality and morbidity.

Examples of actions relating to quality and safety

- Scottish Patient Safety Programme tools are routinely utilised. (Scotland)
- All maternity staff have a clear understanding of the concept of risk assessment and management. (Scotland)
- Patient communication and language support systems are effectively employed. (Scotland)
- Adverse incidents/near misses information is routinely collated and used for individual and team development. (Scotland)
- A mechanism for effective team development and communication is in place. (Scotland)
- Maternity care staff have a clear understanding of the importance of social risk, e.g. domestic abuse, child protection concerns. (Scotland)
- Women will be supported to make an informed decision about their place of birth by providing a balanced description of the benefits and risks of the different types of maternity settings. This will include information on midwife-led units, homebirth and consultant-led units. (Northern Ireland)
- The Health & Social Care Trusts (HSC) will consider how best to maximise choice in intrapartum care, while also meeting other key priorities and statutory obligations. A networked approach to maternity care, with cross-boundary flows between HSC organisations and possibly other jurisdictions, will be necessary. (Northern Ireland)
- Where a consultant-led unit is provided, a midwife-led unit will be available on the same site. As well as providing services for the local population, the Belfast Trust will provide the regional centre for Northern Ireland to care for the most complex cases. (Northern Ireland)
- Evidence and best practice support maternity service specifications, and service specifications are reviewed. (New Zealand)
- Nationwide Service Frameworks support the provision of continuity of care to women throughout their maternity experience. (New Zealand)
- Maternity services are culturally safe and appropriate. (New Zealand)
- Primary, secondary and tertiary services are effectively linked with seamless transfer of clinical responsibility between levels of maternity care and between maternity and other health services. (New Zealand)
- All District Health Boards report on implementation of the Maternity Referral Guidelines processes for transfer of clinical responsibility. (New Zealand)
- Local multidisciplinary clinical audit demonstrates effective linkages between services. (New Zealand)
- All District Health Boards plan locally and regionally for effective clinical and organisational pathways to respond to maternity and neonatal emergencies. (New Zealand)
- All clinical commissioning groups should have agreed service specifications with their Trust. These should include how local maternity care is expected to contribute to achieving the Department's objectives, including those that have historically received less attention, such as mental health and reducing inequalities. In developing the service specifications, local NHS bodies should compare local performance and resources against suitable benchmarks and investigate significant variation. (England)
- The Australian Health Ministers' Advisory Council (AHMAC) recommends a national maternal mortality and morbidity review process to the Australian Commission on Safety and Quality in Health Care (ACSQHC) for continuous improvement of maternity care. (Australia)
- AHMAC agrees to recommend to ACSQHC that systems and processes are developed to use statistics, core maternity indicators, and the maternal and perinatal mortality and morbidity review to improve public and private maternity care. (Australia)
- States and Territories consider the implementation of publicly funded homebirth models based on findings of their investigations. (Australia)

Access

In terms of access, the Australian plan outlines the approach in the most comprehensive way. First, it presents 'access' as a broad priority area and then set out 4 key areas whereby access will be increased: (1) for women and their families in accessing '*information that supports their needs*'; (2) to local maternity care by '*expanding the range of models of care*'; (3) increasing access in '*rural*' areas; and (4) increasing access in '*remote*' areas.

Other plans focus on different elements. Northern Ireland, for example, identifies the importance of location ('*locally accessible care*') and this was also the case for Canada, where the services would be delivered '*regardless of where they live*'. New Zealand highlights access to 'consistent' and 'comprehensive' care ('*all women have access to a nationally consistent, comprehensive range of maternity services*'), while also drawing attention to 'financial barriers' ('*to ensure there are no financial barrier to access for eligible women*'). Scotland focuses on the timing of care as well as utilisation, noting '*early direct access and uptake*'.

Key areas arising in respect of access include:

Providing a range of models of care and multiple services, and facilitating and actively promoting their use; making provision for, identifying and addressing inequalities; developing processes to support clinical privileges, admitting and practice rights of eligible midwives and medical practitioners; and extending referral pathways for at-risk clients.

Examples of actions relating to access

- Systems are in place to ensure that all women are offered the option of attending a midwife as the first professional contact, ensuring women are also aware that the choice of seeing their GP at any point in their pregnancy is available. (Scotland)
- Antenatal care services are tailored and proportionate to local population need. (Scotland)
- Inequalities in access to maternity services are identified and effectively addressed. (Scotland)
- Antenatal care services are promoted through all appropriate NHS and local authority services, including sexual and reproductive health services, mental health services, community addiction services, specialist mental health services, social services, etc. (Scotland)
- When a woman becomes pregnant, she will be facilitated to make early direct contact with a midwife. For women with straightforward pregnancies, antenatal care will be provided primarily by the midwife in the local community. Women with complex obstetric conditions will have care led by a consultant obstetrician. (Northern Ireland)
- The appropriate levels of primary, secondary and tertiary maternity services and facilities are identified and available to meet population needs. (New Zealand)
- Women and their babies have access to the levels of maternity and newborn services, including mental health, that are clinically indicated. (New Zealand)
- Australian Governments, through Closing the Gap initiatives, continue to provide supported accommodation and travel options for Aboriginal and Torres Strait Islander women and key family members who travel to access appropriate levels of maternity and neonatal care. (Australia)
- States and Territories expand formal referral pathways for women experiencing depression and mental illness. States and Territories expand options for overcoming separation of mothers from their babies when receiving mental health care. (Australia)
- Jurisdictions use best endeavours to facilitate the clinical privileges, admitting and practice rights of eligible midwives and medical practitioners. (Australia)
- Clinical commissioning groups and Trusts should agree long-term, sustainable plans for the distribution and capacity of maternity services in their locality. The plans should be agreed

regionally and involve other relevant bodies, including NHS England, and representatives of service users. The plans should include agreements on how neighbouring Trusts and maternity units will cooperate, for example, through networks, and arrangements for ensuring that resources are used efficiently if expected occupancy levels are not met. (England)

- Australian Governments implement and expand evidence-based maternity care models for at-risk women. (Australia)

Person-centredness

A commitment to 'woman-centred care' is included in almost all plans reviewed and, again, different aspects are highlighted. These range from ensuring a '*woman-centred approach*' (New Zealand) to '*mothers to report a good experience*' (England) and '*improved experiences for mothers and babies*' (Northern Ireland) to '*placing the needs of the mother and family at the centre*' (Wales).

Other terms used include 'positive' experience where women are treated with '*dignity and respect*' (Wales). Both Scotland and Canada include references to public engagement in care, with Scotland making a commitment to '*public involvement ... is proactively and routinely sought and utilised to improve services*' and Canada committing to '*ensuring the voices of Canadian women are heard*'. Australia embeds a woman-centred approach throughout the entire system, noting that it will '*ensure maternity service planning, design and implementation is woman-centred*'.

Key areas arising in respect of person-centredness include:

Actively seek feedback on client experience using a variety of methods; utilise the feedback to generate improved understandings and implement changes; provide individualised information for women.

Examples of actions relating to person-centredness

- 'Patient experience feedback tools' and 'patient and public involvement processes' are integral to maternity care service improvement. (Scotland)
- Maternity care staff are actively supported to deliver person-centred care through effective learning and development, and supervision processes. (Scotland)
- Maternity care services utilise the Scottish Health Council's *Good Practice in service user involvement in maternity services*. (Scotland)
- Prospective parents will be considered as partners in maternity care and given all relevant information, in appropriate formats, to make informed choices about what is best for them and their baby. (Northern Ireland)
- Women of childbearing age who have long-term conditions, even those not planning a pregnancy, who are on regular medication or who have other risk factors will be proactively given tailored advice by their GP and specialists about pregnancy as part of their general management. (Northern Ireland)
- Women are able to provide feedback on their experience of using maternity services. (New Zealand)
- NHS England should oversee research to understand what affects women's choices, such as travel distances, demographic factors and the availability of specialist services. Such research would help the NHS bodies within each local area to manage occupancy better. (England)
- Provision of needs-based antenatal and postnatal education. (Wales)
- Provision of support for mothers wishing to breastfeed. (Wales)
- Establish local Maternity Services Liaison Committees. (Wales)
- Actively seek and respond positively to service users' views. (Wales)

Workforce

While workforce emerged as a common theme within the priorities of all plans, it was less visible than the previous areas discussed above. Workforce is identified as a core area in the Australian plan and, as with 'access', 4 specific areas are identified under this heading: (1) its commitment to 'a wellness paradigm' by stating it will '*provide an appropriately trained and qualified maternity workforce that provides clinically safe woman-centred maternity care within a wellness paradigm*'; (2) coherent with issues arising throughout the plan, Australia makes a commitment to support the Aboriginal and Torres Strait Islander maternity workforce; (3) supporting a workforce in 'rural' and 'remote' areas; and (4) a commitment to developing a culture of '*interdisciplinary collaboration*'.

Both Wales and Scotland focus on '*appropriately trained and skilled staff*' (Scotland) and a '*highly trained workforce*' (Wales). Canada adopts a different approach to workforce, noting that '*an inter-professional, inter-governmental, inter-jurisdictional stakeholder coalition who would come together and create working models*'. In addition, the Canadian plan was the only one in which the education element was made explicit, noting that there would be '*cooperation*' and '*a standardized pan-Canadian curriculum around obstetrical and gynaecological education*'. Workforce was not explicitly identified as a priority area for either New Zealand or England, although the assumption may be that giving commitments to high-quality services implicitly suggests a well-qualified workforce to deliver them.

Key areas arising in respect of workforce include:

Integration of services; workforce planning (developing a more detailed plan to take account of current and predicted needs, skills mix, sustainability of workforce and support for ethnic minorities to provide professional care); incentivising wider access to care; development, implementation and use of guidance; reviewing clinical placements and research plans with Higher Education Bodies.

Examples of actions relating to workforce

- Integrated service/workforce/financial planning mechanisms are in place and responsive to changing epidemiology and demographics in the population. (Scotland)
- Workforce planning takes account of current and predicted workforce demographic profiles. (Scotland)
- Workforce planning of skill mix enables the delivery of person-centred, safe and effective services. (Scotland)
- A national plan for a sustainable maternity workforce is developed and reviewed at least every 5 years. (New Zealand)
- The appropriate mix of current and future workforce is identified and implemented at a local level. (New Zealand)
- An appropriate and sustainable workforce is available to provide maternity care. (New Zealand)
- Initial year: The Australian Health Ministers' Advisory Council (AHMAC) examines tools to assist in future planning for maternity care, including in rural and remote communities. Later years: AHMAC develops a rigorous methodology to assist in future planning for maternity care, including in rural and remote communities. (Australia)
- Initial year: AHMAC develops a National Maternity Services Capability Framework for the provision of maternity care. Later years: All jurisdictions implement a National Maternity Services Capability Framework. (Australia)
- Australian Governments consider the use of the National Guidance for Collaborative Maternity Care in the development of maternity care policy. The maternity workforce incorporates the National Guidance for Collaborative Maternity Care in their clinical practice. (Australia)

- The national Australian Government provides training scholarships to increase the maternity workforce in rural and remote Australia. (Australia)
- Australian Governments implement the flexible delivery of education and training for the rural and remote maternity workforce. (Australia)
- Australian Governments, through Closing the Gap initiatives, continue to provide support to increase the number and capacity of Aboriginal and Torres Strait Islander people in the maternity workforce across all disciplines and qualifications. (Australia)
- Health Workforce Australia (HWA) investigates strategies to improve productivity, performance and retention for the maternity workforce. (Australia)
- Australian Governments continue to provide training, mentoring and supervision of staff undertaking perinatal mental health screening. (Australia)
- States and Territories consider the implementation of maternity care programmes that utilise midwives to their full scope of practice. (Australia)
- The national Australian Government monitors the effectiveness of the introduction of Maternity Benefits Scheme and Pharmaceutical Benefits Scheme items and professional indemnity insurance in increasing access for women to local, private primary maternity services. (Australia)
- States and Territories consider and implement mechanisms to increase access to midwifery postnatal care, outside hospital settings, to at least 2 weeks after birth. (Australia)
- AHMAC and HWA facilitate increased access to clinical training places for midwives, GPs, obstetricians, specialist obstetricians, anaesthetists and neonatal paediatricians. AHMAC and HWA develop strategies to increase funding for clinical training places for the maternity workforce. (Australia)
- Review of current workforce numbers, skill mix and skills against the vision and themes set out in this document to inform the development of local workforce and service improvement delivery plans. (Wales)
- Create and implement research and development plans in partnership with Higher Education Institutions. (Wales)
- The Australian Government introduces MBS and PBS subsidies for antenatal, intrapartum (excluding homebirth) and postnatal services provided by eligible midwives. (Australia)
- Maternity care services enable wider regional and national research collaboration. (Scotland)

Information

Canada and Scotland both have a strong focus on the collection of data. The Canadian plan particularly highlights the importance of *'supporting the creation of accurate, rigorous, data-gathering mechanism ... at the federal level to ensure comparability of data'*. Relevance of the data collected was also highlighted in Scotland's plan, which notes that data collected would be of *'relevance and utility to clinicians, service planners, performance managers and the Scottish Government'*. Scotland also includes a principle related to communication and information for women, suggesting it should have the following key features:

- enables women to make informed decisions about their care;
- is clear, consistent, balanced and accurate, and based on the current evidence;
- is supported by written information and/or available in different formats;
- is presented in a way that all women can understand (including women with additional needs such as sensory (visual, hearing) or learning difficulties, women who do not speak or read English, and women with poor health literacy).

Northern Ireland also make a commitment to *'effective communication'* as one of its outcomes.

Key areas arising in respect of information include:

Two broad areas – one relating to the overall data systems and the second relating to information for clients. *System level*: Real-time data capture with relevant presentation; ensure effective data systems in place; develop minimum datasets/core indicator sets and report on them at regional and other levels; identification of data gaps and action taken. *Level of the individual*: Hand-held records and electronic health records; protocols around data sharing; providing relevant information for clients; consistent approaches to referral; and transfer of information.

