



ROYAL
COLLEGE
OF MIDWIVES

Special edition – Editorials 2003-2021

EVIDENCE
BASED
MIDWIFERY

Contents

2003

First edition of Evidence Based Midwifery	7
Research: experimentation and inspiration for our lifeworld.....	8

2004

Qualitative research: a valuable contribution to midwifery knowledge	9
The structure of the UK Research Assessment Exercise in 2008	10

2005

Knowing and doing: symbiosis between practitioner and researcher	11
From dusty shelves and lofty thoughts to publication.....	12

2006

Doctoral midwifery: an investment for the profession	13
‘Ouch, that really hurt...’: painful ripples from sensitive research	14
History in the making: a personal chair in midwifery research for Northern Ireland	15

2007

Psychological autopsy: researching maternal suicide	16
A guide to understanding theoretical and conceptual frameworks	17
Opinion: the value of statistics in midwifery research	18
The PhD viva: a necessary rite of passage	19

2008

The Doctoral Midwifery Research Society: a concrete structure for supporting doctoral midwifery research	20
Systematic reviews: the never-ending search for answers to important questions	21
From research assessment exercise (RAE) 2008... To research excellence framework (REF) 2013	22
Midwife-led versus other models of care for childbearing women: implications of findings from a Cochrane meta-analysis	23

2009

On the antiquity of evidence-based midwifery and its discontents	24
Practice: a battlefield where the natural versus the technological	25
Observations from the field of PhD research	26
Understanding intellectual property	27

2010

Lessons learnt from ‘real world’ research	28
Midwifery in the technological world: rapidly evolving phenomena	29
Enhancing capacity and capability in research undertaken by midwives	30
Moving midwifery research forward in the revolutionary information and high-tech era	31

2011

Research ethics: issues for midwives	32
Occularcentrism and the need to ‘see’ the evidence of impact	33
Achieving optimal birth using salutogenesis in routine antenatal education	35
A snapshot of African research presented at the ICM 29th Triennial Congress 2011, Durban, South Africa	36

2012

Artistic approaches to data collection: illustrations and collage	37
Appropriateness of technology interventions in maternity systems	38
What do we hope to achieve through doctoral midwifery research education?	39
Pregnancy: the battle against hidden harm from chemicals, viruses, bacteria, pollutants and chips	40

2013

The ‘z generation’: digital mothers and their infants	41
A rapid synopsis of the Caldicott 2013 information review	42
Occularcentrism and epigenetics: visioning the hardware and software of the human gene.....	43
Looking through the research lens at the challenges facing midwives delivering evidence-informed antenatal education	44

2014

Midwives and the research integrity agenda	45
Midwives united: technology as the conduit	46
Over-the-counter pain medication in pregnancy	47
Optimal screening for Down syndrome: non-invasive prenatal testing?	48

2015

‘Inside looking out...outside looking back’ post-REF 2014 personal reflections	49
The truth revealing power of technology to impact on human error in midwifery practice	50
The future role of technology in the healthcare industry	51
Accessing data from safe havens and warehouses: pinnacles and pitfalls	52

2016

Past, present and future reflections on health technologies: male dominance, electronic research and sensor technologies	53
Zika virus disease epidemic: the role of the midwife in mitigation	54
Building on success and learning from experience: recommendations from the UK Stern report	56
Bespoke birth for the modern Z generation	57

2017

The internet of things	58
Using social media for research	60
Eye movement desensitisation and reprocessing therapy: a ray of hope	61
New guidance: decisions on staff and outputs for REF 2021	62

2018

I spy with my little electronic eye your digital profile: living with the discoverability factor	63
Intrauterine prenatal surgery: an alternative to abortion	64
Reflections on bullying in midwifery and the potential role of EMDR in processing past memories and reducing the impact of trauma	65
Research dissemination and impact: reflections on the Doctoral Midwifery Research Society’s Spotlight on Breastfeeding Research.....	66

2019

World Birth Defects Day: the baptismal experience of using social media to communicate key resources and shared knowledge	67
Virtual birth in 2030	68
Hello <i>Watson</i>	69
What is DORA?	71

2020

REF 2021: still time to publish your paper in Evidence Based Midwifery	73
The wonder world of fetal microchimerism	75
COVID-19 birth memories: ‘It was like going into a war zone where there was an unknown, invisible and deadly enemy waiting for you...’	77
Masked identity in COVID-19: seeing the face of midwives and mothers	79

2021

The Ockenden report: personal reflections on fetal monitoring and its place in modern midwifery care	82
The digital midwife	85
Reflections on COVID-19: parallel reality, occularcentrism and blurred boundaries	87
Those were the days of ploughing the research landscape, sowing the seeds of knowledge and now is the time to write research – Reflections on the development of the RCM’s Evidence Based Midwifery journal	89



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First edition of *Evidence Based Midwifery*

Welcome to the first edition of *Evidence Based Midwifery*. As part of the re-launch of the *RCM Midwives Journal* that took place last October, it was decided to develop a peer-reviewed scholarly supplement appearing initially twice a year alongside the *RCM Midwives Journal*. *Evidence Based Midwifery* is designed to complement those research articles that will continue to appear in the main journal. It will also provide a forum for midwifery researchers, educationalists and academics to publish original research and to have their scholarly activity counted as part of the UK universities' Research Assessment Exercise (RAE).

As clinical governance becomes an even greater part of midwives' daily practice, it is necessary to ensure that where there is evidence to support it, practice is guided by proven research. While recognising that not every midwife should, or indeed ought to become involved in the undertaking of midwifery research, we all have a responsibility to support the development of midwifery knowledge and to implement research findings in our own practice. The aim of *Evidence Based Midwifery* is to assist midwives in pushing forward the boundaries of midwifery knowledge with the ultimate aim of improving care for mothers and babies.

This inaugural edition puts three aspects of midwifery practice under the microscope. Mead explores midwives'

views of their own and their colleagues practice in relation to intrapartum care as part of a midwifery-led service. Her findings show significant variations in both unit policies and practices together with the adoption of aspects of care whose value is not supported by currently available evidence. As with many such research reports it identifies areas for further research. Begley explores how student midwives experience caring for women who have had a stillbirth, miscarriage or neonatal death. There are pointers in this study for all midwives in examining how midwives (at whatever stage in their career) can be best supported in providing care in such situations. Finally there is the study by Symon and Lee evaluating the use of a male facilitator for antenatal education sessions. Again this report is but the first stage in a larger body of research by providing ideas for further evaluation in seeking to include and support fathers in the transition to parenthood.

As *Evidence Based Midwifery* becomes established on the midwifery scene, the editorial board would wish that all midwifery researchers see this journal as one of their main routes for disseminating research-based findings. The Royal College of Midwives remains committed to continuing to develop the art and science of midwifery.

Louise Silverton
RCM deputy general secretary

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Research: experimentation and inspiration for our lifeworld

Research brings us light to see old and new practices with fresh eyes. However, new insights are never enough – just another layer of meaning uncovered. Each new understanding compels us to delve deeper and probe further into the unknown areas of our practice, our humanity, our very being. Yet each piece of sound research – albeit small or large – brings a little more light to our lifeworld. A glimmer of hope, a shadow of promise keeps us in a state of awe as we anticipate a life journey of discovery.

Throughout history we have read about the inquisitive midwives; keen observers of human nature who experimented with procedures, medicinal preparations and emotive language to bring about birth. Trial and error was and still is an exceptionally important aspect of our history of childbirth and errors are part of our humanity. There is no need for shame when we review our progress in knowledge and understanding of childbirth. For example, midwives observed that the majority of women vomited prior to birth and this led to several experimental practices designed to capitalise on the physiological outcomes often associated with this event. Gelis (1991: 137): 'A child placed too high must be brought down by making the mother's gorge rise. To this end they sometimes irritated the throat artificially by making her swallow little feathers and bits of thread. Clearly they also tried to invoke nausea by suggesting disgusting things to eat, made of animal intestines and foul substances, the very sight and smell of which made the stomach heave.'

Another area in which research, technological progress and a shift in public perception has made a substantial contribution to knowledge and practice is that of anaesthesia and caesarean birth. In the 1700s, caesareans were conducted on women without anaesthesia. Gelis (1991: 234) also reports that people always felt troubled by births in which the mother was unconscious, 'absent' from her body – living or dead. Women, who were alive, were held down and cut open to extract the baby. These babies were considered 'non-born', because they were extracted and those who lived were not 'normal'. They were 'miraculous', because they had escaped death.

Language, symbols, illustrations, texts and storytelling were the modes of delivering the discoveries that were made about humankind. Our lives would be bereft of so much pleasure if we did not have people throughout history who were inspired to keep records, to share their knowledge with us and to provide us with more fuel to help us on our journey towards enlightenment.

Therefore, as we reflect on our past and look towards the future research agenda let us be encouraged to continue to observe, record, report, experiment and analyse the fabric and meaning of childbirth.

Gelis J. (1991) *History of childbirth*. Polity Press, Basil Blackwell: Oxford.

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Qualitative research: a valuable contribution to midwifery knowledge

This edition contains a discussion paper on evaluation research methods and four research papers on descriptions of traumatic birth, women's experience of early motherhood, postnatal support in the community and the philosophical foundations of normal birth.

Most papers presented use qualitative research approaches, the aim of which is to: 'Produce a coherent and illuminating description of and perspective on a situation that is based on, and consistent with detailed study of the situation' (Ward-Schofield, 1993: 202).

Qualitative researchers try to understand the meaning individuals ascribe to their life experience and in this case their experience of birth, life after birth and the role of the midwife in their lifeworld. These studies describe, map, analyse and detail the patterns of everyday experiences for the women who come to us for care during their childbirth experience – narratives and stories that are embedded in the social fabric of the everyday world of midwives. As midwife researchers there is a burden of truth-telling to bear for each insight gained and it is the researcher who is ultimately responsible for the rigour of the research.

Every qualitative account is unique yet the findings and interpretations must be sufficiently detailed to allow the reader to walk through the research process – 'walk the talk'. The reader must be convinced by the written word that conveys insightful descriptions of the data trail, veracity and confirmability of meaning attributed to the insight gained from the complete research process.

The written quality of the work is a key component in the value judgements attributed to individual pieces of research. Hammersley (1987) alluded to this factor when stating that qualitative data is often judged on how well it represents the features of the phenomenon that it sets out to describe.

Descriptive accounts are foundational pillars for those who are charged with the task of resource allocation and capital planning. Outcomes from health services research will be used by the government to shape and target services and therefore it is worth investing in evaluation research that will enable us to develop frameworks and processes for reporting and analysing qualitative research that will maximise impact.

Sandelowski and Barroso (2003) would argue that despite the prominence and applicability of health service research using qualitative methodologies, the value of this research is limited due to the need to integrate the findings from the collective research. They propose that the future value of qualitative research will be greatly enhanced through a rigorous and analytic process of qualitative meta-synthesis. This approach values the unique contribution of individual research studies, while combining their collective outputs.

Moving midwifery forward requires us to focus on improving public, professional and organisational confidence in the outputs from qualitative research and therefore we need to begin to write about our research with the expectation that it will be subject to analytic techniques such as meta-analysis and meta-synthesis.

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The structure of the UK Research Assessment Exercise in 2008

The sixth national Research Assessment Exercise (RAE) is to be completed by 2008. This exercise will facilitate the four higher education (HE) funding bodies (Higher Education Funding Council for England (HEFCE), Higher Education Funding Council for Wales (HEFCW), Scottish Higher Education Funding Council (SHEFC), and Department for Employment and Learning Northern Ireland (DELNI)) in distributing public funds, based on a rigorous assessment process that is both transparent and robust.

This is an extremely important assessment of research that will determine the level of funding for HE institutions. Although the exercise is called RAE 2008, only outputs (publications, etc.) published between 1 January 2001 and 31 July 2007 will be included. There will be 15 main panels and 67 sub-panels. Nursing and midwifery are together in unit of assessment 11 in main panel 'c' along with dentistry, nursing, allied health professions/studies and pharmacy.

The main difference between RAE 2008 and RAE 2001 is the introduction of quality profiles, as well as a two-tier panel structure, both of which have been introduced to enhance the robustness of the exercise. Each sub-panel will have a chair, expert panel members (not normally exceeding 15), and one or two observers (not yet decided). The sub-panel chairs will be appointed by the four HE funding bodies' chief executives, who will review the nominations along with the main panel chairs, the RAE team and the RAE steering group. Sub-panel members will mainly be 'practising researchers of suitable personal standing and expertise'. It is desirable that at least a third of the members of each sub-panel should have previous RAE panel experience. The four HE funding bodies have stated that the membership of sub-panels will 'reflect the diversity of the research

community, in terms of age, gender, ethnic origin, scope and focus of their home institution, and geographical location' and panel members will be individuals 'with a significant personal record in research at the highest level' (see: www.rae.ac.uk/pubs/2004/03/rae0403.doc). Panel membership is important, as the criteria for assessment for each unit will be decided by the sub-panel and approved by the main panel along with one or two international assessors (where appropriate). Up to four research outputs may be submitted (not yet decided for each panel). Eligible outputs and other details of data to be collected will be outlined in the *Guidance of Submissions* due to be published in June 2005.

The outcomes of RAE 2008 will impact on the quality, type and future funding of research and approximately £9 billion (over six years) will be allocated by the four HE funding bodies to institutions that are conducting top quality research.

One thing we can be certain about is the importance of peer-reviewed publications. *Evidence Based Midwifery* is preparing a special edition of the journal for the International Congress of Midwives in Brisbane 2005. We are looking for research papers of around 3000 words with an international focus.

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Higher Education Funding Council for England, Higher Education Funding Council for Wales, Scottish Higher Education Funding Council, Department for Employment and Learning Northern Ireland. (2004) *Research Assessment Exercise 2008*. See: www.rae.ac.uk/Pubs/2004/03/ (accessed 4 and 11 November 2004).

I would like to thank Josie Linton RAE officer (infor@rae.ac.uk) for advising on the content and accuracy of this information.

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Knowing and doing: symbiosis between practitioner and researcher

The International Confederation of Midwives (ICM) Congress in Brisbane brings together midwives from across the world to share the 'experience of being a midwife'. Every midwife who attends will have knowledge of, and perhaps experience of, doing and using research. In theory, midwives believe in the symbiotic relationship between research and practice yet in reality, the two appear to be operating parallel to one another. Evidence of this can be seen from the use of titles such as 'research and development' and established forums for 'active researchers' or 'practice development midwives'. Categorisation and the need for classification may be necessary, but there comes a point when separating the two may not be beneficial to midwives or women.

Let us consider the unique and cyclical relationship between research and practice and how they dovetail together to promote better midwifery care. In order to deliver the best care, we need to 'know' what is best. To 'know' we must ask questions that are meaningful and answerable. The research conducted must be rigorous and its application to clinical practice evident. However, dissemination of findings requires symbiosis between research and practice. For this to happen, we need to have midwives who are clinical researchers.

In the UK, consultant midwives are actively engaged in disseminating research findings and in many instances conducting clinical research. However, midwives who wish to specialise in clinical midwifery research have no career pathway and subsequently many research midwives end up working as research assistants in medical trials or applying for doctoral funding in studies that are not midwifery based. The lucky few secure funding to undertake midwifery research and leave the

clinical setting for the university sector. Most student fellowships require the practitioner to leave clinical practice and undertake full-time university education for a three-year period. This 'extraction' from clinical practice sends out a strong message about the balance between knowing and doing and fragments the symbiotic relationship between research and practice.

'Choice' is a very common word and it is used every day in midwifery practice, yet midwives themselves have limited choice when it comes to making a decision to choose a clinical research pathway. Joint appointments between universities and Trust hospitals seemed to be ideal but in reality they have been problematic, fraught with difficulty mainly caused by serving two masters at one time.

Bridging the gap between research and practice is possible with the development of appropriately funded infrastructure to educate, support and develop practitioners. Midwifery needs its clinical and academic researchers to offer a combined and independent contribution to knowledge and practice. Modern healthcare systems appear to value the administration and management contribution more than research. This is evident by the well-defined management structure at every level of service delivery. A comparable structure needs to be established to provide the necessary structure to support midwife researchers in their clinical practice.

Too much emphasis on the components instead of the whole of midwifery can be detrimental and lead to marginalisation and territorialism: academics in 'ivory towers' and clinicians 'navel gazing'.

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From dusty shelves and lofty thoughts to publication

The imagery of theses and reports abandoned on shelves, left to grow obscure with layers of dust as they wait in hope for us to fulfil 'our promise to publish' is rather disconcerting isn't it? Yet, this is the plight of so much of our research. Theses and unpublished reports are symbols of human endeavour, personal and professional sacrifice and every one has a story to tell or a vision to share. Unopened and untold, their journey is incomplete.

The destiny of research is a professional hearing through publication and dissemination. Those who contribute to our research have been promised that we will disseminate our findings. Yes, we promise and yes, we believe we will get round to it when we 'have more time', but unfortunately, many of us never make the time. We have a tendency to fall into one of three main categories: those who manage to publish, those who give up after trying and those who never try.

Publication is a rigorous process and there are no perfect publications, in the same way that there are no perfect research studies. How can we increase our chances of having our papers published? A major challenge is to remove the clutter that tends to conglomerate as we try to 'tell the whole story' in one paper. This is a very common occurrence. Other challenges include keeping to journal conventions with regard to tables, word limit and referencing, as well as managing to tackle critical comments from reviewers and editors. No one manages to publish without personal effort and support. The journey to publication is challenging all the way.

Sustaining motivation, nurturing and supporting writers and

reviewers throughout the publication processes are the most important factors that contribute to successful outcomes. Once published, the papers have found their freedom from dusty shelves and lofty thoughts to soar across the electronic gateways of the boundless internet and be downloaded by an eager global audience.

Information is powerful and we have a duty to disseminate our research nugget(s), regardless of lustre, weight or country of origin. Therefore, I would encourage you to lift that unpublished research, blow the dust off it and share your little bit of the bigger picture with the rest of the profession.

As Archbishop Desmond Tutu reminds us: 'Do your little bit of good where you are; it's those little bits of good put together that overwhelm the world.'

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Doctoral midwifery: an investment for the profession

As more midwives develop highly sophisticated skills in research methodology and achieve the highest possible academic qualification – the doctorate – consideration of its investment and outcome is worthwhile.

All four UK countries have doctorally-prepared midwives, and numbers range from zero to seven in any single university, with an average of two. Funding is variable, with a small number having secured research and development monies. A rough estimate of the number of midwives in doctoral programmes in the UK based on recent personal communication with professors of midwifery is 50.

Those fortunate to be undertaking doctoral research appear to be university department employees or studentship holders – very few are self-funding. It is unfortunate that there are no specific monies at research and development departments ring-fenced for midwives to undertake PhDs. However, this situation may change. For example, midwifery research has a distinct identity in the Research Assessment Exercise 2008, and I would argue that this is indicative of midwifery's developing research and development profile.

The importance of doctoral research is clear: future midwifery will be shaped by leadership in education and research today. Knowledge development and dissemination are critical components of any professional organisation, and while direct-entry midwifery is a major development, the retention of newly-qualified recruits is the new challenge. These midwives need to be assured of an academic as well as a clinical career pathway to

enable them to make career choices.

Adequate investment in midwifery educators to prepare them for doctorate studies needs to be carefully planned and monitored to ensure they have sufficient support and resources, and peers need to be ready to share the extra workload while their colleagues attain doctorates. The more doctoral midwives, the greater chance there is of midwives engaging in clinical research – protecting and nurturing our young recruits, midwife educators and new doctoral students is a major challenge for the whole profession and one that we must all be ready to embrace.

Achieving a PhD is a particularly strenuous endeavour, and a rite of passage. Any midwife who has been through the process will tell about the journey into the unknown, and many of the problems faced are not the anticipated academic challenges but more to do with role conflict.

Preparing midwives for post-doctoral midwifery is as important as preparing new entrants to the profession, and doctoral midwives should not feel forced to migrate to academic institutions, but should be encouraged and actively supported in maintaining clinical posts. This requires investment, commitment and support – teamwork, sacrifices and perseverance will be needed to forge a shared vision for the profession of midwifery.

Marlene Sinclair
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'Ouch, that really hurt...': painful ripples from sensitive research

The risks involved in sensitive research are real for the midwife as researcher and the woman as participant. Elam and Fenton (2003) would argue that all human research has potential to become 'sensitive' – emotional triggers can go off at any time.

When we talk about sensitive research, most of us think of sexual health and intrusive probing of people's personal lives. The mention of the word 'sex' causes a sharp intake of breath from many, and the idea of doing research in this area elicits fear and anxiety. However, one must remember that this is an important subject often studied by social scientists, psychologists and anthropologists, and in which midwives are particularly well placed to conduct necessary field research. The everyday practice of midwifery stems from a direct result of sexual activity, from copulation to in vitro fertilisation. Confidentiality, respect, non-maleficence and choice are essential frames of governance for every midwife and researcher. Protecting interviewees and researchers in the field are issues that are becoming commonplace for ethical committees to address.

Researchers need to understand the potential for pain to be caused by their research and be cognisant of the ripples that emanate from their presence in the life of the participant. Consider the potential for searing pain in the soul of both the woman and the midwife when she agrees to share her experience of sexual abuse or domestic violence. In this setting, the midwife is challenged to 'touch and feel pain' as well as maintain anonymity and confidentiality. The weight of carrying a caring burden for a suffering fellow human is not to be underestimated.

How can we prepare for the field in which sensitive research will be conducted? The work of Lee (1993) is particularly helpful, as it provides a model of sensitivity based on defining whether the nature of the research is a 'substantial threat' for the researcher and the participant. Lee's model gives a framework for classifying or assessing this threat with regard to 'intrusion, sanction and power'. A good outcome is more likely if the researcher considers each of these issues in depth and prior to entering the field – a more prepared researcher, participant and environment should provide a safer and more productive research process. In practice, this may lead to substantial delays as the researcher learns how to conduct sensitive interviews and becomes a more competent listener and more confident reporter, while participants may engage in activities to increase their confidence in discussing personal issues.

In conclusion, principal investigators and research supervisors need to prepare students and research assistants, in order to minimise the 'ouch factor' and the ripples of pain that can be felt from poorly-prepared researchers' activities.

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History in the making: a personal chair in midwifery research for Northern Ireland

On 27 September, I was promoted to professor of midwifery research at the University of Ulster Institute of Nursing Research. I am truly honoured – being the first midwife to become professor of midwifery research in the island of Ireland is, frankly speaking, breathtaking.

Dr William Featherstone Montgomery was the first doctor to be appointed professor of midwifery in 1829 at the College of Physicians in Dublin, and Dr Little was the first at Belfast Royal Academical Institution in 1835 (O'Sullivan, 2006). Midwife professors in the UK have a relatively short history: Mary Renfrew was the first in 1994, followed rapidly by Mavis Kirkham and Lesley Page. In Scotland it was Tricia Murphy Black, and most recently Billie Hunter in 2005 for Wales. Midwifery chairs are now seats of wisdom held by midwives.

For midwives in Northern Ireland, this appointment signals a major academic development for the profession. Midwifery has been formally recognised as an academic player in the field of research and as such, a real competitor for research monies, studentships and knowledge transfer.

I expect this chair to make a significant contribution to the capacity of my university to advance midwifery scholarship and evidence-informed clinical practice. It will establish it as an influential seat of midwifery theory and research, and reinforce the strength in depth that the subject has now achieved.

I remember my first research journal club in the neurosurgical unit of the Royal Hospital in Belfast in 1985, where I

understood little about the rigour of academic research. By 1990, when I introduced the first multidisciplinary journal club in the Lagan Valley Maternity Unit, the focus was the same – person-centred care, best practice informed by best available research evidence. But this time, midwives, doctors, physiotherapists and pharmacists came together in teams to discuss clinical policy and guidelines. Of course, we did not use the buzz words 'evidence-informed guidelines', 'meta-analysis', 'meta-synthesis' or 'hierarchies of evidence'. There was a genuine innocence about academia and a healthy respect for teaching and research.

Undertaking clinical research for my PhD involved a tough journey, but forced me to become stronger and more resilient. My experience of doctoral supervision since (n=12 to date) has assured me of the value of this learning.

As for the future, my particular field of expertise is how technology is used in support of childbirth. I believe its use should be appropriate, effective, efficient, ethical and based on best evidence as well as experiential knowledge. Midwives are expert users and we should be harnessing technology to bring about good outcomes where it is most needed.

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Psychological autopsy: researching maternal suicide

The potential for joy and fulfilment associated with successful birth can be shattered by the death of a mother who ends her life. Midwives speak in whispers with hands on hearts, murmuring: 'I just can't believe it... if only I could have done something...'

Over the years, intimate conversations with colleagues have convinced me that as midwives and researchers we need to deepen our understanding of suicidality to be better prepared to take an active role in prevention, detection and support. Increasing knowledge of the factors underpinning the event, understanding inquiry processes and empathising with family and colleagues requires preparation and sensitive management. Midwives drawn toward conducting research in this area require expert knowledge and training to undertake sensitive research. In this field, the potential for harm to family members of the deceased and to the researcher are increased.

A basic PubMed search for papers on suicide, pregnancy and research, in English from 1956 to 2007 and using several combinations of terms, found six main research studies. The most relevant from a UK perspective was that of Appleby (1991), reporting prevalence rates for suicide in pregnancy to be 0.17/100 000. This seminal work has recently been updated by McGowan et al (2007) and the rate estimated to be 0.9/100 000. Internationally, US researchers Lindahl et al (2005) reported nine studies that have attempted to identify the scope of the problem, concluding that, while suicide deaths and attempts were lower during pregnancy, they accounted for up to 20% of all postpartum deaths.

A further search using PubMed revealed the most common

research method to be 'psychological autopsy'. This was first described by Schneidman and Faberow (1957) and was developed to assist enquiries into deaths that were ambiguous. It depends heavily on documentary analysis – of the autopsy report, police records and personal documents – substantiated by interviews with family and friends in order to build a comprehensive picture of the deceased, their environment and psychological state, and has become the basis for much of the evidence we have. However, the method has problems related to the number and type of informants who contribute to the inquiry, the appropriate timing and place of interviews, selection criteria for interviewees and confirming the veracity of responses.

The effect of maternal suicide eaves an indelible stain on the lives of all those who come into contact with it. Midwives could provide new research knowledge in this area, and perhaps even replace psychological autopsy with a new midwifery research approach.

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A guide to understanding theoretical and conceptual frameworks

Mentioning 'theoretical framework' or 'conceptual framework' to midwives is likely to be met with either silence, a shrug of the shoulders or an arched eyebrow that says 'I know what you are talking about, but please don't ask me too much about it'. These reactions are understandable, but I hope that this brief editorial will help novice researchers, educationalists and clinical midwives to grasp the essence of theoretical frameworks and their potential contribution to midwifery practice.

A theoretical framework can be thought of as a map or travel plan. When planning a journey in unfamiliar country, people seek as much knowledge as possible about the best way to travel, using previous experience and the accounts of others who have been on similar trips. 'Survival advice' and 'top tips' enable them to ascertain the abilities, expectations and equipment that may help them to have a successful journey with good outcomes, to achieve their objectives and return to base safely.

At the start of any research study, it is important to consider relevant theory underpinning the knowledge base of the phenomenon to be researched. By addressing simple questions, the researcher can begin to develop a loosely-structured theoretical framework to guide them. The following questions have been adapted from Slevin and Basford (1999: 298):

- What do I know about the phenomenon that I want to study?
- What types of knowledge are available to me (empirical, non-empirical, tacit, intuitive, moral or ethical)?
- What theory will best guide my midwifery practice?
- Is this theory proven through theory-linked research?
- What other theories are relevant to this practice?
- How can I apply these theories and findings in practice?

In considering these questions and critically appraising the literature, the quantity of information that emerges can be cumbersome, and it is often unclear whether it can be brought together to build something meaningful, aesthetically pleasing and scientifically sound. To address this, researchers consider many constructs or permutations – amalgamations, definitive properties, relationship differentials, knowledge derivatives and practice outcomes and effects. This search for theoretical understanding and its translation into meaningful practice is what is done when developing a theoretical or conceptual research framework. This framework must have a clear practice outcome, if it is to be of clinical relevance.

Having considered knowledge outcomes from the literature carefully, permutations or links between these can be projected and predictions made on how relationships might impact on outcomes. These concepts move from being completely abstract and unconnected to becoming a tentative or loose framework to explore and test theory. Alternatively, relationships between different concepts can be observed using grounded theory research, and used alongside theoretical constructs to test emerging theories by deliberately manipulating the variables.

Research is a journey toward an endpoint – to develop new knowledge that will contribute to practice – and a theoretical map provides a guide. In the case of a field trip, it can be theorised that factors such as body mass index and fitness levels may determine whether individuals will achieve their objectives

or not. These assumptions are based on knowledge and understanding of environmental stressors, personality traits, for example. Similar processes of enquiry and synthesis of data are required in developing a theoretical research framework.

Initial preparatory work leads to the identification of certain factors that are likely to have an impact on the outcome – this can be likened to a crystallisation process in which emerging or tentative factors that are relevant to the research study begin to make themselves visible. The next stage of the process involves mapping out or visualising these theoretical threads to form some diagrammatic representation of inter-relatedness. Imagination is important to avoid producing linear or circular diagrams. Successful theoretical constructs such as Maslow's pyramidal hierarchy of needs or Bruner's spiral theory of learning can provide inspiring mental images of frameworks that have anchored previous knowledge and theory development.

Researchers often get excited by the 'aha' moment, when they begin to 'see' the relevance of theories about adaptation, motivation and decision-making, for example and how they can help formulate research questions, select an appropriate research design and report findings within a structured framework. This is only the beginning of the theoretical journey – once the relevant theories or constructs have been identified, their place in the caring context clearly articulated and tentative relationships between them posed, the research study can progress rapidly. However, it is important to review the framework and synthesise data outcomes at each stage of the research process to further develop, test or confirm relationships between the variables. The theoretical framework evolves and develops until it becomes refined and burnished, to emerge as a robust outcome of the research.

The process of designing a theoretical framework is developmental and experiential. I would argue that the personal journey is a life-changing event for many researchers, and one that should not be feared. The journey toward theoretical 'know how' and 'know what' is worthy of careful planning and preparation. It starts with reading the literature, asking basic questions, describing and defining relationships and proposing potential links between emerging factors. The end result of sound theoretically-based research is filtration and absorption of knowledge that trickles and merges into the thought processes and senses of clinicians. If midwifery research is to be efficacious and effective, its contribution must be made visible – better research, underpinned by sound theory and leading to demonstrable effects on practice.

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Professor Marlene Sinclair
Editor

Opinion: the value of statistics in midwifery research

Key words: Statistics education, midwifery, evidence, evidence-based midwifery

Statistics is a much maligned subject, and the saying attributed to Disraeli – that there are ‘lies, damned lies, and statistics’ (Paine, 1924: 246) – has not helped. Yet, midwifery researchers need to be competent in both qualitative and quantitative methods. This editorial is a plea for a greater emphasis on statistics in under- and postgraduate research education, and an appeal to recognise the subject’s beauty.

Testing theory with statistics

Statistics has a logic and aesthetic quality that lies at the heart of research, referring to observation, data collection and the description, inference and examination of relationships. This is not unlike the ideas of Mill (2002), who wrote of methods of agreement, difference, residues and concomitant variations. One of the attractions of statistics lies not in certainty but in the fact that we can say how probable the result we obtained is. From this, we can evaluate the degree to which our result could simply be due to chance. We make statements of conjecture (hypotheses) about relationships between the variables we observe, we collect data on these variables (observations) and we can then describe our results and evaluate the statements (hypothesis testing). Having done this, we can either reject or fail to reject the hypothesis.

An interesting yet simple case that may illustrate this is that of a divorce that took place in 1949 (Altman, 1980). The wife of a soldier claimed that she gave birth at approximately 50 weeks’ gestation (her claimed observation). He claimed as grounds for the divorce that his wife had been unfaithful, since he could not be the father. What was the probability of gestation lasting almost 50 weeks? Unfortunately for the soldier, statistics were not used to evaluate his case. The appeal judges agreed ‘that the limit of credibility had to be drawn somewhere, but on medical evidence 349 [days], whilst improbable, was scientifically possible’ (Barnett, 1997: 248). The hypothesis we need to test is whether or not a 349-day gestation period is significantly different from that of 40 weeks (the observation from the population). To answer this question, we need to realise that all observations vary, but how probable is it that it could vary by 69 days? If this were only probable one in 100 000 times, who would you believe – the wife or the husband? This is the basis of all statistical tests, and when we say that a result is statistically significant we are referring to the probability that the results could be due to chance (this should not be confused with clinical significance).

A continuum of research education

All modules on statistics and research design should be based on a continuum of study. Unfortunately, modular courses are discrete and semester-based, and little attempt may be made to integrate study at undergraduate, masters and doctoral levels. Arguments made for this include that ‘we are not training statisticians’ and ‘you can always get help from a statistician’. Yet, knowledge of basic statistics is necessary for all researchers, and getting help from a statistician only after data is collected means that it is often difficult to retrieve useful findings.

At undergraduate levels, students should be competent in the use of univariate and bivariate statistics, using statistical software packages, probability and hypotheses testing. Postgraduate students should be introduced to more widely used multivariate statistical methods, and at doctoral level more sophisticated multivariate methods should be explored. ‘Competence’ should mean being able to demonstrate numerical and reasoning skills through examinations, workshops or skill-based activities.

What constitutes evidence?

Evidence Based Midwifery (EBM) depends on papers that provide evidence, but on what kind of evidence should it rely? Would anecdotal, intuitive, or ‘common-sense’ evidence be appropriate, and in what contexts? Do qualitative designs provide the same level of evidence as those with a quantitative design? There is a hierarchy of evidence ranging from studies based on meta-analysis, systematic reviews and randomised controlled trials (RCTs) to expert opinions (Centre for Evidence-Based Medicine, 2007). Those that rely most heavily on statistical methods are more highly rated as sources of a sound evidential base. ‘Research design is a data discipline’ and this is primarily a statistical issue (Kerlinger, 1979: 327).

A few years ago, a UK Cochrane Centre staff member gave a lecture referring to meta-analysis and statistical methods of combining data from various studies. At a subsequent question and answer session, she was challenged by nurses on the basis that she had used no examples from qualitative studies. Her answer was succinct – that results from qualitative studies cannot provide evidence of the efficacy of specific treatments or interventions, only RCTs can do this. And in this lies the challenge to researchers in midwifery. To meet this, there must be greater emphasis on statistics in under- and postgraduate programmes.

Midwifery research has made great strides and EBM is testament to the progress that has been made, but there are still many challenges to be met. In identifying problems (which are not unique to midwifery), I wish to suggest a way forward. Improving this aspect of education and recognising the role that statistics has to play in informing the profession’s evidence base can only enhance midwifery knowledge and practice.

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The PhD viva: a necessary rite of passage

Key words: Midwifery education, doctoral research, doctorate, PhD, viva voce, oral examination

A PhD is an amazing accomplishment and the title of 'Dr' is something of which to be really proud. It symbolises dedication, commitment, sacrifice, personal achievement and a successful academic journey. Naturally, one expects a robust system to be in operation to ensure that those who successfully acquire this prestigious title are indeed worthy of it.