Examples of actions relating to information

- There is a dynamic approach and processes in place to ensure that data capture and presentation is relevant and meets current needs, including equality impact assessment requirements. (Scotland)
- Any gaps in datasets/information at national and local levels is identified and action taken. (Scotland)
- Maternity care services have efficient and effective systems in place for data collection and analysis. (Scotland)
- Maternity care services ensure that all women are provided with and encouraged to use the Scottish Women Hand-held Maternity Record. (Scotland)
- Work will progress to agree minimum datasets, definitions and contributing data to a regional dashboard in order to promote quality improvement and influence choice. (Northern Ireland)
- The Northern Ireland Maternity (NIMAT) system (a computerised recording system that allows recording of a large amount of detail about the woman's past medical, social and obstetric history, and her current pregnancy) will be continually reviewed and updated to ensure it is 'fit for purpose' to promote coordinated regional data collection, in line with data protection principles and information governance. (Northern Ireland)
- A maternity communication protocol/pathway will be developed, outlining the principles for communication and information-sharing across the primary, community and hospital interface. As part of this process, each should understand respective roles and responsibilities, especially on 'who' and 'how' a pregnant woman contacts the health service in the event of a concern or clinical emergency. (Northern Ireland)
- A national electronic maternity record is developed and fully implemented. (New Zealand)
- A nationally standardised maternity and perinatal database is developed and fully implemented. (New Zealand)
- All women have access to pregnancy, childbirth and parenting information and education service. (New Zealand)
- The Department of Health and NHS England should develop a framework to gain assurance about the performance of maternity services. Without comprehensive data on key outcomes and activity, the Department has only limited assurance on progress and value for money. There is also a risk that, at local level, the NHS focuses disproportionately on performance against the limited measures that are available or overlooks areas where data are poor. The new maternity dataset, in conjunction with information held by other stakeholders, provides the opportunity to better monitor performance. (England)
- The Australian Health Ministers' Advisory Council (AHMAC) develops and endorses a nationally consistent approach to information transfer and referral from maternity care to child, and family healthcare, including general practice. (Australia)
- AHMAC agrees and makes available a set of nationally consistent and accessible maternity service outcomes and core maternity performance data. (Australia)

Inequalities

Only two plans deal with the area of inequalities in their stated priorities – England and Australia. The England plan has, as one of its aims, *‘to promote public health with a focus on reducing inequalities’* and while this aspect links closely with financial barriers outlined in respect of access, it is broader than that. The Australian plan deals with inequalities in respect of two priority areas, by developing an expanding *‘culturally competent maternity care’* for the Aboriginal and Torres Strait Islander people and by *‘appropriate maternity care [for] women who may be vulnerable due to medical, socioeconomic and other risk factors’*.

Preventing problems was a feature of the plans of Northern Ireland (*‘healthier women at the start of pregnancy’*), Scotland (*‘early intervention, prevention and promotion of maternal and infant health’*) and Wales (*‘promote healthy lifestyles’*). Both Northern Ireland and New Zealand place a focus on the outcome sought, as follows: *‘Give every baby and family the best start in life’* (Northern Ireland) and *‘achieve optimal health outcomes for mothers and babies’* (New Zealand).

Key areas arising in respect of inequalities include:

Improving early access; effective communication; evidence-based care; alleviation of poverty through income supports; and supporting a healthy lifestyle.

Examples of actions relating to inequalities

- Work to reduce the health inequalities faced by Aboriginal and Torres Strait Islander mothers and babies, and other disadvantaged populations. (Australia)
- The Department of Health intends to address inequalities through improved early access to maternity care. (England).
- Use of strengths-based approaches in promoting health and behaviour change. (Scotland)
- Effective communication, translation and interpretation services are in place. (Scotland)
- Inequality sensitive practice is promoted. (Scotland)
- High-quality, evidence-based antenatal care that identifies risks early and takes effective action to deal with them, capitalising on the evidence that the antenatal period is an optimum point at which most women are highly motivated to do what is best for their baby. (Scotland)
- Schemes to improve maternal nutrition during pregnancy. (Northern Ireland)
- Measures to alleviate poverty in families, including income maximisation and employability services. (Scotland)
- A universal approach to major public health messages for women and girls of childbearing age will be promoted. This includes the importance of healthy lifestyles and a focus on the social factors and clinical conditions that are known to have an adverse impact on outcomes for mother and baby. (Northern Ireland)
- Provision of healthy lifestyle education to mothers and their families. (Wales)
- Provision of public health skills training for health professionals. (Wales)

Governance and accountability

Issues relating to governance and accountability only emerge in the plans for Canada and New Zealand. Although the actions are very limited, they include national policy and guidance, and oversight of planning, implementation and evaluation.

Example of actions relating to governance and accountability

- Underwriting a national body to oversee the planning, implementation and evaluation of long-term multidisciplinary collaborative care strategies for maternity care. (Canada)
- Accountability and planning mechanisms are in place to ensure that the delivery of maternity care is reflective of national policy and guidance. (Scotland)
- Mechanisms are developed at NHS Board/regional level to integrate maternity care into all relevant service planning structures. (Scotland)

Costs

Costs emerge in the plan for England, where, interestingly, as a country with significant data available, there is some criticism of the Department of Health because of a failure to provide in-depth costs (as well as other information) on maternity services. Some attention is also paid to this in the New Zealand plan. In Canada, costs are identified for issues that cause increases in costs.

Key areas arising in respect of costs include:

Assessing the affordability of the various commitments in the plan; developing an appropriate payment framework; incentivising cost-effective behaviours; and dealing with cost issues arising in respect of malpractice and liability.

Examples of actions relating to costs

- The Department should assess the affordability of implementing the various commitments in its plan for maternity services. The Department did not satisfactorily consider the achievability, affordability and local implications of implementing its 2007 strategy and there are concerns that the available resources are not sufficient to meet all the objectives in full. (England)
- NHS England and Monitor (the sector regulator for health services in England) should ensure that the payment framework for maternity services is fair and incentivises cost-effective behaviour. Many commissioners pay for services outside the payment by results framework and the reported costs of providers vary substantially. NHS England and Monitor should review the recently introduced pathway tariffs to check that the tariffs are set at the correct level and are working as intended. (England)
- The NHS in England ought to ensure that it incentivises cost-effective behaviour, that the payment framework for maternity services is fair and that the pathway tariffs that were recently introduced to ensure the tariffs are correctly set are operating as planned. (England)
- Assist in the reduction of barriers, including those issues of malpractice, liability, funding and compensation, in addition to regulatory and legislative barriers. (Canada)
- Ensure that maternity service specifications are adhered to within each District Health Board-funded maternity service. (New Zealand)

Summary

This chapter has presented an analysis of strategic approaches to maternity services across 7 different jurisdictions – Australia, Canada, New Zealand, England, Wales, Northern Ireland and Scotland. With the exception of the Canadian plan, which was developed and published by the Canadian Society of Obstetricians and Gynaecologists, all others were led by Government. While there is little consistency in the ways in which the plans are constructed, there are some common features outlined in their visions and aims and three key areas were identified, namely: quality and safety; a reduction in inequalities; and client experience. Again, there are differences in the way these are understood and presented, and consequently the priorities and actions also differ in their focus and level of implementation. Furthermore, there is no common terminology used across the plans, with a variety of different areas identified, including outcomes, priority areas, standards, leadership, aims, principles and themes.

The Invitation to Tender for the present international literature review identified a number of key areas and indicative actions are drawn from the plans in respect of each. These are quality and safety; access; person-centredness, workforce; staffing and training; information; governance and accountability; and costs. Actions are also identified in respect of inequalities, which has emerged in this analysis as an area of importance.

12. Areas for consideration

1. While the birth rate in Ireland has fallen over the last two years, this followed a long and sustained increase in births in Ireland since the early 2000s. The increases took place in the context of a population that had additional needs arising from women being older at the time of delivery, increases in obesity, an increase in the proportion of non-Irish national women giving birth and significant financial constraints. **There are, therefore, significant pressures on the overall maternity system and consideration will need to be given to ensuring an adequate funding model is put in place to support current needs.**
2. As requested in the Invitation to Tender, this report focuses on models of care across jurisdictions. The maternity services in Ireland are predominantly hospital-based and medically-led and are provided in 19 maternity units across the country, with only a small number of births taking place outside those areas. This is in contrast with services provided in other countries, particularly the Netherlands, New Zealand and the UK, where care is currently provided in a range of settings including home, midwife-led units and tertiary care hospitals. The Australian strategic plan for maternity services has also given a strong commitment to the provision of a wider range of choices for women in where, and from whom, they receive care during pregnancy and childbirth. **Similar consideration needs to be given to maternity services in Ireland.**
3. Safety in maternity settings has traditionally been measured through maternal and infant mortality rates, although there is general agreement that international comparisons in that regard are complex, challenging and subject to reporting difficulties. A recent WHO (2013) report comparing maternal mortality across jurisdictions shows a 33% increase in maternal mortality ratios between 1990 and 2013 for Ireland and an 81% for Canada over the same period. The maternal mortality rates for each of the remaining jurisdictions in this review fell by between 14% (Australia) and 57% (New Zealand). Infant and perinatal mortality rates for Ireland compare well with those of other countries, although again some challenges in direct comparisons arise. The 2012 *Confidential Maternal Death Enquiry in Ireland* report provides substantial learning in terms of safety, but it is clear that safety in maternity services, similar to other healthcare settings, is complex. **Developing safe maternity services requires a comprehensive, multiprofessional and multisector approach and consideration needs to be given to how this might best take place.**
4. Increasingly, safety in maternity services is being measured by a broader range of indicators, including, for example, morbidity rates, intervention rates and maternal experiences of care. While the data from Ireland are limited in this regard, particularly in terms of women's experiences of care, what is available, however, suggests that Ireland has a high rate of interventions, particularly caesarean section and, similar to elsewhere, these rates are continuing to increase. Analyses conducted using Irish data show wide variation according to hospital, HSE regions and models of funding (public and private care). Women who choose to have care provided privately have higher levels across a range of interventions and this is similar to the findings from other countries, particularly Australia. Ireland is the only country in this review where national data are not collected on maternal experiences of maternity services. **Consideration needs to be given to providing mechanisms through which women's voices can be heard and acted upon in the delivery of maternity services.**

5. The literature from Ireland, and internationally, shows that alternative models of care, predominantly midwife-led and in out-of-hospital settings, result in lower levels of intervention, higher levels of satisfaction and are equally safe for mothers and infants for low-risk pregnancies and birth. This literature includes meta-analyses and Cochrane systematic reviews, which are considered a 'gold standard' in terms of evidence. While an evaluation of a midwife-led unit in Ireland, conducted in 2009 using a randomised trial methodology, found similar type positive findings to those outlined, their availability and accessibility continues to be exceptionally restricted. **Consideration needs to be given to a broader range of choices for mothers in Ireland.**
6. Home births, which account for almost 30% of all births in the Netherlands, are negligible in Ireland, with only 176 in 2012. A recent large prospective study in England, deemed to be '*a genuine breakthrough in a debate on place of birth*' (Buekens and Keirse, 2012), analysed the outcomes for almost 65,000 low-risk births (about 81% of the overall cohort) across a range of settings. The findings show that for women who had previously given birth, the home setting was safe and resulted in a better experience when compared with hospital-based care. The situation for women giving birth for the first time showed a modest increase in risk for their infants and this needs to be taken into account. **Further consideration of home births needs to take place in the Irish context.**
7. Evaluating and assessing the costs associated with childbirth are complex and there is no single methodology used universally. There is a consistency, however, in terms of the relative costs, which show that out-of-hospital settings for low-risk women result in lower costs. Where interventions take place, those costs are higher. In the context of the Government's commitment to primary care settings, **consideration needs to be given to the provision of antenatal, intranatal and postnatal care in multiple settings.**
8. This international literature review has identified large data sources for most countries. It is clear that relative to most of these countries, data in Ireland are limited and this is evidenced by the number of variables where Ireland could not be reported upon in the 2013 *European Perinatal Statistical Report*. **Consideration now needs to be given to the development of a comprehensive and strategic approach to identifying gaps in data and information, and to mechanisms through which these gaps can be filled.**
9. Finally, while the discourse in respect of the workforce focuses on the importance of multidisciplinary care, the literature around maternity suggests two highly polarised and differing philosophical understandings of the nature of pregnancy and childbirth internationally, focused on two distinct areas. One understanding views pregnancy and childbirth as inherently risky and for those authors, the literature focuses on areas of high risk and interventions. The alternative literature highlights the normal physiological processes of birth and focuses on midwife-led care, maternal satisfaction and experiences, and on the case for a broader range of choices for women. **Some consideration needs to be given to mechanisms through which these two positions can be accommodated and integrated in a mutually respectful way.**

References

- Agha, M., Agha, R.A., Sandall, J. (2014) 'Interventions to Reduce and Prevent Obesity in Pre-Conceptual and Pregnant Women: A Systematic Review and Meta-Analysis', *PLoS ONE*, Vol. 9, No. 5:e95132. DOI:10.1371/journal.pone.0095132
- All-Ireland Traveller Health Study Team (2010) *All-Ireland Traveller Health Study: Our Geels. Summary of Findings*. Dublin: School of Public Health, Physiotherapy and Population Science, University College Dublin. Available at: www.dohc.ie/publications/aiths2010/ExecutiveSummary/AITHS2010_SUMMARY_LR_All.pdf?direct=1
- Anderson, L.B., Melvaer, L.B., Vidbech, P., Lamont, R.F. and Joergensen, J.S. (2012) 'Risk Factors for developing post-traumatic stress disorder following childbirth: A systematic review', *Acta Obstetrica et Gynecologica Scandinavica*, Vol. 91, No. 11, pp. 1261-72.
- Ap Dewi, S., Jones, S., Atenstaedt, R., Charles, J., Richardson, G., Bevan, A. and Jones, A. (2011) *Maternity Services Literature Review*. Cardiff: Public Health Wales.
- Arksey, H. and O'Malley, L. (2005) 'Scoping Studies: Towards a Methodological Framework', *International Journal of Social Research Methodology*, Vol. 8, No. 1, pp. 19-32.
- Arulkumaran, S. (2010) 'Clinical governance and standards in UK maternity care to improve quality and safety', *Midwifery*, Vol. 26, No. 5, pp. 485-87.
- Arulkumaran, S., Chandraran, E., Mahmood, T., Louca, O. and Mannion, C. (2008) *Maternity Dashboard Clinical Performance and Governance Score Card*. London: Royal College of Obstetricians and Gynaecologists. Available at: <http://www.rcog.org.uk/files/rcog-corp/uploaded-files/GoodPractice7MaternityDashboard2008.pdf>
- Association of Anaesthetists of Great Britain & Ireland and Obstetric Anaesthetists' Association (2013) *OAA/AAGBI Guidelines for Obstetric Anaesthetic Services 2013*. London: Association of Anaesthetists of Great Britain & Ireland and Obstetric Anaesthetists' Association.
- Attree, M. (1993) 'An analysis of the concept "Quality" as it relates to contemporary nursing care', *International Journal of Nursing Studies*, Vol. 30, No. 4, pp. 355-69.
- Australasian Maternity Outcomes Surveillance System (AMOSS). Available at: <http://www.amoss.com.au/page.php?id=38>
- Australian Bureau of Statistics Births. *Summary statistics for Australia(a)*. Available at: <http://www.abs.gov.au/AUSSTATS/abs@.nsf/mf/3301.0>
- Australian Health Ministers Advisory Council (2008) *Primary Maternity Services In Australia – A Framework for Implementation*. Paper prepared by the NSW Department of Health on behalf of the Maternity Services Inter-jurisdictional Committee. Sydney: Department of Health, NSW.
- Australian Institute for Health and Welfare (2011) *Australia's Mothers and Babies 2009: Perinatal statistics. Series No. 25*. Canberra: Australian Institute for Health and Welfare. Available at: <http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=10737420980>
- Australian Institute for Health and Welfare (2013) *Maternity Information Matrix (MIM)*. Available at: <http://maternitymatrix.aihw.gov.au/Pages/About-the-MIM.aspx>
- Australian Institute for Health and Welfare, and National Perinatal Epidemiology and Statistics Unit (2011) *National core maternity indicators*. Canberra: Australian Institute for Health and Welfare.
- Australian Medical Workforce Advisory Committee (2013) *The specialist obstetrics and gynaecology workforces in Australia. An update, 2003 to 2013*. Sydney: Australian Medical Workforce Advisory Committee.
- Australian National Health and Medical Research Council (2010) *National Guidance on Collaborative Maternity Care*. Canberra: National Health and Medical Research Council. Available at: http://www.nhmrc.gov.au/files_nhmrc/publications/attachments/CP124.pdf
- Bai, J., Gyaneshwar, R. and Bauman, A. (2008) 'Models of antenatal care and obstetric outcomes in Sydney South West', *Australian and New Zealand Journal of Obstetrics and Gynaecology*, Vol. 48, No. 5, pp. 454-61.
- Ball, J.A., Washbrook, M. and Royal College of Midwives (2014) *Birthrate Plus®: What it is and why you should be using it*. London: Birthrate Plus® Consultancy Limited and The Royal College of Midwives. Available at: https://www.rcm.org.uk/sites/default/files/Birthrate%20Plus%20Report%2012pp%20Feb%202014_3.pdf

- Barrett, H.L., Devin, R., Clarke, S., Nitert, M.D., Boots, R., Fagermo, N., Callaway, L.K. and Lust, K. (2012) 'A fifteen-year retrospective review of obstetric patients requiring critical care', *Obstetric Medicine*, Vol. 5, No. 4, p. 166.
- Barry, J. and Daly, L. (1988) *The Travellers' Health Status Study: Census of Travelling People, November 1986*. Dublin: Health Research Board.
- Bautista-Castaño, I., Henriquez-Sanchez, P., Alemán-Perez, N., Garcia-Salvador, J.J., Gonzalez-Quesada, A., García-Hernández, J.A. and Serra-Majem, L. (2013) 'Maternal Obesity in Early Pregnancy and Risk of Adverse Outcomes', *PLoS ONE*, Vol. 8, No. 11.
- Beck, C. (1998). 'A review of research instruments for use during the postpartum period', *American Journal of Maternal Child Nursing*, Vol. 23, No. 5, pp. 254-61.
- Begley, C., Higgins, A., Lalor, J., Sheerin, F., Alexander, J. Nicholl, H., Lawler, D., Keenan, P, Tuohy, T. and Kavanagh, R. (2009a) *Women with Disabilities: Barriers and facilitators to accessing services during pregnancy, childbirth and early motherhood*. Dublin: School of Nursing and Midwifery, Trinity College Dublin.
- Begley, C., Devane, D. and Clarke, M. (2009b) *An evaluation of midwife-led care in the Health Service Executive North Eastern Area*. Dublin: Health Service Executive.
- Begley, C., Murphy, K., Higgins, A., Elliott, N., Lalor, J., Sheerin, F., Coyne, I., Comiskey, C., Normand, C., Casey, C., Dowling, M., Devane, D., Cooney, A., Farrelly, F., Brennan, M., Meskell, P. and MacNeela, P. (2010) *Evaluation of Clinical Nurse and Midwife Specialist and Advanced Nurse and Midwife Practitioner Roles in Ireland (SCAPE). Final Report*. Dublin: National Council for the Professional Development of Nursing and Midwifery in Ireland.
- Begley, C., Devane, D., Clarke, M., McCann, C., Hughes, P., Reilly, M., Maguire, R., Higgins, S., Finan, A., Gormally, S. and Doyle, M. (2011) 'Comparison of midwife-led and consultant-led care of healthy women at low risk of childbirth complications in the Republic of Ireland: A randomised trial', *BMC Pregnancy and Childbirth*, Vol. 11, No. 85. Available at: <http://www.biomedcentral.com/1471-2393/11/85>
- Behan, J., Condon, N., Milićević, I. and Shally, C. (2009) *A Quantitative Tool for Workforce Planning in Healthcare: Example Simulations*. Dublin: Skills and Labour Market Research Unit (SLMRU) and Planning & Research Department, FÁS.
- Behruzi, R., Hatem, M., Goulet, L., Fraser, W. and Misago, C. (2013) 'Understanding childbirth practices as an organizational cultural phenomenon: A conceptual framework', *BMC Pregnancy and Childbirth*, Vol. 13, No. 205. Available at: <http://www.biomedcentral.com/1471-2393/13/205>
- Behruzi, R., Hatem, M., Goulet, L. and Fraser, W.D. (2014) 'Perception of Humanization of Birth in a Highly Specialized Hospital: Let's Think Differently', *Health Care for Women International*, Vol. 35, No. 2, pp. 127-48.
- Boivin, J., Bunting, L., Collins, J.A. and Nygren, K.G. (2007) 'International estimates of infertility prevalence and treatment-seeking: Potential need and demand for infertility medical care', *Human Reproduction*, Vol. 22, No. 6, pp. 1506-12.
- Bonar, S. (2013) *State of Maternity Services report 2013*. London: Royal College of Midwives.
- Boulkedid, R., Sibony, O., Goffinet, F., Fauconnier, A., Branger, B. and Alberti, C. (2013) 'Quality Indicators for Continuous Monitoring to Improve Maternal and Infant Health in Maternity Departments: A Modified Delphi Survey of an International Multidisciplinary Panel', *PLoS ONE*, Vol. 8, No. 4. Available at: <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0060663>
- Bourgeault, I.L., Neiterman, E. and Lebrun, J. (2011) 'Midwives on the move: Comparing the requirements for practice and integration contexts for internationally educated midwives in Canada with the U.S., U.K. and Australia', *Midwifery*, Vol. 27, No. 3, pp. 368-75.
- Brick, A. and Layte, R. (2011) 'Exploring Trends in the Rate of Caesarean Section in Ireland, 1999-2007', *Economic and Social Review*, Vol. 42, No. 4, pp. 383-406.
- Brown, S.J., Sutherland, G.A., Gunn, J.M., and Yelland, J.S. (2014) 'Changing models of public antenatal care in Australia: Is current practice meeting the needs of vulnerable populations?', *Midwifery*, Vol. 30, No. 3, pp. 303-309.
- Buchan, J., Ball, J. and O'May, F. (2000) *Determining Skillmix in the Health Workforce: Guidelines for managers and health professionals*. Geneva: World Health Organization. Available at: http://www.who.int/management/determining_skill_mix.pdf
- Buekens, P. and Keirse, M.J. (2012) 'In the literature: Home birth – Safe enough, but not for the first baby', *Birth: Issues in Perinatal Care*, Vol. 39, No. 2, pp. 165-67.

- Buitendijk, S. (2011) 'Gender Issues in Determining the Service and Research agenda for Pregnancy and Birth Care: The Case of Home Birth in the Netherlands', *Interdisciplinary Science Reviews*, Vol. 36, No. 2, pp. 193-202.
- Byrne, U. (2014) *Fitness to Practise – Lessons for Midwives*. Presentation to CIS Obstetrics Forum, 11th February 2014. Dublin: Nursing and Midwifery Board of Ireland. Available at: <http://stateclaims.ie/wp-content/uploads/2014/02/Ursula-Byrne-Obstetric-Forum-Farmleigh-2014.pdf>
- Byrne, C., Kennedy, C., O'Dwyer, V., Farah, N., Kennelly, M. and Turner M.J. (2011) *What models of maternity care do pregnant women in Ireland want?* Dublin: UCD Centre for Human Reproduction, Coombe Women and Infants University Hospital. Available at: <http://www.lenus.ie/hse/bitstream/10147/137015/1/Article5890.pdf>
- Care Quality Commission (CQC)(2013) *National findings from the 2013 survey of women's experiences of maternity care*. Newcastle upon Tyne: Care Quality Commission. Available at: http://www.cqc.org.uk/sites/default/files/documents/maternity_report_for_publication.pdf
- Carolan, S., Brosnan, M. and Ryan Withero, P. (2009) *Planning the workforce for delivering the future*. Dublin: Royal College of Surgeons in Ireland, Institute of Leadership and Healthcare Management and the National Maternity Hospital.
- Centers for Disease Control and Prevention (CDC) and US Department for Health and Human Services (2007) *Preventing Smoking and Exposure to Secondhand Smoke Before, During, and After Pregnancy*. Atlanta, GA: Centers for Disease Control. Available at: <http://www.cdc.gov/nccdphp/publications/factsheets/prevention/pdf/smoking.pdf>
- Centre for Maternal and Child Enquiries (CMACE) (2010a) *Maternal obesity in the UK: Findings from a national project*. London: Centre for Maternal and Child Enquiries. Available at: <http://www.hqip.org.uk/assets/NCAPOP-Library/CMACE-Reports/10.-December-2010-Maternal-Obesity-in-the-UK-Findings-from-a-national-project-2008-2010.pdf>
- Centre for Maternal and Child Enquiries (CMACE) (2010b) *Confidential Enquiries into Maternal Deaths in the United Kingdom*. London: Centre for Maternal and Child Enquiries. DOI: 10.1111/j.1471-0528.2010.02847.x
- Centre for Workforce Intelligence (2013) *Horizon scanning – A strategic review of the future healthcare workforce: Informing the maternity workforce. Summary report*. London: Centre For Workforce Intelligence. Available at: <http://www.cfw.org.uk/publications/horizon-scanning-a-strategic-review-of-the-future-healthcare-workforce-informing-the-maternity-workforce>
- Chalmers, B., Kaczorowski, J., O'Brien, B and Doyle, C. (2012) 'Rates of Interventions in Labor and Birth across Canada: Findings of the Canadian Maternity Experiences Survey', *Birth: Issues in Perinatal Care*, Vol. 39, No. 3, pp. 203-10.
- Chief Nursing Officers of England, Northern Ireland, Scotland and Wales (2010) *Midwifery 2020: Delivering expectations*. Department of Health, Social Services and Public Services, Northern Ireland; Welsh Assembly Government; Department of Health, England; The Scottish Government. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/216029/dh_119470.pdf
- Child and Maternal Health Observatory (ChiMat) data source. Available at: <http://www.chimat.org.uk/>
- Chow, S.S.W. (2014) *Report of the Australian and New Zealand Neonatal Network 2012*. Sydney: Australian and New Zealand Neonatal Network.
- Christiaens, W., Verhaeghe, M. and Bracke, P. (2010) 'Pain acceptance and personal control in pain relief in two maternity care models: A cross-national comparison of Belgium and the Netherlands', *BMC Health Services Research*, Vol. 10, No. 268. Available at: <http://www.biomedcentral.com/1472-6963/10/268>
- Clarke, A., Allen, P., Anderson, S., Black, N. and Fulop, N. (eds.) (2004) *Studying the organisation and delivery of health services: Research methods*. London: Routledge.
- Clinical Strategy and Programmes Directorate, HSE, and Institute of Obstetricians and Gynaecologists, Royal College of Physicians of Ireland (2013) *Obesity and Pregnancy: Clinical Practice Guideline*. Dublin: Health Service Executive and Institute of Obstetricians and Gynaecologists, Royal College of Physicians of Ireland.
- Comas, M., Catala, L., Sala, M., Paya, A., Sala, A., Del Amo, E., Castells, X. and Cots, F. (2011) 'Descriptive analysis of childbirth healthcare costs in an area with high levels of immigration in Spain', *BMC Health Services Research*, Vol. 11, No. 77. Available at: <http://www.biomedcentral.com/1472-6963/11/77>

- Comfort, A.B., Peterson, L.A. and Hatt, L.E. (2013) 'Effect of health insurance on the use and provision of maternal health services and maternal and neonatal health outcomes: a systematic review', *Journal of Health, Population and Nutrition*, Vol. 4, No. 2, pp. 81-105.
- Commonwealth of Australia (2011) *National Maternity Services Plan 2010*. Canberra: Commonwealth of Australia. Available at: [http://www.health.gov.au/internet/publications/publishing.nsf/Content/BFE6AE67A9BC1BF1CA257A1B001B4B2D/\\$File/maternity%20plan.pdf](http://www.health.gov.au/internet/publications/publishing.nsf/Content/BFE6AE67A9BC1BF1CA257A1B001B4B2D/$File/maternity%20plan.pdf)
- Confidential Enquiry into Maternal and Child Health (2004) *Why Mothers Die 2000–2002: The Sixth Report of the Confidential Enquiries into Maternal Deaths in the United Kingdom*. London: Royal College of Obstetricians and Gynaecologists.
- Coombe Women & Infants University Hospital (2013) *Annual Clinical Report 2012*. Dublin: Coombe Women & Infants University Hospital. Available at: <http://www.coombe.ie/index.php?nodeid=110>
- Cornsweet Barber, C. (2009) 'Perinatal Mental Health Care in New Zealand: The Promise of Beginnings', *New Zealand Journal of Psychology*, Vol. 38, No. 1, pp. 32-38. Available at: <http://www.psychology.org.nz/wp-content/uploads/NZJP-Vol381-2009-5-Barber.pdf>
- Coulm, B., Le Ray, C., Lelong, N., Drewniak, N., Zeitlin, J. and Blondel, B. (2012) 'Obstetric Interventions for Low-risk Pregnant Women in France: Do maternity unit characteristics make a difference?', *Birth: Issues in Perinatal Care*, Vol. 39, No. 3, pp. 183-91.
- Council of the European Union (1993) *Council Directive 93/104/EC of 23 November 1993 concerning certain aspects of the organization of working time*. Brussels: Council of the European Union.
- Coxon, K., Scamell, M. and Alaszewski, A. (2012) 'Risk, pregnancy and childbirth: What do we currently know and what do we need to know? An editorial', *Health, Risk and Society*, Vol. 14, No. 6, pp. 503-10.
- Crettenden, I.F., McCarthy, M.V., Fenech, B.J., Heywood, T., Taitz, M.C. and Tudman, S. (2014) 'How evidence-based workforce planning in Australia is informing policy development in the retention and distribution of the health workforce', *Human Resources for Health*, Vol. 12, No. 7. Available at: <http://www.human-resources-health.com/content/12/1/7>
- Crozier T.M. and Wallace, E.M. (2011) 'Obstetrics admissions to an integrated general intensive care unit in a quaternary maternity facility', *Australian & New Zealand Journal of Obstetrics & Gynaecology*, Vol. 51, No. 3, pp. 233-38.
- Cusack, E., Dempsey Ryan, D., Kavanagh, C. and Pitman, S. (2014) *An Evaluation of the Development and Implementation of a Nursing and Midwifery Metrics System in HSE Dublin North Healthcare Services*. Dublin: Nursing and Midwifery Planning and Development, Office of the Nursing and Midwifery Services Director.
- Darra, S. (2009) '“Normal”, “natural”, “good” or “good-enough” birth: Examining the concepts', *Nursing Inquiry*, Vol. 16, No. 4, pp. 297-305.
- De Jonge, A. *et al* (2013) 'Severe adverse maternal outcomes among low risk women with planned home versus hospital births in the Netherlands: Nationwide cohort study', *BMJ* 2013. DOI: 10.1136/bmj.f3263
- Department of Children and Youth Affairs (2012) *State of the Nation's Children: Ireland 2012*. Dublin: Government Publications.
- Department of Health and Ageing [Australia] (2008) *Improving Maternity Services in Australia: A Discussion Paper from the Australian Government*. Canberra: Commonwealth of Australia. Available at: [http://www.health.gov.au/internet/main/publishing.nsf/Content/8913DED8386618A5CA257BF0001B0A26/\\$File/Improving_Maternity_Services_In_Australia.pdf](http://www.health.gov.au/internet/main/publishing.nsf/Content/8913DED8386618A5CA257BF0001B0A26/$File/Improving_Maternity_Services_In_Australia.pdf)
- Department of Health [Western Australia] (2011) *Models of Maternity Care: Updated Evidence on Outcomes and Safety of Planned Home Birth*. Perth: Health Networks Branch, Department of Health, Western Australia.
- Department of Health (2003) *Report of the National Task Force on Medical Staffing*. Dublin: Department of Health.
- Department of Health (2012) *Future Health – A Strategic Framework for Reform of the Health Service, 2012-2015*. Dublin: Department of Health. Available at: http://www.dohc.ie/publications/pdf/Future_Health.pdf?direct=1
- Department of Health (2013) *Healthy Ireland – A Framework for Improved Health and Wellbeing, 2013-2025*. Dublin: Department of Health. Available at: <http://www.dohc.ie/publications/pdf/HealthyIrelandBrochureWA2.pdf?direct=1>