The viva as evidence

Academic institutions need to be certain that those who attain a PhD have been subject to a rigorous examination process. Evidence of achievement must be demonstrated on paper in the written thesis and (in most countries) also in person.

In the viva voce or oral examination, the student is called upon to discuss and 'defend' their thesis. This is the arena in which they must articulate in-depth knowledge and understanding of their particular research in the context of what is already known. Examiners must be satisfied with evidence that the candidate has:

- A thesis that offers a 'unique contribution'
- The competence to 'research with the necessary rigour'
- 'Expert knowledge' in the subject area.

Candidates may well ask whether it is possible to prepare for safe passage through this daunting experience, and the answer is 'Yes'.

Preparation is the key to success

There is no doubt that preparing for a PhD viva can be stressful for students, supervisors and examiners, as well as family and friends. Information on how to prepare is available from supervisors, student support services, university departments, peers, colleagues and friends. A simple internet search for viva preparation provides at least six months' material to work through.

The best advice that anyone can give is: 'Read, read and read!' Read the thesis in question, read journals and conference proceedings, and read other PhD theses. Candidates should read their thesis in a structured way, bookmarking key chapters with coloured tags, selecting points that answer specific questions and summarising all chapters. They should compose responses to the most important and probable questions, such as 'Tell me about your PhD research' or 'What is your PhD all about?' Answers should be written out, read and learnt, and students should practise articulating and elaborating on them.

It is crucial for candidates to be ready with a well rehearsed two-minute oral presentation on what their thesis is about – what was done, why it was done and what was found. Every student needs this distilled and ready to recall, as they will be sharing it with peers, academics and others for the rest of their life. However, the viva requires more than a summary – it needs to elicit the distinct contribution of the research to the knowledge in this area. The thesis should contain a section that demonstrates this contribution clearly, such as new methodological approaches or theoretical developments, and candidates must know this section in depth and be ready to discuss it with confidence.

Students should remember that this is their PhD – their contribution to the body of knowledge, theory, practice and

understanding in this subject area. They should acknowledge the limitations of their research – no research is perfect or complete – but also recognise the new knowledge emanating from it.

Examiners expect candidates to have rehearsed their answers to being asked 'So what?' questions, which are designed to enable the student to talk about their research with confidence. The examiner is not out to fail them, but needs to be sure that the research was conducted by the student, and that they know and understand it. Candidates must also be ready to address deeper and more probing questions, and to talk about their future plans. The question 'If you were to start all over again, would you do anything differently?' is sometimes asked at the end of the viva. It is looking for a response that demonstrates the student's overall understanding of the research process. The PhD is a training exercise in research so there is no need to be too self-critical, but candidates should think about this question carefully as their thesis will present a justified and soundly argued case for asking the research question, selecting an appropriate method and mode of analysis. The question requires a response that is relevant, appropriate and meaningful. Hindsight is a great advantage, but none of us have it without lived experience.

On the day

It is important for candidates to remember that they know more about their PhD than anyone else in the room. The viva is a great opportunity for them to talk about their research, and they should go into it with a positive attitude and an expectation that it will be challenging and fair.

On a practical level, arriving in good time with all the necessary materials and switching mobile phones to silent mode will certainly help! Having family or significant others nearby may also provide support. Candidates can bring anything they need as evidence of their personal journey through the PhD, be it a field diary, wallchart, notes, videos, emails or text messages. They should have a copy of their thesis that is signposted with colours or codes to ensure easy and quick retrieval of information.

If a question is not understood, honesty really is the best policy. Asking if it could be rephrased, or for an indication of the page number or section of the thesis to which it refers can unlock the thoughts that lead to an answer. Students should also ask if unsure whether they are answering with the appropriate depth or breadth.

The PhD viva is a necessarily challenging experience, and the acquisition of a doctorate is all the more rewarding for it. Although it may be an understandably intimidating prospect, with the right preparation, a positive mindset and a confident approach, midwives can (and do) perform brilliantly at their viva. In doing so, they step into a 'wider world' of midwifery research that enriches the profession immeasurably.

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The Doctoral Midwifery Research Society: a concrete structure for supporting doctoral midwifery research

Key words: Doctoral midwifery research society, DMRS, definition of midwifery research, information age

When I launched the Doctoral Midwifery Research Society (DMRS), it was 'blue sky thinking' materialising into a concrete structure... a midwifery dream come true. I believe this is a major development for serious midwife researchers to use as a landscape for designing, drawing, imprinting and showcasing high-quality midwifery research. However, I do hope the DMRS will be able to grow fast enough to keep up with the modern needs of midwives living in the 'instantaneous age' where demands for faster, shorter and more transient communication pressurise us every day. Life for many of us is like that described by Wittel (2001: 51) where 'network sociality consists of fleeting and transient, yet iterative social relations; of ephemeral but intense encounters'. The era of electronic connectivity is at our finger-tips and modern media technology can be used to bring the gold nuggets of research interviews, news from the latest research reports, lectures from visiting professors and communications from discussion-forums to the membership rapidly and in some cases instantaneously. We are living in the 'information age' and media technology is one key that may actually facilitate our survival in this 'network-supported society'. Living in 'liquid modernity' (Bauman, 2000) is already a reality for many of us and one in which the DMRS will have to become a strong and increasingly more visible resource. It is our intention, in time, with adequate funding, to be in a stronger position to harness many of the benefits of modern technology to communicate with each other, albeit through 'articulate' technology, 'telemidwifery', 'podcasts', 'skype' or email.

The origination of this new society arose from several factors – the major one being a growing number of midwives with PhDs in the UK, the Republic of Ireland and the rest of the world with no distinctly visible or tangible forum for discussion, debate and community development. In addition, as midwifery researchers mature and leave the seed bed with bursting shoots of new knowledge, they need nourishment that comes from cross-fertilisation of ideas and the sharing of fruits from labour-intensive searches for meaning and understanding. This appetite for communion can only be satisfied through sharing of our time and experience with each other. Therefore, the overall aim of the DMRS is to advance midwifery practice through the promotion, development and dissemination of midwifery research. I define midwifery research as 'a rigorous process of inquiry that aims to provide knowledge of and insights into the efficacy and effectiveness of midwifery practice; its effects on women, babies, parents, family and society. It includes research on the education and training of midwives, the use of information and communication technologies, the organisation and delivery of maternity services, and employment conditions and terms affecting midwives' working lives'.

A fundamental objective of the DMRS is to 'provide quality support and guidance to doctoral and post-doctoral midwife researchers regionally, nationally and internationally'. A major commitment of the society is to provide – whenever possible – 'a platform for midwife researchers to engage with academics, peers, colleagues, service users, commissioners and policy-makers in a strategic endeavour to ensure best evidence is indeed underpinning everyday practice'. This

is in keeping with the strategic plan for research and development in Northern Ireland (Health and Personal Social Services in Northern Ireland, 2007) and the DMRS aims to play its part in:

- Developing an enabling infrastructure to support research that will impact on maternity care, management and service delivery
- Building the research confidence and skills of midwives working in health and personal social services (HPSS)
- Working in partnership with the HPSS research and development (R&D), related institutions and organisations to strengthen the quality and impact of midwifery research
- Supporting midwives to develop models of dissemination to effectively transfer and diffuse key outcomes for public health arising from midwifery and midwifery-related research
- Ensuring patient and public involvement in HPSS R&D
- Placing a strong emphasis on 'doing' and 'using' research for the good of society and for the advancement of midwifery practice.

The DMRS is sponsored by the Northern Ireland R&D Office and can be accessed from the website: doctoralmidwiferysociety.org. The first meeting used podcasts to capture Professor Billie Hunter's inspirational lecture on qualitative research (Hunter, 2007). The original lecture can be heard via the DMRS website or read in *Evidence Based Midwifery (EBM)*. The second meeting used video to capture an invigorating lecture on metasynthesis by Professor Soo Downe (Downe, 2008). This video can again be viewed on the website or the paper read in this edition of *EBM*.

In conclusion, the DMRS has been developed to meet a need in midwives for a research menu that offers a wide and varied assortment of delights. It is important to remember the key ingredients for its emergence came from midwifery pioneers, who fought to change our stable diet and introduce research and all of its nomenclature into our undergraduate and postgraduate curriculae. These changes in curriculae, professional practice standards, evidence-informed practice and government-led policies have all been influential in building strong edifices for the future development of midwifery research. The DMRS is a concrete foundation ready for pillars of knowledge to be placed and a building of great architectural beauty to arise.

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Systematic reviews: the never-ending search for answers to important questions

Key words: Systematic review, evidence-based health care, pregnancy, childbirth, practice guideline

When I have had the privilege of being an editor for the Pregnancy and Childbirth Group (PCG) of the Cochrane Collaboration, which began in 1995, it has been the best professional opportunity I have ever had. As a result I work with wonderful people all over the world, who share a common interest in generating the best evidence to inform the care of childbearing women. Moreover, I have learned far more about scientific rigour than I did during my formal graduate studies. The experience has been invaluable. However of course, the important question is what, if any, effects have systematic reviews had on the health and wellbeing of childbearing women and their families worldwide?

We have plenty of evidence of the worldwide importance attached to Cochrane Reviews. The reviews of great relevance to conditions in low-income countries have been incorporated into the World Health Organization Reproductive Health Library (UNDP/UNFPA/World Health Organization/World Bank Special Programme of Research, Development and Research Training in Human Reproduction, 2008) and widely disseminated, free of charge within low-income countries. The Reproductive Health Library also includes implications for practice as well as instructional videos, which help to bridge the gaps between evidence and the realities of incorporating the evidence into practice. Recently the PCG editors produced *A Cochrane pocketbook: pregnancy and childbirth*, published this spring (Hofmeyr et al, 2008). It is our hope that the book will provide handy access for clinicians to abstracts of Cochrane Reviews. These publications however, are simply examples of efforts to disseminate the reviews. They tell us nothing about whether there has been an impact on childbearing women and their families.

Our Cochrane Review of continuous labour support (Hodnett et al, 2007) led to national practice guidelines in Canada, the UK and the US. However, the only clear evidence I have that the review had a tangible benefit for childbearing women is that it led to new laws in Uruguay and Brazil to ensure that women have the right to companionship during labour. Of course, research evidence rarely results in legislation, and in one sense it is sad that legislation was needed to ensure that women were not forced to labour alone.

It seems there is an inverse relationship between the amount of solid research evidence and the number of prescriptions and proscriptions concerning pregnancy and childbirth.

Many important questions about the effects of care remain unanswered, partly because no one has completed a systematic review, and partly because so little research has been conducted on questions relevant to healthy childbearing women. Examples include advice, such as advice to abstain from caffeine, alcohol, soft cheeses, and sexual activity, and advice about exercise and what forms of exercise are safe at each stage of pregnancy. Some may respond, 'why bother doing a Cochrane Review when we know there have

been no trials on the topic?' My response is that an 'empty' review can be very valuable, by calling attention to the lack of evidence. An 'empty' review can remind us that in the absence of good evidence, we have no right to be prescriptive to childbearing women, and it can be a clarion call to researchers to generate the evidence.

When I began doing systematic reviews, I had the naïve idea that generally speaking, a systematic review would provide a simple answer to a simple question: 'Is this form of care helpful?' Anyone who still thinks that a yes/no answer is common need only read a few Cochrane Reviews, starting with the one on continuous cardiotocography in labour (Alfirevic et al, 2006) to see how complex an answer can be.

Like all things related to the care of childbearing women, the results of systematic reviews can be upsetting when strongly-held beliefs are challenged. The Cochrane Review of home-like versus institutional birth settings (Hodnett et al, 2005) that we conducted generated enormous controversy in Australia. Results were misinterpreted and misused by both sides in a debate over whether freestanding birth centres should be available (Hodnett et al, 2007). (It seemed irrelevant that our review included no trials of freestanding birth centres).

So why do I keep pushing for more systematic reviews, and regular updates of systematic reviews? Because a careful systematic review is a necessary albeit insufficient condition for ensuring that decisions about care are informed by the best available evidence. What's more, it can tell us when to shut up, back off and not interfere.

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From research assessment exercise (RAE) 2008... To research excellence framework (REF) 2013

Key words: Research assessment exercise (RAE), research excellent framework (REF), bibliometrics

The UK national research assessment exercise (RAE) is reaching its grand finale and on 18 December, the results will be made public. On 5 January, confidential reports will be made available to academic institutions. Before the results have time to arrive and the impact is celebrated or commiserated, we have already switched off RAE 2008 and turned on REF 2013. This is evidenced in the reported 22 institutions that are involved in piloting the new REF assessment process (Higher Education Funding Council for England, 2008a).

We need a robust system to ensure equitable allocation of research funds. However, it is important to note: research funding allocation is a global issue. There are no valid and reliable measurement systems available and the Higher Education Funding Council for England (HEFCE) is acting appropriately by piloting the new bibliometric citation index: 'As bibliometric techniques have the potential to provide robust and usable indicators of research quality across a number of disciplines. However, citation data should be used with caution to construct indicators that can be used in research assessment. They must be constructed using robust methods, the indicators should be interpreted by experts who understand the limitations and the patterns of citation behaviour in that discipline, and they should be used alongside other indicators of research quality' (HEFCE, 2008b).

Our RAE provides individual and institutional assessment data analyses on publications, research grants, students, environment and peer review. The now 'outdated' UK RAE was assessed in relation to the rest of the world and was congratulated on its overall comprehensive approach (Thelwall, 2008). In comparison to other countries, it is surprising to discover that somewhere like the US has no national system for research assessment, and funding allocation depends on competitive grants with national evaluations of little concern. Peer review forms only a small part of the Australian research evaluation system with greater emphasis placed on research income (Thelwall, 2008).

Leaving 2008 RAE in the hands of the assessors let us move forward to prepare ourselves for success in REF 2013. Guidance at this stage is difficult and although I have sought advice from the UK's eminent academics, the repeated nature of the response is familiar and similar: focus remains on publication, peer review, research grants and citations. Therefore, the important message is to develop a deeper understanding of publication impact factors (IF) and bibliometrics.

Bibliometrics is an electronically-supported process in which measures of the number of publications, their properties, word frequencies, citation analysis, co-word analysis and author details can be collated at the touch of a button. The recognised index systems are the Institute for Scientific Information (ISI) and Science Citation Index (SCI) developed by Eugene Garfield in 1955 (Garfield, 2006) primarily to support scientific literature searching. In 1992, Garfield sold ISI to Thomson Scientific who provide citation data on approximately 7000 of the 23,000 journals available. It is useful to note that new competitors, Google

Scholar and Scopus (Elsevier Science) are now producing large-scale online databases, which contain embedded citation indices (Thelwall, 2008). However, the original value of citation systems remains the same as its primary focus was and is to provide researchers with citation data that enables them to know how other researchers have cited a research paper and whether or not the research has been updated. It also provides data on scattered publications in non-mainstream journals thus ensuring collective knowledge acquisition. The ability to review citations and produce statistics on their numbers, all articles by an author, research group or country led to the development of the IF.

Noble assumptions that counting citations would be a reliable measure of scientific value were evidenced in the perception that the more influential the research was, the more likely it was to be cited (Mowday, 1997). However, it was not long before many of the process' and system's limitations were identified: lack of assessment of the citations' quality, poor comparability between subject specific groups and across groups, self-citation and the bias towards English language (Dong and Mondray, 2005).

The formula for determining the IF is calculated by the number of citations from ISI-indexed articles published in year x to articles in the journal published in the years x-1 and x-2, divided by the number of citable items published in years x-1 and x-2.

New developments are constantly facing us and one important new challenger is 'webometrics'. This name is given to the quantitative analysis of all web data. One major advantage of the webometrics is the speed at which citation data can be produced. One major disadvantage is the lack of quality control.

In conclusion, our preparation for REF 2013 must be to keep our focus on doing high-quality research that makes a difference to public health and wellbeing. IF is going to continue to be a major indicator of research output. With rapidly developing new technologies and five years for globalisation impact, who can really plan with confidence for a sea of change?

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Midwife-led versus other models of care for childbearing women: implications of findings from a Cochrane meta-analysis

Key words: Midwife-led care, continuity of care, Cochrane review

Midwives are primary providers of care for childbearing women around the world. However, there has been a lack of synthesised information to establish whether there are differences in morbidity and mortality, effectiveness and psychosocial outcomes between midwife-led and other models of care. In midwife-led care, the midwife is the woman's lead professional, with one or more consultations with medical staff often part of routine practice or as necessary. Other models of care are where the physician/obstetrician is the lead professional, and midwives and/or nurses provide intrapartum and postpartum care under medical supervision in hospital. Shared care is where the lead professional changes depending on whether the woman is pregnant, in labour or has given birth, and on whether care is given in the hospital, birth centre (free standing or integrated) or in community setting(s); and where the majority of care is provided by physicians or obstetricians.

The primary objective of this review was to compare midwife-led models of care with other models of care for childbearing women. It was hypothesised that differential effects and outcomes were due to the levels of continuity with the care provider (caseload models of care offer higher levels of personal relationship continuity than team), whether women were categorised as low or mixed risk, and provision of pregnancy care in a community setting.

We searched the Cochrane Pregnancy and Childbirth Group's Trials Register (January 2008), Cochrane Effective Practice and Organisation of Care Group's Trials Register (January 2008), Current Contents (1994 to January 2008), CINAHL (1982 to August 2006), Web of Science, BIOSIS Previews, ISI Proceedings, (1990 to 2008), and the World Health Organization Reproductive Health Library, number nine. We did not apply any language restrictions. Trial authors were contacted for additional data where necessary.

Models of care were classified as midwife-led, other or shared care on the basis of the lead professional in the ante- and intrapartum periods, as decisions and actions taken in pregnancy often affect intrapartum events. All published and unpublished trials in which pregnant women were randomly allocated to midwife-led or other models of care during pregnancy, and where care is provided during the ante- and intrapartum period in the midwife-led model. All authors evaluated methodological quality. Two authors independently checked the data extraction.

The review summarises 11 trials involving 12,276 women in four countries. The trials involved midwife-led models of care that included either team or caseload midwifery, women classified as low or mixed risk, and care provided in both community and hospital settings. The trials included licensed midwives, and none included lay or traditional midwives. All trials were conducted in high-income countries and no trials offered home birth.

Levels of continuity (measured by the percentage of women who were attended during birth by a known carer varied be-

tween 63% to 98% for midwife-led models of care to 0.3% to 21% in other models of care). Women were classified as being at low risk of complications in six studies, and as 'low and high' and 'high' risk in five studies. Two studies offered a caseload team model of care, and nine studies provided a team model of care.

In the primary comparison, the results consistently showed significantly less use of some interventions for women who were randomised to receive midwife-led care compared to women randomised to receive other models of care. Specifically, women were less likely to experience antenatal hospitalisation, the use of regional analgesia, episiotomy and instrumental delivery, and more likely to experience spontaneous vaginal birth, no intrapartum analgesia/anaesthesia, feeling in control during labour and childbirth and to be attended at birth by a known midwife.

In addition, women who were randomised to receive midwife-led care compared to women randomised to receive other models of care were less likely to experience fetal loss before 24 weeks' gestation, and their babies were more likely to have a mean shorter length of neonatal stay. There were no statistically significant differences between groups for total fetal loss/neonatal death or more than or equal to 24 weeks. Overall, we did not find any increased likelihood for any adverse outcome for women or their infants associated with having been randomised to a midwife-led model of care. These results were moderate in magnitude and generally consistent across all the trials.

Women's experiences of care reported included maternal satisfaction and in the majority of studies, satisfaction with care appeared to be higher in the midwife-led compared to other models of care.

Results generally suggested a cost-saving effect in intrapartum care and a trend towards a cost-saving effect of midwife-led care in comparison with medical-led care.

Not all areas of the world have health systems where midwives are able to provide midwife-led models of care and health system financing is a potential barrier to implementation. Policy-makers who wish to achieve clinically important improvements in maternity care, particularly around normalising and humanising birth, should consider midwife-led models of care and consider how financing of midwife-led services can be reviewed to support this.

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On the antiquity of evidence-based midwifery and its discontents

Key words: Evidence, faith, patterns of knowing

At a recent visit to an exhibition at the Staedel Museum, Frankfurt-am-Main (Kemperdick and Sander, 2008), I was astounded to stumble upon a 600-year-old painting of evidence-based midwifery! The painting in question is *Nativity* by the great but anonymous Northern Renaissance painter, the Master of Flémalle. Among a number of websites, an image of the painting can be found on: www.dl.ket.org/web-museum/wm/paint/auth/flemalle/nativity.jpg. The original is located in Dijon at the Musée des Beaux-Arts.

For the most part, the painting consists of the sort of iconography that will be familiar to those brought up in the Christian tradition. In the setting of a stable, we see Mary, Joseph and the baby Jesus, with shepherds, an ox and a donkey in the background, and angels hovering about. However, it also includes two midwives on the right of the picture. The scene is based on an apocryphal gospel that had currency in the Middle Ages which told how, when Mary went into labour in the stable, Joseph went off to seek midwives to assist in the birth. Possibly because of his advanced age, by the time he managed to return with the midwives, Mary had already given birth and can be seen kneeling in worship of the delivered Christ child.

The back story to the scene before us is the Christian belief that Mary gave birth as a virgin. In the painting, the two midwives are being asked to accept on faith that this is the case. The midwife with her back to us has done so. However, the midwife facing us is less prepared to accept such a counter-intuitive claim on faith alone. Her response is recorded on the banderole floating around her head – ‘[Nullum] credam quin probavero’ – ‘I will only believe that which I have verified’; a clear and succinct summation of the tenets of evidence-based practice, albeit from a rather individualistic perspective. And what does she get for her rejection of blind faith in favour of empirical evidence? Divine retribution for her scepticism withers her right hand, at which her left hand clutches. Because of her hubris in using her intellectual skills to rationally and empirically assess the evidence before her, God has stripped her of her manual skills. The angel above her informs her of the only way out – abandon rationality, embrace faith, touch the head of the Christ child, and the withered hand will be healed.

At this point you may be thinking that while the painting might be interesting in a quirky kind of way, it can hardly have anything useful to say concerning contemporary evidence-based midwifery. Well, I'm not so sure. Let us think about a text that might be described as approaching the status of a modern-day gospel within midwifery and nursing – Carper's (1978) taxonomy of the fundamental patterns of knowing. One of the uses that the author's model has been put to is to attacking evidence-based practice (EBP). Leading theorists including Jean Watson and Betty Neuman (Fawcett et al, 2001) have accused EBP of privileging a very

narrow form of empirics at grave cost to ethical, personal and aesthetic knowing. Why should this have happened? What appeal do empirics have that the other patterns of knowing lack?

On serendipitously reconsidering Carper at the same time as I was discovering the Master of Flémalle, what struck me as a major difference between the various patterns of knowing was that while empirics were amenable to processes of refutation and verification, the others were not. In Carper's words: ‘*Knowledge gained by empirical description is discursively formulated and publicly verifiable*’ (1978: 16). In contrast, aesthetic experience ‘*resists projection into the discursive form of language*’ (16); the reciprocity required in personal knowing ‘*cannot be described*’ (18); and even the value judgments intrinsic to ethics are ‘*not amenable to scientific enquiry and validation*’ (20). The problem with forms of knowledge that cannot be tested or even described is that it is very difficult to discover how, or even if, they are being used. So how might we be persuaded that midwifery knowledge includes personal, aesthetic and ethical ‘knowing’. Presumably, we have to take it on faith?

The ineffability of these patterns of knowing may at least in part explain their eclipse by EBP. What has changed in the last 600 years is that the value of claims based on faith has decreased considerably compared to those based on evidence. This is certainly the case in relation to the professions. Can we really expect clients today to take it on faith alone that midwives are animated by authenticity, empathy and ethics? If we can't, then the issue becomes less about reining in an over-dominant evidence-based midwifery, and more about rethinking our approach to other patterns of knowing to ensure that they too are publicly verifiable, so that clients can clearly see the evidence, in terms of practical and relational effects, that midwives are using these patterns of knowing effectively.

All that said, may I conclude superstitiously by expressing the fervent hope that this rather tendentious attack on ‘faith-based midwifery’ will not lead to the retributive withering of any body parts!

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Practice: a battlefield where the natural versus the technological

Key words: Birth technology, doctoral midwifery research, technocratic, natural, evidence-based midwifery

In 1999, I introduced my doctoral research with a statement about modern childbirth taking place in a veil of tension between the technocratic and natural models of childbirth. Technocratic – where events and midwives’ reactions may be largely guided by electronic and other devices, and a natural model in which the midwives’ role is to provide security and support for the mother as she births according to her own body’s timetable. The literature provided a key to understanding the diversity of public perception of technology, with the scientific philosopher Ellul (1963: 83) stating: ‘*Technology produces values of unimpeachable merit, whilst simultaneously destroying values no less important – impossible to state that technology brings about absolute progress or regress.*’

Habermas (1984) proposed the silent infiltration of technology into society and argued that purposive rationality had become the ‘*dominant belief system due to society valuing and demanding technical efficiency*’. The revelatory power of technology was embodied when ‘*...user and recipient of technology become integrated with the machinery to form an interpretative and transparent relationship and the human body experience becomes hermeneutically transparent in that it can be interpreted in a similar way as a text*’ (Ihde, 1990: 90).

The literature was not without critics like Reynolds (1991), who warned about the abuse of technology allowing humanity to destroy natural cycles on one hand while building fabrications of it on the other. Healthcare literature provided a similar pattern of oppositional views with Donnison (1977) proposing that technology enables men to dominate the processes of childbirth. Oakley (1987) said expert technological knowledge enables the medical profession to control childbirth. However, other writers such as Wajcman (1991) perceived technology to be empowering, giving women control over their childbirth experience, while Doyal (1995) perceived the ‘*technologisation*’ of childbirth to be a demonstration of patriarchy, male domination of women and the medicalisation of childbirth by male obstetricians. This view was supported by Dover and Gauge (1995), who reported that technology de-skills midwives and undermines their professional expertise, and midwives were being accused of ‘*trusting the technology too much*’ (Hemminki and Merilainen, 1996: 1569).

This controversial background formed the context of my research involving an observation programme, comprising 17 case studies conducted across midwifery units in Northern Ireland – a postal survey targeted all practising midwives (1086 with a 60% response rate). Complementary fieldwork involved the survey of computer competence among new entrants to midwifery/nursing courses (731 with a 100% response rate) and in-depth interviews with midwifery managers (10).

The observation studies confirmed the midwife as in a key position in relation to exercising judgement and assuming responsibility for a woman and her baby’s welfare when technology is used – the technology did not undermine the midwife’s position, rather it appeared to focus and strengthen it. Women and their partners used the cardiotocography machine as an electronic

window to provide them with evidence of their babies wellbeing and it aided them in the processes of delivery. Midwives’ willingness to use technology was affected by their level of training, perceived competence, and confidence.

Often students perceive technology to be an important aspect of their work and are motivated to use it. Those with no training in computers scored significantly lower on confidence ($p < 0.001$) and motivation ($p < 0.001$). Midwifery managers considered midwives ought to be assessed for technical competence as part of their undergraduate education. There was a belief that those who were very proficient in technology usage would enable labouring women to be more independent and less dependent on the midwife as ‘*truly competent midwives use machines as tools and allies to support and enhance decision-making skills*’ (Sinclair, 1999).

The role of the midwife in the modern labour ward demands specialist skills in technology. Midwives need to be highly competent in the use of induction technologies ‘*hardware*’, as well as the ‘*software*’ required to support women in natural childbirth. These skills need to be clearly identified and appropriately addressed through curriculum development.

Ten years later, the battle continues and entrenchment has become part of the fabric of practice, with some holding fast to man-managed labour in a consultant-led environment or woman-led labour in a midwife-led unit.

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Observations from the field of PhD research

Key words: Observation, clinical research, midwifery, doctoral studies, PhD, evidence-based midwifery

Many of you reading this editorial will be familiar with the statement: “*I want to do a PhD.*” You may have personal experience of being in this position or you may have been listening to a colleague considering this journey. To date, I have had the privilege of facilitating 11 women to safely walk in and out of the field of research and obtain a PhD in midwifery research. The journeys have taken us along many different paths, but I believe all of them have shared the same revelatory experience in which the moment of understanding of what it is all about occurred, and it was only then that they were able to say “*Now... I see!*”. The journey to this point in a researcher’s life can be very challenging as the student needs to be able to transcend the familiarity of everyday practice in order to see the world through the lens of a researcher. This takes exposure in the field of research, time, persistence, confidence and supportive feedback. Coming to know and understand the lived experience of doing doctoral level research is ‘very challenging’, and this is particularly pertinent in clinical midwifery where the field of research is the midwives’ daily practice. I deliberately chose the words ‘field of research’, because I think this helps separate ourselves from the familiar sight of clinical practice and explore an imaginary landscape to ‘see’ and ‘feel’ the field of clinical practice through the eyes of a novice researcher.

Imagine yourself standing in an ordinary green field. Your aim is to experience the phenomenon of being in the field. Your working objectives are to describe what you see, hear, feel and think. Your tools are yourself, a pen and notepad. At first you may see nothing, but an expanse of grass and probably some weeds and stones, but as you focus your attention on achieving your goal you begin to see more and more. You may find yourself scanning the parameters of the field and quickly noting landmarks. You might even recognise familiar church spires or faraway landmarks. After some time when you begin to focus less on the need to find data, but allow your senses to take over, you begin to see small animals, butterflies, wasps and flies. You begin to hear the familiar and the unfamiliar, like the sounds of the crickets, birds, cows, dogs, aeroplanes, trains. Your skin begins to monitor the warmth of the sun or the frost of the morning and you try to protect yourself. As you begin to familiarise yourself with your new surroundings, you remember your primary aim and start writing furiously to try and record the event.

Questions begin to tug at your mind and heart. What do I write? How can I find the right words to describe what I see and feel? How do I organise my thoughts, what do I write about first and what is the order? How do I make sense of what I have written? Can anyone else see and hear what I have heard? When do I stop writing? These are the familiar questions that bring challenge and excitement to researchers and can only be answered from being in the field and living through the experience. Research text-books and supervisors will help, but the personal journey of learning and knowing cannot take place without self-exposure, supportive feedback and self-determination. This is real experiential learning and the process requires personal commitment, trust and old-fashioned ‘learning by doing’.

In my previous editorial (Sinclair, 2009), I made reference to my own doctoral research in which I spent hundreds of hours in labour wards observing women, machines and midwives. The observation was focused on understanding the role of high-technology in the labour ward. The focus was broad and the field was immense in terms of structure, organisation and practice (like walking into the earlier imaginary green field and seeing everything, but not knowing what was important). However, as time passed, my observation skills became more acutely tuned and I developed a systematised approach to data collection. It was only after many hours of literally observing everything that ‘was’ or ‘happened’ in the labour room – from replacing entonox cylinders to watching domestic attendants cleaning the room that distractions became less obvious and my senses were activated so that the real research focus became clear. Only then was it possible to frame the observation in a manner that made the data selection more meaningful and manageable. The half-hourly observation pattern underpinning routine management of labour became the natural categorical record for writing about the actions, interactions and decisions in a more structured framework. This structure had always been there, but I had not recognised the obvious and the “*Now... I see!*” experience occurred only after ‘being’ in the research field for a long time. Every researcher needs time to become familiar with people, routines, procedures and patterns so that they can gain the confidence to look critically at the field with eyes that are trained to pierce the clouds of muddle and focus on what is important. Field research training is valuable regardless of whether or not the design is exploratory, descriptive or experimental. Every clinical researcher needs to develop skill in critically examining the field of practice with the lens of a practitioner, a professional and a researcher. The benefit of doing so can enable the researcher to ask more relevant and meaningful questions that are clinically and academically relevant to professional practice.

So, if a PhD is in your thoughts or on your horizon take the time now to consider your area of practice. Start by physically observing the phenomenon of interest and immersing yourself in the field of experience before designing the research route or unpacking the vast literary treasure of academia. Try to put on the lens of a researcher and stand with your pen and paper and begin to write down what you see, hear, feel and believe before you collect vast files of published papers. Taking time in the field to observe is never wasted, it is an investment for the future as it will enable you to make more informed decisions about the research design, method and analysis.

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Understanding intellectual property

Key words: Intellectual property, patent, technology disclosure, evidence-based midwifery

For most of you reading this editorial the term ‘intellectual property’ is probably quite vague. You are wondering what it means and why you should be concerned about it.

Intellectual property (IP) is a descriptive term for outputs from creative activity and includes data from artistic, literary, scientific and industrial developments (UK Copyright Service, 2004). For those of you involved in research at universities, you need to be aware that the IP from your research belongs to the university when you are an employee. This ownership is enshrined in legislation emanating from The Patents Act (1977) (as amended) and the Copyright, Designs and Patents Act (1988) in which it is stated that the ‘IP generated by an employee during the course of his/her normal duties belongs to his/her employer’ (Patents Act, 1977 (as amended): section 39).

What about the rights and role of the individual researcher or creator in this legislation? When doctoral students enrol for PhD programmes at universities, they normally sign an IP rights-related agreement on registration. Simply speaking, they sign the IP over to the university. In most cases, this is a requirement for registration and in the majority of cases we give little thought to the process and may leave the institution without reference to IP again. However, in some cases where research leads to the development of potentially commercial outputs, the case is different.

Two years ago, one of my former students developed a product ‘Designer Breastfeeding’[®] (Stockdale, 2007). This was my first experience of learning about the process and procedures involved in protecting the student, the research products and the relevant parties or stakeholders with regard to IP. Lessons learnt are worth sharing with those of you who are about to start your journey or those of you who are, for example, developing applications for valid and reliable tools for measurement.

When we thought we might have a product that could be commercial or exploitable, we contacted our university’s office of innovation for advice and they asked a series of questions about the ‘invention’ and for details about the products of the research, such as publications or conference papers. We proudly presented a profile of dissemination activities. However, we discovered that it is not always in the interest of the research to publish or disclose findings prior to taking their advice – in some incidences publication of research can disclose the novelty of a product. Any disclosure of the research, for example, in poster format, exhibition, or conference, may render the product ‘non-patentable’ and work against further development.

If you think your research could lead to a new or novel application or product, do not publish until you have filed for the patent. Once you have filed for this and completed the standard paperwork, you can publish and present. This is a major issue and one worth remembering. Fortunately, face-to-face support and advice was available from our office and the next stage for us was the completion of a technology disclosure form. This form was important, because this is the paperwork that determines the proportion of the remuneration that the inventor receives and the other stakeholders.

You will notice the small copyright symbol © after Designer Breastfeeding[®] and this is a marker to inform all readers that this is copyrighted to the author (in this case Dr Janine Stockdale at Trinity College, Dublin). The correct term should include ‘Copyright [dates] by [author/owner]’ but a small © is acceptable. Another term commonly used is ‘All rights reserved’. Copyright expires 70 years from the end of the calendar year in which the author dies or if there is joint ownership, then the end of calendar year in which last surviving joint owner dies. The UK Copyright Service provides the following statement:

‘Copyright is an automatic right and arises whenever an individual or company creates a work. To qualify, a work should be regarded as original, and exhibits a degree of labour, skill or judgement.

Interpretation is related to the independent creation rather than the idea behind the creation. For example, your idea for a book would not itself be protected, but the actual content of a book you write would be. In other words, someone else is still entitled to write their own book around the same idea, provided they do not directly copy or adapt yours to do so.