- Department of Health and Children, Medical Education and Training Group (2006a) *Medical Education in Ireland: A New Direction. Report of the Working Group on Undergraduate Medical Education and Training* (Fottrell Report). Dublin: Department of Health and Children.
- Department of Health and Children, Medical Education and Training Group (2006b) *Preparing Ireland's Doctors to meet the Health Needs of the 21st Century*. Dublin: Department of Health and Children.
- Department of Health and Social Security [UK] (1980) *Inequalities in Health: Report of a Research Working Group* (The Black Report). London: Department of Health and Social Security.
- Department of Health [UK] and Partnerships for Children, Families and Maternity (2007) *Maternity Matters: Choice, access and continuity of care in a safe service*. London: Department of Health/Partnerships for Children, Families and Maternity.
- Department of Health, Social Services and Public Safety [Northern Ireland] (2012) *A Strategy for Maternity Care in Northern Ireland, 2012-2018*. Belfast: Department of Health, Social Services and Public Safety.
- Department of Reproductive Health and Research, WHO (1996) *Care in Normal Birth: A practical guide (Report of a Technical Working Group)*. Geneva: World Health Organization.
- Devane, D., Begley, C.M., Clarke, M., Horey, D. and O'Boyle, C. (2007) 'Evaluating Maternity Care: A Core Set of Outcome Measures', *Birth: Issues in Perinatal Care*, Vol. 34, No. 2, pp. 164-72.
- De Vries, R., Wiegers, T.A., Smulders, B. and van Teijlingen, E. (2009) 'The Dutch Obstetrical System: Vanguard of the Future in Maternity Care'. In: R.E. Davis-Floyd, L. Barclay, B. Daviss and J. Tritten (eds.), *Birth Models that Work*. Berkeley, CA: University of California Press.
- Dineen, M. (2012) *HSE Breastfeeding Report: Analysis of letters of complaint sent by Maternity Services patients post discharge*. Dublin: Presidion.
- Directorate of Clinical Strategy and Programmes, HSE (2013) *Pathways for the Critically ill Woman in Obstetrics* (Position Paper). Dublin: Health Service Executive.
- Dobbins, M., DeCorby, K., Robeson, P., Husson, H., Tirilis, D. and Greco, L. (2010) 'A knowledge management tool for public health: [health-evidence.ca](http://www.biomedcentral.com/1471-2458/10/496)', *BMC Public Health*, Vol. 10, No. 496. Available at: <http://www.biomedcentral.com/1471-2458/10/496>
- Douglas, N., Robinson, J. and Fahy, K. (2001) *Inquiry into obstetric and gynaecological services at King Edward Memorial Hospital, 1990-2000. Final Report*. Perth: Government of Western Australia.
- Draycott, T., Sibanda, T., Laxton, C., Winter, C., Mahmood, T. and Fox, R. (2010) 'Quality improvement demands quality measurement', *BJOG, An International Journal of Obstetrics & Gynaecology*, Vol. 117, Issue 13, pp. 1571-74. Available at: <http://onlinelibrary.wiley.com/doi/10.1111/j.1471-0528.2010.02734.x/abstract;jsessionid=66AE2E5D755B1F37481F163F079110FC.f02t04>
- Dubois, C. and Singh, D. (2009) 'From staff-mix to skill-mix and beyond: Towards a systemic approach to health workforce management', *Human Resources for Health*, Vol. 7, No. 87.
- DuPree, E., O'Neill, L. and Anderson, R. (2009) 'Achieving a Safety Culture in Obstetrics', *Mount Sinai Journal of Medicine*, Vol. 76, No. 6, pp. 529-38.
- ESRI (2013a) *Perinatal Statistics Report 2012*. Dublin: Health Research and Information Division, Economic and Social Research Institute. Available at: http://www.esri.ie/_uid/9495a3d4-7e97-4588-a1d3-c091fa1e7838/NPRS2012.pdf
- ESRI (2013b) *Activity in Acute Public Hospitals in Ireland: Annual Report 2012*. Dublin: Health Research and Information Division, Economic and Social Research Institute. Available at: <http://www.esri.ie/UserFiles/publications/SUSTAT49.pdf>
- Edozien L.C. (2011) 'Structured Multidisciplinary intershift Handover (SMITH): A tool for promoting safer intrapartum care', *Journal of Obstetrics and Gynaecology*, Vol. 31, No. 8, pp. 683-86.
- Einarsdóttir, K., Kemp, A., Haggard, F.A., Moorin, R.E., Gunnell, A.S. et al (2012) 'Increase in Caesarean Deliveries after the Australian Private Health Insurance Incentive Policy Reforms', *PLoS ONE*, Vol. 7, No. 7:e41436. DOI:10.1371/journal.pone.0041436
- Epstein, R.M. and Hundert, E.M. (2002) 'Defining and assessing professional competence', *JAMA*, Vol. 287, No. 2, pp. 226-35.
- Escuriet, R., Pueyo, M., Biescas, H., Colls, C., Espiga, I., White, J., Espada, X., Fusté, J. and Ortún, V. (2014) 'Obstetric interventions in two groups of hospitals in Catalonia: A cross-sectional study', *BMC Pregnancy and Childbirth*, Vol. 14, No. 143. Available at: <http://www.biomedcentral.com/1471-2393/14/143>
- European Board and College of Obstetrics & Gynaecology (2011) *Standards of Care for Women's Health In Europe*. European Board and College of Obstetrics & Gynaecology.
- European Parliament and Council (2000) *Directive 2000/34/EC of the European Parliament and of the Council of 22 June 2000 amending Council Directive 93/104/EC concerning certain aspects of the organisation of working time to cover sectors and activities excluded from that Directive*. Brussels: European Parliament and Council.

- Euro-Peristat Project with SCPE and EUROCAT (2013) *European Perinatal Health Report. Health and care of pregnant women and babies in Europe in 2010*. Available at: <http://www.europeristat.com/images/doc/Peristat%202013%20V2.pdf>
- Eurostat (2003) *Assessment of Quality in Statistics – Definition of Quality in Statistics, Working Group, Luxembourg, October 2003*. Luxembourg: Eurostat. Available at: http://epp.eurostat.ec.europa.eu/pls/portal/docs/page/pgp_ds_quality/tab47141301/definition_2.pdf
- Fahy, M., Doyle, O., Denny, K., Mcauliffe, F.M. and Robson, M. (2013) 'Economics of childbirth', *Acta Obstetrica et Gynecologica Scandinavica*, Vol. 32, pp. 508-16.
- Francis, R. (2013) *Report of the Mid Staffordshire NHS Foundation Trust Public Inquiry. Executive Summary*. London: HMSO.
- Freeth, D., Ayida, G., Berridge, E. J., Mackintosh, N., Norris, B., Sadler, C. and Strachan, C. (2009) 'Multidisciplinary Obstetric Simulated Emergency Scenarios (MOSES): Promoting patient safety in obstetrics with teamwork-focused interprofessional simulations', *Journal of Continuing Education in the Health Professions*, Vol. 29, No. 2, pp. 98-104.
- Fyfe, E.M., Thompson J.M.D., Anderson, N.H., Groom K.M. and McCowan, L.M. (2012) 'Maternal obesity and postpartum haemorrhage after vaginal and caesarean delivery among nulliparous women at term: A retrospective cohort study', *BMC Pregnancy and Childbirth*, Vol. 12, No. 112. Available at: <http://www.biomedcentral.com/1471-2393/12/112>
- Gagnon, A.J., DeBruyn, R., Essén, B., Gissler, M., Heaman, M., Jambey, Z., Korfker, D., McCourt, C., Roth, C., Zeitlin, J., Small, R. and for the ROAM Collaboration (2014) 'Development of the Migrant Friendly Maternity Care Questionnaire (MFMCQ) for migrants to Western societies: An international Delphi consensus process', *BMC Pregnancy and Childbirth*, Vol. 14, No. 200. Available at: <http://www.biomedcentral.com/1471-2393/14/200>
- Garling, P. (2008) *First Report of the Special Commission of Inquiry into the circumstances of the appointment of Graeme Reeves by the former Southern Area Health Service*. Sydney: Special Commission of Inquiry, Acute Care Services in NSW Public Hospitals.
- Gärtner, F.R., Freeman, L.M., Rijnders, M.E., Middeldorp, J.M., Bloemenkamp, K.W.M., Stiggelbout, A.M. and van den Akker-van Marle, M.E. (2014) 'A comprehensive representation of the birth-experience: Identification and prioritization of birth-specific domains based on a mixed-method design', *BMC Pregnancy and Childbirth*, Vol. 14, No.147. Available at: <http://www.biomedcentral.com/1471-2393/14/147>
- Geia, L.K., West, R. and Power, T. (2013) 'Editorial. Addressing perinatal mental health issues for Aboriginal and Torres Strait Island parents and their families: Working towards better maternity outcomes', *Contemporary Nurse*, Vol. 46, No. 1, pp. 70-72.
- Government of Ireland (1998) *Report of the Commission on Nursing*. Dublin: The Stationery Office.
- Grigg, C., Tracy, S.K., Daellenbach, R., Kensington, M. and Schmied, V. (2014) 'An exploration of influences on women's birthplace decision-making in New Zealand: A mixed methods prospective cohort within the Evaluating Maternity Units Study', *BMC Pregnancy and Childbirth*, Vol. 14, No. 210. Available at: <http://www.biomedcentral.com/1471-2393/14/210>
- Grzybowski, S., Stoll, K. and Kornelsen, J. (2011) 'Distance matters: A population-based study examining access to maternity services for rural women', *BMC Health Services Research*, Vol. 11, No. 147. Available at: <http://www.biomedcentral.com/1472-6963/11/147/>
- Haggerty, J.I., Reid, R.J., Freeman, G.K., Starfield, B.H., Adair, C.E. and McKendry, R. (2003) 'Continuity of care: A multidisciplinary review', *British Medical Journal*, Vol. 327, No. 7425, pp. 1219-21. Available at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC274066/>
- Halliday, L.E., Peek, M.J., Ellwood, D.A., Homer, C., Knight, M., McLintock, C., Jackson-Pulver, L. and Sullivan, E.A. (2013) 'The Australasian Maternity Outcomes Surveillance System: An evaluation of stakeholder engagement, usefulness, simplicity, acceptability, data quality and stability', *Australian and New Zealand Journal of Obstetrics and Gynaecology*, Vol. 53, No. 2, pp. 152-57.
- Ham, C. and Hartly, N. (2013) *Patient-centred leadership: Rediscovering our purpose*. London: The King's Fund.
- Hampton, K.D., Mazza, D. and Newton, J.M. (2013) 'Fertility-awareness knowledge, attitudes, and practices of women seeking fertility assistance through educational interventions', *Journal of Advanced Nursing*, Vol. 69, No. 5, p. 1076-84.
- Hanafin, S. (2014) *Knowledge Management for a Healthy Ireland: Key Issues and Preliminary Framework*. Dublin: Department of Health (unpublished).

- Hanafin, S. and Brooks, A.M. (2009) 'From Rhetoric to Reality: Challenges in using data to report on a National Set of Child Well-Being Indicators', *Child Indicators Research*, Vol. 2, pp. 33-55.
- Harding Clarke, M. (2006) *The Lourdes Hospital Inquiry: An Inquiry into peripartum hysterectomy at Our Lady of Lourdes Hospital, Drogheda*. Dublin: Government Publications. Available at: <http://www.lenus.ie/hse/bitstream/10147/42922/1/2679.pdf>
- Harris, R.V. (2013) 'Operationalisation of the construct of access to dental care: A position paper and proposed conceptual definitions', *Community Dental Health*, Vol. 30, No. 2, pp. 94-101.
- Hasson, F., McKenna, H., Keeney, S. and Gillen, P. (2005) 'What do midwifery healthcare assistants do?', *Midwives*, Vol. 8, No. 2, pp. 74-77.
- Hawley, G., Janamian, T., Jackson, C. and Wilkinson, S.A. (2014) 'In a maternity shared-care environment, what do we know about the paper hand-held and electronic health record: A systematic literature review', *BMC Pregnancy and Childbirth*, Vol. 14, No. 52. DOI:10.1186/147-2393-14-52
- Health and Social Care Information Centre (2013) *NHS Maternity Statistics – England, April 2012 to March 2013. Provider level analysis [.xls]*. London: Health and Social Care Information Centre. (See Table F: Place of birth. Accessed from: <http://www.hscic.gov.uk/catalogue/PUB12744>)
- Heaman, M.I., Sword, W.A., Akhtar-Danesh, N., Bradford, A. Tough, S., Janssen, P.A., Young, D.C., Kingston, D.A., Hutton, E.K. and Helewa, M.E (2014) 'Quality of prenatal care questionnaire: Instrument development and testing', *BMC Pregnancy and Childbirth*, Vol. 14, No. 188. Available at: <http://www.biomedcentral.com/1471-2393/14/188>
- Henderson, J., Hornbuckle, J. and Doherty, D. (2007) *Models of Maternity Care: A Review of the Evidence: Towards Future Directions in Maternity Care*. Perth: Department of Health, Government of Western Australia.
- Heslehurst, N., Sattar, N., Rajasingam, D., Wilkinson, J. Summerbell, C.D and Rankin, J. (2012) 'Existing maternal obesity guidelines may increase inequalities between ethnic groups: A national epidemiological study of 502,474 births in England', *BMC Pregnancy and Childbirth*, Vol. 12, No. 156. Available at: <http://www.biomedcentral.com/1471-2393/12/156>
- HIQA (2010) *Draft National Standards for Safer Better Healthcare: Consultation Document*. Dublin: Health Information and Quality Authority.
- HIQA (2012) *National Standards for Safer Better Healthcare*. Dublin: Health Information and Quality Authority.
- HIQA (2013) *Investigation into the safety, quality and standards of services provided by the Health Service Executive to patients, including pregnant women, at risk of clinical deterioration, including those provided in University Hospital Galway, and as reflected in the care and treatment provided to Savita Halappanavar*. Dublin: Health Information and Quality Authority.
- HIQA (2014) *Catalogue of National Health and Social Care Data Collections*. Dublin: Health Information and Quality Authority.
- Höglund, B., Lindgren, P. and Larsson, M. (2012) 'Pregnancy and birth outcomes of women with intellectual disability in Sweden: A national register study', *Acta Obstetrica et Gynecologica Scandinavica*, Vol. 91, pp.1381-87. Available at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3549474/>
- Hollowell, J., Puddicombe, D., Rowe, R., Linsell, L., Hardy, P., Stewart, M., Redshaw, M., Newburn, M., Christine McCourt, C., Sandall, J., Macfarlane, A., Silverton, L. and Brocklehurst, P. (2011) *The Birthplace National Prospective Cohort Study: Perinatal and maternal outcomes by planned place of birth, Birthplace in England research programme, Final Report, Part 4*. London: NIHR Service Delivery and Organisation programme.
- Holohan, T. (2014) *HSE Midland Regional Hospital, Portlaoise Perinatal Deaths (2006-date)*. Dublin: Department of Health. Available at: <http://www.lenus.ie/hse/bitstream/10147/313524/1/portlaoiseperinataldeaths.pdf>
- Hoope-Bender, P., de Bernis, L., Campbell, J., Downe, S., Fauveau, V., Fogstad, H., Homer, C.S.E., Powell Kennedy, H., Matthews, Z., McFadden, A., Renfrew, M.J. and Van Lerberghe, W. (2014) 'Improvement of maternal and newborn health through midwifery', *The Lancet*. DOI:10.1016/S0140-6736(14)60930-2
- House of Commons Committee of Public Accounts (2014) *Maternity services in England (Fortieth Report of Session 2013–14. Report, together with formal minutes, oral and written evidence)*. London: HMSO.
- Howarth, G.R. (2013) 'The rising cost of litigation: A threat to private obstetric care?', *Obstetrics & Gynaecology Forum*, Vol. 23, No. 4, pp. 33-36.
- HSE (2008) Report into the circumstances pertaining to the death of Mrs Tania McCabe and her infant son Zach at Our Lady of Lourdes Hospital, Drogheda on Friday 9 March, 2007. Dublin: Health Service

- Executive. Available at:
http://www.hse.ie/eng/services/publications/Hospitals/Report_into_maternal_and_child_death_at_Our_Lady_of_Lourdes_Hospital.pdf
- HSE (2010) *Update on the work of the MET Unit*. Dublin: Medical Education and Training Unit, Health Service Executive. Available at:
<http://www.lenus.ie/hse/bitstream/10147/121592/1/metupdate2010.pdf>
- HSE (2011) *The National Miscarriage Misdiagnosis Review*. Dublin: Health Service Executive.
- HSE (2012) *Implementation of the Recommendations of the Report of the National Miscarriage Misdiagnosis (Review April 2011)*. Dublin: Health Service Executive.
- HSE (2013) *Investigation of Incident 50278 from time of patient's self referral on the 21st of October 2012 to the patient's death on the 28th of October 2012*. Dublin: Health Service Executive.
- HSE (2014) *Medical Workforce Planning: Interim Project Report*. Dublin: Health Service Executive.
- HSE and Department of Health and Children (2009) *An Integrated Workforce Planning Strategy for the Health Services*. Dublin: Health Service Executive and Department of Health and Children.
- HSE and Institute of Obstetricians and Gynaecologists, Royal College of Physicians of Ireland (2013) *Clinical Practice Guideline: The Irish Maternity Early Warning System (I-MEWS)*. Dublin: HSE and Institute of Obstetricians and Gynaecologists, Royal College of Physicians of Ireland.
- Institute of Medicine (2001) *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, DC: National Academy of Sciences.
- Institute of Obstetricians and Gynaecologists (2006) *The Future of Maternity & Gynaecology Services in Ireland, 2006-2016 (Report from Institute Subgroup)*. Dublin: Institute of Obstetricians and Gynaecologists.
- Irish Nurses and Midwives Organisation (INMO) (2014) *Midwifery survey confirms staffing crisis*. Dublin: Irish Nurses and Midwives Organisation. Available at: <http://inmo.ie/Article/PrintArticle/11417>
- Jentsch, B., Durham, R., Hundley, V., and Hussein, J. (2007) 'Creating consumer satisfaction in maternity care: The neglected needs of migrants, asylum seekers and refugees', *International Journal of Consumer Studies*, Vol. 31, No. 2. pp. 128-34.
- Jomeen, J. and Martin, C.R. (2008) 'The impact of choice of maternity care on psychological health outcomes for women during pregnancy and the postnatal period', *Journal of Evaluation in Clinical Practice*, Vol. 14, pp. 391-98.
- Jones, R. (2013) 'A guide to maternity costs – Why smaller units have higher costs', *British Journal of Midwifery*, Vol. 12, No. 1, pp. 54-59.
- Joseph, K.S. (2007) 'Theory of obstetrics: An epidemiologic framework for justifying medically indicated early delivery', *BMC Pregnancy Childbirth*, Vol. 7, No. 4, pp. 1-15.
- Kabir, Z., Clarke, V., Conroy, R., McNamee, E., Daly, S. and Clancy, L. (2009) 'Low birthweight and preterm birth rates 1 year before and after the Irish workplace smoking ban', *BJOG, An International Journal of Obstetrics & Gynaecology*, Vol. 116, No. 13, pp. 1782-87.
- Kabir, Z., Daly, S., Clarke, V., Keogan, S. and Clancy, L. (2013) 'Smoking Ban and Small-For-Gestational Age Births in Ireland', *PLoS ONE*, Vol. 8, No. 3. Available at:
<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0057441>
- Kinder, P. (2001) Report of the Maternity Services Review Group to the North Eastern Health Board. Kells: North Eastern Health Board.
- King, D., Martin, B., Dwyer, J., Healy, J., Owada, K., Smith, L., Sun, L., Van Deth, A., Wainer, J. and Willis, E. (2008) *Review of the Gynaecological Cancers Workforce: Report for Cancer Australia*. Adelaide: National Institute of Labour Studies, Flinders University. Available at:
http://www.canceraustralia.gov.au/sites/default/files/publications/review-gynae_cancers_workforce1_504af01e1d2dc.pdf
- Kitzinger, S. (2012) 'Rediscovering the Social Model of Childbirth', *Birth: Issues in Perinatal Care*, Vol. 39, No. 4, pp. 301-304.
- Klazinga, N. (2008) 'The Health System in the Netherlands', *Eurohealth*, Vol. 14, No. 1, pp. 8-10.
- Knight, H.E., Gurol-Urganci, I., Mahmood, T.A., Templeton, A., Richmond, D., van der Meulen, J.H. and Cromwell, D.A. (2013) 'Evaluating maternity care using national administrative health datasets: How are statistics affected by the quality of data on method of delivery?', *BMC Health Services Research*, Vol. 13, No. 200. Available at: <http://www.biomedcentral.com/1472-6963/13/200>
- Knight, M., Workman, M., Fitzpatrick, K., Acosta, C., Peirsegeale, P., Mistry, V. and Kurinczuk, J.J. (2013) *UKOSS Annual Report 2013*. Oxford: National Perinatal Epidemiology Unit.
- Kohn, L.T., Corrigan, J.M. and Donaldson, M.S. (eds.) (2000) *To Err is Human: Building a Safer Health System*. Washington, DC: Institute of Medicine.

- Kornelsen, J., Stoll, K. and Grzybowski, S. (2011) 'Stress and anxiety associated with lack of access to maternity services for rural parturient women', *Australian Journal of Rural Health*. Vol. 19, No. 1, pp. 9-14.
- Kozhimannil, B.K., Shippee, P.T., Adegoke, O. and Virnig, A.B. (2013) 'Trends in Hospital-based Childbirth Care: The role of health insurance', *American Journal of Managed Care*, Vol. 19, No. 4, pp. 125-32.
- KPMG (2008) *Independent Review of Maternity and Gynaecology Services in the Greater Dublin Area*. Dublin: Health Service Executive.
- Land, J.A. and J.L. Evers J.L. (2003) 'Risks and complications in assisted reproduction techniques: Report of an ESHRE consensus meeting', *Human Reproduction*, Vol. 18, pp. 455-57.
- Larkin, P., Begley, C.M. and Devane, D. (2012) '“Not enough people to look after you”: An exploration of women's experiences of childbirth in the Republic of Ireland', *Midwifery*, Vol. 28, No. 1, pp. 98-105.
- Layte, R. and Turner, M. (2013) 'Does pregnancy offer us a chance to reduce obesity in Ireland', *ESRI Research Bulletin*, 2013/2/4. Available at: http://www.ucd.ie/t4cms/Turner%20and%20Layte%20RB_1.pdf
- Leahy-Warren, P. (2012) 'Post natal depression – Role of the practice nurse', *Nursing in General Practice*, Vol. 6, No. 5, pp. 25-29. Available at: <http://www.lenus.ie/hse/bitstream/10147/257044/1/PagesfromNURSINGGENERALPRACTICENOV122.pdf>
- Lewis, G. and Drife, J.O. (2001) *The fifth report: Why mothers die, 1997-1999*. London: RCOG Press.
- Lifestyle Statistics, Health and Social Care Information Centre (2013) *Statistics on Smoking: England, 2013*. London: Health and Social Care Information Centre. Available at: <http://www.hscic.gov.uk/catalogue/PUB11454/smok-eng-2013-rep.pdf>
- Lutomski, J.E., Greene R.A., and Byrne B.M. (2012a) 'Severe maternal morbidity during childbirth hospitalisation: a comparative analysis between the Republic of Ireland and Australia'. *European Journal of Obstetrics & Gynaecology and Reproductive Biology*. Vol. 163, No. 2, pp 148-153.
- Lutomski, J.E., Morrison, J.J. and Lydon-Rochells, M.T. (2012b) 'Regional variation in obstetrical intervention for hospital birth in the Republic of Ireland, 2005-2009', *BMC Pregnancy and Childbirth*, Vol. 12, No. 123. Available at: <http://www.biomedcentral.com/1471-2393/12/123>
- Lutomski, J.E., Murphy, M., Devane, D., Meaney, S. and Greene, R.A. (2014) 'Private health care coverage and increased risk of obstetric intervention', *BMC Pregnancy and Childbirth*, Vol. 14, No. 13. Available at: <http://www.biomedcentral.com/1471-2393/14/13>
- Lyons, S.M., O'Keeffe, F.M., Clarke, A.T. and Staines, A. (2008) 'Cultural diversity in the Dublin maternity services: The experiences of maternity service providers when caring for ethnic minority women', *Ethnicity and Health*, Vol. 13, No. 3. pp. 261-76.
- Maben, J., Morrow, E., Ball, J., Robert, G. and Griffiths, P. (2012) *High quality care metrics for nursing*. London: National Nursing Research Unit, Kings College London.
- Macaldowie, A., Wang, Y.A., Chambers, G.M. and Sullivan, E.A. (2013) *Assisted reproductive technology in Australia and New Zealand 2011*. Sydney: National Perinatal Epidemiology and Statistics Unit, The University of New South Wales, Australia. Available at: <http://npesu.unsw.edu.au/surveillance/assisted-reproductive-technology-australia-new-zealand-2011>
- Malott, A.M., Murray Davis, B., McDonald, H. and Hutton, E. (2009) 'Midwifery Care in Eight Industrialized Countries: How does Canadian midwifery compare?', *Journal of Obstetrics and Gynaecology Canada*, Vol. 31, No. 10, pp. 974-79.
- Malouf, R., Redshaw, M., Kurinczuk, J.J. and Gray, R. (2014) 'Systematic review of health care interventions to improve outcomes for women with disability and their family during pregnancy, birth and postnatal period', *BMC Pregnancy and Childbirth*. Vol. 14, No. 58. Available at: <http://www.biomedcentral.com/1471-2393/14/58>
- Martin, C. and Kasperski, J. (2009) 'Developing interdisciplinary maternity services policy in Canada. Evaluation of a consensus workshop', *Journal of Evaluation in Clinical Practice*, Vol. 16, No. 1, pp. 238-45.
- Martijn, L., Jacobs, A., Amelink-Verburg, M., Buitendijk, S. and Wensing, M. (2013) 'Adverse outcomes in maternity care for women with a low risk profile in The Netherlands: A case series analysis', *BMC Pregnancy and Childbirth*, Vol. 13, No. 219. Available at: <http://www.biomedcentral.com/1471-2393/13/219>
- Maternal Death Enquiry Ireland (2012) *Confidential Maternal Death Enquiry in Ireland, Report for Triennium 2009-2011*. Cork: Maternal Death Enquiry.
- Maternity Experiences Survey (2013) *What Mothers Say: The Canadian Maternity Experiences Survey: Executive Summary*. Ottawa: Public Health Agency of Canada. Available at: <http://www.phac-aspc.gc.ca/rhs-ssg/survey-enquete/mes-eem-eng.php>