Names, titles, short phrases and colours are not generally considered unique or substantial enough to be covered, but a creation, such as a logo, that combines these elements may be.

In short, work that expresses an idea may be protected, but not the idea behind it’ (UK Copyright Service, 2004).

International recognition of a common understanding of copyright has been laid out by what is commonly known as the Berne convention. The World Intellectual Property Organization (WIPO) administers the convention (WIPO, 1979).

Understanding IP is beneficial to all of us so that we can protect our research products and share the remuneration from commercial exploitations in a fair and equitable manner. It is worth remembering there is potential for re-investing all proceeds into generating further research. However, you may be motivated to develop a spin-off company and set up your own small business. Remember research can generate income!

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Lessons learnt from 'real world' research

Key words: Research, editorial, field research, lessons learnt, evidence-based midwifery

This special edition of *Evidence Based Midwifery* (EBM) provides a unique collection of papers illustrating the lessons learnt by midwife researchers 'doing research' in the real world where life is complex and human needs are palpable. The insights shared demonstrate what research is all about – challenges to be faced, obstacles to overcome, the sweet fruit of perseverance and the invaluable support from good supervisors.

A common theme addressed in the papers by Chotiga et al (2010) and Kerrigan and Houghton (2010) is one of accessing the sample population and both papers offer a profound and salutary message: 'Do not underestimate the complexities and sensitivities of research that involves human beings... Communication across different cultures, in different languages with multiple interpreters requires personal commitment, time, dedication and perseverance.' In addition, Chotiga et al (2010) has a novel presentation style that offers a unique frame of reference, permitting the reader access to the mindset of the research supervisor in her role as teacher, leader, expert and carer.

The inarguable value of discussion and communication between researchers coming from different research paradigms is another insight shared with us by Stenhouse and Letherby (2010). One major reflection in this paper is the concluding comment in which the authors seem to me to be alluding to the potential loss of professional and personal self in pursuit of a shared multidisciplinary team view in which 'we' becomes symbolic of a culmination of hidden layers of 'negotiation, compromise and accommodation' (Stenhouse and Letherby, 2010). The lasting effect of this reflection may pierce the hearts and minds of those who truly strive to reduce the tokenism of multidisciplinary and team-work in order to achieve the desired and hard-to-reach 'shared but collaborative voice' (Stenhouse and Letherby, 2010).

Marshall et al (2010) illustrate the dimensions and properties of 'reflexivity' in the context of undertaking ethnographic research to explore issues of consent to intrapartum procedures. It facilitates a deeper understanding of the processes involved in the real world of field research, where the application of rigour with regard to reflexivity is complex and challenging. It offers an invaluable contribution to our knowledge about process and application of research methodology in clinical practice.

van Teijlingen et al (2010) share lessons learnt from undertaking research in developing countries within Asia and Africa, where understanding the infrastructure, culture and Hawthorne effect of the research process itself cannot be underestimated. In their concluding paragraph they offer much advice, but the last sentence echoes loudly of learned wisdom: '...reflect on your experience of doing research and learn from your own mistakes and those of others' (van Teijlingen et al, 2010).

The reflection by Spence (2010) is one of those rare papers that captures the imagination and conjures images of a secret world lost and found in which the imagination plays havoc with historical information revealed, contextualised and revitalised to produce contemporaneous and synthesised data for

multiple usage. The author appeared to revel in her role as field detective and used all means available to access the 50-year-old patient records and live survivors who were born 'small for gestational age' in Belfast during the 1950s (Spence, 2010).

Perseverance is a highly desirable trait in any researcher and the paper by Lagan (2010) demonstrates a range of challenges faced by a researcher undertaking novel technological research that posed definitive ethical, technical and methodological issues. Lessons learnt and motivations to persevere are key determinants of the overall experience.

On reflection of the overall contribution to midwifery knowledge, it is worth noting some important points: accessing vulnerable groups for what are often researcher-led outcomes is always going to be an ethically difficult decision, but the results often provide new knowledge or understanding that is meritorious in itself. The cultural and sociopolitical aspects experienced in the research field are contextually binding and cannot be detached from the lifeworld of the participants. Understanding the layers of characteristics in a given sample cannot be described without peeling back the cover and exposing the underlying vulnerability of the people concerned and this is evidenced in several of the papers presented. In essence, protecting the safety, wellbeing and identity of vulnerable participants is a major challenge for the researcher and the supervisor. No amount of forward planning or research training can prepare the researcher for the messiness of real life, in which multiple factors merge and mesh to seal the fate of individuals.

In conclusion, this special edition of *EBM* offers a wealth of knowledge gained by the researcher in the field of real world research where access, communication, culture, history and ethics are plaited to provide an elaborate and intricate understanding of the research process in action.

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Midwifery in the technological world: rapidly evolving phenomena

Key words: Litigation, new birth technologies, human error, evidence-based midwifery

Young et al (2001) reported obstetric litigation was costing the NHS £160m to 200m per year and accounted for 60% of all pay outs. Widdup and Goodchild (2009) under the Freedom of Information Act (2000) published shocking statistics in the *London Evening Standard* detailing £27m pay outs for obstetric litigation in London alone. It is understandable that in an economic recession, technological research that offers a solution appears as a ray of hope. However, caution is required as the 'hope' that comes from discovery knowledge can be so powerful, it blinds people to the consequences of sanctioning new technologies without the requisite evaluation of their fitness for purpose. Regardless of pregnant women's acceptability of these devices, we continue to invest in, and exploit technological solutions to situations in which human error can be overcome by artificial intelligence. However, it is important to note that once initiated, the technological cycle is unstoppable and we may reduce human error of one kind, only to replace it with error of another kind: human device error.

Research support for new technologies is evident in the literature where there are reports of proposed financial savings, reduction in human error and a better chance of winning legal cases through the development of sophisticated new monitoring technologies such as the computerised labour monitoring device (CLM) and a modification of the amniotomy hook StationMaster (SM). In 2007, it was announced that the company Barnev had attained US Food and Drug Administration approval for its new CLM device for measuring cervical dilatation and the position of the fetal head (Barnev, 2007). The new device had been subject to a multi-centre trial and proven to be effective and accurate in monitoring the progress of labour. It was also advertised as a useful tool in litigation cases. The system was based on ultrasound technology, with a clip on the maternal cervix and the fetal head providing a graphical display of fetal descent.

Recent research by Luria et al (2009) reported reliability issues with the device and noted 'high variability was observed between subjects for all indices measured', but offered a ray of hope by identifying that these vectors may serve as indicators for normal and abnormal progress of labour and concluded that 'we need more data to demonstrate statistical significance'. The device may reduce error in assessment, but it is dependent on accurate placement of the sensor on the cervix by the midwife or doctor. Therefore, if the device is not properly applied, it will lead to false records and this leads to errors in judgement and so on... the cycle continues. In addition, the machine needs to be acceptable to women and, to date, their role in designing, testing and evaluating this device is not evident.

Awan et al (2009) reported the outcome from tests on SM, a 'simple modification of the amniotomy hook which works by relocating the point of reference for station assessment from the ischial spines to the posterior fourchette'. They trialled the device with 20 midwives and 20 doctors from Liverpool Women's NHS Foundation Trust using a mannequin. The authors concluded:

"Inaccuracies in SM readings can arise from either inaccurate calibration of the instrument or from the actual measurement... for a method to be brought into routine clinical use it needs to be simple, low cost and acceptable to women and carers alike."

Childbirth is everyone's business and its strength and fragility are subject to internal and external factors that are not always controllable. Human nature is imperfect and every new technological discovery leads to a fresh set of problems to be addressed. The technological solution to reducing human error in childbirth is not without cost and in the future may lead to robotic birth, if we do not take control of device development and develop a framework for creating, synthesising and filtering new and emerging technologies in childbirth. Finding a balanced position is essential if we are to progress. The challenge is to remain critical yet receptive to new technological developments and ask ourselves how new devices contribute to our knowledge, understanding and experience of postmodern childbirth.

We live in the 'instantaneous age' where postmodern woman lives as part of the new Generation Y. This is the age of new communication technologies evidenced in the use of social networks, such as Twitter, Facebook and YouTube. These instantly accessible repositories give postmodern labouring women a new window of opportunity to record, explore and monitor their childbirth experience in real time. Our role as midwife in this new world is embryonic and subject to rapid change.

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Enhancing capacity and capability in research undertaken by midwives

Key words: Research capability, collaborative research activity, research support, evidence-based midwifery

As clinical academic careers for midwives become better articulated and funded, then some of the more significant impediments that have stood in the way of research are breaking down. The need for sufficient capacity and capability has been well explored, but attention must be paid to how the growing workforce of researchers are supported.

There are some positive signs of change and development. In the UK, the new Academy for Nursing, Midwifery and Health Visiting Research was launched in 2009. It has modest, but important ambitions and has declared its mission to be: '*An expert collaborative voice for all aspects of research involving nursing, midwifery and health visiting in the UK, including policy development, its implementation and evaluation through negotiation and dialogue with other key stakeholders*' (Academy for Nursing, Midwifery and Health Visiting Research, 2010).

The Academy has been established as a collaborative enterprise between midwifery, nursing and health visiting organisations, such as the RCM, RCN, and UNITE/Community Practitioners' and Health Visitors' Association. This is the first time that such organisations have joined together in common purpose and is a measure of how positively they see the development of competent research.

The need for a collective voice on matters relating to research is immediate. The necessary policy infrastructure to shape clinical academic careers is now in place in the UK (UK Clinical Research Collaboration, 2007) and a requirement to develop mentorship schemes and expert support for those developing their clinical academic career is important. The combined expertise of the Academy's collaborating organisations is powerful, as is their collective capacity to lobby for investment and change.

A re-emergence of clinical leadership as a force for innovation and improvement can also be seen across the UK and is particularly well highlighted by policy intentions from the recently elected UK government. A renewed purpose is beginning to emerge from that landscape, as well as renewed structures that will deliver research and development for health and social care. The Academy has a potentially unique part to play in shaping that landscape and can offer a strong platform of professional expertise in that it:

- Offers a UK perspective
- Can provide views from clinicians, practitioners, researchers, educators and those in the clinical arena
- Has strength through its multi-organisational composition
- Can help to articulate client/patient experiences of midwifery, nursing and health visiting research.

At its outset, the Academy developed three work streams – mentorship and leadership schemes for clinicians and practitioners in relation to their research activities; and a 'case studies' booklet of clinical academics who are midwives, nurses and health visitors demonstrating 'model careers'.

The Academy has held an annual colloquium event since its

inception and at its most recent event in March of this year further refined its work streams, including a strategy to secure funding to continue the Academy's work. It is actively seeking such support for a senior academic appointment to join the team, as well as innovation fellowships.

Research leadership and capability is key for development:

- A 'think tank' was held in Manchester in June (jointly hosted by the Academy and Comprehensive Local Research Networks) to consider the career prospects of midwives and nurses working in clinical research centres. Our debate was assisted by the NMC and National Institute for Health Research
- In collaboration with the University of Cambridge and Cambridge University Hospitals NHS Trust, a series of lectures focusing on clinically-based research has been developed
- The Academy is seeking active engagement in the leadership development work of the Department of Health and the NHS Institute
- A Delphi survey of clinically-based senior midwives and nurses and those in academia was undertaken to develop a shortlist of research topics. Work is now underway to capture the views of service users
- A mentorship scheme for senior midwife and nurse leaders from the clinical arena and academia – initially funded by the Health Foundation – started in 2010 and will continue with funding from the Burdett Trust for a further three years
- The Academy is holding a second annual residential summit meeting for senior midwives, nurses and health visitors with the NHS Institute for Innovation and Improvement.

The Academy is proving to be a powerful alliance. Our work streams offer support to those embarking on their research careers, as well as those further on in their career development. Midwifery has a significant part to play in the continuing work of the Academy. It has proved to be a powerful partner and there is, of course much more to do.

Our combination of research, scholarship and purposeful leadership must now stand a strong chance of making change for the better. Midwifery must not wait for permission to lead or act, it must continue to seize the initiative itself.

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Moving midwifery research forward in the revolutionary information and high-tech era

Key words: evidence-based midwifery, doctoral midwifery research society, technology, childbirth

The Department of Health's new consultation paper – *Liberating the NHS: An Information Revolution* (2010) – sets out the new vision for the NHS in which it commits to moving towards a much more sophisticated and integrated information management system. The idea is to connect people with their healthcare information, to 'meet the needs of individuals and local communities, put patients and service users in control, connect systems, provide information to a variety of audiences and promote sharing of information'. This is indeed a revolutionary proposal and I am sorry it was not released before we launched our first Global Doctoral Midwifery Research Society Conference in partnership with the RCM in September when we had the pleasure of an address by Bill McCluggage, deputy government chief information officer for the cabinet. His speech was visionary and focused on a new information era in which the control was shifting from the technologists and administrators to the patient or the mother entering the maternity services. The audience was fascinated he demonstrated with great flair how technology was a power to be harnessed and used efficiently and effectively within the modern NHS. The emerging challenge for midwives, as I perceive it, is to be ready and willing to adapt and change the supporting maternity service infrastructure with appropriate technologies designed with us, and for us, so that we can positively impact on the health and social care we provide to the women we serve. The technologies themselves are challenging and midwives need to be ready to offer maternity care in a world that may become more virtual than real at times. It is important to recognise that today's under-25s are from Generation Y, growing up with the internet and being savvy users of mobile technologies, social networks, smartphone apps, YouTube, 3D gaming, Wii technologies, not to mention the range of search engines providing instantaneous problem-solving.

The midwifery world we live in is changing at a phenomenal rate and we have a global network of young women and young mothers who use the internet as an everyday ritual. The easy access to the web from mobile technologies has made instant access 24 hours a day possible and the quality of handsets and the speed of transition are rapidly evolving. Our computerised systems are so advanced we now have biomechanical models simulating the mechanics of vaginal birth (Li et al, 2010) and we have *Avatar* and *Second Life* virtual worlds in which people can live in an imaginary place, and even give birth there. For example, the Te Wahi Whānau is a virtual birthplace where student midwives can view computer-generated labour and birth scenes. The programme, produced by Second Life Education in New Zealand and PookyMedia, offers students an opportunity to experience normal birth in a replica of the actual birthing

facility. This seductive technology is 3D, *Second Life* technology offering the public an opportunity to leave their ordinary everyday real-life world and live in a virtual world where women can make believe they are pregnant, give birth and become a mother. The games people play can become the realities of tomorrow and it is important for technologists, designers, mothers and health professionals responsible for maternity services to realise the value and potential from 3D innovation and its applicability to the real world in which physiological birth happens.

We are facing a revolution in information and healthcare technologies and it seems like yesterday for some of us who are old enough to remember the headlines when the world's first test tube baby, Louise Brown was born by caesarean at Oldham District and General Hospital on the 25 July 1978. Following the birth of Louise, the floodgates were opened and within 12 months the revolutionary work of Dr Richard Levin in 1979 who was the first person in the world to legalise surrogacy in North America hit the headlines. The possibilities that are offered to us by new technologies are endless, but we need to be proactive and take responsibility for directing and steering the profession to engage in planning for the needs of the new high tech consumer who is at home with technology in every aspect of their working, social and professional life.

I strongly believe midwives can make a difference to the way in which new technologies are developed, applied and adopted in practice. Safe and effective care is a priority for every midwife and human factors and ergonomic tools, methods, concepts and theories are being used to design, test and improve our healthcare systems with signs of innovation and early adoption (Carayon, 2010). The electronic patient record is at our fingertips, the electronic switchcard is virtually in the post and the mobile phone downloads for instantaneous applications to support breastfeeding, antenatal education and labour and birth are already in the clouds waiting for us to dial up, download and pay up. The revolution is already history!

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Research ethics: issues for midwives

Key words: Technology, childbirth, doctoral midwifery research society, evidence-based midwifery

The four main principles of research ethics for midwives are the same as for any researcher who has contact with human beings; respect for autonomy, beneficence, non-maleficence and justice. These ethical principles therefore challenge all researchers to consider the risk of harm to the person(s) involved in their research endeavour and to do all in their power to reduce or minimise that risk. However, from a realist perspective, when carrying out research that involves human beings, achieving 'zero risk' is recognised as impossible; human subjects research by its very nature can be 'sensitive' and leave individuals prone to variation in their perception of the benefits, threats and all that lies in between in this continuum of participation. The key principles of ethical research must therefore always be imposed on the researcher that is the students, supervisors and sponsors must be accountable for ensuring that all logical and auditable steps have been taken to demonstrate that their research is ethical, rigorous and commensurate with good clinical practice. In relation to midwifery research, the midwife researcher must act appropriately and within the sphere of her role as a registrant practitioner, to protect the rights of the individual woman, do her no harm, obtain informed consent, respect her individual autonomy and be an agent of professional, legal and moral justice.

While research ethics is today an accepted part of the research process, historically, it is important to note that it was the inhumane experimentation on Jewish prisoners in Nazi concentration camps that led to the need for a recognised ethical code. Development and universality of the ten key principles of ethics is therefore underpinned by the Nuremberg Code (1948); stating that all subsequent research involving human beings must have their voluntary consent and the benefits of the research must outweigh any potential for harm. It was almost 20 years before the World Medical Association (1964) produced a declaration guidance statement that focused on the appropriate conduct of clinical research; known as the *Declaration of Helsinki*, the statement has now been revised four times, with the most recent revision occurring in 1996. The key messages of the statement are presented under three broad categories: basic principles (12 statements), medical research combined with professional care: clinical research (six statements) and non-therapeutic biomedical research involving human subjects: non-clinical biomedical research (four statements). These core elements have consistently reiterated to researchers, the good ethical and clinical practice of autonomy, informed consent, beneficence, non-maleficence, justice and more recently, appropriate independent critical appraisal of the research by appointed committee members.

It is therefore not surprising that the main principles of ethics should be at the heart of every researcher's work and every research ethics committee whose role it is to appraise the submissions before them. As the challenges of research meets the required ethical principles autonomy, beneficence, non-maleficence and justice, the papers selected for this special themed edition of *Evidence Based Midwifery*, clearly

demonstrate the importance of careful and guided application by midwifery researchers.

The first paper, by Ryan et al (2011), is a very subtle presentation of the ethical issues and conflicts experienced by five different researchers consciously considering whether or not they were wearing their professional code of conduct hat or their clinical researcher hat; the associated consequences, dilemmas and issues surrounding this challenge is debated and discussed.

The paper by Herron et al (2011) is extremely relevant to researchers' conducting online research and challenges them to explore their professional and academic beliefs about whether or not informed consent is required for this type of research.

The third paper, by Rees (2011), provides an illustration of the problems associated with an 'outsider' to the profession (social worker) conducting sensitive research. Discussing issues such as methodology, professionalism, anonymity, confidentiality and legal issues. Ledward (2011) focuses on the deeper philosophical issues associated with seeking informed maternal consent, respect for maternal autonomy and the role and rights of the fetus.

The final paper, by Anderson (2011), offers educators conducting student research, advice on how to tip the balance from being one of potential vulnerability for the students, to becoming one in which there is a balance of power between the researcher and participants.

In concluding this special edition it is important to remind ourselves that our knowledge of healthcare ethics must be established on research evidence. As a profession we need to collate this evidence for future syntheses so that we can collectively, rationally and sensitively guide our midwifery research strategists and ethicists of the future.

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Occularcentrism and the need to 'see' the evidence of impact

Key words: Occularcentrism, CTG machine, research impact, REF 2014 and evidence-based midwifery

We live in a modern world in which seeing is believing and we only believe what we can see. This phenomenon is known as occularcentrism (Jenks, 1995) and it is pervasive, silent and infiltrative. Our modern society values and promotes science and technology, evidenced in the value we place on the visual image or cinematics over and above the phonetics of annunciation that comes to us from the 'word'. This fascination with and dedication to research that provides us with pictures of uterine life is irreversible and we cannot fail to see evidence of it in our everyday practice where women want to see their unborn baby. Midwives eagerly develop their ultrasound scanning skills and families are willing to pay up to £450 for high definition 4D scans. This need for health professionals to display data on screen for others to see is irrefutably commonplace and accepted as standard practice leading to the visual healthcare industry growing exponentially.

I have been observing the slow but steady progress of occularcentrism in midwifery practice since I first started studying for my PhD in 1994. It was at this time that I first became aware of the dilemmas associated with the difference between the pinard, sonicaid and the cardiotocograph (CTG) machine and in my search to make sense of the promotion, desirability and trust in all things 'high-tech' I noted in my field diary: 'The pinard provided audible evidence but it could only be heard by one person, the sonicaid provided audible evidence and this could be heard by all present but it was time bound and could not be reviewed or "seen" by others. However, the CTG could provide audible and visible evidence and this was accessible and retrievable'.

This was my first introduction to occularcentric power in action and it has to be acknowledged as being integral to the overarching acceptability and continued use of CTG machines by clinical midwives in spite of policies and guidelines for limited usage. The CTG provides us with the evidence that counts for us, for women and for lawyers. Modernity with its rationalism and universality assumes 'visible evidence' is basic and integral to quality service delivery and this particular machine with its unique combination of philosophy, science, art and technology makes it a highly desirable product that rests comfortably with our technologically sophisticated youth of today. The hidden lifeworld of the fetus can now be seen through the visual display properties of the CTG machine. Very soon, we will have a machine that provides visual data of the birthing journey as the baby navigates the mother's pelvis and birth canal into the world (Awan et al, 2009).

This desire to see is changing the landscape of clinical midwifery research and research in general. Evidence-based practice is leading us to demand and expect an 'evidence base for everything' and this requires visual, searchable, demonstrable data to prove benefits and

impacts. Research funders have every right to expect to 'see' the evidence of their investment in us as researchers and with the new research assessment exercise known as the Research Excellence Framework (REF, 2014) we need to be prepared to capture the visible evidence of impact on practice.

Seeing the benefits of research demonstrated in impact measures is highly valued, but data collection has been problematic. Translating research from the field or laboratory to the clinical or public setting requires concerted effort by researchers, clinicians, funders and policy-makers and we know it takes 15 to 17 years for the time lag between research expenditure and eventual health gains to be realised and more importantly 'visualised'. The evidence for this statement comes from a recent and highly innovative report produced by the Health Economics Research Group et al (2008) after an economic evaluation was commissioned by the Academy of Medical Sciences, the Medical Research Council and the Wellcome Trust. This report has major implications for healthcare in the UK, including midwifery, as this is the first time we have been able to 'see' the health gains from investment of public and charitable funds in research. The evaluators devised a methodology for estimating the value of this investment, and in their summary, they translate this effect into a meaningful equation: 'The health and GDP [gross domestic product] gains derived from UK public and charitable investment in cardiovascular disease research (over the period 1975 – 1992) is equivalent to an annual rate of return of around 39% (37% for mental health research).' They translate this further by stating the benefits as '30% in direct GDP and 9% indirectly via health gains (Health Economics Research Group et al, 2008: 2). The importance of this report is yet to be realised and it will take years before we have further evidence of impacts in health gains for midwifery, obstetrics and women's health. The REF 2014 may assist in reducing the time it takes for research to demonstrate impact as it measures 'outputs, impact and environment' with respective weightings of 65% for outputs, 20% for impact* and 15% for environment. Impact has been defined by Higher Education Funding Council for England (HEFCE) (2011) as any identifiable benefit to or positive influence on the economy, society, public policy or services, culture, the environment or quality of life.

The REF 2014 guidance section on 'impact' clearly asks institutions for a precise, 500-word, description (case study) of the visible evidence of the specific benefit or impact from the research.

Three specific types of information are required and the following guidance is provided:

One: detailed description and specific evidence of actual benefit or impact including:

* from the REF 2010 pilot exercise

- An explanation of the nature of the impact in terms of its reach and significance
- Details of when the impact occurred and
- Evidence of the above including appropriate indicators

Two: explain how the unit's research activity contributed to the impact:

- An outline of what the underpinning research was, when this was undertaken and by whom
- How the research influenced or contributed to the impact
- Any efforts made by the institution to exploit or apply the research to secure the impact
- Acknowledgement of any other significant factors or contributions to the impact.

Three: provide references to:

- Key research outputs that underpin the impact- and states how the research was peer reviewed
- External sources that could corroborate the information provided

Impact must be visibly measurable and HEFCE are 'convinced that the value of research must be sold to funders and impact is the way to accomplish this.' The indicators for measuring impact in REF 2014 have been identified as follows:

- Creating new businesses, improving the performance of existing businesses, or commercialising new products or processes
- Attracting R&D investment from global business
- Better informed public policy-making or improved public services
- Improved patient care or health outcomes
- Progress towards sustainable development, including environmental sustainability
- Cultural enrichment, including improved public engagement with science and research
- Improved social welfare, social cohesion or national security.

In March 2011, HEFCE produced an information document entitled *Decisions on assessing research impact* (REF 01: 2011). Under 'attribution and timeframe', it stated:

A To be credited for an impact, the submitting unit must *show* [my emphasis] that it undertook research that made a distinctive contribution to achieving the claimed impact or benefit, that meets standards of excellence that are competitive with international comparators. The submitting unit need not have undertaken all of the contributing research, or have been involved in exploiting the research

B The timeframe for the underpinning research will be up to 15 years between the publication of at least some research output(s) that made a distinctive contribution to the impact, and the start of the assessment period (January, 2008). This timeframe may be extended by a further five years for some UOAs, if the sub-panel makes an exceptional case for doing so (HEFCE, 2011: 1).

The REF 2014 is designed to 'inform the selective allocation of quality-related research (QR) funding to higher education institutes from 2015-16 on the basis of excellence and provide:

- Benchmarking information and reputational yardsticks.
- Accountability for public investment in research and demonstrate its benefits.'

The challenge facing the midwifery research community is to fully grasp the meaning of what counts as evidence and this is becoming more complex as the different value systems compete for representation. The inclusion and exclusion criteria for what counts as evidence requires consideration of the value we attribute to different types of knowledge, for example, knowledge from ethicists, philosophers, scientists, theologians, policy-makers and health economists. I would strongly argue that we will lean towards high visibility evidence. However, the problem with evidence comes from the process of knowledge development and its acceptance by the community to which it belongs. From an epistemological perspective, the basis of knowledge is a justified true belief that is shared by the rest of the community. According to philosopher AJ Ayer (1956), for knowledge to exist in real terms, there must first be a conviction that something is factually correct prior to/irrespective of any proofs or evidence to support it; secondly, this must be tested and proven to be true irrespective of our beliefs or justifications; and, thirdly, it is only after testing from empirical research or logical reasoning that we really come to know the truth. Theoretically speaking, modern midwives have a problem with accepting what they cannot see and those who have 'faith' to believe what they cannot see and actively facilitate the growth of the intuitive senses will be severely challenged in an occularcentric midwifery world.

In conclusion, regardless of whether I succumb to this position or theoretical stance, our future midwifery research endeavours must produce demonstrable, visible, verifiable, relevant, accessible evidence of impacts because we live and work in a midwifery world that must see to believe and believes only that which it sees – the modern world is very much a seen phenomenon (Jenks, 1995: 12).

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Achieving optimal birth using salutogenesis in routine antenatal education

Key words: Theory for midwifery practice, salutogenesis, antenatal education, evidence-based midwifery

Midwife researchers face a challenge to reclaim and revolutionise UK antenatal education programmes as a catalyst to achieving optimal birth. We propose that a radical reform of such education using salutogenic theory will provide the necessary shift of focus from the prevailing and negative forces associated with avoiding risk to that of a more positivistic and optimal health promoting experience for women. Salutogenesis offers midwives an opportunity to positively influence public health by empowering women to confidently take control of their birthing and mothering experiences.

The opportunity to build women's confidence and influence their expectations for optimal birth and breastfeeding during the antenatal period remains the privilege and responsibility of the midwife. However, in order for midwives to make antenatal education the driver that it should be, midwives need to systematically apply theory to practice. The theory of salutogenesis offers us a conceptual way of thinking about how we can influence women to make it their goal to move towards health and wellbeing rather than avoiding 'dis-ease'.

Salutogenesis, according to Antonovsky (1996), is related to the extent to which a person has a belief in their ability to move towards greater health, by using the resources and thinking available to them. However, the theory recognises that stressors and unexpected life events such as obstetrical emergencies happen, but it is the person's salutogenic response termed as a sense of coherence (SOC) that empowers them to continue moving towards optimal health. When people experience a SOC, Antonovsky proposed that they would:

- Wish to and be motivated towards coping (meaningfulness)
- Believe that the challenge is understood (comprehensibility)
- Believe that the resources to cope are available to them (manageability) (Antonovsky, 1996).

Of course not all pregnant women enjoy the same 'low-risk' starting point; often a pathogenic focus related to the bio-medical model of care is called for. It should however be pointed out that Antonovsky (1996), although emphasising the positive outcomes of a salutogenic approach to personal and optimal health, was not outright in his disregard for the pathogenic paradigm. Instead he stated that pathogenic orientation also had a powerful role to play in obtaining health; however, he proposed that rather than risk management and the avoidance of ill-health taking centre stage, the health professional routinely approach the provision of health care by asking: "How can I facilitate this person in moving towards greater health?"

The 'practicalities' associated with moving all women towards an improved experience of health within a high-quality maternity service is not without its challenges for midwives and their obstetric colleagues (RCOG, 2011). Routinely empowering women through the creation of a strong SOC (whatever their starting point) requires that all health professionals understand and manage the interactive complexity of the cognitive, motivational and behavioural dynamics of women's experience of pregnancy and birth.

Historically the interaction between the goals people set (cognitive), their drive to achieve their goals (motivation) and their experience (behaviour) is multi-factorial in nature (Stockdale et al, 2008; 2011). In theory, a woman might form a personal goal to experience a 'natural' birth without pain relief (cognitive input), however, her lack of confidence in her ability to achieve this goal (motivational input) influences her behaviour and she requests pharmacological pain relief as an additional means of coping with labour (behavioural input). Unfortunately, the woman interprets the meaning of the experience as 'feedback of failure to achieve her original goal of a natural birth'. As a result of this perceived 'moving away' from her natural birth goal, her confidence in her ability to take control of her birthing experience decreases further and she finds coping with birth more challenging and distressing.

This hypothetical cameo of what might occur as a result of the interaction between cognition, motivation and behaviour, is important because it illustrates how women might think about, plan and experience their birth. Furthermore, it also demonstrates how important it is for midwives to learn how to positively influence women's motivational, cognitive and behavioural processing of their experience.

Midwifery researchers have a responsibility to make their research relevant to practice and, in doing so, they must strive towards providing practitioners with theoretically and systematically designed salutogenic interventions that have been tried and tested. Personal research experience has taught us that when researchers engage with this theoretical and systematic process with their midwifery colleagues, they can empower women to develop a salutogenic orientation towards their experiences (Stockdale et al, 2011a; 2011b).

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A snapshot of African research presented at the ICM 29th Triennial Congress 2011, Durban, South Africa

Key words: African midwifery research, HIV/AIDS, pasteurisation of breastmilk, caring in midwifery, postnatal care, preceptorship, evidence-based midwifery

'Increasing women's access to quality midwifery services has become a focus of global efforts to realise the right of every woman to the best possible health care during pregnancy and childbirth.' This is the opening statement of *The state of the world's midwifery* report's executive summary (UNFPA, 2011), which was launched at this year's ICM congress in Durban. And with a global emphasis, this edition of *EBM* highlights the challenges facing our midwifery colleagues in Africa.

HIV/AIDS is one of the major public health issues facing the African population. The first paper by Minnie et al (2011) explores the factors influencing counselling for HIV testing of pregnant women using qualitative approaches and interviewing lay counsellors who provide the service. Although the voices of the women are not presented, the information provided is highly relevant to the local population in South Africa where the study was undertaken. Furthermore, the research is supported by a recent document from the World Health Organization (WHO) *The global health sector strategy on HIV/AIDS 2011-2015* and in particular, the section on *Strategic direction 1: optimize HIV prevention, diagnosis, treatment and care outcomes* where it clearly states the importance of counselling services provision and a commitment to tackling the issue of HIV/AIDS through: '...promoting provider-initiated HIV testing and counselling, re-testing, and counselling of couples in antenatal, maternal, newborn and child health services' (WHO, 2011: 11). The WHO have also committed to supporting the generation of evidence related to gender-based health inequities and barriers to accessing services and will 'include women (including women living with HIV) and community carers in developing policies and normative guidance aimed at ensuring that HIV services meet the needs of women' (WHO, 2011: 28). This strategic WHO (2011) document strengthens and adds to the recommendations posed by Minnie et al (2011).

On a related issue, the second paper by ten Ham et al (2011) focuses on the pasteurisation of breastmilk as a potential method of inactivating HI type 1 virus in the home. The paper is a systematic review and compares the evidence on two methods of pasteurisation: flash-heating and pretoria. The evidence demonstrates the effectiveness of both treatments in eliminating the HI virus, but nutritional and protective safety could not be confirmed. However, it is the potential for a major reduction in the transmission of HI virus from breastmilk to infants that cannot be under-estimated and the recommendations for education and training of both midwives and mothers to access new evidence for safe and effective practice are also supported by the WHO (2011) strategy.

The third paper by Chokwe et al (2011) is a rather disturbing description of 'uncaring' and 'caring' practice as observed by student midwives when they reflect on their clinical placements. The paper is qualitative with a large sample size of 76 learners and portrays very poor practices where midwives demonstrate

cruelty to mothers. The most positive message from this revealing paper is that the learners knew the behaviours displayed were uncaring. The challenge for educators is to ensure the learners become model 'carers' for the future and there is a strong message for the South African Nursing Council to tackle this unacceptable behaviour by qualified practitioners.

The fourth paper by Sakala et al (2011) is a descriptive study using a convenience sample of 154 mothers attending the under-five clinics with infants aged between eight and 12 weeks old for postnatal care in Malawi. The aim of the study was to identify the factors influencing the utilisation of the postnatal services provided. However, the sample was limited to those who actually attended and the 100% response rate from this group was unusual and would require some further exploration to rule out perceptions of coercion. The major finding from the study was the role of the midwife in providing advice to women with regard to the importance of attending postnatal services and implications for supervisors of midwives to ensure that a more robust postnatal appointment service was operationalised.

The final study by Dennis-Antwi (2011) is a qualitative study exploring the important issue of preceptorship in Ethiopia, Ghana, Uganda and Zambia with a sample of 100 participants. The main approaches were interviews and focus groups and the sample included midwifery tutors, preceptors, midwives and key stakeholders from the maternity services. The main outcomes indicated that while all of the countries knew the value of preceptorship and wished to provide the requisite training and support, the current systems were failing to do so. The current environments did not reach an adequate standard for optimal support of newly qualified midwives and this has major implications for future education programmes and service delivery. The major threat identified was the potential for poor post-registration support (preceptorship) to undermine the WHO (2011) efforts to reduce maternal and infant mortality due to 'limited practical skills and poor attitudes to care'.

In conclusion, this special edition of *EBM* highlights some of the issues that midwives in Africa are researching and it provides an illuminative picture of the challenges facing the WHO, women, practitioners, educators and researchers.

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Artistic approaches to data collection: illustrations and collage

Key words: Artistic expression, childbirth art, collage, illustrations, evidence-based midwifery

In October 2011, archaeologists in Italy discovered fragments of ceramic pots. The excitement of the find was heightened as the world learned of the two small pictures depicting a woman giving birth. The illustrations are likely to be over 2600 years old and as such would be the earliest known artistic representation of the birthing process in Western Europe (Discovery News, 2011). Researchers from a wide range of backgrounds are already actively engaged in data analyses with expert anthropologists, archaeologists, historians, technologists and artists working collaboratively to determine its meaning for our postmodern culture. This phenomenon is a perfect example of how illustrative, artistic data can be used as evidence for historical research purposes and it is another example of occularcentrism, as previously discussed in the June editorial (Sinclair, 2011).

The sheer fact that this particular image of a mother with her long ponytail birthing the head and shoulders of her infant is highly symbolic of the culture of the people at that time. When I looked at the picture, I was struck by the graphical illustration of the woman, alone, upright and in the squatting position. The artist valued this birth and that is evident in the detailed portrayal. Having studied fine art, it is not possible to 'see' with the fetters on and as I kept looking at the image I was transfixed with a sense of the power of creativity and timeless spirituality surrounding the act of birth. This simple line drawing conveys birthing power and energy. It has withstood destructive elements and the corrosion of time and the image does not change its form, but the interpretation is fluid and will be heavily influenced by the philosophy, politics and culture of our time. The origins and history of art enrich our lives and it is important to remind ourselves that art is the earliest form of communication known to us and, as such, is priceless. Symbolism and spirituality were major concepts depicted in the visual world of early times and artists are renowned for their endeavours to depict the deeper meaning of life and this can make us feel very uncomfortable. For example, the same portrayal of the power of birth could arguably be evidenced in modern times by referral to the recent birth of baby boy in 2011 at the Microscope Art Gallery in New York. His mother, Marni Kotak, an arts performer, gave birth with the help of a midwife as part of an art installation and live exhibition. This artistic expression was designed to demonstrate that human life was and is a profound work of art (Canning, 2011). However, this particular use of art may be too abstract and philosophical for many of us to comprehend and therefore it is important to focus on the use of visual communications at a more grounded level.

The methodological home for artistic approaches is ethnography where using symbols, drawings and multimedia are part of the process. Applied and creative use of artistic techniques offers a different form of knowledge and a different way of seeing and knowing. Approaches include the use of photographs, drawings, collage, cartoons, pictures, music, poetry, storytelling, role play and using diaries. Midwives are learning to use artistic approaches to enrich research data

collection in situations where words are not enough and sometimes it is too painful to talk. In other instances, language is not used because of the sensitivities, translation issues or speech impediments of the participants and these issues offer a strong rationale for the use of creative methods. I have personal experience of using artistic approaches to collect data over the past 15 years; mainly illustrations and collage although poetry is beginning to emerge. The research studies have been focused on exploring women's birth memories and perceptions of normal and technological birth (Sinclair, 1999). My doctoral students have used video, multimedia, graphical illustrations and poetry. However, collage and illustrations have been most popular and this is understandable. The main attractiveness of collage is the rapid building of the image and the fluidity of materials while the use of illustrations seems to be more popular with those who have some confidence in their drawing ability.

Key principles for the researcher include clearly articulating the rationale for artistic/creative approaches and how they are the most appropriate medium for collecting data to answer specific research questions. In addition, data analyses must be carefully planned and, if necessary, supplementation by interpretative interview, focus group or online discussion. Based on previous research, asking women to remember their birth experience and to let their mind form pictures requires considerable planning and extensive pilot work to ensure person-centeredness. Strategies for confidence building and practical use of the tools of the trade – such as paint, pencils, oils, camera, video – need to be incorporated into the project planning, if participants are to engage meaningfully. One of the most important factors to bear in mind when using creative approaches is to ensure clarity of understanding with regard to the fact that artistic ability is not required.

In conclusion, artistic approaches in the form of illustrations and collage are being used in midwifery research, but one of the most profound differences is the fact that the researcher using creative methods needs to learn to listen visually and this will require training, support and practice.

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Appropriateness of technology interventions in maternity systems

Key words: Birth technology, occularcentrism, decision-making and evidence-based midwifery

When we want to know about the safe and effective use of a medication, we can choose to find information from sources such as the British National Formulary, the Food and Drug Administration or the Medicines and Healthcare Products Regulatory Agency but we do not have the same level of immediate access to evidence for the safe and effective use of other, common or routinely used, birth technologies. I would strongly argue that this situation must change and, as the market becomes flooded with newer and more sophisticated technologies, we need a much more robust and transparent mechanism to aid us in our everyday decision-making. For example, on 7 May 2012, I was fascinated to read about new research emanating from Erasmus MC, *Embryos floating in i-space*, and the application of new 3D hologram technology that enables scientists to see the minutest aspects of early fetal development. For me, this is another example of our need to see what is hidden and the power of technology to show us what we cannot see with our human eye (occularcentrism driving us towards the development of newer and more powerful visual technologies).

There is no European guidance on the minimum or maximum application of technology to the 'normal' or 'higher-risk' pregnancy, and no agreed classification of the technologies currently available. It is over 25 years since the consensus conference on the appropriate use of technology by the WHO in 1985, from which targets for caesarean birth rates (10 to 15%) emerged. Today, modern women who are pregnant use Twitter, Facebook, smartphones, pregnancy apps, google analytics and online support systems, such as Netmums, to manage pregnancy, prepare for birth and adjust to motherhood. When they enter the health service, they are subject to a wide range of overt and covert birth technologies that are applied routinely. In the antenatal period, these include drawing blood for a range of purposes, electronic record-keeping, anomaly scans and fetal monitoring. In the intrapartum period, even births that are termed 'normal' are supported by a range of 'invisible technologies' from simple administration procedures to techniques and pharmacological interventions to aid effective pain relief in labour.

Defining and classifying the technological applications available is a complex process. Sinclair (2010) offered a crude classification of 'low technology' mechanical devices, such as the pinard stethoscope for fetal monitoring, that demand skill and expertise in interpretation, and high technology devices characterised by their electronic or artificial intelligence, such as the cardiocograph machine and dinomapp classified as monitoring devices and the IVAC and Graseby devices classified as intervention controlling devices.

The majority of women who give birth in Europe follow a similar antenatal care pathway involving the use of technology for pregnancy confirmation, pregnancy

monitoring, fetal surveillance and labour management. The recent EUROCAT (2010) *Special report: prenatal screening policies in Europe 2010* demonstrates the wide variation in policy, practice, legal standing and availability of a range of technologies for fetal screening, including the use of ultrasound, biochemical analyses, triple tests and abortion. However, there is no discernible distinction between 'low-risk' and 'high risk' women. More invasive and/or prolonged technological procedures and devices are used for women deemed 'higher risk' due to chronic conditions, such as epilepsy or diabetes. In many countries, such women are subject to intensive monitoring leading to a 'domino effect' that's more likely to end in higher risk of caesarean section and instrumental birth.

Women in the higher risk categories are more likely to have an increased risk of carrying a fetus with an anomaly and face the abortion decision. European data for 2006 to 2010 (EUROCAT, 2010) demonstrates the detection of 92,702 anomalies in utero of which termination of pregnancy for fetal anomaly (TOPFA) was carried out on 15,670 (rate of 16.9%). However, newer technological procedures offer the option of fetal surgery for babies who have a wide range of conditions such as cleft lip and palate, spina bifida and heart defects such as ventricular septal defect and patent ductus arteriosus. These techniques are becoming more successful, but they remain complex and expensive, and they are not always available. The US pioneered fetal surgery but Europe is developing its own body of expertise and several randomised controlled trials have taken place. The potential for technology to reduce the impact of birth defects is one area that requires careful evaluation. However, technology acceptance requires multi-faceted approaches to produce the right type of evidence and collective consciousness to interpret and transfer the meaning into everyday life. For example, the growing problem facing the population of women who conceive while on prescribed lifelong medication is what range and level of birth technology 'needs to be made available for whom' and 'in what circumstances'.

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What do we hope to achieve through doctoral midwifery research education?

Key words: Doctoral midwifery research, education, aim of doctoral research, training, philosophy, evidence-based midwifery

At the recent launch of our English branch of the Doctoral Midwifery Research Society in partnership with the RCM, I shared some thoughts with the membership about the discussions surrounding the future of doctoral research education and made reference to the salutary thought of prescribed research in a future where the world statistics on doctorally prepared researchers begin to emerge. With this global data comes a picture demonstrating huge variation in what actually constitutes a PhD or, in some settings, a taught doctorate. The take-home message for us is to be ready for change and be ready for the challenge to state what we as midwives consider doctoral education or doctoral training ought to be: is doctoral training education that is enlightening, creative, develops a knowledgeable thinker and values intuitiveness or is it a narrow prescription of a person who is trained to conform and be competent in a pre-defined skill set in applying set rules and regulations from a position of philosophical detachment? It seems like doctoral education has evolved to become more of the doctoral research training and less of the knowledgeable and intuitive thinker. Moving our discussion beyond that of semantics, we must perceive the value and purpose of research education as that which has immense implications for the future of midwifery research.

The very way that we talk about PhDs can distinguish between education that is 'fit for purpose' and education that is inherently good, challenging and of intrinsic value to the person doing the research and society. 'Fit for purpose' is the common phrase used by many to describe the expectation that modern research will yield valuable data for public health research and many midwifery research leaders will steer students to undertake research that has been identified and targeted as important by policy-makers and strategists. The purpose is to fulfil a need and that may be institutional, societal and even personal or a combination. However stated, the aim of this type of education is to produce in the person a specified set of skills like we see in our taught doctorate programmes where the achievement of specified goals are stated, and the accumulation of credits to reach the stated level is the goal of the student and the institution. This approach will naturally lead to a cadre of trained doctoral midwives who have a pre-specified skill set and who are fit for clinical or public research. Is this the aim of midwifery research at doctoral level... to train instead of educate? Can and should we be satisfied with training only?

The natural continuation of training is indeed a comfort zone for many midwives whose experience has been the regimented and prescribed training, fit for a specific purpose and a journey, in which extrinsic needs of the organisation are paramount. In addition, if one undertakes doctoral 'training' as opposed to doctoral 'education' and applies for a specific or advertised doctorate, the parameters are already in place and the person is only challenged to follow the prescribed

path to completion. From this perspective, one could argue that it is possible not to have any real philosophical skills in conceptualisation and the plain hard work of growing an idea from concept to reality.

For those who take this path, the glory of the title 'Dr' may become a burden, as the expectations about the abilities of the student to write proposals from scratch may be an insurmountable obstacle. Another perspective worth thinking about is the collection of academic credits from completed doctoral education modules in taught courses and the accumulation of fragments of programmes pre-determined by those in authority as being key to the award of the doctorate. These credit-bearing modules are often compulsory, leaving little time in the academic training programme for the actual act of researching and none for theory generation, exploration and testing. This is a common problem in taught doctorates and has led to the rather cruel, but possibly true, iteration that the taught doctorate research experience is a 'glorified masters'. We need to stop and really think about this as the future of our midwifery research education requires some philosophic discussion on what the aim of doctoral research education ought to be. I would strongly argue that this discussion considers research from inception at undergraduate level to post-doctoral level and we decide on the best way to maximise the research potential of our midwives for the future.

Let us work together to consider this issue in more depth. If we believe the aim of our doctoral research education is primarily the preparation of midwives to become contributors to the public health research agenda, answering questions that are pre-determined by the good and great; is that not very different to the intrinsic value of focusing on becoming excellent researchers with minds that are free to think without the fetters of forced application and outputs that are visible and measurable? You may believe we need to do whatever is prescribed by government, as this is where the funding will come from, but be wary of the 'economy-centred' path that will rob you of your research passion and make you fit a neat box. Others may hold fast to the argument that research ought to be both self-fulfilling and morally valuable to the society in which we live. As educators, should we not lead the philosophic arguments about the very purpose of education and research and differentiate between the different models and theories of both? As a professional midwife and a researcher, I believe we ought to be able to lead midwifery researchers to become theorists and philosophers and refute the plans to develop the universal doctorally prepared person who will take his or her place in the global army of research conformists.

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Pregnancy: the battle against hidden harm from chemicals, viruses, bacteria, pollutants and chips

Key words: Research, chemicals, awareness, pregnancy, evidence-based midwifery

The modern mother needs to be wearing internal and external armour to battle the hidden enemy, and the modern midwife needs to provide the right types of weaponry to prepare women for their pregnancy journey. Every day we read news reports, research papers and alerts that identify the harm to the mother and baby from ingested chemicals. Some are prescribed and we refer to them as 'medications' and others are consumed for recreational purposes and we refer to them as 'drugs'. There is a vast difference between compliance with prescribed medication for life-threatening conditions, such as cardiac anomalies, diabetes and asthma, and recreational drugs, such as marijuana, cocaine, ecstasy and ketamine.

The known enemies are alcohol and cigarettes. Another hidden harm is the potentially unknown effects of non-ionising radiation emissions from computers, mobile phones and other household items, such as microwaves, alarms, electric doors, electric blankets and televisions. But it will take data from case-controlled studies to give us the necessary evidence and that will take years.

Pregnant women need to know where to go to if they need information about the safety of using products, such as deet found in flea sprays and insecticides. Threats from the so-called 'fresh air' include viruses and bacteria and we advise women to become vaccinated.

The battle against infection is probably the most dangerous of all and has a mortality ticket for both mother and baby, as we have observed in the past two years with the number of mothers who have died from H1N1. It is understandable that the DH issued new advice for pregnant women encouraging them to take the pertussis vaccine as the number of new cases reported in 2011/2012 was approximately 5000 (DH, 2012).

What we need to learn from these events is that infection is a major threat and we need to be constantly alert. Our attention has just been focused on the harm from 'chips and crisps'. Unbelievable. I am sure some of you are asking yourselves, 'Whatever next?' However, this research warrants serious consideration. It was the result of robust research evidence demonstrating a smaller head circumference for babies whose mothers ingested the chemical acrylamide, found in starchy foods heated to very high temperatures. The research involved 20 sites with 14,000 participants across Europe. The UK arm took place in Bradford and 186 mothers participated. The data from mothers about food consumption was based on self-report using the Food Frequency Questionnaire, but one of the major scientific measures in the study was cord blood analysis to detect the levels of acrylamide (Pedersen, 2012).

The potential for harm to the infant was alarming and linked to longer-term outcomes impacting on neurological

and psychological development. The UK cohort of infants had significantly higher levels of the drug in their cord bloods and dietary patterns indicated higher consumption of chips and crisps. So we advise pregnant women to cut down on these foods. This new evidence is likely to be adopted by us, because it fits well with the key behavioural change messages around prevention of obesity in pregnancy.

Now I want to touch on an even more sensitive subject: 'breastfeeding' and harm from dioxins emanating from man-made products such as PVC and bleached chlorinated paper and microwave plastics. These polychlorinated dibenzodioxins (PCDDs) or plastics, commonly referred to as dioxins, are transferred in breastmilk and accumulate over time and are known carcinogenics. The US Department of Health and Human Services Public Health Service Agency for Toxic Substances and Disease Registry (ATSDR, 2006) states animal studies have indicated that PVC is likely to increase the risk of cancer in infants and young children.

Some twenty years ago, Greenpeace campaigned about this harmful toxin being transferred in breastmilk and formula food. Dioxins accumulate in the body over time and can effect brain development. In 1998, the WHO reported that dioxin concentrations in breastmilk had reduced by 50% (WHO, 1998). The current mantra remains: 'Breast is best and the benefits outweigh the risks.' But it is important to note, there is no evidence to state there are no risks associated with breastfeeding. Weighing up the balance between harm and good is complex and midwives need to refer mothers to the website Otis for advice about fear of birth defects (otispregnancy.org/files/deet.pdf). The battle against harm of one kind or another will always be with us and we need to be constantly vigilant.

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The 'z generation': digital mothers and their infants

The author would like to thank Maria Herron for inspiring her to theorise about the future of social media technologies in health care.

Key words: Birth technology, social media, mobile technology, evidence-based midwifery

My granddaughter is 20 months old and I am amazed at her ability to press the precise buttons on the iPhone to answer it. Of course, her language skills are crude, but the garbled words are definitely aimed at the picture of her father or mother that appears with the ringtone. Why am I writing about this in an editorial to my midwifery colleagues? We need to gear ourselves up and be ready to support the digital natives coming into our maternity services today and, more importantly, tomorrow. The new mothers preparing for birth are from a unique generation of technologically savvy citizens – 'generation z', born after 1995 and referred to as 'digital natives' (Howe and Strauss, 2000).

Technology permeates every aspect of modern life for the z generation and as soon as the pregnancy is confirmed, tweets herald the announcement to the global e-community. Pictures of the 3D scan posted on Facebook follow.

During pregnancy, mothers-to-be download apps for exercise monitoring and preparation for labour and birth. When labour begins, or if a caesarean birth is planned, the date and time are posted on the network(s) and, during labour, tweets, emails and texts keep everyone informed. When the midwife or doctor pronounces a statement of progress on the labour, this becomes a social media communication for global access.

Midwives and doctors need to be conscious of this as not only is there an opportunity for these conversations to be recorded on smartphones, they can be tweeted, texted or emailed immediately to the eagerly-awaiting family and followers. As midwives, it is vital for us to be conscious of the layers of technology now surrounding every aspect of our work and the social media technology that is there, but almost invisible. I would predict it is only a matter of time before the legal eagles call for the data generated through the social media communication network to be available for medico-legal cases.

Almost 30 years ago, I can remember the very first birthing video request by a doctor when I was assisting his wife, who was in labour with their first child. This event was indeed novel and it was the talk of the tea room for many days. Professional opinion was polarised into two camps: those who felt it was perfectly acceptable, and those who thought it was totally unacceptable; an intrusion into the private world of the birthing space. I was not asked to consent to being part of their everlasting memory of the event and was never privy to viewing the footage.

Today, I have the rights, and we have ethical and governance procedures, to ensure that consent is taken for every person caught on camera. However, less obvious technologies are a natural part of everyday life and we see how much mobile phone footage is used when disasters occur and people instantly switch on the camera that now comes as standard on nearly all mobile phones. Speed cameras,

surveillance cameras and now birthing room cameras.

Mobile phones are being increasingly used to access the internet, and recent data from Fox and Duggan (2012) reports 85% of adults in the US own a mobile phone, more than half of which are smartphones. Furthermore, 52% have searched for health-related information online and one in five smartphone owners have downloaded health apps. Our previous research (Lagan et al, 2011) provided important evidence to support perceptions of increased use of the internet for seeking health information by pregnant women. Data from the UK Office for National Statistics (2011) show that 46% of female internet users and 38% of males had used the internet in the three months prior to the survey in search of online health information. While global data indicate that almost a quarter of all females who have been online have searched for health information (Fox, 2011).

The acceptability of social media has had an enormous impact on our behaviour and you can switch on the television to observe this in action as you watch mothers and midwives showcase birth to the global audience. The modern woman does not seem to have any inhibitions about cameras recording her birth, as evidenced by the increasing number of programmes following birthing journeys.

The mobile is switched on in our birthing worlds, regardless of whether the birth is taking place in the home, midwife-led unit, obstetric labour ward or theatre. We need to be ready for this becoming the 'social norm and the professional status quo' and we need to train our new midwives and doctors to expect 'big brother to be watching'.

I believe that there is mounting evidence to support the global acceptance of social media platforms and online support systems. As such, maybe we need to look into strategic planning and the formation of guidelines to address the effective use of information communication technologies in practice, so that we can be ready for generation z?

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A rapid synopsis of the Caldicott 2013 information review

Key words: Research, information sharing, data access, evidence-based midwifery

Midwives seeking to do research that requires access to social, treatment, GP, diagnostic and birth outcome data using health and social services ICT systems will welcome the recommendations and principles set out in the recent *Caldicott review* (DH, 2013). There is a clear acknowledgment of the value of research to the NHS and public and the need to find robust ways of sharing social care data and medical data to support better research. The review is published one year after the NHS in England published its 10-year strategy, entitled: *The power of information: putting us all in control of the health and care information we need* (DH, 2012). The overall aim of the strategy is to ‘use information and technology to improve health, care and support – to improve the patient experience and quality of care by putting people first’.

It is important to note, the review comes shortly after the Administrative Data Taskforce published its report and recommendations in December 2012 (ADTF, 2012) for linking data between government departments across the four UK countries. Among their recommendations for a single UK data research network include a call for legislation to enact and facilitate research access to admin data and to permit linkage between departments, a single UK-wide researcher accreditation process, a strategy for public engagement and allocation of appropriate funds.

Several of these proposals appear to be incorporated into the *Caldicott review*, including a proposed model for information sharing, more consistency and clarity around information research governance, the establishment of safe havens, the addition of a seventh principle to the Caldicott six principles set out in 1997, patient consent and ethical and legal practices.

The review states that linkage between data sets for good reasons and in line with the Caldicott principles, access to data will be supported as part of a robust approach to making information for research purposes more available within a secure environment (DH, 2013). This access will increase the potential for researchers to undertake population-based observational research studies as data linkage is essential.

The review also offers new hope for researchers who wish to conduct studies without facing complex information governance review systems and processes that lack consistency and clarity of interpretation. Clear instructions about access to different types of NHS information are provided: data that identifies individuals and can only be collated with a clear legal foundation; data that is anonymised using the ICO’s anonymisation code and can be accessed and published freely.

However, there is reference to the problematic category of data known as the ‘grey area’ where data that has been coded or given pseudonyms for data protection can be linked to other data and in doing so can become identifiable. For midwives doing research using maternity care records

and seeking to link data on GP databases, prescription databases and diabetic database, for example, and seeking outcomes for known groups, these issues have indeed been problematic. The good news is that Dame Caldicott recommends the establishment of ‘accredited safe havens’ where data can be accessed in ‘specialist, well-governed, independently scrutinised environments’. This information centre will be provided under the Health and Social Care Act (2012) and guidance on consent to use personal confidential data that can legally be shared has become the remit of the Information Commissioning Group.

It was refreshing to note the panel had received information about what could be done to improve public awareness of the benefits of research, what it involves and the way in which health and social data are used to provide meaningful interpretations of risk factors and health outcomes.

Recommendation seven of the review states: ‘All organisations in the health and social care system should clearly explain to patients and the public how the personal information they collect could be used in de-identified form for research, audit public health and other purposes. All organisations must also make clear what rights the individual has open to them including any ability to actively dissent.’ The government is clearly working to integrate information systems to enable data integration, data access, data sharing and data safety. The establishment of the Health and Social Care Information Centre, where all NHS, public health and social care information in England will be kept, will become a major centre for research and will attract global interest.

It is important for the voice of midwife researchers and professional representatives to be at the government table when action plans for the online or cloud-based information centre and ‘safe havens’ are being drawn up.

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Occularcentrism and epigenetics: visioning the hardware and software of the human gene

Key words: Epigenetics, oxytocin, occularcentrism, birth technology, evidence-based midwifery

The ability to see the world is one of the most highly valued sensory gifts we possess. Our fascination with ‘seeing’ and the need for visioning what is hidden beneath the surface drive our occularcentric being towards more sophisticated technological advances (Sinclair, 2011). The drive to see what cannot be seen by the human eye alone is, without doubt, a relentless human endeavour. However, with regards to new technological advances, we can see them with the attitude of ‘the glass is half empty or half full’.

Midwives – in their manifold roles as practitioners, researchers, scientists, epidemiologists or others – need to be able to comfortably vision technological advances with a mindset that sees the critical value of the applied technology to their individual sphere of work. This is how we, as midwives, develop our understanding of the psychological, physiological, sociological, cultural and, more recently, the epigenetic processes of childbirth. The role of epigenetics in midwifery research has to be staked out, so that our contribution to knowledge development, theoretical understanding and the practical relevance can be made visible in this occularcentric world, where seeing is believing.

The structure of our genes (our hardware) never changes, but epigenetics (our software) is one way that genes are programmed to either increase or decrease gene expression; affecting our physiology and our behaviour. Some epigenetic programming is heritable from generation to generation, giving genes a software memory.

The state of the science is such that we have little data on whether childbirth is an epigenetic event or not. However, evidence from animal and human research suggests two sensitive periods surrounding birth that may epigenetically alter stress, metabolic and immune systems (Zhang et al, 2013). These two periods are during gestation (for example, the fetus exposed to high maternal stress) and early childhood (for example, offspring exposed to high adversity). For instance, pregnant women living through an extreme famine may epigenetically alter the programming of their offspring’s metabolics to prepare for famine-like conditions, by an increased risk of obesity for their sons in adulthood (Ravelli et al, 1976).

The EPIIC (Epigenetic Impact of Childbirth) is an international, interdisciplinary research collaboration, with expertise in fields including genetics and midwifery. In its recent publication, Dahlen et al (2013) hypothesised that events during the intrapartum period affect the epigenetic remodelling processes and subsequent health of the mother and offspring. They hypothesised that epigenetic mechanisms are at play in studies showing a relationship between mode of birth and increased risk later in life for metabolic or immune dysfunctions: obesity, type I diabetes, asthma, eczema and multiple sclerosis. If they are correct, then every aspect of interference with the normal physiology of birth

in a supportive environment needs to be examined in a new light. Questions about the impact of a technological birth compared to a physiological birth on the future programming of the baby need to be addressed in robust scientific studies.

A recent study suggested that an aspect of childbirth could be an epigenetic event by showing epigenetic differences in the oxytocin receptors of placental tissue in elective cesarean versus vaginal birth (Kim et al, 2013). Researchers in Ireland (Brennan et al, 2011) have been exploring gene expression patterns in mothers who have caesarean section for dystocia. The gene ontology analysis revealed 70 genes differentially expressed between the two groups of caesarean section mothers leading the authors to suggest ‘an underlying molecular basis for dystocia in first-time mothers in spontaneous labour’.

As new knowledge about pharmacological, environmental and epigenetic factors grow, public expectations for genetic profiling and personalised medicine will increase exponentially. Our role as midwives in this new world of opportunity is to engage with the scientists and clinicians and combine our knowledge about the human hardware and software to truly understand the impact of what we do in our childbirth practices that will enhance the quality of life for the newborn and mother.

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Looking through the research lens at the challenges facing midwives delivering evidence-informed antenatal education

Key words: Antenatal education, technological lens, woman focused lens, technology, midwife education, evidence-based midwifery

The 'Z' generation of new mothers and fathers are hungry for instant access to data that can be linked and mapped in seconds and arrive on their mobiles, with multi-media resources including video, blogs, YouTube links, Google alerts and online publications. The appetite for traditional, face-to-face antenatal education classes may be lost if we do not take action now and begin to prepare our student midwives and our midwife educators for this rapidly changing technological field.

Technology-based learning may have many advantages over a traditional educational setting, however, development of face-to-face education has a unique role to play. An expert teacher does not rely on transferring information to novice pupils, instead, as a highly skilled communicator, they have the ability to facilitate the learners in using the information to generate their own knowledge.

A teacher who can achieve this face-to-face has the power to emulate the educational experience that occurs online where the student is in control of their learning. This teacher will always teach with impact and will undoubtedly remain in post; he or she may become exceptional and may even be highly desirable and sought after.

I say this because I wholeheartedly believe we will always value the human touch, the personal contact and the interaction that guides us towards understanding knowledge for ourselves. For example, we all remember excellent teachers who brought joy to the antenatal classes and kept us totally enthralled as we absorbed their every word and thought about how we could apply their ideas.

Women and their partners today want that same expert teaching in their antenatal education sessions and not just online; a midwife educator who, as an expert, facilitates their personal learning and helps them discover what their options are and what is likely to work for them. I can still remember the breastfeeding antenatal class I attended in 1981 where the midwife advised us to toughen up our nipples in preparation for breastfeeding by wearing rough or coarse fabrics without a bra. You have to ask yourself where did this type of information come from and where was the evidence to support it? Of course there was no randomised controlled trial (RCT) or feasibility or cohort study to support the advice. The midwife was sharing her lived experience with us and we all believed what she had to say was valuable and highly relevant to our planning and preparation for our breastfeeding experience. There were no online tutorials on YouTube to show you how to breastfeed, or apps to help remind you which side you fed on last time. However, this teacher's approach was successful for many of us and you have to ask yourself why? Was it the skill of the educator and her ability to prepare us for a realistic breastfeeding experience or was it that she cared

for us and invested in our success? Maybe it was both.

It is important for our new midwives to value both evidence from the RCTs and what technology has to offer in the application of that evidence. However, midwives, as experts, must remember that true learning is what happens when we support women in their discovery of their different options, and facilitate them in exploring how those options might work for them. It is only when midwives as educators achieve this that real evidence-based practice can exist. Our thinking must remain free and we need to view all evidence-based education with the women we care for in mind. If we don't, we will stifle creativity, innovation and women will not find what works for them and in what circumstances.

This is where the internet has one up on face-to-face education; the internet does not see you or I in a particular social class, or with a particular skill set, or as a somebody or nobody. We are all simply 'users' of a service available and we all can generate our own knowledge from the different choices we are presented with. The internet is an amazing resource that connects, collects and stores our top tips and remains in the control of women, not midwives or researchers, who look with the research lens and dismiss that which is not supported by best evidence.

The challenge for midwives in the future, however, is to learn how to harness the power of the internet by being 'digitally ready' and 'face-to-face ready' in equal parts. Women need midwives who have achieved in both skill sets – who have equally developed their ability to teach and communicate through both human and technological interfaces. The midwife in the antenatal setting can be either virtual or real and the choice should be the woman's as to which midwife she interacts with and at what point in time. In fact, midwifery education ought to prepare midwives to be the conduit between the woman and the technology, so that the information exchange, information analysis and synthesis are, literally speaking, a natural streaming of information in human or electronic format.

I believe the norm for antenatal education of mothers and fathers in the future will be online and face-to-face, with mothers making the choice of connecting to education forums, drawing data from repositories, becoming members of communities of practice, using avatars and attending 'good old-fashioned face-to-face classes'.

The choice does not have to be technological or face-to-face, nor should it be. Choice should be blended to meet women's needs – needs that are met through an evidence-based, technological and midwife to women-centred lens.

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Midwives and the research integrity agenda

Key words: Research integrity, honest broker, truth telling, whistleblower, evidence-based midwifery

Welcome to the first edition of *EBM* in 2014 – the year the ICM Congress is held in Prague. A staggering 1360 abstracts from midwives in 85 countries were peer reviewed and over a 1000 papers selected for presentation (ICM, 2014). We are delighted that research is gaining an even higher profile within the profession and that midwifery researchers have an increasingly visible role. However, with this elevation comes increased accountability and the need for midwives to develop a research integrity code of practice, if we are to maintain public trust and confidence in a research world that is being torn apart by frequent exposure of plagiarism, lies and fraud.

The new ‘Retraction Watch’ publication data provides sober reading about the number of research papers that have been removed from prestigious journals because of data falsification or interpretation. Top science scandals for 2012 included biomedical researcher Eric Smart, who fabricated 10 years of data using laboratory mouse models that never existed; work that contributed to our scientific knowledge base on cardiac disease and diabetes; Annie Dookhan, a forensic chemist from Massachusetts, was exposed for fabricating records on samples she never processed, leading to possible wrongful imprisonment (Zielinska, 2012).

However, the record for retraction of scientific papers has been set by Japanese anaesthesiologist Yoshitaka Fujii, who pulled 172 papers after being exposed for fabrication of clinical research data, operating without ethical approval and claiming to have seen patients that he did not (Zielinska, 2012). Furthermore, the highly publicised work of Dong-Pyou Han (Iowa University funded by the US NIH for over \$19m) brought us a breakthrough vaccine for AIDS in 2012, but it was faked by spiking rabbit blood with human antibodies to create a false belief that the vaccine was creating the desired immune defence (Leys, 2014).

In 2010, the American Senate introduced the Whistle Blower’s Enhancement Protection Act. According to the Union of Concerned Scientists (2010), this was to protect researchers who found themselves either having to uphold their research integrity in order to protect the public (and consequently losing their job), or keeping quiet about issues of observed untruthfulness, fraud, abuse and illegality (sacrificing their integrity), in order to remain employed.

Although the opportunity to whistleblow is now a protected option in the UK, concerned researchers continue to drive forward a culture of integrity and transparency that prevents the reputational damage associated with whistleblowing. Taking a lead on the need for future researchers and innovators to act with integrity, Harvard Business School reported the findings of a survey of 2000 US psychology researchers, who were asked to report on the prevalence of questionable research practices and incentives for truth-telling (Johnston, 2012). The results revealed that research integrity was questionable on a larger scale than previously thought, with one in 10 researchers owning up to falsification of data and three in

10 doubting the integrity of their own research. Fortunately, there are no midwives identified yet. However, we must be proactive not reactive. Midwives can be brought down like any other researcher who is tempted by money, prestige or the need to achieve academic or professional status in a restricted economic climate, where competitiveness and ambition can lead to decision-making that brings quick, short-term gains, but harms, disrupts and fails public confidence in the long term.

Overall, reports of dishonest healthcare researchers indicate that the research community is under the microscope. Consequently, in 2014, the term ‘honest broker’ is becoming increasingly familiar, as researchers aim to restore public confidence and trust related to the use of data and alignment of politics, policy, research and practice (Pielke, 2010). As midwives, there is a reality that women now act as their own honest brokers, when they turn to other women in chat rooms, social networks and tweets to seek the truth and deliberately avoid professional, evidence-based resources. A loss of confidence in midwives’ advice may be understandable; but perhaps it is time for midwives who may have been motivated to misrepresent or mislead through the way in which they generate or direct evidence-based practice, to respond to the call for truth-telling and re-direct their innovation towards excellence in women-centred care, before either ‘big brother’ software finds them out or a whistleblower emerges.

Professional, legal and moral research training is not a luxury, it is a necessity as midwives and the public need to have confidence in evidence that was honestly and transparently generated, analysed and interpreted with and for women.

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Midwives united: technology as the conduit

Key words: Midwifery regulation, technology, eUNity, evidence-based midwifery

I am writing this editorial conscious of the fact that many of you will be at the triennial congress of the ICM in Prague when it is published. As midwives of the world unite for this face-to-face contact and sharing of the knowledge, skill and art of midwifery, I encourage you to reflect on the current role of the midwife in Nepal, as depicted in the paper by Erlandsson et al (2014) in this edition of *EBM*. It will become clear how important it is for women to be cared for by trained, dedicated professionals and why the professionalisation, legislation and statutory position of midwifery that exists in the UK is the envy of so many across the world.

It is easy for those in the UK to underestimate the value of the RCM and the NMC. I believe we do not appreciate the underpinning structure provided by such organisations, because they are the status quo for us. Their roles in supporting professional practice and public protection are mostly invisible and we cannot fully comprehend their contribution to midwifery practice, education and research unless we experience being a midwife in a country where there is no legislated government input into professional healthcare practice.

This has become a stark reality for me during the past 12 months, as I worked with a team of experts on a UNICEF project. I met outstanding midwives, nurses and doctors who were working extremely hard to achieve some of the political and professional strength that is evident within the UK healthcare system.

I also met mothers living in adverse conditions that seemed insurmountable. Their resilience had a halo effect and I was consumed by their strength and calm way of just being. In the midst of scenes of riches, or scenes of poverty, my senses were finely tuned to the sound of mobile phones and, in some cases, not one per person, but two.