- Maternity Services Action Group (MSAG) (2011) *A Refreshed Framework for Maternity Care in Scotland*. Edinburgh: Scottish Government.
- Matthews, A. and Scott, P.A. (2008) 'Perspectives on midwifery power: An exploration of findings of the Inquiry into peripartum hysterectomy at Our Lady of Lourdes Hospital, Drogheda, Ireland', *Nursing Inquiry*, Vol. 15, No. 2, pp. 127-34.
- Mays, N., Roberts, E., and Popay, J. (2001). 'Synthesising research evidence'. In: N. Fulop, P. Allen, A. Clarke and N. Black (eds.), *Studying the Organization and the Delivery of the Health Services: Research Methods*. London: Routledge (pp. 188-220).
- McBride, O., Morgan, K. and McGee, H. (2010) *Irish Contraception and Crisis Pregnancy Study 2010* (ICCP-2010). Dublin: HSE Crisis Pregnancy Programme. Available at: http://www.ucd.ie/t4cms/ICCP-2010_REPORT.pdf
- McCormack, B., Dewing, J., Breslin, E., Coyne-Nevein, A., Kennedy, K., Manning, M., Tobin, C. and Slater, P. (2010) 'Developing person-centred practice: Nursing outcomes arising from changes to the care environment in residential settings for older people', *International Journal of Older People Nursing*, Vol. 5, pp. 93-107.
- McCrea, B.H. and Wright, M.E. (1999) 'Satisfaction in childbirth and perceptions of personal control in pain relief during labour', *Journal of Advanced Nursing*, Vol. 29, No. 4, pp. 877-84.
- McDonald A., Paterson, H. and Herbison, P. (2012) *Registrar interest in academic obstetrics and gynaecology: A cross-sectional survey*. Melbourne: Royal Australian and New Zealand College of Obstetricians and Gynaecologists.
- McFarlane, A.J., Rocca-Ihenacho, L., Turner, L.R. and Roth, C. (2014) 'Survey of women's experiences of care in a new freestanding midwifery unit in an inner city area of London, England – 1: Methods and women's overall ratings of care', *Midwifery*, Vol. 30, No. 9, pp. 998-1008.
- McFeeley, S. and Dunne, J. (2014) 'Joining-up public service information: The rationale for a national data infrastructure', *Administration*, Vol. 61, No. 4, pp. 93-107.
- McIntyre, M.J., Francis, K. and Chapman, Y. (2011) 'National review of maternity services 2008: Women influencing change', *BMC Pregnancy and Health*, Vol. 11, No. 53. Available at: <http://www.biomedcentral.com/1471-2393/11/53>
- McNelis, M. (2013) 'Women's experiences of care during labour in a midwife-led unit in the Republic of Ireland', *British Journal of Midwifery*, Vol. 21, No. 9, pp. 622-31.
- Medical Council [Ireland] (2008) *Medical Education, Training and Practice in Ireland, 2008-2013: A Progress Report*. Dublin: Medical Council. Available at: <http://www.medicalcouncil.ie/News-and-Publications/Publications/Education-Training/Progress-Report-on-Medical-Education,-Training-and-Practice.pdf>
- Medical Council [Ireland] (2009) *Guide to professional conduct and ethics for registered medical practitioners*. Dublin: Medical Council. Available at: <https://www.medicalcouncil.ie/News-and-Publications/Publications/Information-for-Doctors/Guide-to-Professional-Conduct-and-Ethics-for-Registered-Medical-Practitioners.pdf>
- Medical Council [Ireland] (2011) *Rules for the Maintenance of Professional Competence* (S.I. No. 171 of 2011). Dublin: Office of the Attorney General.
- Medical Council of New Zealand (2011) *The New Zealand Medical Workforce in 2010*. Wellington: Medical Council of New Zealand.
- Merry, L., Small, R., Blondel, B. and Gagnon, A.J. (2013) 'International migration and caesarean birth: A systematic review and meta-analysis', *BMC Pregnancy and Childbirth*, Vol. 13, No. 27. Available at: <http://www.biomedcentral.com/1471-2393/13/27>
- Miller, D.L., Mason, Z. and Jaye, C. (2013) 'GP obstetricians' views of the model of maternity care in New Zealand', *Australian and New Zealand Journal of Obstetrics and Gynaecology*, Vol. 53, No. 1, pp. 21-25.
- Mills, J. (2004) *Directory of gynaecological oncology treatment and support services*. Sydney: NSW Department of Health. Available at: http://www0.health.nsw.gov.au/pubs/2004/pdf/gynae_oncology.pdf
- Ministry of Health [New Zealand] (2008) *National Maternity Action Plan, 2008–2012: Draft for Consultation*. Wellington: Ministry of Health.
- Ministry of Health [New Zealand] (2011) *New Zealand National Maternity Standards: A set of standards to guide the planning, funding and monitoring of maternity services by the Ministry of Health and District Health Boards*. Wellington: Ministry of Health.
- Ministry of Health [New Zealand] (2014) *Maternity Tables 2011*. Wellington: Ministry of Health. Available at: <http://www.health.govt.nz/publication/maternity-tables-2011>

- Minsart, A.F., Buekens, P., De Spiegelaere, M. and Englert, Y. (2013) 'Neonatal outcomes in obese mothers: A population-based analysis', *BMC Pregnancy and Childbirth*, Vol. 13, No. 36. Available at: <http://www.biomedcentral.com/1471-2393/13/36>
- Mistry, H., Heazell, A.E., Vincent, O. and Roberts, T. (2013) 'A structured review and exploration of the healthcare costs associated with stillbirth and subsequent pregnancy in England and Wales', *BMC Pregnancy and Childbirth*, Vol. 13, No. 236. Available at: <http://www.biomedcentral.com/1471-2393/13/236>
- Morgan, K.L., Rahman, M.A., Macey, S., Atkinson, M.D., Hill, R.A., Khanom, A., Paranjothy, S., Husain, M.J. and Brophy, S.T. (2014) 'Obesity in pregnancy: A retrospective prevalence-based study on health service utilisation and costs on the NHS', *BMJ Open*, Vol. 4. Available at: <http://bmjopen.bmj.com/content/4/2/e003983.full>
- Morris, M., Oakley, L., Maconochie, N. and Doyle, P. (2011) 'An investigation of social inequalities in help-seeking and use of health services for fertility problems in a population-based sample of UK women', *Human Fertility*, Vol. 14, No. 1, pp. 16-22.
- Mullally, A., Cleary, B, J., Barry, J., Fahey, T.P and Murphy, D.J. (2011) 'Prevalence, predictors and perinatal outcomes of peri-conceptional alcohol exposure-retrospective cohort study in an urban obstetric population in Ireland', *BMC Pregnancy and Childbirth*, Vol. 11, No. 27. Available at: <http://www.biomedcentral.com/1471-2393/11/27>
- Munro, S., Kornelsen, J. and Grzybowski, S. (2013), 'Models of maternity care in rural environments: Barriers and attributes of interprofessional collaboration with midwives', *Midwifery*, Vol. 29, No. 6, pp. 646-52.
- Murdoch Children's Research Institute (2014) *Victorian Healthy Mothers Healthy Families Survey*. Parkville, Victoria: Murdoch Children's Research Institute. Available at: <http://www.mcri.edu.au/healthymothers>
- Murfet, G.O., Allen, P. and Hingston, T.J. (2014) 'Maternal and neonatal health outcomes following the implementation of an innovative model of nurse practitioner-led care for diabetes in pregnancy', *Journal of Advanced Nursing*, Vol. 70, No. 5, pp. 1150-63.
- Murphy, B.P., Armstrong, K., Ryan, C.A., Jenkins, J.G. (2010) 'Benchmarking care for very low birthweight infants in Ireland and Northern Ireland', *Archives of Disease in Childhood. Fetal and Neonatal Edition*, Vol. 95, No. 1, pp. F30-35.
- Murray, S.F., Buller, A.M., Bewley, S. and Sandall, J. (2010) 'Metrics for monitoring local inequalities in access to maternity care: Developing a basket of markers from routinely available data', *Quality and Safety in Health Care*, Vol. 19, No. 5, p. e39.
- Nair, M., Workman, M., Fitzpatrick, K., Peirsegeale, P., Kurinczuk, J.J. and Knight, M. (2014) *UKOSS Annual Report 2014*. Oxford: National Perinatal Epidemiology Unit.
- National Audit Office (2013) *Maternity Services in England* (Report by the Comptroller and Auditor General). London: HMSO.
- National Clinical Effectiveness Committee (2013) *National Early Warning Score, National Clinical Guideline No. 1*. Dublin: Department of Health. Available at: <http://www.hse.ie/eng/about/Who/qualityandpatientsafety/Standards/nationalstandards/Nstandarddocuments/nearlywarnibngscoreno1.pdf>
- National Health and Medical Research Council (2010) *National Guidance on Collaborative Maternity Care*. Canberra: National Health and Medical Research Council. Available at: <http://www.nhmrc.gov.au/files/nhmrc/publications/attachments/CP124.pdf>
- National Maternity Hospital Holles Street (2013) *2012 Annual Report*. Dublin: National Maternity Hospital Holles Street. Available at: <http://www.nmh.ie/fileupload/NMH%20AR12%20Final.pdf>
- National Maternity Monitoring Group (2013) *Annual Report 2013*. Auckland: National Maternity Monitoring Group. Available at: http://www.health.govt.nz/system/files/documents/publications/nmng-annual-report-2013-4-11-13_web.pdf
- National Perinatal Epidemiology Centre (2013) *Severe Maternal Morbidity Report 2011*. Cork: NPEC.
- NICE (2007) *NICE Guidelines [CG55]: Intrapartum care: Care of healthy women and their babies during childbirth*. London: National Institute for Health and Care Excellence. Available at: <http://www.nice.org.uk/guidance/cg055>
- NICE (2011a) *NICE Guidelines [CG132]: Caesarean Section*. London: National Institute for Health and Care Excellence. Available at: <https://www.nice.org.uk/Guidance/CG132>
- NICE (2011b) *NICE Guidelines*. London: National Institute for Health and Care Excellence. Available at: <http://www.nice.org.uk/guidance/>

- Ndoro, S. (2014) 'Effective multidisciplinary working: The key to high-quality care', *British Journal of Nursing*, Vol. 23, No. 13, pp. 724-27.
- Newnham, E. (2010) 'Midwifery directions: The Australian maternity services review', *Health Sociology Review*. Vol. 19, No. 2, pp. 245-59.
- NHS (2012) *NHS Breast Screening Programme: Annual Review 2011*. London: National Health Service. Available at: <http://www.cancerscreening.nhs.uk/breastscreen/publications/nhsbsp-annualreview2011.pdf>
- NHS (2013) *Our culture of compassionate care: the 6Cs*. London: National Health Service.
- NHS Employers (2007) *Large-scale workforce change: Briefing 36. Maternity support worker role implementation programme. Findings, successes and learning from the NHS Employers' large-scale workforce change programme*. London: National Health Service. Available at: www.nhsemployers.org/publications
- NHS Litigation Authority (2012) *Ten Years of Maternity Claims: An Analysis of NHS Litigation Authority Data*. London: NHS Litigation Authority. Available at: <http://www.nhs.uk/safety/Documents/Ten%20Years%20of%20Maternity%20Claims%20-%20An%20Analysis%20of%20the%20NHS%20LA%20Data%20-%20October%202012.pdf>
- Northern Ireland Audit Office (2014) *Safer Births: Using Information to Improve Quality*. Belfast: Northern Ireland Audit Office.
- Northern Ireland Practice and Education Council for Nursing and Midwifery (2010) *Development of a Maternity Support Worker Programme for Northern Ireland: Final Report*. Belfast: Northern Ireland Practice and Education Council for Nursing and Midwifery. Available at: <http://www.nipec.ni.nhs.uk/pub/Maternity%20support%20worker%20programme%20Final%20Report%20April.pdf>
- Nursing Council of New Zealand (2010) *Evaluation of the Continuing Competence Framework*. Wellington: Nursing Council of New Zealand. Available at: <http://www.hpm.org/download/206/ccf-report.pdf>
- O'Brien et al (2011) 'The Experience of Pregnancy and Birth with Midwives: Results from the Canadian Maternity Experiences Survey Birth', *Birth*, Vol. 38, No. 3, pp. 207-15.
- O'Donoghue, K., Sheridan, C.P., O'Sullivan, K., Greene, R.A. and Higgins, J.R. (2008) 'Timing of birth related to obstetric practice and neonatal outcome', *Irish Medical Journal*, Vol. 101, pp. 205-7.
- O'Dwyer, V., Hogan, J.L., Farah, N., Kennelly, M.M., Fitzpatrick, C. and Turner, M.J. (2012) 'Maternal mortality and the rising caesarean rate', *International Journal of Gynecology and Obstetrics*, Vol. 116, pp. 162-64.
- O'Dwyer, V., Layte, R., O'Connor, C., Farah, N., Kennelly, M.M. and Turner, M.J. (2013) 'International variation in caesarean section rates and maternal obesity', *Journal of Obstetrics and Gynaecology*, Vol. 33, No. 5, pp. 466-70.
- OECD (2013) *Health at a Glance 2013: OECD Indicators*. Paris: OECD Publishing. Available at: http://dx.doi.org/10.1787/health_glance-2013-en
- OECD (2014) *Caesarean sections: Surgical procedures per 1000 live births*. Paris: Organization for Economic Co-operation and Development. Available at: <http://www.oecd-ilibrary.org/social-issues-migration-health/caesarean-sections-caesar-section-table-en>
- Office of the Attorney General (2005) *Health and Social Care Professionals Act 2005*. Available at: <http://www.irishstatutebook.ie/2005/en/act/pub/0027/index.html>
- Office of the Attorney General (2007) *Part 11 of the Medical Practitioners Act (MPA) 2007*. Dublin: Office of the Attorney General. Available at: <http://www.irishstatutebook.ie/2007/en/act/pub/0025/sec0091.html>
- Office of the Attorney General (2011) *Nurses and Midwives Act 2011*. Dublin: Office of the Attorney General. Available at: <http://www.irishstatutebook.ie/2011/en/act/pub/0041/>
- O'Hara, M.W. and Swain, A.M. (1996) 'Rates and risk of postpartum depression – A meta-analysis', *International Review of Psychiatry*, Vol. 8, No. 1, pp. 37-54.
- O'Leary, C.M., Nassar, N., Kurinczuk, J.J. and Bower, C. (2009) 'The effect of maternal alcohol consumption on fetal growth and preterm birth', *BJOG, An International Journal of Obstetrics & Gynaecology*, Vol. 116, No. 3, pp. 390-400.
- Ombelata, W. (2007) 'Access to assisted reproduction services and infertility treatment in Belgium in the context of the European countries', *Pharmaceuticals Policy and Law*, Vol. 9, pp. 189-201.
- O'Neill, O., Cornwell, J., Thompson, A. and Vincent, C. (2008) *Safe Births – Everybody's business: An independent inquiry into the safety of maternity services in England*. London: The King's Fund. Available at: http://www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/safe-births-everybodys-business-onora-oneill-february-2008.pdf
- Orton, L., Lloyd-Williams, F., Taylor-Robinson, D., O'Flaherty, M. and Capewell, S. (2011) 'The use of research evidence in public health decision-making processes: Systematic Review', *PLoS ONE*, Vol. 6,