It was revelatory as the key to unlocking the potential for communicating health and wellbeing messages was ringing in my ears. At one high school, every hand in the classroom went up when I asked if they had mobile phones. This single point of access is, for me, the key to future communications at an global level.

I will keep pushing myself and others to make effective use of technology to further our cause to achieve good. We need to make technology work for midwives across the world as we unify and personalise care for mothers and babies in a positive and health benefiting manner.

Technology has the power to unite, yet it remains under-used by us. Can we not learn from the marketing companies who use technology creatively; with crowdsource funding being one of the latest ways in which to obtain money? We need to adopt their policies and practice and make technology work for public health and wellbeing gain. We need to use the 'seedling' approach to maximising our health and wellbeing messages at a global level, midwives visibly

present, 'health information for all' style. Perhaps Prague is the place and the time for the midwives of the world to take a stand for e-connect and eUNity? Maybe this is the year in which we will consciously start to use technology to improve the health of mothers and babies and disseminate our evidence base, knowledge and experiences by e-sharing?

It is timely that the RCM i-learn and i-folio have just been given a facelift, with a new platform following a record achievement of 8000 users since its launch in 2010 (Hunter et al, 2014). The technology is providing a platform for shared learning, personalised learning and global learning. However, regardless of all the technology available to us, we need to use it appropriately and be fully cognisant of the importance of talking face to face on matters such as the role and training of skilled birth attendants (SBAs). On this important subject, we must have clarity and it is the triplicate or Trinitarian voice of midwives, nurses and doctors that is essential for a future where birthing women, regardless of country, ethnicity or financial status, will have full access to the minimum standards of care in labour and birth that will be delivered by SBAs. Please note: the definition of SBA, as defined by Erlandsson et al (2014: 59), is multi-professional and inclusive: 'physicians, certified nurses, auxiliary nurse-midwives, or degree-trained nurses...'

Modern technology provides a communication platform for midwives, doctors, women, families and politicians. It offers access to a repository of social media, visualisation, crowd sourcing and more new and emerging technologies that provide unprecedented opportunities for unification at a global level. For example, major change at UK government level is evident with the publication of documents such as *Midwifery 2020* (DH, 2010), and the NICE consultation document on intrapartum care (NICE, 2014). Making the key messages from documents such as these available in different languages as info-bites or info-sights that become seedlings is our dissemination challenge. Let's start to make technology work for us at the ICM in Prague.

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Over-the-counter pain medication in pregnancy

Key words: Pain medication, over-the-counter purchase, safety and effectiveness, survey data, evidence-based midwifery

In this edition of *EBM*, we discuss data from a national survey about low back and pelvic pain in pregnancy, which states that 70% of a convenience sample of UK women suffer from this under-estimated and under-reported condition (Sinclair et al, 2014). This high percentage was previously cited in a Cochrane systematic review by Pennick and Liddle (2013) who reported that 66% of pregnant women suffered from low back pain. The women's descriptions of the pain experienced are most harrowing and they challenge us to develop evidence-informed guidelines and effective management strategies.

In the UK, we look to NICE for guidance on how to manage this problem, but there are no specific guidelines. A guideline for pain in labour (NICE, 2007) comes up when you use the search facility on the NICE homepage, but this is currently under review and will be published in December 2014. Advice and guidance for pregnant women about medication is particularly complex, as the conduct of gold standard randomised controlled trial research for efficacy and effectiveness on pregnant women is taboo.

We need to look at our target population – the current 'Z' generation that is largely intolerant of pain and struggles to cope with it, and has grown up in a culture of 'pill for every ill'. This belief system is fuelled by the widespread availability of over-the-counter (OTC) medications, where tablets are purchased like they are sweets. Medications routinely purchased at garages, street corner shops, newsagents, supermarkets and pharmacies include paracetamol, ibuprofen and aspirin. However, when a woman becomes pregnant, decisions about which of these common medications are safest to use in pregnancy becomes a key question. 'Read the packet,' you would wisely advise and this is exactly what I did in my local supermarket.

I picked up paracetamol (500mg) and was surprised to note absolutely nothing written on the packet related to safety or dosage in pregnancy. This may change in the future, as recent evidence is casting a shadow over the safety of the medication with Liew et al (2014) and Evers et al (2011) reporting links with paracetamol usage during pregnancy and the development of behavioural disorders in children. The next pain medication selected was aspirin (75mg) and there was a clear statement: 'Medicines should not be taken in pregnancy and when breastfeeding without consulting a doctor.' However, it did not say anything about taking aspirin. I picked up ibuprofen (200mg) and here under WARNING was a clear statement: 'If you are pregnant do not take this product and ask your doctor for advice.' The NHS Choices website has a clear statement: 'The use of ibuprofen in pregnant women, weeks one to 13, increases the risk of miscarriage and the baby could develop a heart defect or other abnormalities, such as defects in their abdominal wall (gastroschisis) or a cleft palate. After 28 weeks, there is a risk of heart problems in the baby, high blood pressure in the baby's lungs, delay in labour and reduced amniotic fluid levels' (NHS Choices, 2014). This

advice is taken directly from the Medicines and Healthcare products Regulatory Agency website.

What I had thought to be safe yesterday seems less so today. This does not mean that pregnant women should stop taking prescribed medication or expect to suffer unnecessary pain by refusing all pain medication. Indeed not. If this was so, the chances of raised blood pressure due to pain would increase, leading to the potential for additional harm – higher than the risk of taking two paracetamol? What we have to learn to do is weigh up the individual situation, use the best evidence available, and ensure we have national guidelines and local protocols. Then we should consult with medical colleagues and, most important of all, be confident that it is part of our role to discuss medication usage openly with women. This includes prescribed and OTC medication. From a research perspective, epidemiological studies, such as those conducted by the EUROMediCAT team (euromedicat.eu), are extremely valuable, but it is important to note they are focused on exploring medication outcomes for mothers who have chronic conditions, such as epilepsy, diabetes, asthma and depression. Other key databases for midwives to know about include: Safefetus (safefetus.com), NHS Choices (nhs.uk/conditions/pregnancy-and-baby), FDA for women (www.fda.gov/forconsumers/byaudience/forwomen) and the Organization of Teratology Specialists (mothertobaby.org) and UKTIS (medicinesinpregnancy.org).

Signposting women and professional colleagues to access valid and reliable information about medication usage in pregnancy is our shared responsibility.

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Optimal screening for Down syndrome: non-invasive prenatal testing?

Key words: Down syndrome, screening, technology, non-invasive prenatal diagnosis, evidence based midwifery

Statistics from the WHO on Down syndrome estimate an effect size of 1:1000 to 1:1100 live births each year (WHO, 2014). Recent UK statistics, produced from the *National Down Syndrome Cytogenetic Register* (Morris et al, 2014), report the rate 2.7:1000 births for babies born in England and Wales. They also report a significant increase in the proportion of women diagnosed prenatally, from 45% in 2008 to 77% in 2012 for women under 35 years, and from 68% in 2008 to 80% for women over 35 in 2012.

Historically, recognition of Down syndrome was evidenced three centuries ago by Dr John Langdon Down, a medical doctor from Cornwall, who first described and classified Down syndrome in 1862 under the label of a 'Mongolian idiot' (Dunn, 1991). Today, it is the most common chromosomal abnormality present at birth and has become a major focus for prenatal screening worldwide. New screening technologies have made remarkable advances in the past 15 years and this is most visible when we look back at recommendations from the UK National Screening Committee in 2001, which advised that all pregnant mothers should be offered one of the available screening tests for Down syndrome. The committee recommended that by 2010 the screening tests should have a positive rate of less than 3% and a detection rate of more than 75%. Major advances in screening technology have taken place since and the American College of Medical Genetics and Genomics (2012) refer to the current gold standard antenatal screening for Down syndrome as a combination of data from the first trimester collected between 11 and 14 weeks' gestation, including assessment based on maternal age, ultrasound for nuchal translucency thickness and maternal serum analytes (free beta human chorionic gonadotrophin and pregnancy-associated plasma protein A). They report this assessment has 90% sensitivity and 95% specificity for predicting Down syndrome.

Technology has advanced rapidly and we have next-generation sequencing of circulating cell-free DNA in maternal plasma capable of identifying nearly all Down syndrome pregnancies with low false-positive rates based on a single maternal blood test for non-invasive prenatal screening (Glen et al, 2012). The blood test is undertaken around 10 weeks' gestation and the results are available within 10 to 14 days.

The test costs between £99 and £800, depending on the provider (currently available from medical staff in Harley Street in London and independent diagnostic companies). It is not free within the NHS at this time, but may become so following the results of the National Institute for Health Research funded UK study looking specifically at non-invasive prenatal testing (NIPT) for Down syndrome. The study is being led by the RAPID team from Great Ormond Street Hospital for Children in London and involves six sites where women who have a risk of a Down syndrome baby – >1:1000 – will be offered NIPT. There is some persuasive

research evidence reporting NIPT tests have 100% sensitivity and 100% specificity (Zimmermann et al, 2012). However, amniocentesis or chorionic villus sampling is still being performed for confirmatory diagnosis.

Recent UK research explored NIPT preferences of 335 women and 181 health professionals using discrete choice experiments (Hill et al, 2012). The results demonstrated preference for 'safe' tests conducted early in pregnancy, with high accuracy. For women, the key attribute was 'no risk of miscarriage, whereas for health professionals it was accuracy'.

In 10 years, based on current knowledge of personalised medicine, epigenetics and values-based medicine, one can envision a maternity service where optimal NIPT for Down syndrome and other chromosomal abnormalities will be incorporated into everyday antenatal care. The technology used in NIPT can scan the entire genetic code of the fetus leading to the need for sound bioethical principles to be put in place. The challenge for us as midwives is to remain committed to listening to the voices of the women we serve, while maintaining our professional, legal, moral and academic integrity in the midst of a sea of turbulent cultural and technological change.

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'Inside looking out... outside looking back': post-REF 2014 personal reflections

Key words: HEFCE, REF 2014, personal reflection, evidence-based midwifery

In December last year, the long-awaited REF 2014 results were published by the Higher Education Funding Council for England (HEFCE) and I felt like I was watching another demonstration of 'switching on the Christmas lights', only this time it was not a small local event, instead it was a major national event with illumination on research excellence across the whole of the UK providing insight on institutional research power that ranged in quality, strength and impact. HEFCE reported that '30% of our research was world leading (rated 4*), 46% was internationally excellent (3*), 20% recognised internationally (2*) and 3% recognised nationally at 1*. Academic staff, totalling 52,061 across the UK, submitted 191,150 research outputs and of these, 6975 were the new impact case studies'.

The 'excellence' of our UK research had been appraised and now the response from the press, public and researchers would be unwrapped and their delight, disappointment and uncertainty would be revealed. I was not surprised to read about the accusations of game play, threshold setting, fierce staff selection procedures and potential loss of innovation; finger-pointing straight at the research institutions. In January this year, in keeping with the post-Christmas spirit, the emphasis quickly focused on the financial impact and the discussions on potential funding models for quality-related research distribution. However, this has not yet been revealed and speculation will continue until HEFCE finally publish its decision.

As a member of the REF 2014 panel for nursing (including midwifery), allied health professions, pharmacy and dentistry, I reflected on my experience as a member of the decision-making panel and felt comfortable with the process and outcome of the work that I had been involved in.

It was the calibration exercises for each aspect of the evaluation process, the double-blind peer reviewing of papers, the triple reviews for case studies with consumer involvement and the audit trail created where evidence of the justification for the decision-making in complex cases could be archived that led to me feeling this internal sense of coherence and stability amidst a raging public, professional and academic discourse of capitalism, elitism and game playing.

When I was on the inside of the processes of REF, my goal was primarily to do the business with rigour, accountability and justice. This was not without challenges and occasional arguments, but the judiciary approach of seeking third-party review and panel discussion when necessary to reach arbitration provided the necessary transparency and robustness, satisfying my personal conscience. As a researcher with expertise in midwifery, I gained a breadth of understanding about the overall UK profile of midwifery research including insight into the range of

methodologies being used, outcome studies on effectiveness of interventions, qualitative studies on women's pregnancy, birth and early motherhood experiences including impact case studies demonstrating how midwives had contributed to the institutional profiles across the UK.

In REF, the sub-panels were tasked for the first time with assessing 'reach and significance of impacts on the economy, society and/or culture that were underpinned by excellent research conducted in the submitted unit, as well as the submitted unit's approach to enabling impact from its research' (REF, 2011). These new impact case studies contributed to 20% of the overall score and it is here that midwives have the greatest potential to make a significant difference in the next REF 2020.

On a very personal note, I did try to have midwifery in the title of our panel, however, it was not possible on this occasion, but the request was recorded. For the future REF exercises, midwives need to be more visible as researchers with more publications, more impact case studies and more people submitted. If we can focus on achieving these goals for the next REF, we will have more substance and evidence to substantiate our request for recognition and representation on the requisite panel having earned the honour of having midwifery named on the title of the panel.

Our challenge is to undertake top quality research using appropriate methodologies and to make the dissemination of this research accessible, easily understood and contextually relevant. Speaking as your editor of *Evidence based midwifery (EBM)*, I was delighted to see several of our high-quality research papers included in the REF 2014 and this is important to share with you, because HEFCE made it clear that we were to focus on the quality of the papers submitted and not the impact factor of the journal. This is important for our readership to note, as we strive to achieve our impact factor this year. Citations were used to aid decision-making only, but they may have a bigger part to play in the next assessment exercise so it is important to keep this in mind. I can't emphasise enough how proud I am to see midwifery being recognised by the respective institutions, so many midwives being submitted to REF 2014 and papers from *EBM* being submitted.

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The truth revealing power of technology to impact on human error in midwifery practice

Key words: Technology, human error, patient safety, evidence-based midwifery

Blaming technology for human errors is not new and human error is still the subject of ‘name and shame’ in midwifery and, with high-profile cases of alleged misconduct becoming public news, the key question for me is, can we use technology to reduce human error?

While reading the recent court case of Montgomery (2015), I was struck by the fact that a scan to estimate the weight of the baby at 38 weeks in a primip diabetic mother was not performed, as the clinician decided it would not be in the mother’s best interest, even though the mother was rightly and intuitively worried about the weight of her baby. The use of the ultrasound technology could have revealed a valuable estimate of fetal weight and may have resulted in a different chain of events, if acted upon. However, the baby was born at 38+6 days and suffered shoulder dystocia and hypoxia. The risk of such a birth was not discussed with the client and, in reading the transcript, it was stated clearly that the ‘doctor wished to avoid caesarean section’.

This landmark case is very sad and challenges the way midwives practice shared decision-making in the UK and I have no doubt that it will lead to high-risk women being more informed and autonomous. Technology provides us with data on risk assessment, NICE guidelines, internet data from ‘Doctor Google’, surveillance and diagnostic technologies and national statistics, all of which are ‘truth-telling and revealing’ with regard to human behaviour.

Fortunately, there is a shift in public, professional and legal understanding about human error and we have many factors to consider if we are to have any real impact on reducing adverse outcomes that result from negligence. Leape et al (1991) produced research to demonstrate that errors are common and occur in almost every human activity and knowing how to use research, education, training, quality assurance procedures, guidelines and critical reviews from practice are essential. They also advocated computerised, automatic ‘fail-safe’ systems for medication dispensation and anticipated the development of ‘less hazardous medications’ to reduce the outcome from human error.

Human error cannot be completely eradicated, but it can be understood and defined and managed. Our knowledge in this area is still in its infancy and the past 25 years have resulted in enhanced understanding.

Theoretically speaking, regardless of how we define the concept of error, we still fall into one of two perception camps (Dekker, 2000). We either consider human error as the ‘cause of the trouble’ or we consider human error to be a manifestation or symptom of ‘deeper trouble’. This division pervades modern thinking and Dekker refers to old views and new views of error. The tenets of the old view focused on ‘human error’ as the key to failure where human factors were responsible for inaccurate assessments, wrong decisions and bad judgements. This led to the production of statistics

to name and shame those guilty of human error and led to the rapid growth of new technologies with fail-safe modes and alarm systems to protect the patient from human error. The ‘new view’ proposes human error as a symptom or manifestation of system failure, and symptomatic of trouble deeper inside a system, and sophisticated technologies are not the solution, as technology is dependent on human usage. Therefore, it is understandable that patient safety is both a national and international priority. In the UK, the National Patient Safety Agency (2010), now Patient Safety First, identified the human factors at play as being all of those that ‘influence people and their behaviours’, including the individual, organisation, context, environmental and job’ including technologies.

I have always professed the need to use technology appropriately and judiciously in maternity care and still meet midwives with polarised opinions on the benefits and the drawbacks of using technology in practice. The paper by Martin (2015) in this edition of *EBM* demonstrates the cultural factors at play in the clinical setting, where the MEOWS technology is viewed both positively and negatively and yet it can be used appropriately. Some midwives will use technology aware of its limitations and its possibilities and some will refrain from its use and follow the rules and guidelines with some reluctance. The use of the most powerful machines with artificial intelligence, such as the CTG machine, will continue to be the source of many of our negligence cases, where we are accused of failing to act on the evidence portrayed. I dare to argue that the power of modern technology to support our practice and illuminate good care may indeed be harnessed by an overzealous and tenacious attachment to all things organic and natural. I believe we can and ought to use technology more effectively to assist us in maintaining safety in our maternity systems.

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The future role of technology in the healthcare industry

Key words: Research, industry, technology, health care and evidence-based midwifery

The research community faces a new future, as it prepares to make research impact more visible and collaboration with industry more acceptable post-REF2014 (Dowling et al, 2015) and Health Education England, in partnership with the National Institute for Health Research, prepares to develop clinical academic career pathways for all health professions. For those working in maternity services, the time for planning a future in which education research and practice are integrated is now, with the evidence of impact from investment in midwives, nurses and health visitors demonstrating a good return for investment (Health Education England, 2014).

Raising the bar (Lord Willis, 2015) follows REF2014. The independent review of the education and training of nurses and care assistants in the NHS by Lord Willis sets out recommendations for a collaborative future, where the shared goal is to achieve a world class NHS, underpinned by effective research. He recognised the need for strategic leadership, evidence-based practice, integrated education systems and high-quality information systems to deliver the future health service in light of an ageing population with complex healthcare needs, rapidly expanding technologies and increased public expectation. The report builds on predictions from Health Education England (2014) in which the population estimates for the whole of the UK is 68 million, of which 18 million are likely to require long-term care, 2.9 million will have complex healthcare needs and two million will suffer from dementia. The current nursing and care assistant workforce is reported to be 630,000 registered nurses and 1.5 million care assistants (Willis, 2015). The systems have to change and the role of the consumer in planning services has been recognised and is now incorporated into all policies.

He also recognises: 'Technology will play an increased role in the education and training of our workforce, as well as the education and empowerment of patients and their carers. E-learning, apps and simulators are currently assisting nursing and care support staff to access education and training outside the classroom, enabling regular updates of skills and knowledge. This results in a more educated and competent workforce that is able to deliver harm-free and clinically effective care' (Willis, 2015: 26).

When I read the report, I was struck with the clear message about the importance of the future NHS gearing itself up to an integrated and systems approach to using technology and research more effectively in every layer of the healthcare industry including education, administration, surveillance, monitoring and diagnostics. However, we have been slow to work with technology and industry, but now we need to start envisioning a future where we actively design and plan for the strategic benefits emanating from these alliances and connections on a macro, meso and micro scale as new technologies developed or designed by clinicians are taken to the market and the profits re-invested into local and

national healthcare systems (House of Commons Science and Technology Committee, 2013). Mobile health care is the future and the electronic health record that we talked about 25 years ago is now a reality. The use of apps for all aspects of maternity care is becoming more and more popular and 'generation z' are becoming older and more sophisticated users of technology. Support groups for patients, carers and new mothers are accepted as the norm and more midwives are referring mothers to websites for information and evidence-based guidance.

The future with technology is expansive, alluring and daunting. The integration of mobile technology is visible in the classroom, the hospital administration system, the antenatal clinic, labour room, and the education system is now well-established and it is worth ending this editorial with a reflection back to the mid-1990s when technology was novel, unreliable, mistrusted and risky.

In 1996, I was involved in the first UK telemedicine (teledermatology) project in Queen's University Belfast. Professor Richard Wooton and I went on to design the first application of telemedicine in a breastfeeding context (Sinclair et al, 2000). The application was perfect for dealing with a visual problem of positioning and attachment for successful breastfeeding, but the technology was bulky, expensive and required major enthusiasm and commitment from the user. Today, we have excellent systems capable of high velocity transfer of data and much more user-friendly systems that are designed to communicate with other programmes seamlessly. The predictive power of the latest healthcare technologies will no doubt shape our future health service.

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Accessing data from safe havens and warehouses: pinnacles and pitfalls

Key words: Data access, safe haven, data warehouse, evidence-based midwifery

The next research assessment exercise is on the horizon and it is time for midwives to consider how to map and plan a path to achieving reliable and valuable public health research data on the childbearing population. 'Big data' population data, linked data and anonymised data are now available for the clinical and research community to explore, combine and test, providing midwives with new information sharing opportunities.

This means that midwives and women, with researchers, have new opportunities to engage in finding answers to key questions that impact on maternal and child health and wellbeing at the macro, meso and micro levels.

Opportunities for multidisciplinary research that starts in pregnancy and ends in Primary 7 or beyond is now theoretically possible. For example, how many of us have wondered about the milestone achievement of babies growing into childhood with complex instrumental births compared to babies with ideal physiological births?

What about the babies whose mothers had to take anti-depressants or anti-epileptic drugs, or insulin therapies and what about longer-term educational outcomes for the preterm babies?

Now we can do much more than wonder – we can actually search a large combined data set to obtain a sufficient sample of linked data from registries of birth, child health and educational attainment to answer questions with more robust evidence.

The intermediary role of the Honest Broker Service (HBS) (Health and Social Care, 2015) is a new development in UK politics and one that is likely to have a huge impact on the distribution of taxpayer's money in years to come. Imagine if you could predict the most effective targeting of resources across the UK, based on robust data from a range of relevant resources? Tempting, indeed. The potential for future planning to optimise health and social welfare is becoming a reality as we move rapidly towards full digitisation.

Why am I so excited about this? The answer is simple. For years we have tried to access reliable maternity, child health and medication data and obstacles presented to securing these have included limited access due to handheld records in archives, data spread across multiple sites, missing data entries, missing data from files, difficulty in securing access, time restrictions, governance issues and politics.

Today, whether you are a practitioner, an educator, a manager, an organisational body – such as the RCM – or a researcher, we all have access to valuable intelligence data gathered through the intermediary role of the HBS and brought into the safe haven of a data warehouse for us to explore: electronic data that has been imported, verified and cleaned (Health and Social Care, 2015).

Data access and security agreements have been put

in place, appropriate training in using the data has been provided and ethical and research governance procedures are in place. Looks very straightforward, you may think. However, the process of securing access and bringing data from various sources is not simply 'a couple of clicks away'. Accessing data from safe havens and warehouses has both pinnacles and pitfalls.

My experience of recent encounters has demonstrated teething problems in the new system. I can assure you these problems are not insurmountable and they are similar to those encountered in developing any new system. They are more to do with understanding the administrative processes, including research governance and ethics, but most of all getting your head around the length of time it takes to draw in the data and the financial costs incurred.

I was first introduced to the HBS about a year ago and the pinnacle before me was the great potential for a data crunching climb that made my jaws grind with excitement. However, having engaged with the services, I now know the pitfalls and would advise taking time to chew over some of the following challenges and consider the money required to obtain the data and the time factor involved, including acquiring full ethical approval and research governance.

My research team was quoted an estimated cost of £450 per day for the services required and at least four days of work for our specific projects that required data from all of Northern Ireland and access to three different datasets (maternity, child health and prescription). The pitfall for us was not expecting to have to pay for the service as the cost was not included in the sales pitch in December 2014.

My closing comments for this year are that the potential for rich and valuable research outcomes of immense public health benefit surpass any discomfort that is associated with bedding down a new service and living with the teething troubles.

In conclusion, everything has a cost. Hopefully in the future we may agree licensing for institutions to access certain datasets and thereby minimise costs to this excellent data rich resource, because if we search this haystack of information, we will surely find the needles that prick our consciences and jettison us into reasoned action and the delivery of worthwhile public health outcomes.

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Past, present and future reflections on health technologies: male dominance, electronic research and sensor technologies

Key words: Technology, research, sensor technology, maternity, data, information, data capture, knowledge transfer, evidence-based midwifery

In 1990, I was shown the computer room and, believe me, it was a sight to be forever remembered – a dark room filled with awe and mystery into which every now and then a very senior person would take my little hard square computer disk and emerge with it magically ‘formatted’.

Curious Marlene was determined to master the special skill and disseminate the knowledge of ‘how to’, but I met considerable resistance, as this was definitely the man field and it was a little like GOLF (‘Gentlemen Only, Ladies Forbidden’).

The ritual of obtaining a disk and taking it to the master for his magical formatting continued for months, until I learned by stealth, observation and reading a technical instruction manual how simple this was. It made me determined to share every piece of simple knowledge I had about computers with my colleagues and, in particular, my female colleagues. This led to me developing a BSc module ‘Surfing the internet’ in 1996.

After discovering that electronic databases for literature searching were being developed at a phenomenal rate and I would not have to sit in the library with flimsy microfiche slides and large index volumes, I started a module on evidence-based midwifery, exposing midwives to the world of electronic searching for evidence. Then, I lived in a small bubble where the local world and its context were keeping me living happily but in ‘splendid isolation’.

The internet has changed this for me, and for all of us, and now we can live in the world of social media with virtual reality and electronic touching at micro, meso and macro level. Talking to people almost anywhere in the world at any time of the day or night is so routine for the millennials, yet I can remember how difficult it was to make a long distance telephone call and how expensive it was.

Today, we Skype without a fee. However, there are risks for us to be wary about and unregulated and unmonitored online purchasing is an area ripe for conflict, harm and international legislation.

We can purchase medical devices including: sonicaid, blood pressure monitors, SPO2 monitors, infusion pumps, medications and abortion kits, among others, and all we need is the money. The CE marking or FDA approval is not something the majority of the general public consider, as many trust the internet for purchasing in the same way as they trust Facebook, YouTube or Netmums.

The user, lurker or contributor to social media accepts and signs up to shared information with a level of naivety and disclaimers and ‘I agree’ tick boxes are just completed as quickly as possible to get to the desired goal.

The new sensor technology is the major shaper of our future lives in maternity care and this is mainly because of its data-capturing power. Data can be collected from

implants within us, sensors touching us on the outside and a full range of electromagnetic devices surveilling, testing, impacting; affecting all of our lives without us ever being conscious of its presence.

The recent outbreak of the Zika virus demonstrates the power of technology to connect, inform, share, support and enable knowledge transfer and dissemination rapidly at a global level.

Resources, such as Healthcare Information For All, are powerful testimonies to the invaluable impact of an open access route to knowledge transfer (Healthcare Information For All, 2016).

Technology is becoming more and more invisible as it develops at a phenomenal rate. The modern micro computer chip would not have been imagined in 1990 when I stood outside the room in which the single computer was housed. The future is indeed sensor data capture, but it will evolve much more rapidly than we can fully comprehend.

I look at the technology available today and its mega potential for use by the generation of young people known as the ‘post-millennials’, or the ‘z generation’, in particular. Every day, smarter technology is developed and the market can be flooded with a range of tested and untested medical devices, making internet purchasing a risky business (Gibson, 2015).

These young people are currently 18 to 20 years old and they live online. They are experts in the use of ‘emojis’ and we now have a full dictionary of emojis (World Translation Foundation, 2016) that is based on the concept of crowdsourcing. This is a live dictionary resource where people come to find meaningful symbols and also share these with the online community. The online world of our teenagers should not be alien to us – it is an open resource and we are free to access it at the touch of a button. Our role is to be aware of it, be critical of it and know what is being used by the women in our care and be able to advise them of the recommended quality assurance and safety standards.

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Zika virus disease epidemic: the role of the midwife in mitigation

Key words: Zika virus, research, infection, technology, social media, communication, evidence-based midwifery

Midwives are on high alert because we know the Zika virus can cause microcephaly and crosses the placental barrier at any stage of pregnancy. We have robust evidence to demonstrate it is transferred in seminal fluid (Atkinson et al, 2016); blood (Deckard et al, 2016); urine (Zang et al, 2016); saliva (Barzon et al, 2016) and breastmilk (Colt et al, 2016). Pregnant women are vulnerable and so are midwives as frontline professionals. The Zika virus was originally isolated in monkeys living in the Zika Forest in Uganda in 1947. A year later, it was evident in the African mosquito *Aedes africanus* and the first human case was reported in Nigeria in 1952 (Faye et al, 2014). The virus has been detected in short outbreaks since then, but it was not until April 2015 when the virus was confirmed in Brazil that the infection became a major global issue. 'Zika' has since become a household name and has captured the attention of people around the world, as it threatens the safety of every individual. There is no vaccine and no cure. However, I am confident we will find it and we know that the world's finest and brightest researchers are working on the case for us.

What can we do as midwives to help in this situation? I think the single most important behaviour we can engage in is reverting back to our training in cross-infection and to be even more vigilant in taking precautions and adhering to basic principles of preventing and containing cross-infection. Information sharing is key and enacting protocols for local management of emerging threats are the priority. In addition, we need to put effort into caring for our own health and wellbeing and maintaining a safe and effective workforce. The RCM has launched a campaign, 'Caring for You', aimed at improving the health, safety and wellbeing of midwives and MSWs (visit the RCM website for further details). We know we are facing an epidemic and a global emergency has been declared. The evidence is compelling and the European Centre for Disease Prevention and Control (ECDC) reported:

'Microcephaly and other fetal malformations potentially associated with Zika virus infection or suggestive of congenital infection have been reported in eight countries (Brazil, Cape Verde, Colombia, French Polynesia, Martinique, Marshall Islands, Panama and Puerto Rico)... and as of 14 May 2016, Brazil has reported 7534 suspected cases of microcephaly from all states and in the Federal District. Of these cases, 1384 are reported as confirmed cases of microcephaly, 207 of which had laboratory-confirmed presence of Zika virus infection. This is an increase of 96 suspected cases of microcephaly, and two confirmed microcephaly cases with laboratory confirmation of Zika virus infection since the last update on 7 May... Among the 7438 suspected cases of microcephaly, 273 intrauterine or neonatal deaths were reported. Of these, 59 cases were investigated and confirmed (microcephaly or central nervous system malformations)' (ECDC, 2016).

The ECDC (2016) reported that the Zika virus epidemic is now affecting EU member states within mainland Europe, EU

overseas countries and territories and outermost regions, via women or men who have travelled in countries where Zika is prevalent. With the internet and modern biotechnology, we can observe the concerted efforts of world leaders to synchronise efforts to mobilise resources and capacities to enable detection, rapid response and global communication. This is a time of crisis and it needs to be managed effectively without mass panic. It is essential for the public and, in particular, health professionals to be kept informed of new developments and given advice to enable appropriate interventions to be activated to keep vulnerable people in their care safe. Even though we do not have a vaccine or a cure, we need to remind ourselves of the AIDS crisis in the 1980s and how much progress we have made in its detection, management and containment.

Our technology should enable us to find the vaccines and medications much quicker and with the experience of managing Ebola, we have established knowledge, memory and patterns of effective working behaviours to enable us to be more confident in managing worldwide crises. It is a time when our global networks and internet access are of enormous value in communicating key messages, sharing resources and providing advice for pregnant women. Online resources are available and videos, podcasts and webinars are free. I have been impressed with the high quality of the freely downloadable infographics, which can be used for antenatal clinics, intranets, Facebook pages and social network sites.

Identifying resources and increasing access to them is something we can all do in this battle against a common enemy. If the public and health service workers in particular can see what we are doing individually, professionally, academically and collaboratively at local, national and international levels, this will reduce the burden of anxiety and lead to more public confidence in us.

The ECDC has been producing key public health documents for us and the latest of these was published on the 16 May on rapid assessment (ECDC, 2016). These documents are essential for midwives to read and use, as they provide us with the most up-to-date information on the history of the disease, transmission routes, the global infection rate, laboratory measures, latest scientific evidence, impact of the disease, prevention measures and surveillance techniques.

The data midwives need for themselves and for pregnant women are easily accessed from valid and reliable internet sources using any mobile device or computer and I would recommend we access this preparedness planning guide for disease transmitted by *Aedes aegypti* and *Aedes albopictus*.

Today, I imagined myself as a mother seeking information about Zika virus and did a quick Google search of the words 'Zika virus'. In three seconds, I had 56,000,000 results. The first 10 unique resource locators (URLs) are the most important for capturing the attention of the 'information seeker' and are highly prized and sought after. We know the

majority of us seeking information will not go past that first page and, therefore, the key information we require needs to be on that first page. Therefore, you will share my joy that the major bona fide public health resources were displayed on page one: first, the Centres for Disease Control and Prevention; second, NHS Choices; third, WHO; fourth, Wikipedia; fifth, BBC News; sixth Fit for Travel and the remaining sites were news items reporting individual athletes freezing sperm or boycotting the Olympics for fear of becoming infected by the Zika virus. However, I was a little disappointed not to see the recent communication by the RCM (2016) or the joint guidance by RCOG et al (2016) on the first page.

It is important for us to remember that the use of social media at a crisis time can be exceptionally valuable. We can use Facebook, WhatsApp and Twitter as vehicles to communicate key messages about the spread, prevention and management of Zika virus to pregnant women and the profession. The use of social media has potential to mitigate unnecessary fear and panic in the public arena. Midwives can use it positively to provide valid information and access to helpful resources and support services.

As we prepare for the summer holidays, we need to remember and remind women that the main transmission route for the Zika virus is a bite from the *Aedes* mosquito and prevention is still the most important factor that we can use in our defence. The mosquito is most active between sunrise and sunset, therefore, we need to advise pregnant women to use safe and effective mosquito repellents, cover their arms and legs and use mosquito nets at night. Simple measures like eating nutritious food, taking exercise and getting sufficient sleep have a key role to play in supporting our immune system to fight off infections and minimise the negative impact on our health.

The most recent advice from the ECDC advises pregnant women not to travel to areas with known widespread transmission and, if this cannot be avoided, they recommend strict adherence to the aforementioned safety measures. The ECDC and local governments provide maps showing the Zika transmission in the past nine months, so that pregnant women and travellers can check their potential exposure to the virus. We know the summer period will be a season of growth for the mosquito and the risk of infection is increased.

Therefore, providing women with key information on prevention is one of the most important contributions midwives can make to deter the harm from this global threat. Referring women to the ECDC updates and local government websites, such as the guidance section of gov.uk, for UK residents will help. We should develop a dissemination plan to ensure health promotion and disease prevention information is posted on every online and public portal and to maximise the knowledge level of every midwife about the key aspects of the disease, prevention measures and advice, all of which will contribute to the safety of the profession, pregnant women and the general public. This is not a time to bury our heads in the sand or shrug this off as just another scare. This is a time for concerted efforts to minimise harm, manage risk and collect as much data as possible to enable evidence-informed strategies and guidance to be developed as rapidly as possible.