- No. 7:e21704. DOI:10.1371/journal.pone.0021704. Available at:
<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0021704>
- Pacagnella, R.C., Cecatti, J.G., Parpinelli, M.A., Sousa, M.H., Haddad, S.M., Costa, M.L., Souza, J.P., Pattinson, R.C. and the Brazilian Network for the Surveillance of Severe Maternal Morbidity Study Group (2014) 'Delays in receiving obstetric care and poor maternal outcomes: Results from a national multicentre cross-sectional study', *BMC Pregnancy and Childbirth*, Vol. 14, No. 159. Available at:
<http://www.biomedcentral.com/1471-2393/14/159>
- Parekh, A., MacInnes, T. and Kenway, P. (2010) *Monitoring poverty and social exclusion 2010*. York: Joseph Rowntree Foundation.
- Parker, S., McKinnon, L. and Kruske, S. (2014) 'Choice, culture and confidence': Key findings from the 2012 having a baby in Queensland Aboriginal and Torres Strait Islander Survey', *BMC Health Services Research*, Vol. 14, No. 196. Available at: <http://www.biomedcentral.com/1472-6963/14/196>
- Pasupathy, D., Wood, A.M., Pell, J.P., Fleming, M. and Smith, G.C.S. (2010) 'Time of birth and risk of neonatal death at term: Retrospective cohort study', *British Medical Journal*, Vol. 341. Available at:
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2904877/pdf/bmj.c3498.pdf>
- Penchansky, R. and Thomas, W. (1981) 'The concept of access: Defining the relationship to consumer satisfaction', *Medical Care*, Vol. 19, No. 2, pp. 127-40.
- Penfold, J. (2014) 'Introducing convenience and calm to gynaecology', *Primary Health Care*, Vol. 23, No. 9, pp. 8-9. Available at: <http://dx.doi.org/10.7748/phc2013.11.23.9.8.s9>
- Perinatal and Maternal Mortality Review Committee (2010) *Perinatal and Maternal Mortality in New Zealand 2007. Third Report to the Minister of Health – July 2008 to June 2009*. Wellington: Perinatal and Maternal Mortality Review Committee. Available at:
<https://www.hqsc.govt.nz/assets/PMMRC/Publications/Third-PMMRC-report-2008-09.pdf>
- Perinatal and Maternal Mortality Review Committee (2014) *Eighth Annual Report of the Perinatal and Maternal Mortality Review Committee: Reporting mortality 2012*. Wellington: Perinatal and Maternal Mortality Review Committee. Available at:
<http://www.hqsc.govt.nz/assets/PMMRC/Publications/eighth-PMMRC-report-June-2014.pdf>
- Peterson, W.E., Medves, J.M., Davies, B.L. and Graham, I.D. (2007) 'Multidisciplinary Collaborative Maternity Care in Canada: Easier said than done', *Journal of Obstetrics and Gynaecology Canada*, Vol. 29, No.11, pp. 880-86.
- Pfeffer, N. and Coote, A. (1991) *Is Quality Good for You? A Critical Review of Quality Assurance in Welfare Services*. London: Institute for Public Policy Research.
- Pilkington, H., Blondel, B., Drewniak, N. and Zeitlin, J. (2012) 'Choice in maternity care: Associations with unit supply, geographic accessibility and user characteristics', *International Journal of Health Geographics*, Vol. 11, No. 35. Available at: <http://www.ij-healthgeographics.com/content/11/1/35>
- Platts, J., Mitchell, E.A., Stacey, T., Martin, B.L., Roberts, D., McCowan, L. and Heazell, A.E. (2014) 'The Midland and North of England Stillbirth Study (MiNESS)', *BMC Pregnancy and Childbirth*, Vol. 14, No. 171. Available at: <http://www.biomedcentral.com/1471-2393/14/171>
- Psaila, K., Schmied, V., Fowler, C. and Kruske, S. (2014) 'Discontinuities between maternity and child and family health services: Health professionals' perceptions', *BMC Health Services Research*, Vol. 14, No. 4. Available at: <http://www.biomedcentral.com/1472-6963/14/4>
- Public Health Agency of Canada (2009) *What Mothers Say: The Canadian Maternity Experiences Survey. Executive Summary*. Ottawa: Public Health Agency of Canada. Available at: <http://www.phac-aspc.gc.ca/rhs-ssg/survey-enquete/mes-eem-eng.php>
- Public Health Agency of Canada (2013) *Perinatal Health Indicators for Canada 2013: A Report from the Canadian Perinatal Surveillance System*. Ottawa: Public Health Agency of Canada.
- Quirke, B. (2012) *Selected Key Findings and Recommendations from the All-Ireland Traveller Health Study – Our Geels 2010*. Dublin: Pavee Point Travellers' Centre.
- Redshaw, M. and Heikkila, K. (2010) *Delivered with care: A national survey of women's experience of maternity care 2010*. Oxford: National Perinatal Epidemiology Unit.
- Redshaw, M., Malouf, R., Gao, H. and Gray, R. (2013) 'Women with disability: The experience of maternity care during pregnancy, labour and birth and the postnatal period', *BMC Pregnancy and Childbirth*. Vol. 13, No. 174. Available at: <http://www.biomedcentral.com/1471-2393/13/174>
- Reibel, T. (2004) 'Normal birth: A thing of the past or the new future for primary health care', *Primary Health Care Research and Development*, Vol. 5, No. 4, pp. 329-37.
- Reid, R. and Taylor, J. (2007) 'A feminist exploration of Traveller women's experiences of maternity care in the Republic of Ireland', *Midwifery*, Vol. 23, No. 3, pp. 248-59.

- Reid, R., Haggerty, J. and McKendry, R. (2002) *Defusing the confusion: Concepts and measures of continuity of healthcare*. Vancouver: Canadian Health Services Research Foundation.
- Reiger, K.M. (2011) ‘“Knights” or “Knaves”? Public Policy, Professional Power, and Reforming Maternity Services’, *Health Care for Women International*, Vol. 32, No. 1, pp. 2-22.
- Renfrew, M.J., Homer, C.S.E., Downe, S., McFadden, A., Muir, N., Prentice, T. and Hoop-Bender, P. (2014) ‘Midwifery: An Executive Summary for *The Lancet’s* Series’, *The Lancet*, June 2014, pp. 1-8.
- Roberts, C.L., Bell, J.C., Ford, J.B. and Morris, J.M. (2008) ‘Monitoring the quality of maternity care: How well are labour and delivery events reported in population health data?’, *Paediatric and Perinatal Epidemiology*, Vol. 23, pp. 144-52.
- Roberts, C.L., Ford, J.B., Algert, C.S., Bell, J.C., Simpson, J.M. and Morris, J.M. (2009) ‘Trends in adverse maternal outcomes during childbirth: A population-based study of severe maternal morbidity’, *BMC Pregnancy and Childbirth*, Vol. 9, No. 7. Available at: <http://www.biomedcentral.com/1471-2393/9/7>
- Romanowski, B., Robinson, J. and Wong, T. (2013) *Gonococcal Infections Chapter Revised 2013: Canadian Guidelines on Sexually Transmitted Infections*. Ottawa: Public Health Agency of Canada. Available at: <http://novascotia.ca/dhw/cdpc/documents/Canadian-STI-Guidelines-for-Gonococcal-Infections.pdf>
- Rosenbaum, S. and Sage, W.M. (2013) ‘Maternity Care and Liability’, *Women’s Health Issues*. Vol. 23, No. 1, pp. e3-e5.
- Rowe, R.E., Garcia, J., Macfarlane, A.J. and Davidson, L. (2002) ‘Improving communication between health professionals and women in maternity care: A structured review’, *Health Expectations*, Vol. 5, No. 1, pp. 63-83.
- Rowland, T., McLeod, D. and Froese-Burns, N. (2013) *Comparative study of maternity systems*. Wellington: Ministry of Health.
- Royal Australian and New Zealand College of Obstetricians and Gynaecologists (2014) *Standards of Maternity Care for Australia and New Zealand*. Melbourne: Royal Australian and New Zealand College of Obstetricians and Gynaecologists.
- Royal College of Midwives (2013) *Submission to The People’s Inquiry for London’s NHS*. London: Royal College of Midwives.
- Royal College of Nursing (2012) *Nursing dashboards – Measuring quality*. London: Royal College of Nursing. Available at: http://www.rcn.org.uk/_data/assets/pdf_file/0004/428440/004198.pdf
- Royal College of Obstetricians and Gynaecologists (RCOG) (2001) *The National Sentinel Caesarean Section Audit Report*. London: RCOG Clinical Effectiveness Support Unit.
- Royal College of Obstetricians and Gynaecologists (RCOG) (2008) *Maternity Dashboard Clinical Performance and Governance Score Card*. London: Royal College of Obstetricians and Gynaecologists. <http://www.rcog.org.uk/files/rcog-corp/uploaded-files/GoodPractice7MaternityDashboard2008.pdf>
- Royal College of Obstetricians and Gynaecologists (RCOG), Royal College of Midwives, Royal College of Anaesthetists and Royal College of Paediatrics and Child Health (2007) *Safer Childbirth: Minimum Standards for the Organisation and Delivery of Care in Labour*. London: RCOG Press
- Royal College of Physicians and Surgeons of Canada (2010) *Objectives of Training in Obstetrics and Gynecology*. Ottawa: Royal College of Physicians and Surgeons of Canada.
- Ryan, P., Revill, P., Devane, D. and Normand, C. (2013) ‘An assessment of the cost-effectiveness of midwife-led care in the United Kingdom’, *Midwifery*, Vol. 29, No. 4, pp. 368-76.
- Sakala, C. and Corry, M.P. (2008) *Evidence-based Maternity Care: What It Is and What It Can Achieve*. New York: Milbank Memorial Fund. Available at: <http://www.milbank.org/uploads/documents/0809MaternityCare/0809MaternityCare.html>
- Sakala, C., Yang, T.Y. and Corry, M.P. (2013a) ‘Maternity Care and Liability: Pressing Problems, Substantive Solutions’, *Women’s Health Issues*, Vol. 23, No. 1, pp. e7-e13.
- Sakala, C., Yang, T.Y. and Corry, M. (2013b) ‘Maternity Care and Liability: Most Promising Policy Strategies for Improvement’, *Women’s Health Issues*, Vol. 23, No. 1, pp. e25-e37.
- Sakala, C., Yang, T.Y. and Corry, M. (2013c) ‘Maternity Care and Liability: Least Promising Policy Strategies for Improvement’, *Women’s Health Issues*, Vol. 23, No. 1, pp. e15-e23.
- Sandall, J. (2012) ‘Every Woman Needs a Midwife, and some Women Need a Doctor Too’, *Birth: Issues in Perinatal Care*, Vol. 39, No. 4, pp. 323-26.
- Sandall, J., Homer, C., Sadler, E., Rudisill, C., Bourgeault, I., Bewley, Nelson, P., Cowie, L., Cooper, C and Curry, N. (2011) *Staffing in Maternity units: Getting the right people in the right place at the right time*. London: The King’s Fund.
- Sandall, J., Soltani, H., Gates, S., Shennan, A. and Devane, D. (2013) ‘Midwife-led continuity models versus other models of care for childbearing women (Review)’, *Cochrane Database of Systematic Reviews*, Issue 8, Art. No.: CD004667. DOI: 10.1002/14651858.CD004667.pub3

- Schölmerich, V.L.N., Posthumus, A.G., Ghorashi, H., Waelput, A.J.M., Groenewegen, P. and Denктаş, S. (2014) 'Improving interprofessional coordination in Dutch midwifery and obstetrics: A qualitative study', *BioMed Central*, Vol. 14, No.145. Available at: <http://www.biomedcentral.com/content/pdf/1471-2393-14-145.pdf>
- Schroeder, E., Petrou, S., Patel, N., Hollowell, J., Puddicombe, D., Redshaw, M. and Brocklehurst, P. (2012) 'Cost effectiveness of alternative planned places of birth in woman at low risk of complications: Evidence from the Birthplace in England national prospective cohort study', *British Medical Journal*, Vol. 344. Available at: <http://www.bmj.com/content/344/bmj.e2292>
- Shahir, A.K., Briggs, N., Katsoulis, J. and Levidiotis, V. (2013) 'An observational outcomes study from 1966–2008, examining pregnancy and neonatal outcomes from dialysed women using data from the ANZDATA Registry', *Nephrology*, Vol. 18, No. 4, pp. 276-84.
- Shepherd, J. (2014) 'Uncovering the Silent Victims of the American Medical Liability System', *Vanderbilt Law Review*, Vol. 67, No. 1, pp. 151-95.
- Slyker, J.A., Patterson, J., Ambler, G., Richardson, B.A., Maleche-Obimbo, E., Bosire, R., Mbori-Ngacha, D., Farquhar, C. and John-Stewart, G. (2014) 'Correlates and outcomes of preterm birth, low birth weight, and small for gestational age in HIV-exposed uninfected infants', *BMC Pregnancy and Childbirth*, Vol. 14, No. 7. Available at: <http://www.biomedcentral.com/1471-2393/14/7>
- Small, R., Roth, C., Raval, M., Shafiei, D., Heaman, M., McCourt, C. and Gagnon, A. (2014) 'Immigrant and non-immigrant women's experiences of maternity care: A systematic and comparative review of studies in five countries', *BMC Pregnancy and Childbirth*. Vol. 14, No. 152. Available at: <http://www.biomedcentral.com/1471-2393/14/152>
- Smith, A.H., Dixon, A.L. and Page, L.A. (2009) 'Health-care professionals' views about safety in maternity services: A qualitative study', *Midwifery*, Vol. 25, No. 1, pp. 21-31.
- Snowden, A., Martin, C., Jomeen, J. and Hollins, C. (2011) 'Concurrent analysis of choice and control in childbirth', *BMC Pregnancy and Childbirth*, Vol. 11, No. 40. Available at: <http://www.biomedcentral.com/1471-2393/11/40>
- Society of Obstetricians and Gynaecologists of Canada (2008) *A National Birthing Strategy for Canada: An inclusive, integrated and comprehensive pan-Canadian framework for sustainable family-centered maternity and newborn care*. Ottawa: Society of Obstetricians and Gynaecologists of Canada.
- Sonfield, A. and Kost, K. (2013) *Public Costs from Unintended Pregnancies and the Role of Public Insurance Programs in Paying for Pregnancy and Infant Care: Estimates for 2008*. New York: Guttmacher Institute.
- State Claims Agency (2012) *Clinical Adverse Events Notified to the State Claims Agency under the terms of the Clinical Indemnity Scheme. Incidents occurring between 01/01/2012 and 31/12/2012 – Final Report*. Dublin: State Claims Agency.
- Statistics New Zealand (2014) *Births and Deaths: Year ended December 2013*. Available at: http://www.stats.govt.nz/browse_for_stats/population/births/BirthsAndDeaths_HOTPYeDec13.aspx
- Stramrood, C.A.I., Paarlberg, K.M., Huis In'd Veld, E.M., Berger, L.W., Vingerhoets, A.J., Schultz, W.C. and van Pampus, M.G. (2011) 'Posttraumatic stress following childbirth in homelike- and hospital settings', *Journal of Psychosomatic Obstetrics and Gynecology*, Vol. 32, No. 2, pp. 88-97.
- Sullivan, E., Hall, B. and King, J. (2007) *Maternal deaths in Australia, 2003–2005. Maternal Deaths Series No. 3*. Sydney: National Perinatal Statistics Unit, Australian Institute of Health and Welfare.
- Šumilo, D., Kurinczuk, J.J., Redshaw, M.E. and Gray, R. (2012) 'Prevalence and impact of disability in women who had recently given birth in the UK', *BMC Pregnancy Childbirth*, Vol. 12, No. 31. Available at: <http://www.biomedcentral.com/1471-2393/12/31>
- Sutcliffe, K., Caird, J., Kavanagh, J., Rees, R. Oliver, K. Dickson, K., Woodman, J., Barnett-Paige, E. and Thomas, J. (2012) 'Comparing midwife-led and doctor-led maternity care: A systematic review of reviews', *Journal of Advanced Nursing*, Vol. 68, No. 11, pp. 2376-86.
- Sutherns, R. and Bourgeault, I.L. (2008) 'Accessing Maternity Care in Rural Canada: There's more to the story than distance to a doctor', *Health Care for Women International*, Vol. 29, No. 8-9, pp. 863-83.
- Talic, A., Kurjak, A., Ahmed, B., Stanojevic, M., Predojevic, M., Kadic, A.S. and Di Renzo, G.C. (2011) 'The potential of 4D sonography in the assessment of fetal behavior in high-risk pregnancies', *Journal of Maternal-Fetal and Neonatal Medicine*, Vol. 24, No.7, pp. 948-54.
- Taylor, C., Shewbridge, A., Harris, J., Green, J. S., (2013) 'Benefits of multidisciplinary teamwork in the management of breast cancer', *Journal of Breast Cancer: Targets & Therapy*, Vol. 5, pp. 79-85.
- Thomas, V. and Dixon, A. (2012) *Improving safety in maternity services: A toolkit for teams*. London: The King's Fund. Available at:

http://www.kingsfund.org.uk/sites/files/kf/field/field_related_document/Improving-safety-in-maternity-services-toolkit-service-improvement.pdf

- Thompson, D. (1995) *The Concise Oxford Dictionary of Current English*. Oxford: Clarendon Press.
- Tope, R., Thomas, E., Henwood, S. and Beer, E. (2006) *Introducing Maternity Support Workers: How are they enhancing maternity services?* Oxford: HERC Associates.
- Tracy, S.K., Welsh, A., Hall, B., Hartz, D., Lainchbury, A., Bisits, A., White, J. and Tracy, M.B. (2014) 'Caseload midwifery compared to standard or private obstetric care for first time mothers in a public teaching hospital in Australia: A cross sectional study of cost and birth outcomes', *BMC Pregnancy and Childbirth*. Vol. 14, No. 46. Available at: <http://www.biomedcentral.com/1471-2393/14/46>
- Turner, M.J. (2011a) *Consultant workforce planning for obstetrics and gynaecology in the Republic of Ireland, 2012-2022, Position Paper* (unpublished).
- Turner, M.J. (2011b) 'The use of quality control performance charts to analyse cesarean delivery rates nationally', *International Journal of Gynecology and Obstetrics*, Vol. 13, No. 3, pp. 175-77.
- Tyler, S. (2012) *Commissioning Maternity Services: A Resource Pack to support Clinical Commissioning Groups: July 2012*. London: NHS Commissioning Board. Available at: <http://www.england.nhs.uk/wp-content/uploads/2012/07/comm-maternity-services.pdf>
- UNFPA (2011) *The State of the World's Midwifery 2011: Delivering Health, Saving Lives*. New York: United Nations Population Fund. Available at: http://www.unfpa.org/sowmy/resources/docs/main_report/en_SOWMR_Full.pdf
- Vendittelli, F., Tassie, M.C., Gerbaud, L. and Lemery, D. (2014) 'Appropriateness of elective caesarean deliveries in a perinatal network: A cross-sectional study', *BMC Pregnancy and Childbirth*, Vol. 14, No. 135. Available at: <http://www.biomedcentral.com/1471-2393/14/135>
- Wagner, M. (2001) 'Fish can't see water: The need to humanise birth', *International Journal of Gynaecology and Obstetrics*, Vol. 75, pp. s25-37.
- Waldman, R., Kennedy, H.P. and Kendig, S. (2012) 'Collaboration in maternity care: Possibilities and challenges', *Obstetrics & Gynecology Clinics of North America*, Vol. 39, No. 3, pp. 435-44.
- Welsh Government (2011) *A Strategic Vision for Maternity Services in Wales*. Cardiff: Welsh Government.
- Wilkinson, S.A. and Stapleton, H. (2012) 'Overweight and obesity in pregnancy: The evidence-practice gap in staff knowledge, attitudes and practices', *Australian and New Zealand Journal of Obstetrics and Gynaecology*, Vol. 52, No. 6, pp. 588-92.
- Wilkinson, S.A., Poad, D. and Stapleton, H. (2013) 'Maternal, overweight and obesity: A survey of clinicians' responses to their pregnant clients', *BMC Pregnancy and Childbirth*, Vol. 12, No. 117. Available at: <http://www.biomedcentral.com/1471-2393/13/117>
- Williams, J., Greene, S., McNally, S., Murray, A. and Quail, A. (2010) *Growing Up in Ireland: National Longitudinal Study of Children. The Infants and their Families: Infant Cohort*. Dublin: Government Publications.
- Witt, W.P., DeLeire, T., Hagen, E.W., Wichmann, M.A., Wisk, L.E., Spear, H.A., Cheng, E.R., Maddox, T. and Hampton, J. (2010) 'The prevalence and determinants of antepartum mental health problems among women in the USA: A nationally representative population-based study', *Archives of Women's Mental Health*, Vol. 13, No. 5, pp. 425-37.
- World Federation for Medical Education and Association of Medical Schools in Europe (2007) *WFME Global Standards for Quality Improvement in Medical Education: European Specifications*. Copenhagen: World Federation for Medical Education.
- WHO (1985) 'Appropriate technology for birth', *The Lancet*, Vol. 2, pp. 436-37.
- WHO (1996) *Care in Normal Birth: A practical guide (Report of a Technical Working Group)*. Geneva: World Health Organization.
- WHO (2010) *WHO International recruitment of health personnel: Draft global code of practice*. Geneva: World Health Organization.
- WHO (2014) *Trends in Maternal Mortality: 1990 to 2013*. Geneva: World Health Organization. Available at: http://apps.who.int/iris/bitstream/10665/112697/1/WHO_RHR_14.13_eng.pdf?ua=1
- WHO, UNFPA, UNICEF, Mailman School of Public Health and Averting Maternal Death and Disability (AMDD) (2009) *Monitoring emergency obstetric care: A handbook*. Geneva: World Health Organization.
- Yelland, J.S., Sutherland, G.A. and Brown, S.J. (2012) 'Women's Experience of Discrimination in Australian Perinatal Care: The double disadvantage of social adversity and unequal care', *Birth: Issues in Perinatal Care*, Vol. 39, No. 3, pp. 211-20.

Appendix: Data sources for infographics

Number of Births

UK: Euro-Peristat Project with SCPE and EUROCAT. (2013) European Perinatal Health Report. The health and care of pregnant women and babies in Europe in 2010.

Available at: https://premup.org/media/documents/european-perinatal-health-report_2010.pdf

Canada: Public Health Agency of Canada (2013) Perinatal Health Indicators for Canada 2013: A Report from the Canadian Perinatal Surveillance System. Ottawa: Public Health Agency of Canada.

The Netherlands: Euro-Peristat Project with SCPE and EUROCAT. (2013) European Perinatal Health Report. The health and care of pregnant women and babies in Europe in 2010. Available at: https://premup.org/media/documents/european-perinatal-health-report_2010.pdf

Australia: Australian Bureau of Statistics Births. Summary statistics for Australia(a) Available at: <http://www.abs.gov.au/AUSSTATS/abs@.nsf/mf/3301.0> (Rates have been calculated using final rebased (2001 to 2011) and preliminary (2012) estimated resident population, based on the 2011 census)

Ireland: The Economic and Social Research Institute (2013) Perinatal Statistics Report 2012. Dublin: Health Research and Information Division, The Economic and Social Research Institute.

New Zealand: (2014) Births and Deaths: Year Ended December 2013 Available at: http://www.stats.govt.nz/browse_for_stats/population/births/BirthsAndDeaths_HOTPYeDec13.aspx (This figure for New Zealand represents live births only)

Maternal Age 35+

UK: Euro-Peristat Project with SCPE and EUROCAT. (2013) European Perinatal Health Report. The health and care of pregnant women and babies in Europe in 2010. Available at: https://premup.org/media/documents/european-perinatal-health-report_2010.pdf

Canada: Public Health Agency of Canada (2013) Perinatal Health Indicators for Canada 2013: A Report from the Canadian Perinatal Surveillance System. Ottawa: Public Health Agency of Canada

Ireland: The Economic and Social Research Institute (2013) Perinatal Statistics Report 2012. Dublin: Health Research and Information Division, The Economic and Social Research Institute.

The Netherlands: Euro-Peristat Project with SCPE and EUROCAT. (2013) European Perinatal Health Report. The health and care of pregnant women and babies in Europe in 2010. Available at: https://premup.org/media/documents/european-perinatal-health-report_2010.pdf

Australia: Australian Institute for Health and Welfare (2011) Australia's Mother's and Babies 2009: Perinatal statistics series no. 25. Canberra: AIHW Available at: <http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=10737420980>

24% of Women who gave birth were from outside of Ireland

The Economic and Social Research Institute (2013) Perinatal Statistics Report 2012. Dublin: Health Research and Information Division, The Economic and Social Research Institute. Available at: http://www.esri.ie/_uvid/9495a3d4-7e97-4588-a1d3-c091fa1e7838/NPRS2012.pdf

Antenatal Care

Schölmerich et al. (2014) 'Improving interprofessional coordination in Dutch midwifery and obstetrics: a qualitative study', BioMed Central, Vol. 14, No. 145. Available at: <http://www.biomedcentral.com/content/pdf/1471-2393-14-145.pdf>

O'Brien et al. (2011) 'The Experience of Pregnancy and Birth with Midwives: Results from the Canadian Maternity Experiences Survey Birth.' Birth, Vol. 38, No. 3, pp. 207–215.

Smoking

Australia: Australian institute for Health and Welfare National Perinatal Epidemiology and Statistics Unit and Australian institute for Health and Welfare (2011) National core maternity indicators. Canberra: Australian institute for Health and Welfare. (14.5% smoking in pregnancy for all women giving birth, 2009)

New Zealand: Ministry of Health (2014) Maternity Tables 2011. Wellington: Ministry of Health. Available at: <http://www.health.govt.nz/publication/maternity-tables-2011> (15.3% were identified as smokers at time of registration with their lead maternity carer in 2011)

Ireland: Williams, J., Greene, S., McNally, S., Murray, A. and Quail, A. (2010) Growing Up in Ireland: National Longitudinal Study of Children. The Infants and their Families: Infant Cohort. Dublin: The Stationary Office. (18% at some time during the pregnancy, 2010. Survey data)

Canada: Public Health Agency of Canada (2013) Perinatal Health Indicators for Canada 2013: A Report from the Canadian Perinatal Surveillance System. Ottawa: Public Health Agency of Canada (12.3% between 2005-2008 at any stage in the pregnancy.)

England: Lifestyle Statistics, Health and Social Care Information Centre (2013) Statistics on Smoking: England, 2013. Health and Social Care Information Centre. Available at: <http://www.hscic.gov.uk/catalogue/PUB11454/smok-eng-2013-rep.pdf> (12% of mothers continued to smoke throughout their pregnancy)

Alcohol

Canada: Public Health Agency of Canada (2013) Perinatal Health Indicators for Canada 2013: A Report from the Canadian Perinatal Surveillance System. Ottawa: Public Health Agency of Canada. (National Data)

Ireland: Williams, J., Greene, S., McNally, S., Murray, A. and Quail, A. (2010) Growing Up in Ireland: National Longitudinal Study of Children. The Infants and their Families: Infant Cohort. Dublin: The Stationary Office. (Survey data)

Obesity

Layte, R. and Turner, M. (2013) 'Does Pregnancy Offer Us a Chance to Reduce Obesity in Ireland'. ESRI Research Bulletin, Available at: http://www.ucd.ie/14cms/Turner%20and%20Layte%20RB_1.pdf
(UK Prevalence study identified BMI ≥ 35 at any point in pregnancy at 4.99%)

Fertility

The Economic and Social Research Institute (2013) Perinatal Statistics Report 2012. Dublin: Health Research and Information Division, The Economic and Social Research Institute.

Inequalities

New Zealand: Perinatal and Maternal Mortality Review Committee (2014) Eighth Annual Report of the Perinatal and Maternal Mortality Review Committee Reporting mortality 2012. Wellington: Perinatal and Maternal Mortality Review Committee. Available at: <http://www.hqsc.govt.nz/assets/PMMRC/Publications/eighth-PMMRC-report-June-2014.pdf>

Ireland: Quirke, B. (2012) Selected Key Findings and Recommendations from the All-Ireland Traveller Health Study – Our Geels 2010. Dublin: Pavee Point Travellers' Centre.

Caesarean Sections

Euro-Peristat Project with SCPE and EUROCAT. (2013) European Perinatal Health Report. The health and care of pregnant women and babies in Europe in 2010. Available at: https://premap.org/media/documents/european-perinatal-health-report_2010.pdf

Multiple Births

The Economic and Social Research Institute (2013) Perinatal Statistics Report 2012. Dublin: Health Research and Information Division, The Economic and Social Research Institute.

Public Health Agency of Canada (2013) Perinatal Health Indicators for Canada 2013: A Report from the Canadian Perinatal Surveillance System. Ottawa: Public Health Agency of Canada.

Length of stay

The Economic and Social Research Institute (2013) Perinatal Statistics Report 2012. Dublin: Health Research and Information Division, The Economic and Social Research Institute. (single births)

Time of birth

O'Donoghue et al. (2008) 'Timing of birth related to obstetric practice and neonatal outcome.' Irish Medical Journal, Vol. 101, pp. 205-7.

Distance from maternity facility

National Audit Office (2013) Maternity Services in England (Report by the Comptroller and Auditor General). London: The Stationary Office.