We have facts about the Zika virus already, including its effect

on neural stem cells and human brain development leading to microcephalic infants. The WHO released a statement in 2016 based on the evidence from *in vitro* and *in-vitro* studies of the effect of the virus on neural cells leading to ‘microcephaly, Guillain-Barré syndrome and other neurological disorders’ (WHO, 2016). Research is underway to determine the effect of the virus at different stages of pregnancy and the longer term sequelae from infection in the early neonatal period. Case reports are essential for data capture and knowledge acquisition in these early days of mapping the virus may become part of the role of some midwives.

Until we have clear local guidelines, midwives should operate in a similar manner to dealing with the flu epidemic and minimise harm by early detection, isolation, self-protection, effective waste disposal, effective communication and accurate record-keeping. Very soon we will see new drugs, new vaccines, specific guidelines – including laboratory tests for confirmation of the disease – and more detailed guidance on containment and prevention measures. In the meantime, midwives need to continue to be vigilant in maintaining high standards of practice for prevention of cross-infection. These core principles are our best line of defence until we know more.

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Building on success and learning from experience: recommendations from the UK Stern report

Key words: REF, Stern report, recommendations, research assessment exercise, evidence-based midwifery

‘The UK stands out as the country where quality of research outputs influences more than 10% of the universities’ overall institutional funding. The average in other countries is around 5%’ (Stern, 2016: 48-9).

Assessing research is a costly business with the 2008 Research Assessment Exercise (RAE) costing £66m and the latest Research Excellence Framework (REF2014) costing £246m. Therefore, it was understandable that the government commissioned a review of the process with Lord Nicholas Stern appointed as chair in November 2015.

The value of research and its impact on society and the economy needs to be justified and the funding provision understood. Currently, funding for research in the UK has unique features operating within two funding streams; competitive grant funding in combination with a quality rated (QR) block grant that is allocated based on a research assessment exercise.

We were waiting with bated breath for Lord Stern’s independent review of the REF, published in July. The Department for Business, Energy and Industrial Strategy (BEIS) appointed the Technopolis group to do the literature review, international comparators for REF, synthesis of the 300 responses to the consultation exercise and 42 interviews with key stakeholders including Healthcare Environment Inspectorates (HEIs), business and industry bodies, research charities and intermediaries, government departments and executive agencies, academics and individual experts (Nielsen et al, 2016). There is evidence of a well-conducted, transparent review destined to shape the UK research platform and menu of activities.

The reports are clearly presented; logical, evidence supported and meaningful, with 12 key recommendations. The Stern report includes comparisons of REF in Belgium, Czech Republic, Denmark, Finland, Italy, New Zealand, Norway, Sweden and the UK that demonstrate the uniqueness of our system with its dual funding system and unique focus on rewarding excellence (Stern, 2016).

The following 12 recommendations are proposed:

- All active research staff should be returned in the REF.
- Outputs should be submitted at unit of assessment level with a set average number per full-time equivalent, but flexibility to submit more or less than the average.
- Outputs should not be portable.
- Panels should continue to assess on the basis of peer review. However, metrics should be provided to support assessment and panels should be transparent in their use.
- Institutions should be given more flexibility to showcase interdisciplinary and collaborative impacts by submitting institutional level impact case studies.
- Impact should be based on research of demonstrable quality. However, case studies could be linked to a research activity

and a body of work.

- Guidance on the REF should make it clear that impact case studies should not be narrowly interpreted and need not solely focus on socioeconomic impacts.
- A new, institutional level environment assessment should include an account of the institution’s future research environment strategy, a statement of how it supports high quality research and research-related activities.
- That individual unit of assessment environment statements are condensed, made complementary to the institutional level environment statement and include those key metrics on research intensity specific to the unit of assessment.
- Where possible, REF data and metrics should be open, standardised and combinable with other research funders’ data collection processes.
- That government and UKRI could make more strategic and imaginative use of REF to better understand the health of the UK research base, resources and potential.
- Government should ensure there is no increased administrative burden to HEIs from interactions between the Teaching Excellence Framework and REF.

The recommendations are based on the evidence obtained and each one is prefixed with a short explanatory section. The normal government statement endorsing or supporting the recommendations was not published at the same time. However, there is talk in the research community suggesting HEFCE will act on all of the recommendations.

I see some instant gains for researchers who felt marginalised and excluded in the last REF because of ‘game playing’ and I see the foundation of REF remaining focused on peer review and supported in a transparent way with metrics. The potential for outputs to be reduced, pooled and not portable will take away some pressure and increasing visibility and acknowledgement of interdisciplinary outputs is welcomed. The success of the UK REF is now formally enshrined and we will be waiting for news from HEFCE on the way forward. Watch this space!

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Bespoke birth for the modern Z generation

Key words: Bespoke birth, Z generation, technology, social media, evidence-based midwifery

Bespoke birth should not be private business it should be our core business and bespoke birth is birth with and without technology. I want to share the reasons for this statement with you based on a recent paper I presented at the Palazzo Medici Riccardi in Florence, Italy (Sinclair, 2016). This was a culmination of research data, theory and personal beliefs based on 20 years of research.

Online support and e-connectivity are hallmarks of the modern generation of new mothers who communicate more with each other than us as their health professionals. As more of our mothers are coming from the Z generation, it is important for us, as health professionals, to be ready for the bespoke birth experience that these women are likely to request. The Z generation are technologically savvy and expect to see machines and devices as they grew up in the world of the internet. We live in a world where an electronic myriad of data drives touches lives at the push of a button, creating momentous change and it is in this rapidly digitalised world that precious birth takes place.

Academically, we can define concepts, build theories, create designs and develop products and devices that are relevant, effective and meaningful to those who need and use them. With more and more midwives obtaining PhDs and engaging in research, we use the internet for accessing NICE guidelines, WHO updates, safety alerts and we also use the rapidly growing research link databases such as ORCID, Research Gate and academia.eu, to name a few.

We cannot function without technology as it provides health professionals with online data. We use monitoring and surveillance technologies and we access electronic records, APPS, online library databases and laboratory results. We are beginning to use robots for teaching mechanisms of normal labour, second life and avatars for education and training in breastfeeding. In addition, technology is a platform for social and political activity and we need to start using technology with our parents to let them know we will support them in achieving their 'bespoke birth', whatever that is for them.

We need to remember that as soon as the baby is born, the mobile phone is out and the pictures are sent to a growing number of platforms such as YouTube, WhatsApp, Snapchat and many others. Politicians and our own RCM are using Twitter and Facebook to communicate key messages to inform or seek support. Our conferences are moving from face-to-face to webinars and live streaming. Our world is changing rapidly because of new technologies that permeate every aspect of our lives. We have new communication portals, instant access, instant feedback and, most of all, we need to remember that every mother and father we meet has access to the same online data as we have and this is why I would stress the importance of us engaging in online searching as part of our everyday midwifery practice.

Mothers can find apps for pregnancy, birth, infant feeding, child development and, of course, they can go online and purchase fetal monitors, mini scanning devices, DNA profile kits, abortion kits and abortion pills. Naturally, the marketers are very interested in pregnant women and this is evidenced in Google's analysis of online searches by pregnant women that demonstrated:

'New and expecting parents do twice as many searches as non-parents and health is their biggest concern. Mobile searches @ babies & parenting have grown 25% since 2013 and views of parenting videos on YouTube were up 329%' (Rost et al, 2014).

I undertook a simple Google search to see if there were any devices to prevent perineal tearing, as that is a big fear for most mothers. I was amazed to find Swedish trial data from a sample of 1148 women testing a new perineal protection device by Leveesson et al in 2014 with positive results (significant reduction in first- and second-degree tears). This is the type of data women will present to us in the future. They will challenge us to use birth technologies that are evidence based and come to us with the data downloaded onto their mobile device. They will also expect us to use sensor technologies based on evidence from current trials, as this is technology that can enable women to stay at home for longer. We can be reassured that the mother and baby are well, because we have full access to the mother by live chat, and her data and that of her baby can be viewed real time using sensor technology. This is our future.

We need to engage with women and birth technology on an everyday basis. With rapid advances in personalised medicine, epigenetics and, more recently, robotics, the lifeworld of the Z generation of new mothers is an exciting field of new technologies. We must stand as a multiprofessional team of midwives, obstetricians, anaesthetists, paediatricians and researchers actively engaged in partnership activities to determine guidelines for the appropriate use of old, new and future birthing technologies with our parenting groups and policy-makers.

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The internet of things

Key words: Internet, smart systems, technology, internet of things, transforming maternity services, evidence-based midwifery

Midwives in the UK and Ireland are gearing up for a new era of smarter working on the superhighway of e-life; working and playing within the 'internet of things (IoT)'. If you are wondering what the IoT is, the Wiki definition is best summarised as: 'The infrastructure of the information society in which there is a combination of software, hardware, data and services that will connect current systems and technologies. It is a combination of sensor technologies, cyber systems and smart grids within which there will be remote access and countless possibilities to share useful data' (Wikipedia, 2017). So what will this mean for us as midwives?

This will result in better data linkage between and within health systems using sensors to read vital signs and engaging in more home monitoring and remote diagnostics. Theoretically speaking, this will increase mother and midwife information exchange at a professional and social interface using e-technology as the conduit. It will provide new possibilities for the extraction of big and small data that will influence midwives' education, research, policy and practice. In coming to terms with the meaning of IoT, I was reading the blogs on the Digital Health Network website and was impressed with the commentaries about Simon Stevens, NHS England chief executive, who announced his strong support for IoT and the use of smart technologies within the NHS for patient monitoring and assessment. He stated: 'By harnessing insights from real world data, the quality of care will be improved for pregnant women, and detection of sepsis and acute kidney injury' (Digital Health News, 2016). Still focusing on IoT at a national level, we can see that Ireland is also taking action to ready itself for its place on this superhighway. One major step noted was the digitalisation of their maternity records. Richard Corbridge, eHealth Ireland chief executive, stated that plans for a new single national system for maternal and newborn data collection are being piloted in Cork before being rolled out to 19 hospitals (Heather, 2016). At a local level, in Northern Ireland, the Public Health Agency plans to launch a new maternity record in April 2017 and hopes to have full digitalisation by 2020.

A quick Google search for maternity research using sensor technology in pregnancy identified a novel study being undertaken at the University of Turku in Finland. The team is exploring the use of a smart band to remotely monitor pregnancy data. Daily activity levels are monitored, including steps taken, sleep patterns and physiological data. Post-birth data are also being collected on parental bonding and skin-to-skin contact using wearable devices to send data on mother-baby distance to the web cloud wirelessly. This project will produce valuable data for midwives. In addition, the Google search threw up a link for a sensor toilet that caught my eye, as I heard about such devices coming from Japan many years ago. However, this was a much more sophisticated device with built-in sensor functionality that

could tell if a woman was pregnant or had an infection. Google has also patented sensor home bathroom technology for assisting patients with cardiac disease to monitor their own health and is composed of a pressure and sensor mat, colour-sensing mirror and an ultrasonic bathtub (Liberatore, 2017). I could see how midwives could use these types of sensor technologies for pregnant women with severe heart disease, diabetes and renal conditions.

The IoT is impacting on service providers and policy planners and local evidence of this was visible in a recent enterprising exhibition in Northern Ireland, where top ICT companies were sharing their portfolios on all 'e-health' products. I went to this event with a specific goal – to obtain as much information as possible about the state of play in Ireland, the UK and other countries. The Netherlands maternity information systems were impressive, but it was one of the US systems that commanded my attention with its demo of a smart digital system with potential to connect maternal data from the laboratory, radiology, pharmacy, imaging data, child health databases and GP practices. In speaking to the exhibitors, I discovered that one of the companies is developing the digital platform for a region in England that has a very large maternity unit. The exhibitors were keen to sell the social networking features and interactive apps. Naturally, I was interested in exploring how we could extract data for research and audit and the system appeared to be able to do this and provide infographics which was quite impressive. I discussed my experience with a professorial information and communications technology colleague, just back from China. She was more impressed with her 'kiosk' experience and the new diagnostic sensor technologies she encountered while there. She provided an enlightening example of self-assessment and evidence-informed decision-making at a very pragmatic level when she decided to have her bloods checked. The process was so simple and she had her blood taken at a health kiosk and the analysis report was ready and downloadable in minutes. This was a good example of what our future health service may look like when we give women more control and access to self-assessment systems and tools. In the future, it may be possible for women with concerns about their mental health and wellbeing to conduct an online assessment of themselves and using one of the validated tools recommended by NICE, such as the Whooley questions for depression (NICE, 2015; Whooley et al, 1997). Following the assessment, they may be sent a text or a tweet to encourage them to contact their midwife to seek specialist midwifery or mental health advice, if they are not in a good place. These tools would have to be adapted and linked using the IoT to make this type of self-assessment as safe as possible and ensure the woman completes the test within her community hub that will be linked to her personal electronic record. Another example of a useful online tool for decision-making, which the

RCM supported, covers place of birth. It enables a woman to fill in her birth choices and to complete risk assessment criteria so that an evidence-based outcome indicating the best place for birth can be provided (Which?, 2016). This is the kind of online self-assessment technology that we are going to need for women of the i-generation. A good example of midwife-led technology can be found in the work of Stockdale et al (2014), where a VBAC intervention was developed with a portal that had two discrete points of entry: one for the women titled 'I can birth' and one for the health professionals titled 'she can birth'. Three apps were developed called My Birth Story, My Birth Thoughts, My Birth Plan, based on motivation theory to assist women in their shared decision-making.

My Birth Story was an app designed to explore women's previous CS birth memories (Stockdale et al, 2014). It was composed of a series of statements from women who had a range of birth experiences from awful to great. For example: 'I knew what date my baby would be born' or 'I was not able to care for my baby myself'. These statements were colour coded pink for good, and grey for not so good. When the woman completed this, a wordle was developed and this meant the clinicians could see at a glance whether or not this woman's previous birth experience had left her with a positive memory or not, just by looking at the colour of the wordle. This app was completed once before the woman saw her midwife and obstetrician. The value of this self-assessment was the instant insight it provided before the first consultation began. The second app was designed to explore changes in a woman's perception of CS throughout her pregnancy and consisted of a sliding scale to indicate whether or not the woman was thinking about a repeat CS or a VBAC. The scale pointing to the left was repeat CS and pointing to the right was VBAC. Another visual display was instantly readable by the clinicians and this provided data on the woman's decision-making at that time and could be correlated with changes over time as the pregnancy progressed and the woman discussed her birth options with her clinical team. The app was completed as many times as the woman wanted. The third app was a birth plan designed for whatever type of birth the woman, her midwife and obstetrician were planning. It is important to state that additional face-to-face antenatal educational classes were part of the intervention, as well as specific training for clinicians. However, this is an example of how the multiprofessional team can use technology effectively and in partnership with women. The study involved a randomised trial conducted in Ireland, Germany and Italy. For more information, visit childbirthresearch.se/optibirth

You may be wondering how this all fits together. I think if you look at the stage that is set in England just now, aptly outlined in Sarah-Jane Marsh's (the chair of the Maternity Transformation Programme Board) *From vision to reality: our first steps towards transforming maternity services* presentation delivered last November (Marsh, 2016), you will see a vision for a maternity service that is linked up and connected. Marsh talks about three key objectives:

- Widening choice across CCG boundaries and deepening choice by providing opportunities for new providers

- Empowering women to take control through Personal Maternity Care Budgets (PMCBs)
- Enabling women to make decisions about their care.

This vision is going to materialise in a new maternity service that has a community hub where women can access personalised data, a service that is digitalised and woman-centred; a service with national standards and dashboards. This is a new vision that has technology doing what it ought to be doing – working for us.

In conclusion, the world stage is set for us to take the lead role in claiming our IoT maternity cyberspace for connecting women, health professionals and services. The future i-generation will live a considerable proportion of their life online and we need to get smart as midwives and plan ahead for a future where we decide how we want the technology to serve us and the women we care for.

We need to take a leading role in developing web applications, self-assessment tools, sensor technologies and design them to maximise women's informed and shared decision-making. I am hoping the RCM will lead us and call a think tank session, or set up a series of exploratory webinars. We need to engage in dialogue to plan the future of our digital maternity services and work in partnership with technologists, geneticists, specialists in cardiology, mental health and diabetes to plan, develop and test new technologies. Time to get your thinking caps on and time to lobby our RCM reps.

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Using social media for research

Key words: Social media, research, internet statistics, evidence-based midwifery

This editorial has one key message for readers – the global field of online data is ripe for harvesting and the harvesters need to be ready to take up their tools and do their job within the confines of their everyday ethical and professional code of conduct.

Social media platforms include Facebook, Twitter, Instagram, blogs, discussion forums, Wikipedia, and other sites that contain user-generated information. Online data generated by the user who tweets, blogs, shares videos and photographs has grown exponentially since the 1980s. If we review the latest statistics on internet use by the world (Greenwood et al, 2016), we find data demonstrating eight out of 10 online users in the US now use Facebook, 32% use Instagram, 31% Pinterest, 29% LinkedIn and 24% Twitter. Younger women (18-29) continue to be the lead users (88%) compared to 65% for those over 65. This is of immense importance to midwives, who will engage with younger women of childbearing age. PEW also reports that almost half of the Instagram users access the platform daily, as do 42% of Twitter's users. Of interest in this report is the data on social media matrix, where it is evident that more than half of online adults (56%) used more than one of the five social media platforms. PEW reported 95% of Instagram users, 93% of Twitter's and 92% of Pinterest users were also on Facebook. Furthermore, this most recent survey explored the use of apps for the first time, as almost 72% of US adults are now using mobile devices, and nearly 30% of smartphone users were using apps, such as WhatsApp, with a continuing trend demonstrating increased usage by the younger generation (18-29).

These recent statistics are clear indicators of the growth of user-generated content now available on the internet and this is of immense interest to all who are involved in health research. However, it is important to be aware of a key factor that will have implications for clinicians, researchers and educators in health and that is the shift from computer use to mobile use and the power of the handheld mobile device for instantaneous use. The speed of access, the globalisation and the instant sharing of data are growing rapidly. If you are planning to do online research, it is important to be familiar with a range of tools for data access, data management and data analysis and to be very conscientious in your ethical and professional stance.

Regardless of the reason for your research (for example, exploring attitudes, seeking data on behavioural trends, intervention design and testing), you need to obtain ethical approval from your local institution. However, there is much debate in the literature on what is public data and many question why they should not use data from a person who has already consented to being used for research purposes and agreed to their data being accessed by third parties. Few people read the small print and tick the box rapidly to access the platform. Remember – your personal data is held on

Twitter and it is a soapbox platform to share with the world. If you are doing online research using any of the social media platforms, it is essential for you to decide if the data is public or private and if you think the user-generator wants the world to see everything.

As professionals, we need to act respectfully, confidentially and sensitively. We must be wise to the potential for harm and the benefits of insightful knowledge and take action to protect the individual, the profession, the institution and ourselves. It is so easy to take a simple phrase for use in research from a blogger, search on Google and within seconds we can identify the precise source, thus risking exposure of the user-generator. Thankfully, we now have recently published guidance *Social media research: a guide to ethics* (Townsend and Wallace, 2017). This document provides a set of ethical guidelines for use by researchers, ethics committees and anyone using online research methodologies. They have produced a framework for ethical research and social media data that takes the researcher through a series of steps to consider legality, privacy and risk factors and publication issues. They provide an extremely helpful series of grounded research case studies using social media to facilitate understanding of the key issues for consideration in different types of research. Another factor is awareness of the rapidity of growth in this area and the need to act from best research ethics principles in any research study.

We must bear in mind the vast array of tools now available to assist us in data management, data analysis and data interpretation. Ahmed (2017) provides an excellent review of the most up-to-date tools, their application, cost and technical requirements. Tools such as Boston University Twitter Collection and Analysis Toolkit are particularly valuable to researchers undertaking Twitter research. Social media research is developing at a phenomenal rate and we need to have guidance on ethical as well as professional and moral issues, so that we can be well prepared to harvest this field of research.

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Eye movement desensitisation and reprocessing therapy: a ray of hope

Key words: Birth trauma, fear of childbirth, PTSD, EMDR, evidence-based midwifery

It is impossible to ignore the growing concern over the mental health and wellbeing of women in childbirth. Fear of childbirth (FoC) is a recognised disorder within the *Diagnostic and statistical manual of mental disorders* (American Psychiatric Association, 2013) and the international classification of diseases (WHO, 2010). It affects an estimated 10% of pregnant women, leading to an increased CS rate and a negative impact on the health of the mother and baby. While the royal colleges are working to tackle mental health issues in pregnancy and NICE guidelines have been published, there is a need for researchers and educationalists to explore new approaches to preventing and treating childbirth trauma (NICE, 2016).

The statistical data on prevalence of PTSD varies and is often quoted at around 3%. However, a recent Harvard research publication estimates we now have a rate of between 4.6% and 6.3%, while a worrying 16.8% of women appear to be showing symptoms of PTSD, such as numbing, flashbacks, and avoidance (Dekel et al, 2017). The authors report the key predictive factor is ‘a negative subjective childbirth experience’. Another systematic review and meta-analysis reported the average prevalence of PTSD to be 4% in postpartum women generally and 18.9% in high-risk women (Yildiz et al, 2017). The outcomes of PTSD can affect mother-infant attachment and the cognitive development of the child. Other negative consequences include job loss, social isolation, psychological disorders and family disruption.

One of the gold-standard trauma-focused psychotherapies for treating PTSD is eye movement desensitisation and reprocessing therapy (EMDR). It is effective at treating specific phobias but little is published about the pregnant population. EMDR is a person-centred, trans-diagnostic, integrative psychotherapy approach recognised by Francine Shapiro in 1989. It is based on an adaptive information processing (AIP) model and helps people who have experienced trauma from any life event to process the memory by using an eight-phase, three-pronged evidence-based approach (Shapiro, 1995). It unlocks the memory using bilateral stimulation. The person recalls the memory of the event with its distressing parts and focuses on holding the memory in their mind (present) while they engage in a series of right to left eye movements designed to stimulate the brain to fully process the memories into the past. WHO recommends it as an effective therapy for managing stress-related conditions (WHO, 2013) and NICE recommends it as a therapy for managing PTSD symptoms (NICE, 2016).

The application of EMDR in midwifery needs to be further explored. A quick literature search provided reassurance that research is underway with the publication of a protocol for an RCT in the Netherlands called the OptiMUM-study, by Baas et al (2017). The study aims to determine whether EMDR therapy is an effective and safe treatment for pregnant women with childbirth-related PTSD or FoC. However, it is just starting, so it will be some time before we have the evidence. I also found a published protocol in the *BMJ* for a systematic review

by Futura et al (2016) on the effectiveness of trauma-focused psychological therapies, compared to the usual postnatal care for treating PTSD symptoms in women following traumatic birth. The protocol explores narrative exposure therapy, trauma-focused cognitive behavioural therapy and EMDR. I expect the outcomes will be published during the next 12 months. Trauma affects midwives, mothers, fathers and babies, and it hurts. EMDR may be the ray of hope, says psychiatrist Paul Miller: ‘Being able to find meaning for our life’s journey is the thing that gives birth to that most human of attributes: hope. We all need hope if we are to have any sense of peace and contentment in our life’s journey. I believe that this is fundamentally what we, as EMDR therapists, help our clients to find: meaning, hope, and contentment’ (Miller, 2015: 77).

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New guidance: decisions on staff and outputs for REF 2021

Key words: REF 2021, midwives, HEFCE guidance, research active staff, impact case studies, research outputs, codes of practice, evidence-based midwifery

The UK Research Excellence Framework (REF) is designed to assess the quality of our UK research outputs and to ensure value for money from research investment of around £2bn from the UK government per year. It is a valuable and much-needed process to assure the government and public that investment in UK research benefits areas such as the economy, society, culture, health, public policy and quality of life.

Following the REF 2014, we had a major review in 2016 by Lord Stern, who was tasked with a full assessment of the research process and the cost benefits of REF. I wrote about the robust recommendations last year (Sinclair, 2016). Since then, the research community, including many of our midwifery key stakeholders, responded to the post-Stern consultation exercise and HEFCE reported receiving 388 responses, which is indicative of the importance of REF in the UK (HEFCE 2016/36).

What do we know about the way forward before we close the doors on 2017? We know the submission date will be in 2020 and the assessment will take place during 2021. We are still under main Panel A: Medicine, Health and Life Sciences and the chair is Professor John Iredale, pro vice-chancellor of health, University of Bristol. We will remain in Allied Health Professions, Dentistry, Nursing and Pharmacy, which is unit 3.

From the guidance REF2017/01 we see a change in the prominence and value of interdisciplinary research and institutional level assessment of the environment both of which have been well received. We know we will have appointees with a specific role in interdisciplinary research on all panels. In addition, there is a change in weighting that is significant and includes a reduction for outputs down from 65% to 60%, the weighting for the environment remains at 15%, but the impact is raised from 20% to 25%.

During the last six months, much discussion and negotiation has been taking place following the initial guidance as there was a distinct lack of clarity and concern for all about the interpretation of staff with significant responsibility for research, number of outputs, open access policy, portability of outputs and the number of impact case studies. HEFCE sent out a further request for feedback from the research community to explore these issues (Atkins, 2017). As of 21 November, HEFCE had released the results of the consultation exercise and we have new guidance on the way forward: bit.ly/2iyIS9a.

The new statement is precise: 'We will implement the recommendations of the Stern review that all staff with significant responsibility for research are returned to the REF, provided they are independent researchers' (HEFCE, 2017: 2).

Institutions are responsible for taking appropriate and consultative action to interpret the guidance and produce a transparent and auditable code of practice (COP) that clearly describes their position on staff with significant research responsibility. The guidance makes it clear that the role of HR and the confirmation of contractual status for researcher contribution will be key to the identification of eligible staff.

HEFCE states the code must include a fair approach to selecting outputs and for the identification of category A staff.

Another major issue was the decoupling of staff from outputs and the exact number of outputs. This has now been clearly set at 2.5 per FTE and a minimum of one and a maximum of five per individual. It is theoretically possible to submit the maximum number of five outputs for one individual and less for others and even none for someone on maternity leave. These changes have significant impact for women in particular and for us as midwives. Academics on maternity leave must not be penalised for taking a year out and this is good news for us.

The contentious issue of output portability has been addressed and the decision to implement a transitional approach to the non-portability of outputs has been agreed. Both institutions can now submit the output, provided it is within the consensus date which will be determined by the date when the 'output was first made publically available'. This is a very important outcome for midwives moving from one institution to another.

We know the number of impact case studies will be a minimum of two and the formula is 'one case study, plus one further case study per up to 15 FTE'. In institutions where the FTEs are 105 plus this will be reduced to an additional case study for every 50 FTEs.

The clarity on the above issues is welcome. The panels have been identified and chairs are being appointed and will be announced in December. The call is out for panel members and it is important for midwifery to be well represented.

In conclusion, it is important for midwives on a range of different contracts with HEIs to be actively engaging in meetings and consultations at their institutions, while they are preparing to write and apply their new COPs, and to talk to RCM representatives about contractual eligibility and equality of opportunity.

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I spy with my little electronic eye your digital profile: living with the discoverability factor

Key words: Social media, Twitter, Facebook, digital footprint, spy software, evidence-based midwifery

Information about people, colleagues, friends and enemies is powerful and the more we believe we know, the greater is our personal challenge to remain ethical and just in our use of that information.

As midwives we adhere to our code of conduct (NMC, 2015) and we are duty bound to confidential use of the personal data we acquire from those women we care for in childbirth. However, how many of us have taken time to think about the magnitude of data that is available about each one of us on the internet? If we so wished, we could purchase spy software of one type or another and retrieve every electronic piece of data that relates to us or to others for a small fee. Recently, I completed a simple online search for spy software and was amazed to see how much information I could acquire about a person without them ever knowing I had opened their emails, accessed their texts and blogs as well as obtaining a profile of their social media activities. Wow, what a shock! Money opens our electronic data fields. This is a salutary reminder for all of us.

Many academics use Research Gate, Academia.edu or LinkedIn to promote their publication profile. The use of Alta metrics for research purposes is acceptable and most academics preparing for REF 2021 will be using their Twitter and Facebook accounts to enhance their outreach and increase their research dissemination profile. However, that is very different to being profiled by a software company espousing expertise in finding our darkest secrets! You may very well be thinking, just now, so what exactly is the problem?

Let me share some thoughts about this with you. When I was a child I lived in a small world where I just knew that only God could see everything I ever did and hear my most secret thoughts. Funnily enough, I was not fearful with this knowledge, as my mother told me that this was the most important factor for living a good life and going to heaven... such childish simplicity. My mother's words echoed through my early years: 'Always remember God is watching and listening and you will do no harm; only good.' How true and wise were these words, but how quickly I forgot about them as the stuff of everyday life consumed my space and the demands of work and family life took precedence. There was little time to think and none at all to remember the words of wisdom.

Many of you will remember the story of Professor Penny Prohith from Edinburgh University who resigned her post as chair of nursing studies in 1992 when she was exposed for claiming to have a PhD. The exposure came about through mostly hand-searching of records. Today, we have the electronic eye of the Retraction Watch group, which has now set up a database of over 16,000 retractions of published papers.

The digital mark or footprint as it is often referred to is a very powerful method of portraying the lifeworld of a person and can be used in the courtroom as well as the social media platform. How many of you Google yourselves and how many of you have paid for the hidden profile? As health professionals we need to remember that the NMC and the public are all watching us with their different lenses. The boundaries between our performance in public and private are being blurred by the online life we now lead with live-streaming and Facetime becoming more and more popular and, as such, becoming another invisible technology that we accept and file away in the recesses of our minds.

Last week I took part in three webinars. During the first one, I completely forgot that every word I said could be heard and re-heard and could not be erased with a quick rub out nor could it be struck through with a pen and a quick signature added. I did not state anything libelous, but I did share personal details that I did not feel comfortable about when I remembered they were 100% accessible and traceable to me. This very sobering thought has inspired me to write this reflection as a reminder to all of you about the new paths we are walking in the 21st century. These are electronic fields with gateways to pleasant – and perhaps not so pleasant – outcomes and ones that we need to take cognisance of right now and be better prepared as midwives, to walk in safely.

The world of work is a very different place now for our young midwives and it is very easy for them to check out any woman who comes into their care by doing a quick search online for their profile. Is that appropriate, I ask you? I know it has happened and I ask you is that a natural part of our new virtual reality? Where do we draw our boundaries now? What do we do if we find unsavoury or child safeguarding issues in the profiles of some of the parents when we are traversing or surfing through our routine social media fields? Of course, every woman and their partner who meets us in the clinic or in their home can easily search for us online and meet our virtual self.

I know for certain, the wisdom of my mother remains the key to retaining sanctity and safety in my mind, body and soul, as now more than ever I see the evidence for supporting that statement about everything being discoverable. More than God is watching us now.

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Intrauterine prenatal surgery: an alternative to abortion

Key words: Intrauterine fetal surgery, prenatal surgery, technology, alternative to abortion, evidence-based midwifery

As midwives we value the precious gift of a baby that is as healthy as it can possibly be and when we know a mother is carrying a baby that has an anomaly, we are challenged to provide the best evidence-informed care.

When the ultrasound scanner is showing the interior world of the fetus, being able to say, ‘everything looks just fine’ is one of the key moments in which we stand together with parents, anxiously waiting for the technology to show us there is nothing obvious to be concerned about. Giving parents the good news about a potentially ‘perfect’ baby based on our limited knowledge and skill in ultrasound has a real ‘feel-good factor’. However, when we see something abnormal, our heart sinks as we ponder the next steps. It is here that our knowledge is key and we need to remain hopeful for the parents, as they look to us for help. Knowing about recent advances in fetal surgery can be of immense comfort and it is this subject. I have always been an ardent supporter of making technology work for us and using it appropriately. Knowing what choices are available to parents who are told their baby has an anomaly is key to making wise decisions and we need to remember that many are deeply opposed to abortion for fetal abnormality (Wallace et al, 2018). These parents look to us and it is our duty to be well-informed about advances in technology and in particular the emerging field of fetal surgery. ‘What can be done to improve the life of my baby?’ is the question they ask when they know they are not going to choose an abortion. This is where we need to keep abreast of technological advances and present the available evidence.

Intrauterine fetal surgery is evolving rapidly due to advances in MRI scanning and aspirations for the realisation of fetal gene therapy and stem cell therapy use in fetuses. Intrauterine fetal surgery is used to treat a wide range of birth defects, such as gastrochisis, diaphragmatic hernia, heart defects, obstructive uropathy, spina bifida and teratoma. It can be carried out by opening the uterus (open surgery), by using fetoscopy with small abdominal incisions (endoscopic) or by using a guided catheter under ultrasound.

As inconceivable and unimaginable as it may seem, this new field of research and treatment is rapidly growing from concept to reality. Today, with the power of visualisation technologies such as ultrasound and MRI, fetal surgery is being recognised and internationally classified in our health database records. The history of its development from the 1960s has recently been the subject of a paper by Koehler et al (2017) where they discuss all of the above, plus the ethics and evolution of the diagnostic and surgical techniques. The use of MRI for fetal diagnostics did not become a reality until the 1980s and has only recently been researched in the UK as an emerging technology with ever-increasing popularity and prestige as a diagnostic tool. The use of MRI in fetal surgery has been of immense value in progressing this field of surgery and has brought immense hope.

A good example of major developments in fetal surgery is in the area of spina bifida. The US National Institute of Health funded a large prospective multicentre study to compare the outcomes of the surgery undertaken at around 23 weeks’ gestation and this study reported the benefits of intrauterine surgery demonstrating a decreased need for shunting, reversal of hindbrain herniation and better neurological functioning (Moldenhauer and Adzick, 2011). This study was a major milestone in the history of fetal surgery. Further significant progress is evidenced in this field with the recent systematic review and meta-analysis (Araujo Júnior et al, 2016). This review was undertaken to compare the outcomes of the different procedures for repair (open fetal surgery compared to fetoscopic) and included the initial extraction of 1080 relevant records for review which is an evidence marker to demonstrate the growing number of studies in this field. The outcome was based on a sample size of 19 relevant records and demonstrated that open fetal surgery had less ‘procedural-related complications, but there was a higher rate of hysterotomy scar complications’. It is important to note from an ethical perspective there is a risk of harm to the mother, as well as the baby, including preterm labour, placental scar issues and CS.

Sharing this knowledge with each other and with parents is important, regardless of whether the surgery is available in their country. We know many will find a way to achieve their goal, even if it means raising funds and travelling abroad. Babies are precious and mothers have demonstrated their willingness to put their life at risk to save and enhance the life and wellbeing of their unborn baby by risking intrauterine surgery. We need to have no fear in sharing this knowledge, facilitating parents to make informed decisions and, where they wish to do so, take an alternative course of action to avoid abortion. It is our duty of care.

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Reflections on bullying in midwifery and the potential role of EMDR in processing past memories and reducing the impact of trauma

Key words: Bullying, EMDR, trauma and evidence-based midwifery

I have been propelled into thinking about my contribution to midwifery research and I confess, it has been a big challenge. The request has had a mixed impact on me and I would summarise it by stating it was cathartic but painful. It made me go to places in my head I did not want to go, but it also made me aware of the fact there are dark spots that cannot be seen in the spotlight until a person is ready to process them. For me, memory lane at the start of my post-doctoral journey was dark and full of deliberate pot holes and fences. These materialised into the faces of well-known midwifery leaders who tried to blot my journey with innumerable obstacles and falsifications and even physical threats. The raw memories of exchanges between the bullies I met in my research journey flooded back and I was sick to the core. However, at this point in my life I have found a new way to deal with these memories: my recent training in Eye Movement Desensitising Reprocessing (EMDR) therapy. Using this evidence-based technique, I have healed my body response and no longer experience the rapid pulse, chest tightness and leg weakness that accompanied the flashbacks. I have now re-processed the raw and vivid images into past memories.

I was being asked to review my contribution to midwifery research and for the first time in my life I was able to describe without fear one thread running through my research history that was wrapped around my heart and embedded in my soul: bullying! I decided to share this one, of 24 in exercise and obesity, PhD threads and track it from origin to present day. However, I could easily have selected one of many threads including but not restricted to: breastfeeding, medications in pregnancy, alcohol, still birth, caesarean birth, disabled women's experiences of childbirth, appropriate use of technology, depression, use of social media, etc. On reflection, I consider bullying to be one of the most important and under-estimated doctoral-midwifery-studies in which I have been privileged to be chief investigator.

With EMDR therapy, I was able to get past the sensory aspects and see how I had taken this experience to a place where it could be researched more objectively and be more fully understood. This became a PhD opportunity to research bullying in midwifery, through the work of one of my doctoral students who produced a novel PhD research contribution that included the first conceptual analysis of the phenomenon and a subsequent, theory-based survey to explore the manifestations of bullying in our student population (Gillen et al, 2008). This research had support from the RCM as we launched a summary at the Doctoral Midwifery Research Society (DMRS) (Gillen et al, 2009). Finding further funding for the research was a dead-end. However, the academic framework was evolving with new knowledge contributions coming from mixed-method research and with national and international surveys (Gillen et al, 2008). I could see for the first time the thread that connected the human experience across cultures and across the professions and it was profoundly visible when we published the Cochrane review looking for interventions to deal with bullying in the workplace (Gillen et al, 2017). However, this was still not helpful in terms

of long-term impact. Even after a Cochrane review, there was no robust intervention or a healing pathway that could be endorsed or tested in the profession and so the trauma was set to continue unless we could find a way to intervene (Gillen et al, 2017). Today, I share with you my thoughts as a survivor of bullying and as a researcher in this field about a possible next step in developing our understanding of the implications of bullying on midwives. More importantly I want to propose a modifiable and organic intervention for us to test as the RCM is a large midwifery organisation. Theoretically speaking, I am proposing to all of you who are listening, that EMDR therapy has a vital role to play in the next stage of our midwifery research and ought to be further tested and explored as a suitable and acceptable intervention for reducing the effects of trauma from bullying within midwifery. As part of any research in this specific subject, I think we need to maximise the social media platforms for exposing bullying in practice, education and research, and for promoting evidence-based interventions to ensure a rapid response to trauma management.

A note of caution, being suspicious and questioning the evidence is essential, as one person's testimonial is insufficient for making change or for any recommendations. We must seek and conduct robust research to obtain the appropriate quality of evidence to support any proposition or belief we propose.

As a researcher in the field for almost 25 years, I must remind you of the need to question every research study and to seek the raw data where possible. The work of the committed folks in Retraction Watch demonstrates how important this is. We need to be sure the data exists and we need to be sure it has been analysed robustly and there is an appropriate evidence trail for scrutiny. I see a valuable endpoint and a good outcome that cries out for us to take forward a clinical intervention using EMDR therapy as one method that may have a positive impact: reducing the trail of trauma we inflict on each other. My role as a researcher is to ask questions, propose theories, seek answers and ask more questions. I do this for my midwifery profession.

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Research dissemination and impact: Reflections on the Doctoral Midwifery Research Society's Spotlight on Breastfeeding Research

Key words: Breastfeeding, Doctoral Midwifery Research Society, congenital anomalies, population data collection, evidence-based midwifery

The sound of exuberant chattering and the vision of sheer joy, manifested in noisy and prolonged hugs was a truly awesome phenomenon to experience at the recent Doctoral Midwifery Research Society (DMRS) event in Ulster in November, when we held our second 'Spotlight on Breastfeeding Research' event. We had anticipated a small group of approximately 50 but this was doubled and we were delighted.

Being a facilitator in bringing people together who share the same passion for a subject is a marvelous gift. I am deeply grateful to the HSC, Public Health Agency, Research and Development Office in Northern Ireland for continuing to support our research dissemination through the DMRS. A small amount of funding can go an incredibly long way and the impact is invisible at the time but you know it is a long-term investment.

Breastfeeding is one of the key areas for research and development within the remit of the DMRS and this second public outreach event on breastfeeding was another great opportunity for networking, sharing new knowledge and disseminating multidisciplinary research.

Last year, we presented the interim results of our breastfeeding literature search review at the DMRS event and we are pleased to be publishing the full paper in this edition of *EBM* (Sinclair et al, 2018). This paper is the product of almost two years' work from a multidisciplinary and multiprofessional team.

The important point to note is the focus of the paper was to identify which interventions, if any, had been tested in the UK or Ireland and had impacted positively on the breastfeeding initiation rates. This was a very narrow focus but it was deliberately tailored to pick up the successful interventions so that we could build on the research knowledge that was already evident. Although we identified over 2000 potential papers, only 12 met the initial screening criteria and of these, three met the full criteria for review. This was a sobering find for us and one that has demonstrated a true lack of targeted, experimental research in the UK. We concluded the review by stating that future studies should also examine the contextual issues alongside the development and implementation of interventions and we hope to see Northern Ireland being involved in new national and international experimental studies.

At this event we presented some crude, preliminary data from an online survey of 100 parents across Europe who had a child born with either spina bifida, Down's syndrome, severe heart disease or cleft lip (Eurolinkcat, 2017). We asked: 'How did you feed your baby?' We were surprised to find that 44% had breastfed, 18% had bottle fed their baby breastmilk and 9% fed their baby breastmilk through a nasogastric tube. The findings were unexpected and we are still completing the analysis. What stands out is the determination of some mothers across Europe to provide their baby with breastmilk. This small data set demonstrates how important it is for those of us collecting data on infant feeding to really listen to parents. We can do this by providing a space for their voices to be heard in the midst of the

noisy data collection process by leaving signposted data entry options in our surveys and by undertaking further exploratory research of a more qualitative nature.

As usual, we have offered the presenters at the DMRS event an opportunity to share their research with all of you by having a fast track to publication option from *EBM*. We envisage further illuminating detail from Clare Relton on her research methodology that demonstrates a positive impact on breastfeeding from the use of financial incentives to be published in the March 2019 edition of *EBM*. Furthermore, data from the live event will soon be posted on the DMRS website (doctoralmidwiferysociety.org) and will include abstracts, biographies, powerpoints and video clips from presenters.

The research questions that need to be formulated to address gaps in our knowledge base require targeted and ring-fenced time set aside for us to focus on key questions that can be answered using appropriate research designs. Funding for breastfeeding research is a requirement if our governments really want to give every baby the best possible start to life and have a long-term sustainable and evidence-based impact on the health of our populations. Collecting infant-feeding data from parents who have a child with a congenital anomaly is a public health surveillance issue and those responsible for population data need to be cognisant of the longer term health statistics that can be obtained from a data entry of this type. These parents are a minority group who can gain an enormous benefit from us seeking small data collection changes at population level.

We concluded our presentation by asking for routine data collection to be more inclusive so that appropriate outcome data can be obtained on the longer term health benefits of breastfeeding infants with congenital anomalies. Pooled and integrated data on child health systems, vaccination records, hospital admissions and prescriptions can provide robust evidence for us on the longer term benefits of breastfeeding. However, we need to have tools for data collection that are sensitive and specific and we need government policies to drive forward change.

In summary, we need to keep talking to each other at events such as the DMRS and we need to articulate our concerns and those of parents to the commissioners and policy makers if we really want to see change.

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Virtual birth in 2030

Key words: Virtual birth, appropriate use of technology, normal birth, evidence-based midwifery

Imagine the normal birth scene 10 years from now. A woman is preparing for birth using a headset and sensor pads from the comfort of her own home!

She is calm and well prepared having experienced virtual birth as part of her antenatal education programme, during which she created her own virtual birth environment using standard technology provided to all women by the hospital. She has selected key people to be with her, to offer her their support, and her personal midwife has been invited into this virtual world. She has a fear of childbirth based on a previous traumatic birth and emergency caesarean section due to a true knot in the umbilical cord. She was triaged in the antenatal system and assessed following online completion of a range of psychiatric instruments to detect post traumatic stress syndrome and depression.

Following online consultation, she was offered virtual and applied eye-movement desensitisation reprocessing therapy to facilitate her in processing the negative birth memories. Applied virtual reality enabled her to use the techniques learnt in treatment at home. Following successful therapy, she no longer fears birth and decides to opt for a vaginal birth after caesarean section. The midwife caring for her received her profile and history prior to the first antenatal booking in the clinic.

The woman has completed a series of online apps downloadable to her mobile phone and this data was ready for the midwife and the obstetrician to view before the woman entered the room. The birth memories were selected from a menu of options with a range of items from positive to negative and the data were presented in an infographic wordle. This provided the midwife and the obstetrician with an early insight into the previous birth experience of this woman and its impact on her mental health. The app also collected data on her medical and social history, including medication profile. Data on birth choices and birth expectations were also collected. Linkage to biochemistry results, ultra-sonographic data and previous hospital admissions and social work referrals were all interconnected and available for download if and when required. Alerts were in the system so that any social issues could be flagged. Data on educational attainment and employment status were also retrievable.

As we move forward, imagine this woman has been treated for her previous birth trauma and is ready to engage in a normal birth. The system is now offering her an opportunity to prepare for birth using applied virtual technology and she can choose to create her perfect birthing environment. This woman goes to the virtual reality maternity centre to prepare her birth support materials. She is going to create her own virtual reality. She decides what is important, what to include in the video footage, whom to film, what sounds, pictures and objects need to be in the frame. She decides to use reflexology for pain relief and has video-recorded a complete session. She has sensors to put on her feet to re-create the activity when she goes into labour. She has recorded her reflexologist and together they relive the

experience. This is modern childbirth. No systemic analgesia required, no fear experienced: a woman at home, comfortable with telemumandbaby monitoring to a local midwifery hub.

Now imagine the birth is imminent: the woman is 39 weeks, cephalic presentation, longitudinal lie and contracting 1:5 with contractions lasting 45 seconds. The woman is mobile, comfortable, wearing her head and sensory technology. She has alerted her midwife and contacted the hospital so that her e-world becomes live and she is linked to the maternity hub. She sees the midwifery team online and knows the obstetrician is on call if she needs a caesarean section.

Her partner is with her and she is in established labour. The midwives check the sensor monitors for the CTG reading and maternal vital signs, and they are happy she is progressing well. The woman has inserted a small vaginal probe like a tampon and this assesses her cervical dilation. She is 4-5 cms with 50% effacement and spines -2/3. This data is picked up by sensor technology and visible to the midwives in the central hub.

A midwife on call with a delivery pack sets out to be with the woman. Her journey is guided by satellite navigation and her presence is monitored. The woman relives her experience of reflexology, listens to selected sounds and music and sees the people who are important to her with her in this virtual world. She is calm and safe and relaxed.

The midwife on route has visual and sensory data downloaded to her mobile phone and can speak directly to the woman. The midwives at the central hub see the same data. The woman has a special relationship with the midwife who will attend the birth and together they have pre-prepared the virtual reality footage, including how to manage the birth if the midwife does not arrive in time. The calm voice and visual image of the midwife are essential to maintaining the intimacy of the birthing environment. The midwife arrives and the woman is clearly ready for birth. She and her partner experience a birth that has been supported by assistive virtual technology.

For some of you this will be a comfortable vision and you will see the benefits of being in a safe and known environment where technology is being used appropriately to support and enable a woman to give birth. The experience described here is one where the midwife is crucially involved in the complete birthing experience. Technology is assistive in providing visible data on every stage of the pregnancy and the birth. Landmarks of fetal descent and vital monitoring are easily read and interpreted and picked up from the central maternity unit for assessment and monitoring. Human and technological support are enmeshed to provide the best birth possible.

The future of virtual reality applied to birth really is in our hands!

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Hello Watson

Key words: Watson, supercomputer, woman-centred care, artificial intelligence, occularcentric power, evidence-based midwifery

Back in the 1990s, I went to London to be trained by Professor Dave Sacket to learn how to use evidence-based medicine to improve clinical decision-making and enhance my clinical midwifery care. It was the new approach to facilitating 'judicious clinical decision-making' based on best evidence from critically appraised topics, warmly referred to as 'CATs'.

However, the limitations of the application in practice quickly became apparent as although the concept was admirable, the infrastructure to support it was not developed. There was a distinct need for better quality research to be undertaken to answer clinical questions. The research needed to be focused on answering questions that were raised by practitioners and that were relevant to everyday clinical decision-making.

In addition, access to more sophisticated search engines to retrieve appropriate published research evidence became a priority once the research had been undertaken. Getting the research evidence published remains a key challenge. The speed of the information retrieval was dependent on the power of the computer to search and retrieve information. The hardware had to change and mobile access was a natural trajectory. In addition, only the evidence that was digital was easy to access and the digitalisation of books and papers became a priority. The movement is now part of our medical and midwifery history and the key principles have been embedded into the decision-making faculties of every healthcare practitioner. The seeds for this journal, *Evidence Based Midwifery*, came from that awareness of the value of publishing research findings and having papers that were easily accessible and of high quality.

Open-access to research has become a major factor for healthcare workers as new research floods our practice at a phenomenal rate and impacts decision-making. Knowing the data and having access to multiple sources – such as pharmacology, biological data, outcomes from clinical trials, guidelines, adverse reports, evaluation data and, more recently, public perception and evaluation data – makes our decision-making more complex but, the more access we have to data, the more evidence-informed that decision-making can be.

Evidence Based Midwifery has become an open-access resource and this huge innovation means that anyone across the globe with access to the internet can find published research papers courtesy of the Royal College of Midwives. This is a mega-resource that needs to be recognised and valued, not only for REF2021, but for midwifery education, practice and research.

In the space of 25 years, microfiche and hard copies of journals bound and logged for access by people on two feet have gone forever. The days of searching reference books while physically standing in the library are history. However, a trip down memory lane is valuable. Looking back, we embraced the new technology with its power to bring us closer to the evidence from our work machines. We were delighted with the rapidity of the advances and as the technology permeated our spaces and made access quicker, we forgot the old ways and

kept looking for more innovation; more databases and more help with synthesising the evidence. But as the volume increases, our ability to interpret it slows down our decision-making. Home access, mobile access, faster downloads and high-speed broadband are now the accepted norm. Laboratories and patient records cannot keep up with our demands for instant access to data and that is where we are likely to see major change in the next few years as the world moves to accept and expect immediate access to confidential patient data.

Say we want access to our personal records; our data might be held in the form of a smart card available for rapid access with our fingerprint or eye scan. We will control who shares our personal file and it is only a matter of time before these changes become reality. Today, for example, I opened an app called HiVision and was amazed to see the information it provided when I took a photo of my TV. Of course, the app is designed to encourage me to make purchases and when I looked at the screen I saw data on the TV type, cost and places to buy. The principle here is the intelligence of the machine and its capacity to provide data. In this example, the data was of no interest, but the potential for the technology to be applied to medical cases such as Type 1 diabetes or pregnancy is mind-blowing. Indeed, one of my current PhD students is working in this field and the array of intelligent sensor technologies for self-screening is growing rapidly (Adams et al, 2019).

We only need to remember how quickly we adopted high-speed access to data and this is evidenced in how quickly film-rental shops went out of fashion as people turned to Sky Movies and then Netflix and Amazon Prime. The market for videos and DVDs has almost dried up as our homes become a central IT hub that will soon show us our laboratory test results, appointments and online health checks and offer us mental health and wellbeing digital support chats.

The occularcentric power of the technology to show us everything within the three-click principle is alluring, captivating and maybe even mesmerising. Social media and internet addiction (Huang, 2017) is a modern disease and Mallorqui Bague et al (2017) report co-morbidities where gambling is linked to behavioural disorders such as 'problematic internet use and gaming disorders'. However, some may argue that technology per se is not the culprit as it cannot operate without the human touch. I see this as a debate for another day and we will consider this in another editorial.

The invisibility of the technology needs to be noted and we need to be aware of it. We only notice the technology when it does not work, not when it is offering us more and more power to illuminate what we cannot see with our normal vision. It's a small but important point. When we want to access the electronic patient record (EPR) to enter a visit to the day obstetrical unit and find there is no access because the module does not exist on our patient information system, we are irritated and complain bitterly. We expect the technology will fix the problem and in most cases it does. When we learned

how to access the library remotely through our mobile phones and home computers our tedious journeys to the library were over and our physical exercise levels dropped.

Enter the FitBit and we have a technologically designed motivator that encourages us to get up and walk. It can even notify us of our lack of movement. The sensor power is amazing and we seem to be continually in the process of developing new technologies that solve one problem while simultaneously giving us another. We proceed to develop a solution to the new problem and a new one emerges and so the cycle is propagated. The journey has been rapid and our young midwives will see even more rapid changes in the power of technology now that we have a new super computer, *Watson*, which is artificial intelligence at its peak. Developments in this field are set to change the world of healthcare, as we know it, with great stealth and powerful social media advertising.

I smile at my children and grandchildren when they call Dr Google, who has an answer for everything. Now, I can foresee a future where Dr Watson will be our first port of call on our clinical iPads and our computer linked screens at the bedside of every woman in our care. We will open our smartphones and retrieve data from the lab and from the EPR and child health system in seconds not minutes. Our smart phones will be ultra powerful and Big Brother watching every move will become the norm. The multiple data sets that I have personally tried to find technical solutions to combine (CTG, IVAC, dinomapp, urinometer, epidural etc.) will be brought together in seconds and data will be integrated and interpreted and decisions proposed for acceptance or rejection.

So let me introduce you to Dr Google's competitor, Dr Watson. IBM designed *Watson*, a super fast computer, in 2011 to take questions and provide answers. It does this by taking the question and analysing it as input, producing a set of features and hypotheses by rapidly processing data it has consumed as 'content' before searching for the best answer (Howard, 2014). It is cognitively programmed and was originally designed to take on the best game players in the US on the *Jeopardy!* quiz show (Rutter and Jennings) and it won the top prize of \$1 million (see http://bit.ly/EBM_Jeopardy). For a detailed description of how *Watson* searches millions of information sources in seconds and analyses them to come up with an answer, visit http://bit.ly/EBM_Watson.

The potential for *Watson* to be applied to healthcare is huge and the past eight years have witnessed a growing body of evidence that demonstrate its applicability to a wide variety of healthcare areas, including screening, diagnostics, treatments and evaluation outcomes.

IBM created *IBM Watson Health* to help researchers and healthcare providers enhance their evidence-based (not just informed) clinical decision-making and provide key facts about their research profiles across the world (see http://bit.ly/Watson_Health). IBM makes a clear statement with reference to the major problems with data overload and the expectation of medical data to double every 73 days by 2020. It also estimates that each one of us will 'generate enough data to fill 300 million books' (IBM Facts, 2019). IBM makes a strong case for the increasing time spent by each one of us in clinical practice

interacting with the electronic patient record (approximately 70% of our time) and propose *Watson Health* as a resource for the provision of individualised patient care plans and, in our case, this is woman-centred, evidence-based care.

This technology is now being tested. When I look at current technology, the advances are phenomenal and it is only a matter of time before we will be using such systems just as comfortably as we now use our mobile phone to access our emails, Twitter accounts and Facebook updates. This new computer can make sense of structured and unstructured data, use natural languages and it has the power to analyse multiple data sets.

It's a mind-blowing thought that a computer is cognitively programmed to think like a human being and can learn from tasks undertaken. This system has been through several stages of morphing and testing in a variety of healthcare settings.

Today, we are reading about the future evidence-based midwifery care supported by artificial intelligence. But it won't belong until *Watson*, or a system like it, will search, collate, interrogate, hypothesise and propose decisions for our consideration based on mega-data crunching. This is the future reality of our health care delivery. Evidence-informed care will be replaced by the evidence-based care. Evidence based on mega-data that has been filtered, cleaned and appropriated for our consideration.

I will end on a key point – we are still in command of this data as we initiate the action and we are the people who act on the evidence. The power is in our hands and the machine is still our artificial assistant.

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What is DORA?

Key words: DORA, research assessment, REF2021, PLAN S, evidence-based midwifery

You are probably thinking: “Oh dear! What have we here, not another acronym?” Yes, it is indeed. But please note, this one is of great importance for you as an individual, if you are chasing promotion and your publication profile is under scrutiny. DORA stands for Declaration of Research Assessment and emerged in 2012 following the annual meeting of the American Society for Cell Biology (ASCB) in San Francisco. At that time, the research community was greatly concerned about the fact that, for many scientists, promotion was based on the correlation between the contributions of the scientist and the impact factor (IF) of the journal(s) in which their work was published.

ASCB members signed up to DORA and made it clear that their intent was to improve the ways in which all of the outputs for research (not just publications) were assessed and they highlighted the need to be judicious in the use of metrics for evaluation and promotions. *Their vision was to advance practical and robust approaches to research assessment globally and across all scholarly disciplines.*

The DORA principles apply to all research, including arts, humanities and social sciences. When I heard the word ‘declaration’ my mind automatically leapt to the famous Declaration of Helsinki 1975 (emanating from the Nuremberg Code 1947) that set out to regulate ethical behaviour in medical research practices following the inhumane treatment of people in concentration camps by the Nazis during World War Two.

Therefore, when I first heard my colleagues talking about DORA, I presumed this was an important document that required detailed review and a conscientious response. Obviously, I hope you will take time to read it in full and make up your own mind. But before you read the Declaration, ask yourself these questions: Is the research publication system ethical and equitable? And are researchers treated with respect regardless of the journal in which they have published their research?

Take time to log-on to the DORA website and view the presentation that highlights the problems with skewed results from impact factors (IFs) and journal-based metrics and the lack of transparency in compilation of IFs.

Let me share with you my simple understanding of DORA. To me, the DORA team are research activists who are online seeking subscribers to sign their Declaration to ensure institutions, publishers, professional societies and individual researchers across the world to agree to changing their research practices. The team spirit seeks to find consensus on the value and need for a unified approach to achieving the best possible research based on achieving a level of agreement and compliance across institutions and organisations. The movement appears to have started because of visible inequities in the research business, unfair treatment of researchers and over reliance on IFs and metrics for promotion.

The team at DORA has outlined 18 principles that target:

funding agencies, institutions, publishers and organisations that supply metrics for researchers. In my opinion, the message is calling for an end to the brain drain from broken and lost researchers, stopping the inequity to accessing research data, curbing the power of the money making publishing companies to dictate citations and IFs and a challenge to all to do what is just and ethical!

DORA has recently published its two-year Road Map (DORA Road Map 2018) which focused on three main objectives:

1. To increase awareness of the need to develop credible alternatives to the inappropriate uses of metrics in research assessment.
2. To research and promote tools and processes that facilitate best practice in research assessment.
3. To extend the reach and impact of DORA’s work across scholarly disciplines and in new areas of the world.

DORA’s overall recommendation states: *Do not use journal-based metrics, such as journal IFs, as a surrogate measure of the quality of individual research articles, to assess an individual scientist’s contributions, or in hiring, promotion, or funding decisions.*

The full content of the Declaration can be accessed from <https://sfdora.org/read/> and you can check their website for evidence of sign up by key organisations across the world. You will see 1,595 organisations and 15,336 individuals have signed the Declaration (accessed 10 December 2019).

Taking a step back into history, it is important to note what was happening in the UK in 2012 when DORA was activated. This was a critical point in time for the Research Excellence Framework (REF2014). As a member of the panel judging the submissions for midwives and nurses I can assure you that we were not permitted to use the IF of the journals to rate the papers we were assessing.

Metrics were only permitted to be used when a team reached deadlock and could not agree on the rating of a particular paper. I can only remember this happening on one occasion and we made reference to the citations for the paper. REF2014 and REF2021 are important for midwifery in the UK and all of those who publish their research in *Evidence Based Midwifery*.

I have been struggling for 10 years to get our IF measured and now I am not so sure of the perceived value based on DORA for *Evidence Based Midwifery*. We do have a challenge ahead of us, however. To be REF2021 compliant, all journals must follow certain rules and produce information about the journal publication timing, open access etc, and follow SHERPA ROMEO REF guidelines (<https://www.jisc.ac.uk/rd/projects/sherpa->).

According to the DORA website, discussions with HEFCE on the REF2021 are in progress and we need to watch the space as updates are likely to materialise.

Many UK universities are currently engaged in discussions

about what to do about DORA. The DORA website has the name of every institution that has signed up. Adding a signature is a decision that requires consideration of many factors including REF2021 Code of Practice statement: ‘Where there is no distinction in terms of quality between two outputs additional metrics will be brought into play...’

This statement is a challenge to DORA recruits. In June 2019, UKRI signed the Dora declaration. It is important to note that in 2018 all of the seven UK Research Councils, now under the umbrella term of the UKRI, signed the Declaration. The UKRI is also a member of the newly formed ‘cOALition S’, set up by the European Commission and the European Research Council, in which the S stands for shock!

This lesser known but important initiative is labelled PLAN S and operates on 10 principles including author ownership of their outputs, prohibition of publication in hybrid or subscription journals and standardisation of article publication charges (APCs). PLAN S has the backing of 12 EU countries and they have all signed up to publish their research in open journals or repositories that can be accessed by all by 2021 (Wikipedia 2019). This important factor will affect dissemination of research findings.

There are many changes afoot and as we prepare for 2020 and the final REF submissions it is important for all research active midwives to have a basic understanding of major initiatives such as these because they will have a major impact on the selection of a journal for publication of key research. Naturally, you know and expect me to point out to you how lucky you are today to be reading this editorial in *Evidence Based Midwifery*, your RCM journal that has always promoted midwifery research and strived to provide the label free platform for dissemination of research.

In the last REF2014 and in REF2021, your papers published in *EBM* were and will continue to be eligible for review. The *EBM* papers in the last REF scored well and in REF 2021 they can score even more highly and, more importantly, you still have time to get that publication into print.

I am continuing to encourage you to select *EBM* for publication of your major research regardless of IF. The IF is secondary with regard to the quality of your research that ought to stand alone. All papers submitted to *EBM* are and will be subject to double blind peer review and we process and publish most of our papers within six months. Three months after publication, all papers are fully open-access and free to all and this is in keeping with SHERPA REF.

This is an exceptional gift to UK midwifery researchers and to the world of childbirth researchers and is under sold and under-estimated as a truly generous Christmas gift given to you and I every year from the RCM. Please let me encourage you this year to open this Christmas gift and use it in 2020 to submit your paper for publication in *EBM*.

I also need to leave you with an important reminder about the next REF 2021 assessment: Research Excellence Framework (REF) panels are briefed on DORA, and the REF2021 guidance (<https://www.ref.ac.uk/publications/>

<https://www.ref.ac.uk/publications/guidance-on-submissions-201901/>) for submitting institutions states that **journal impact factors or hierarchy of journals will not be used in the assessment of outputs** (UKRI 2019).

Finally, before I wish you all the best for Christmas and 2020, I need to take this important time to thank all of you who have given us gifts of excellent peer reviews and sound advice during 2019, all of which have made a major contribution to the quality of our *EBM* papers.

Thank you!

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Editorial

REF2021: still time to publish your paper in Evidence Based Midwifery

Key words: REF2021, evidence-based-midwifery, systematic literature review, deadlines for REF 2021 submission, writing a good abstract

The UK Research Excellence Framework (REF2021) national assessment of research, deadline, for institutional submission is approaching rapidly. However, it is still possible to have your research paper published in Evidence Based Midwifery (EBM) before the final deadline as the cutoff date for acceptance of publications is 31 December 2020. Other important deadlines for us to remember are the 31 July, 27 November (2020) and 29 January 2021. The July deadline is for submission of census data for identification of research active staff, impact, research environment, PhD completions and details of our research income (must be money spent, not new awards). The institutional submission must be completed by the closing date of 27 November 2020 and we still have some leeway until 31 December 2020 for research outputs (publications and outputs related to our impact case studies). The final deadline for producing data on intended publications accepted and pending is 29 January 2021 and this deadline includes updates on impact case studies and additional evidence. Throughout 2021, the submissions will be assessed and we will have the outcome in late December 2021. This will be a major Christmas event for all of us involved in research.

So what can we still publish? We can publish research papers that will support our impact case studies and these need to score 2 on the assessment scale and this is important if you want to provide important evidence about the impact of your research. You can publish any of your research outputs from joint doctoral research and any of your funded research projects. The value of systematic literature reviews cannot be under-estimated. You can enhance their value by providing well-structured and clearly defined research questions with a solid rationale and a robust search strategy and framework for the approach.

You need to include your PRISMA flow chart and robust data extraction tables and assure the audience of your attention to rigor in seeking confirmation of the data extraction, analysis and synthesis. For example, this can be undertaken blindly, and randomly by demonstrating that perhaps you organized sampling of the papers for inclusion/exclusion at key points in the review journey and or perhaps you had an independent population of the data extraction tables and engaged in a process for seeking consensus with co-authors. You may wish to state how many people viewed and reviewed the abstracts and full papers. It is possible to score 2 or more and maybe even -3 with a carefully presented review. These type of outputs are worth focusing on and there is still time to do high quality reviews with clear rationales. You can ensure your review is of global value by writing a focused introduction with a good discussion targeting the clinical and academic significance of your review, relevant to the academic and clinical community. Above all, you must write a succinct abstract as this is essential in any paper. Unfortunately many of us neglect this aspect of our papers and leave writing the abstract to the last minute and rush it without taking the necessary time to include sufficient detail in a structured format. The abstract needs a sufficient background statement followed by a naturally evolving and clear rationale, aim and objectives or hypothesis. This needs to be followed by an appropriate method with sufficient detail on the approach, sample, data analysis and ethical approval (if it is a research study but this is not required if it is a systematic literature review paper). I would advise you to try to include, where the word count permits, a statement on the actions taken by the research team to enhance rigour in the data extraction process, data analysis and synthesis (if appropriate). The final section is your opportunity

to tell the reader how important your findings are at national/international level and their applicability to clinical practice, policy or guidelines. There you have it in a prescriptive format and I really hope you will find this information valuable when you are putting your papers together. A smaller point of reference is to make sure that you choose key words that are impactful and relevant to your midwifery research profession and the subject you have researched. It is still hard to believe that many databases do not have 'midwifery research' as a key term and we need to keep stating the words midwifery research to enable change to take place.

Some useful resources can help you if you are considering submitting a systematic literature review to EBM and I am suggesting a few that might be helpful. For example, if you are doing a narrative synthesis you can use a reporting framework for your literature review as this provides a logical and easy to follow structure and you can use something like the PRISMA-ScR checklist for writing it up (preferred reporting items for systematic reviews and meta analysis extension for Scoping Reviews (Tricco et al 2018). The Joanna Briggs Institute (JBI 2017) produces excellent data on how to undertake a review and a good example of a scoping review is Richards et al (2019) in the BMJ open and a narrative synthesis example would be O'Donnovan et al (2019).

In conclusion, there is still time to publish a paper in EBM that could be included in the REF2021 and

it is important to remember that your paper has the potential to be read by almost 40,000 midwives in the UK. All papers published in EBM are fully open access after 3 months and every paper is subject to double-blind peer review. The REF2021 team are tasked with reading the paper for quality and reach and significance and they are not looking at the journal impact factor. Best wishes for good news from your institutional REF2021 submission.

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Editorial

The wonder world of fetal microchimerism

Wonders unfold every day and the mind boggles at the hidden power of our human bodies to hold secrets that the human eye can never see but the heart and soul feel and intuitively, *just know*. We cannot see the microscopic world of the blood that flows through our veins, however, with modern technological enhancements and powerful microscopes we can visualise our genetic traits through blood profiles. The lifeworld of our blood cells that once was hidden is now visible! I believe it is ocularcentrism that drives us to seek the visual evidence for 'proof' of concept and with the revealing power of technology comes the 'aha' moment when we first *see* (Sinclair et al 2019). The realisation of the gift of precious life that flows from the beginning of time and lasts forever is mesmerising stuff that can set the imagination on fire! The new evidence on 'fetal microchimeria' (FMc) indicates that at conception, transference of maternal and fetal cells occur and that new life lives in us, regardless of whether or not we abort or have a stillbirth or the child or the adult dies. The definition of motherhood is called into question if we consider this fact. What a thought to consider and it brings us a new lens to look at the role of being a mother and the longevity of human cells. The thought of your child's cells remaining in your body for the lifespan is now factual not fictional. The facts are simple: cells from your baby (aborted, miscarried or born) remain in your body for a very long time and your cells also remain in your child, resulting in reciprocal transference, known as 'fetal microchimerism' (FMc) (Shrivastava et al 2019). This fact supports the intuition that mothers often express when they sense their child is in trouble although they have nothing but a feeling to go on. The shared cellular life identified through FMc provides the scientific basis to prove the life line theory. Furthermore, the often heard statement: 'a part of me died when my mother died' can also be scientifically proven ...with our understanding of FMc. Fetal microchimerism refers to the bi-directional transfer of cells from the

mother to the fetus and from the fetus to the mother and can occur at any time from conception to birth. These cells remain in circulation for the lifespan and have been implicated in both positive and negative autoimmune disease progression (Shrivastava et al 2019). The understanding of FMc is an emerging body of knowledge that is focused on determining the role and function of transferred cells from the fetus to the mother during conception, pregnancy and the puerperium (Berencsi et al 2012). Some studies have reported positive associations such as protection from breast cancer (Gadi 2010) and Florim et al (2015) report positive associations with lupus. However, negative associations have been reported with increased risk of pre-eclampsia and cardiovascular disease (Berencsi et al 2012), yet others report both positive and negative associations (Yeung & Dendrou 2019). There is no doubt that this is an area for future research as the facts are still in the process of being collected and synthesised. Another explosive and controversial application of this important new knowledge for religious believers is with regard to the evidence that can be extrapolated to confirm the very special role and veneration of the Virgin Mary, the mother of Jesus Christ. Ministers and faith writers have written books (Calloway 2013) and social media postings, blogs and online commentaries about FMc referring to the evidence from research as confirmation of Mary's virgin birth and her ascension into heaven (Dobkowski 2017). Personal beliefs are to be respected but as midwives we are bound to seek the evidence from the genomics and immunology first and then we must remain sensitive and respectful to the religious beliefs of all the women we serve. We are cognisant of the complexity of human nature and our training prepares us to care for the mind, body and soul, of all those who place their trust in us. Each component of our human nature requires respect, protection and nurturing and FMc is definitely an amazing discovery with soul magnifying potential.

I do hope this brief introduction will encourage you to read more about FMc and some of you may be inspired to undertake research in this subject.

Key words: fetal microchimerism, evidence-based-midwifery, motherhood, genetics, ocularcentrism, spirituality and intuition

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Editorial

COVID-19 birth memories: *'It was like going into a war zone where there was an unknown, invisible and deadly enemy waiting for you ...'*

Keywords: COVID-19, lockdown, memories, Evidence Based Midwifery

As a midwife, I have been greatly privileged to be with many women who have given birth in many different circumstances, the majority of which were beautifully normal with healthy babies, happy parents and fulfilled midwives. However, some were very complex and even tragic. Reflecting on these birth memories can bring a mixture of joy, sadness and, in some situations, pain.

For me, the factors impacting on the births were natural physiological events and not disasters or epidemics like COVID-19. For example, I can still see Serena begging me to call the doctor so that she could go home late Friday night from the maternity ward where she felt she was 'imprisoned' due to a threatened miscarriage of twins. This was her second pregnancy and the first miscarried at 18 weeks. She was now 22 weeks and so happy to be feeling so well with stabilised blood pressure but her heart was breaking. The social distancing and isolation from her husband was just too much for her. As an English army wife living in Northern Ireland during the 1980s, she had major issues with simply being able to see her husband as officers from the army or police visiting family or friends was a known high-risk activity. After eight weeks of 'deprivation' as she put it, she just had to escape home to the barracks to be with him. She wanted to sign herself out and I can remember the doctor explaining to her that this was against medical advice but she ordered the taxi and was away in a flash at 11 o'clock that night. I will never forget her desperation and no amount of pleading from me was going to make any difference. I do not think it is possible for any one of us to fully comprehend the lifeworld of a soldier's wife in time of war when the desire for loving arms is a real dilemma because of the threat to life. In this particular situation her husband was putting his life on the line as the threat of attack was imminent and she knew if he came to the hospital he could be ambushed or shot in cold blood on the ward. This situation was further

compounded by the fact that the life of her twins was also on the line and she had been told she was going to stay on the ward for a long time. I tried everything I could to keep her from signing out but she could not stay. I finished night duty that night and thought of her many times over the next few days. When I returned on Monday at lunchtime I was given the bad news, Serena returned on Sunday night and there was no fetal heart. She was devastated and so was I. When we met we both just cried and hugged each other for a long time. It was a heart-breaking and soul-crushing experience without the anticipated and expected repetitions of *what if* and *if only*. Somehow, these words never came out and yet they were internally palpable. Serena had asked specifically for me to be with her when she was giving birth to her twin girls and they were born two days later. Memories of her pain and sorrow and quiet acceptance will always be with me.

Thinking about the tough decisions we have to make with COVID-19, led me to share this story as it was a true tragedy and a reminder that we can only do our best no matter what choices and dilemmas force us to stand at the crossroads. Lockdown can challenge us all to break the rules or take risks and we need to be prepared to live with the outcome regardless of whether it is good or bad. COVID-19 has been so difficult for so many mothers, midwives, partners and family members. The isolation, social distancing, mask wearing and forced separation have been heart-wrenching to watch. I cannot help myself as I wonder how we will remember these births and

tell their stories. Having listened to several mothers who recently gave birth during COVID-19 and their partners, I found myself struck by the hidden traumatic impact they had experienced and this was eloquently described by one father when he told me that going to the maternity unit was quite a terrifying experience ‘... *it was like going into a war zone where there was an unknown, invisible and deadly enemy waiting for you to walk into the trap!*’ The description haunted me for days and I found myself reflecting on this war against the unseen virus and remembered what it was like going back to being a junior midwife in the 1980s, in Northern Ireland, when the country was a war zone and maternity units and hospitals were dangerous places to be. Many attacks took place in units, hospital grounds or on routes to hospitals. I felt there was a symbiosis in the impact of the unseen enemy that was worth sharing with you. The familiarity of working in a world where the enemy was always hiding, waiting for a weak moment, lurking with a treacherous intent to harm and appearing veiled in many disguises was a real threat to life then and still is today. I must be honest and tell you that in those dark days, we did not talk about it, as fear was not permitted to have a voice. Talking was a dangerous activity and self-protection was never even considered. Our focus was primarily on the safety of the mother and her baby.

Midwives cared for every woman with the same respect and dignity and hushed voices and whispers were the unspoken norm when caring for the captain’s wife/partner or the senior police officer’s or the

prisoner’s. The one thing that would not change was the gift of being in the privileged position of being a midwife, trained and trusted to be the custodian of precious life. The memories of the atmospheric change that was evident for a little while after the births, when the fighting and hatred and pain were suspended, is still crystal clear! Transitory peace and joy were short-lived in a safe space. New life is, and was, and still is, precious, and birth was as remarkable then as it is now.

Today, with COVID-19, our maternity care is under threat again from an unknown enemy but we have the safety net of putting on the armour of PPE to fearlessly face the enemy with our shielded faces, rubber gloves and plastic aprons. In following the rules of safe practice and engagement, we respect the enemy and take every precaution to keep ourselves and the women and babies we care for safe. Our outer layers of PPE enable us to continue to care with loving hearts for those women and babies and families who need us to be there for them.

Colleagues, please continue to be courageous, cautious and, most of all, be midwives!

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Masked identity in COVID-19: seeing the face of midwives and mothers

Keywords: COVID-19, masks, midwives, Evidence Based Midwifery, oclarcentrism

Since the COVID-19 pandemic ‘lock down’ in March 2020, birth in our maternity wards and at home has changed face ... the taken-for-granted, ‘seeing’ the face of the midwife caring for a woman in labour has been shattered by fear of infection and replaced by ‘masked identity’.

The history we are creating will be written about for years to come and those who have lived through it will never forget these unprecedented times. Therefore, I would strongly encourage you to keep a diary and write about the thoughts, fears, joys and unexpected events that you have experienced. Take pictures, collect the nomenclature used in the literature and map your personal and professional journey through this difficult period in human history. The life stories of midwives and mothers in this pandemic matter now and in the future.

In my last editorial, I shared some of the memories of living through troubled days in Northern Ireland and as I write this editorial today, I remember the faces of many mothers who placed their trust in me (Sinclair 2020a). I feel privileged to have been able to walk away from the life of an artist to that of a midwife. I know being able to help a mother to birth her baby and help a father be part of that wonder, has been one of the most fulfilling aspects of my life.

Recently, I have been listening to my colleagues in clinical practice, hearing about their experience of wearing masks and protective clothing and learning about their personal and professional challenges. My thoughts have been focusing on masks: I have been wondering why they are so evocative and I have been trying to understand why some people are reluctant to wear them. I began to think about different types of masks and considered those worn by clowns, actors, Halloween characters, tribal leaders and religious leaders. I concluded that the reasons for wearing these are mostly to create a deliberate impact of wonder, fear or joy; emotions felt by us when we *see* them. The context in which a mask is worn is a

key factor that enables us to accept its use and be comfortable in their presence. Our children quickly accept the masks worn by superheroes and most look forward to taking on a new masked identity at Halloween. Historically, we find many references to the use of masks in the 1800s to protect workers from harmful substances, such as gases or chemical burns (Walton 2020). However, it was close to the end of the eighteenth century before our knowledge of germs and infection improved and some surgical mask wearing was promoted by the medical profession (Moynihan 1906).

Living in Northern Ireland, the very thought of wearing a face mask, or talking about it, brings memories of the ‘Troubles’, the wearing of balaclavas, closed helmets and the vision of blackened faces: all associated with hiding or protecting one’s identity. The armed forces, police and terrorists in Northern Ireland, all used face coverings to protect them from becoming visible or known to the enemy. This was a deliberate act of self-protection driven by fear of the repercussions of being caught on camera or targeted by one group or another. Wearing balaclavas is designed to instil fear. In those days, life was under threat from a human attack not a viral attack! This memory associated with mask-wearing is part of our cultural history and is worth mentioning when we hear about public reticence, or even resistance, to conforming to the recommended guidance and safe practice of mask-wearing (Department of Health (DoH) 2020).

I have focused on a local situation because having lived and worked through it adds a greater awareness of the lasting effects of masked men in our specific community. However, it is important to look nationally and internationally and recognise that concealing one’s identity for ‘good’ or ‘bad’ reasons is true of every culture/country. It is true of individuals involved in recent riots in the USA, highwaymen in the past and in the behaviour of the Ku Klux Klan (KKK). Surgical masks do hide identity! Maskaphobia

is a recognised psychological condition that causes people to have panic attacks when they see masks. It is important for us to remember this as a woman may become traumatised during birth if we insist on sticking to the protocol and do not weigh up the potential for good and harm, using the evidence and guidance with wisdom. In addition, wearing masks makes it difficult for people to hear properly due to muffling of the voice and is an even bigger problem for those who depend on lip reading to supplement hearing loss.

We need to *see* behind the mask, we need to *see* down the microscope, we need to *see* space. Seeing is part of our being and ocularcentrism is a key factor in our modern technological world (Sinclair 2020b). Modern technology fulfils some of our current need to see but we are not satisfied. Yes, with modern technology, we enjoy seeing people on FaceTime, Skype, Microsoft Teams or Zoom, and we are miffed if we just have voices and no pictures. For most of us, we still need to see the person's face, hear their voice and, if possible, touch them (Sinclair et al 2019).

In the past month, I have had email and Skype chats with mothers, health professionals and researchers to hear directly from them about the impact of COVID-19 and, in particular, to hear what they thought about wearing face masks. I would like to share some of their responses with you as a collection of professional mothers' voices (not collected for research purposes and therefore not subject to any thematic analysis):

'We are not asking women to wear masks in the postnatal ward. Everyone is now offered swabs for covid when admitted although some decline. I personally don't think wearing masks makes any difference when assisting women with BF other than to be warm and uncomfortable for the midwife. Most women are focused on the baby and understand about the PPE. Women have already had a midwife wearing a mask antenatally and throughout labour by this stage so have become accustomed.' (Mother and hospital midwife.)

'I feel that it takes away from being personal and may stop women building a relationship with their midwife.' (Mother and community pharmacist.)

'... staff and partners have to wear the masks ... not practical for the women themselves as they need to use the entonox. Mums just accept staff having to wear masks but it might be harder for them to bond with their midwife and it can be hard for them to hear staff talking at times.' (Mother and hospital midwife.)

'She had welcomed her baby prematurely at 32 weeks and baby was in the neonatal unit. She hadn't planned to breastfeed but due to the circumstances and COVID she was trying to pump for baby. She felt absolutely traumatised as you can imagine but this was compounded by the fact she had to wear

a mask and wasn't allowed to kiss the baby. I can't begin to understand how this must have felt. The potential for it to impact on bonding, breastfeeding and also increasing anxiety is just dreadful. We know the fact a mother's kiss to her newborn's head tells her body so much about the pathogens on baby which then influences the makeup of her breastmilk. In my opinion the impact of wearing masks, although important in reducing the spread of COVID, it will be quite detrimental for the mental health of women and possibly on babies' health.' (Mother, researcher and psychologist.)

'... unless you are wearing the see-through visor and even this barrier creates distance, fear and safety and associated memory triggers to times past.' (Mother and professional.)

These working professionals and mothers were well-informed about all aspects of COVID-19, including the scientific data and the need for public and professional compliance. The threads of their conversations can be woven together and I think we could all agree there is a general acceptance of face masks as part of the status quo (Wikipedia 2020) and it is important to note that 'times past' will never be forgotten in the Northern Ireland context. However, you cannot ignore the potential psychological impact that mask-wearing may have on the midwife, mother and baby relationships and well-being and this is an area for us to be concerned about.

I would strongly encourage you to begin to start mapping, documenting and asking the important research questions. Midwives are natural researchers, observers of bonding at birth and totally committed to facilitating women to birth in the best possible way, regardless of complexities. Midwives will find new ways to communicate and build that essential trust. The need to see behind the mask is a modern-day challenge. Already I have heard about midwives who have put little pictures of themselves on the outside of their surgical masks to help women feel more connected, some have made short videos to introduce themselves and others have showed women their 'midwife selfies'. I hear that some midwives have already raised concerns about remembering the importance of guidance, mandates and personalised care and the need to speak out without fear about challenges experienced. This was evident when some midwives added their voices to mothers to fight against the 'mandatory' wearing of face masks in the NICU when they are breastfeeding.

In conclusion, masks are now part of everyday life in maternity care and have a proven role to play in the reduction of COVID-19. Midwives, like others, must act on best evidence (Brooks et al 2020). However, it is important not to forget that evidence must be used judiciously. There is a time when science dominates and there is a time when human intuition and emotional needs must be recognised and valued

so that masked identity in midwifery is applied with wisdom and discernment in a human spirit of loving kindness. New evidence is published every day and the guidance is updated as fast as possible. However, I think there is important COVID-19-related midwifery research to be undertaken now regarding the opposition to, or adoption of, wearing masks and the identification of criteria for extenuating circumstances. More research will help us to understand the complexity of factors we need

to address when we make our evidence-informed contribution to guidance on mask wearing in midwifery practice.

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The Ockenden report: personal reflections on fetal monitoring and its place in modern midwifery care

Keywords: Ockenden report, COVID-19, fetal monitoring, midwifery skills, technology and evidence based midwifery, Evidence Based Midwifery

On 10 December 2020 Donna Ockenden (midwife) published emerging findings from the Independent Review of Maternity Services at the Shrewsbury and Telford Hospital NHS Trust where allegedly avoidable maternal and infant deaths had occurred. The early report was a clear indicator of the need for immediate action and this was after a review of 250 cases from a potential of 1862 cases. It was a sobering read and the urgency of the need for immediate action was loud and clear. As I read through the recommendations I was struck by the numerous references to fetal monitoring and in particular:

'4.22 Fetal heart rate (FHR) monitoring is an essential component of the safe management of labour ... The review team found significant problems with the conduct of intermittent auscultation and in the interpretation of CTG ... [Cardiotocograph]'

'4.26 A mother, admitted in labour with a breech presentation, had inappropriate use of oxytocin for her long labour with CTG concerns ...'

'4.27 A woman presented in labour at 39 weeks. There were CTG abnormalities in labour, which were not escalated ...'

(Ockenden 2020).

The memories of hours of observation of induced labours and the use of the continuous cardiotocography (CTG) machine flooded my thoughts. In my early research exploring the role of the CTG machine in the lifeworld of technologically supported midwifery practice, its place was securely positioned as a necessity for use in births where induction of labour was the status quo (Sinclair 1999). In 2009, 10 years later, the polarised opinions of midwives in midwife-led care settings and those in hospital settings were apparent — with the latter more favourably disposed towards the use of technology. It would be good to replicate the study in 2021. The role and model of the CTG machine

has changed considerably during the last 20 years with much more sophisticated and less bulky fetal monitoring devices available off the shelf and, recently, more computerised software additions have received a favourable review (Judd et al 2020).

With the increased availability of clinical/health/hospital video consultations using downloadable desktop and mobile apps, such as PEXIP, the opportunities for remote monitoring of pregnant and labouring women during COVID-19 have escalated. Video consultation technology offers enhanced care for women and their babies and facilitates midwives to care for women while reducing the risks associated with attending maternity clinics. However, in reminiscing about the old, large, bulky CTG models, I still hold fond memories of the interviews with midwifery managers when exploring their perceptions of the arrival of the CTG machine in the 1970s. The image of one midwifery manager, in particular, is embedded in my memory as she smoked her way through the interview while she gave the most beautifully illustrated description of her memory of the CTG machine's glorious arrival to the labour ward and how it was greeted with respect and anticipation when it was proudly wheeled down the ward by the doctor shrouded in a white sheet. Mothers were delighted with the new high technology and enjoyed hearing their baby's heartbeat. The CTG machine was welcomed by midwives because it was going to be an important tool in the midwifery decision making process and it was going to enable doctors to make clinical decisions to intervene early to reduce neonatal mortality (Sinclair 1999).

The multi-professional team's expectations of the machine's capabilities were, however, beyond its capacity to deliver and the situation today has not changed. Although innovation in design has overcome some of the restrictions to a woman's need to be mobile during labour when monitoring is necessary, the CTG machine is limited by the product hardware

design and the functions of the program software. It is, therefore, impossible for any CTG machine to be 100 per cent accurate in determining abnormal fetal heart rate patterns and alerting clinical midwives and doctors to consider early/instrumental intervention. Even the more sophisticated high-tech models cannot be programmed to take into consideration every human variable likely to impact on fetal well-being, including gestation, fetal weight, fetal anomalies, maternal health and social issues, familial traits, medication and drug history. The human decision making remains the same and I see similarities in expectations of novice researchers who anticipate that by loading up their masses of interview data into a software package, such as NVIVO, the machine will magically produce a perfect data analysis output. How wrong they are!

Every doctoral midwife using software needs to be aware of the limitations of the machine to interpret results in context. The package is excellent for managing large volumes of qualitative data. You put the data in and you direct the action of the program to produce the data output and YOU are the one who must make the interpretation judgement when the software churns out patterns and nodes and clusters of data. The data has to be analysed in context and a researcher has to bear in mind the original research questions, the aim of the study and the specific objectives framing the data entries. You, as the researcher, have already imposed a framework of pre-determined questions for interviews and the data needs to be interpreted bearing this factor in mind.

When we transfer our thinking to the outputs from the CTG machine, we need to be cognisant of the fact that the software program has limitations and will be designed using data available from previously screened mothers' CTG readings. Therefore, an ability to discriminate between different clinical conditions, ethnic origins and social groupings cannot be expected at this time. The data produced is limited to each mother and baby dyad. The newer machines, designed to provide clinical alerts using a traffic light system, are also limited even though they have more sophisticated artificial intelligence. The machine cannot give a 360-degree holistic analysis of maternal and fetal well-being and it is not yet designed to discriminate for social groupings, women with medical issues or ethnic factors. Fetal heart rate is indeed a key variable but on its own, without the fetal PH and the maternal pulse, BP and temperature it is severely limited.

Data from the CTG machine is just one segment of the full picture and needs to be viewed with that lens; our expectations need to be realistic. Based on the recommendations for immediate action with regard to appropriate and effective fetal monitoring from the Ockenden (2020) report, there is a continued need for multi-professional certified competence in

CTG application and interpretation with support for colleagues undertaking fetal well-being monitoring. I would go further to say that midwives and obstetricians need to become more involved in the actual design of the software to ensure the sensitivity and specificity of the future computerised programs are enhanced.

Many times I have been in discussion with academic and clinical colleagues on the role of the CTG machine as a helpful tool for midwives and a source of reassurance for mothers and fathers and a useful learning resource for student midwives. I hear, again and again, that the machine leads to increased caesarean section and instrumental delivery based on Cochrane review (Alfirevic et al 2017) but many fail to critically read the authors' conclusions:

'The question remains as to whether future randomised trials should measure efficacy (the intrinsic value of continuous CTG in trying to prevent adverse neonatal outcomes under optimal clinical conditions) or effectiveness (the effect of this technique in routine clinical practice).' (Alfirevic et al 2017:1).

The effectiveness of the technique is in our domain of practice. We are also the main interpreters of the data outputs and we are the people who initiate active interventions based on our judgement of the evidence presented.

I find myself asking the question: 'Have we lost our skill in CTG interpretation or are we so focused on normality that we are unable to conceive of fetal monitoring as an essential component of our skill set?' Furthermore: 'Are we listening to women who request continuous fetal monitoring?' I have spoken to mothers who had previous stillbirths and, for them and their partners, the CTG machine provided evidence that their baby was alive. Many women have purchased various fetal heart 'recorders' over the internet. Stories from family and friends provide anecdotal data on how some women, and some midwives, feel the value of the CTG is not just in aiding clinical decision making but provides much-needed psychological support that women need even more during COVID-19. The threat of face-to-face contact is real and, in the current pandemic, three UK midwives and five mothers have already died from COVID-19 (Knight et al 2020, Cook et al 2020). The pandemic has definitely had a huge impact on the use of the internet and online platforms that are becoming more attractive to midwives and mothers as they provide several benefits, including acting as a safety net in reducing the risk of exposure to COVID-19. I do hope 2021 will be a year in which we use the full range of technologies available to us appropriately and effectively for the good of the mothers and babies we serve — whether that be online communication via Facebook, WhatsApp, Live Chat, Skype, Zoom or through the use of supportive, surveillance

technologies, such as the CTG machine, or alternative maternal and fetal monitoring equipment.

I am certain that the future of fetal monitoring in 2021 is going to have a major overhaul and we must implement the findings from the Ockenden report (2020):

‘... all maternity services must appoint a dedicated lead midwife and lead obstetrician with expertise

in the field of foetal monitoring in order to improve upon practice in foetal monitoring.’

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The digital midwife

Keywords: digital midwife, technology, role of the midwife and evidence based midwifery

What does the phrase ‘digital midwife’ mean? I searched for it on Wikipedia on 13 March 2021 and *it does not exist*; the option to create it was there but I declined. The meaning of the term was not clear to me and I continued my search.

In my earlier work, a digital midwife was a virtual midwife in touch electronically with women who needed the knowledge and skills of the midwife but could not meet face-to-face, and this was prior to COVID-19. We used this term interchangeably with the ‘virtual midwife’ or the ‘e-midwife’ for research purposes but now it seems the digital midwife is a distinct and specific role, and one of great importance.

In my Google search for digital midwife I found several job advertisements for posts in England and, in one instance, the salary was Grade 8a (West Hertfordshire Hospitals NHS Trust 2021), indicative of the high level of importance and expectations of the post holder. The job specification included being the lead midwife for information technology (IT), coordinator and collator of maternity data in the service and liaising with internal and external agencies on digital matters. It became clear to me that this role was significant and of strategic impact.

Further searching revealed that the origins of the role were rooted in the creation of NHS Digital (2017), and it seemed to me that the voices of midwives had indeed been heard at government level when they were planning a major overhaul of the NHS IT systems in England. The potential for a more accessible electronic patient record (EPR) system with standardised operating systems, streamlined data input, easier data transfer and data access from any patient administration system in the NHS was, and is, of enormous value to clinical midwives and to research midwives. The history of the origination of the digital midwife role and its prominence was beginning to emerge.

Further exploration led to finding a well-established plan of action for the development of the role by the

Royal College of Midwives (RCM). The terminology ‘digital midwife’ was described by the RCM in their March 2021 position statement. The professional impact was evident from the high visibility of the role, which was prominent on the RCM newsfeed and website. The RCM has appointed Hermione Jackson as the specialist advisor on all matters digital. In addition, the RCM is calling for every maternity service to have a new digital midwife appointed within the next 12 months to lead the ‘digital transformation’ (Anon 2021).

I thought about the RCM statement and the 12-month plan and wanted to gain a deeper insight into the expectations of those taking up these new roles. I began to search jobs related to digital midwife. The jobs I found described the uniqueness of the role and the similarities across services. In essence, the role requires a midwife who would retain professional status and yet have a key role in developing the EPR. There appeared to be a recognition of the value of having knowledge of the clinical administration systems that interface with the EPR (NHS Jobs 2021). However, I could not see any reference to research and hope this may eventually be included as a part of the job specification. Research using electronic data requires specific skills but these can be taught.

My next step in this exploration was more like a leap into the ether. The role of the digital midwife had by now taken on a new focus for me; the exploratory work had compelled me to use the researcher lens to imagine how the role could be developed to facilitate midwifery research. First, my midwifery research bias must be acknowledged and I need to declare that my primary goal in the next few sentences is to inspire some of you who read this to take action. I hope you will be eager to develop a digital midwifery research network, or a digital midwifery research data bank, in collaboration with the RCM, that will contain critically appraised and evidence-supported research questions/topics of importance to midwives. Examples are national data on birth type

and place, infant feeding patterns, medications taken during pregnancy, chronic conditions, mental health, birth anomalies, and encapsulating this data within a more user-friendly and interactive system. Hopefully, multiple data sets will be more easily linked, such as prescribing databases, anomaly registers and child health systems.

Midwives are creative with technology so it is great to see news about midwives making technology work for them, and for mothers, during COVID-19. An excellent example was recently reported by the RCM in relation to the Birmingham symptom-specific obstetric triage system (BSOTS). I accessed the Birmingham website and could see it was launched last year as an e-system, built on using specific algorithms to triage women in terms of obstetrical level of need for immediate care. It was refreshing to see the midwifery expertise highlighted and the training led by Professor Sara Kenyon, who is currently working at the Institute of Applied Research in Birmingham and is a registered midwife with an established research profile (Birmingham University 2020).

The programme consists of an online educational component followed by a one-hour clinical element. Reports indicate the BSOTS system is easy to use and has been evaluated positively, with over 15 units currently operating it and more in the preparatory stages (Birmingham University 2020). The most important point to note is the rollout of the training across all four countries of the United Kingdom (UK) and this signals a hallmark of quality and a seal of approval (Jackson 2021).

The light touch search to enlighten myself about the digital midwife led me to ask the next question:

What is a digital doctor? The Wikipedia search mirror-imaged the findings for ‘digital midwife’ (does not exist but I could create a definition). My Google search produced an interesting perspective — the digital doctor search produced over 250,000 hits, with the first couple of pages clearly linking this title with a face-to-face doctor providing online services. My follow-on search of the Royal College of Obstetricians and Gynaecologists’ webpage for ‘digital doctor’ produced interesting results about digital exams but nothing specific to the creation of a new role or a visionary position statement like the recent one by the RCM (2021).

In conclusion, it looks very much as if the COVID-19 pandemic has brought some major benefits to the digital agenda and the technological role of the midwife. I have been researching in this area for over 25 years and, at last, it looks as if the IT systems will talk to each other and accessing data from multiple sources will no longer be a frustrating experience.

The catalyst of the pandemic has to be used for good, where possible, and it is truly inspiring to see the leadership of the RCM paving the way to the digital future. Midwives have a major opportunity to make the EPR fit for research purposes. I hope some keen, early career researchers will already be working on the data linkage and extraction process.

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Reflections on COVID-19: parallel reality, occularcentrism and blurred boundaries

Keywords: COVID-19, e-research, parallel reality, occularcentrism, Evidence Based Midwifery

The lifeworld of many academic researchers during COVID-19 was put on hold as the laboratory was out of bounds, clinical midwifery data collection was totally blocked and touching another person, unless absolutely essential, was unthinkable!

Prior to COVID-19, many challenges faced the researcher who was keen to use e-technology as it was not the norm or easily accepted as a suitable method of data collection. Researchers who wished to use any online platform to involve international participants and users in setting maternity care research priorities, co-produce research on homebirth across cultures or test the efficacy of the delivery of mental health interventions, faced many challenges and required commitment and dedication to achieve the desired research outcome.

The alteration of the mode of delivery of research interactions from face-to-face (F2F) to online was met with reluctance and hesitancy. From personal experience, many challenges faced researchers choosing to use e-platforms for data collection, including difficulty in recruitment, powering the sample, designing appropriate tools for data collection and limiting accessibility to those who were appropriate to complete the online data collection (for example, age, gender, culture and relevant exposure to the phenomenon of interest).

Online research has challenges that are ethical, legal and moral requiring the researcher to exercise vigilance and adherence to professional and academic standards. Ethical approval was often fraught with requirements to resubmit paperwork with attention to minutiae, such as detail on the protection of the unique identifier or the IP address of the person who interacted with the researcher. Caution with regard to the appropriateness of the language used, interpretation of the meaning and conceptual equivalence across cultures was, and remains, a necessity. The online research world was veiled and viewed with suspicion by many.

COVID-19 arrives and instantly, online data collection is popular, necessary and essential. Research studies are fast-tracked through ethics and research governance and sampling issues are resolved more rapidly. Publishers are fast-tracking COVID-19 research papers and monies for research related to COVID-19 have been produced and ring-fenced. It all happened so fast no-one could have been prepared for it. From a research perspective everything and everybody became data for observation, collection and interpretation. The real 'outside' world became a virtual one and we started to live our lives through machines.

If you stop to remember life 18 months ago, human touch was an everyday occurrence. Researchers met their participants F2F for interviews and focus groups and warmly shook hands. Students and supervisors sat together round tables reading transcripts and checking data entries. The essence of being present in the flesh and in the spirit was a desirable and normal everyday phenomenon. Today, we have adapted to life online and research work is now a form of virtual reality where we have altered our expectations to fit the new *modus operandi*.

The general public has altered their expectations for technology to replace F2F events, with virtual reality providing access to everything, such as driving tests and eyesight tests. We even want to know why we cannot pass our driving test using virtual reality! These changes in our perceptions of technology are crucial to our acceptance of the visual power of technologies to provide us with a parallel life lived through machines. COVID-19 has been a catalyst for a parallel lifeworld and what happens next is unknown. Who knows if the online world will become accepted as a norm over the F2F world? Normal is that which occurs most often and, right now, normal is online.

Many midwifery academic researchers, clinical researchers and midwife teachers are working from

home and some will wish to stay at home while others will desire the work environment. Many feel when they are working from home they need to be visible and available from 9–5 because there is a need to be seen to be present and at work. If you cannot be seen, suspicions about your whereabouts are raised. High visibility, being seen to interact F2F, yet online, is becoming an issue. Occularcentrism is dominant where seeing the employee online becomes a necessity for some employers and it is understandable that many employees express anxiety because they feel Big Brother is watching them from the Teams, Skype or Zoom platform. Switching off the machine is becoming more difficult and the boundaries between home and work are blurred. Balancing work, family and home life has undoubtedly become harder during COVID-19 and, for those trying to do online research from home, the challenges have escalated with limited computers, patchy broadband and sharing precious space with partners, siblings and others.

However, it is not all negative. I would strongly argue that one positive outcome from the devastation caused by COVID-19 for the research community is the global acceptance of online research and the potential to reach larger and more diverse samples. Occularcentrism is an applicable frame of reference for understanding how people favour visual contact and how valuable software has become in every home, regardless of socio-economic status, culture and ethnicity (Sinclair et al 2019).

Adaptation to the new home world of e-life that we have been forced to live in has challenged us to become more computer literate, and more accepting of the use of technology, as a normal part of everyday home life. During the pandemic, we moved our work to our homes, adapted our workspaces, accepted schooling online, and sent pictures via WhatsApp or email of our rashes and wounds to our GPs. The occularcentric behaviour of people needing to see each other or see the medical problem or see the learner has resulted in global use of free software to let us 'see'. Seeing from the safety of our homes has become an everyday activity. The need to *see* has resulted in Zoom or Skype becoming household necessities, like washing machines and fridges.

Research is changing and occularcentrism is dominant in our culture. Seeing the impact of our research on the recipients, enabling participants to see us, and seeing behaviour change as we watch from our office at home, is becoming a parallel reality. COVID-19 has significantly and visibly altered our online behaviour and our home and work reality boundaries are blurred by the virtual reality provided by life lived through and within the machine.

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Those were the days of ploughing the research landscape, sowing the seeds of knowledge and now is the time to write research

Reflections on the development of the RCM's Evidence Based Midwifery journal

Keywords: Royal College of Midwives, Evidence Based Midwifery, reflections

It has been my privilege to be the founder and editor of the RCM's *Evidence Based Midwifery* (EBM) journal and to see it become an internationally recognised research journal, formally inducted into the Nursing Journal Hall of Fame (INANE) in 2020 (Nicoll 2020). The award is given for excellence and it was warmly welcomed by the RCM, myself and the membership.

The aim of EBM was to provide midwives (and others) with a robust platform for the publication of high-quality midwifery research when we launched it in 2003 (Silverton 2003). The quality of the research paper was a major factor for all of us as we set out to develop, nurture and support our profession to grow top-quality midwifery researchers.

The challenge resulted in the establishment of a dedicated and committed editorial team and a small number of trusted and reliable reviewers. The administrative processes were minimal but sufficiently functional and fit for purpose. At the beginning, we received a mixture of papers written in a variety of styles: some were full theses, others full reports.

In those days, we spent much of our time advising and revising and pruning papers as they went backwards and forwards many times before acceptance. It is important to remember the era and the context in which not all midwives were graduates and the majority were used to writing short notes for the records, not for public consumption and critical assessment.

Furthermore, the number of midwives with PhDs or MScs was small and this led to the formation of the Doctoral Midwifery Research Society (DMRS), founded in 2007 and supported by a fund from the (then) Northern Ireland Research and Development Office. EBM is the official journal for publication of papers presented at DMRS conferences.

Today, I can say with confidence, the RCM has indeed grown a strong and fruitful tree of knowledge for

producing high-quality research and should glow with pride. The memories of those early days are bubbles of sheer joy as midwives floated with delight when they received their first publication in EBM. I can still see several of my PhD midwives swirling around the place animated with enthusiasm for research and for the EBM opportunity to publish, with RCM support. The distinguished wine and silver journal came with six free copies for those who had published. This was a great gift as hard copies were precious then and holding the journal in your hand was a necessary proof of publication. However, in this new era, everything is available online: hard copies are becoming extinct and a rebrand is necessary.

Those were indeed the days of ploughing the land and sowing the seeds of knowledge and now we are gathering the evidence. Looking back, there were times when the work seemed to be endless and recognition of the journal impact factor seemed an elusive goal. This all changed when the guidance for the REF2014 made it clear that the impact factor of a journal was not to be taken into consideration by the assessment panels (Higher Education Funding Council for England (HEFCE) 2014). This was a major boost for EBM as it made its name known as a serious research journal for showcasing midwifery's contribution to research.

I gleamed with pride when I saw papers published in the journal submitted for assessment in the REF and was even more delighted when they received high scores. We made the grade and this was a major indicator for me that we were achieving the necessary recognition for quality research without having the Thomson Reuter Impact Factor.

In this new era, with so many online journals popping up every day, it is essential to tread carefully: I would strongly advise any midwife planning to publish to select the publication journal with great care. It is worth searching for predator journals by accessing *Beall's List* (Beall 2021) and to be aware of the

Retraction Watch database (Retraction Watch 2021a) which exposes publication misdemeanours and publishes an evidence trail of papers that have been withdrawn due to plagiarism or misrepresentation of data. A recent post on the database demonstrates how a PhD thesis was ripped off by another author and subsequently exposed, leading to it being withdrawn (Retraction Watch 2021b).

Writing research for publication requires ethical and professional knowledge in addition to the expected academic skills. I would therefore also advise authors to visit the Committee on Publication Ethics (COPE) (2021) website to refresh themselves on good ethical behaviour in publication practices and policies.

Google searches on writing for publication produce pages of names of experts who will write papers for you — and charge a range of fees. However, many journals also produce top tips for successful publishing; I was fascinated by a really good short piece in which a selection of authors shared their tips, with catchy headings such as ‘*Prune that purple prose*’ (Nature Careers 2018). In essence the same messages — about audience engagement, good titles, organised content and getting to the point — are all in the prose.

The easy papers to write are the straightforward reporting of randomised controlled trials and cohort studies as they follow a pre-defined script (Consolidated Standards of Reporting Trials (CONSORT) 2021) Writing qualitative papers is a much bigger challenge as they tend to be more complex and information-dense, requiring considerable pruning and refinement.

More recently in EBM we have introduced the opportunity for midwives to publish their research protocol or their literature review protocol. This is important to facilitate the development of publication profiles for midwives who are planning a research career. They are also important outputs for funders and institutions supporting research.

Time passes noiselessly: one hardly notices the amazing developments taking place in the world of midwifery researchers — and looking back is a valuable exercise. Today, I see some of the midwives who published in the early EBM days established in major research roles. I often wonder if they look back and remember their publication experience with the EBM team.

There is a time for everything and now the new EBM in MIDIRS does not require that same level of input and has a large support team with great experience and vision for the future. Our profession is now a graduate midwifery workforce with highly skilled midwives who have the necessary knowledge and skills to produce the highest quality clinical midwifery research, in partnership with the women we serve.

The new era for the journal is just beginning and I am delighted to see it become integrated into the MIDIRS portfolio where a new style of support will facilitate new and much needed growth.

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