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Reflections of an ARC Director: Overview

Richard Lilford, ARC WM Director

I have been Director of an Applied Research Collaboration (ARC) for over 13 years in total – I well remember the day that NIHR Director Sally Davies phoned me to say we had secured the Birmingham and Black Country CLAHRC; a forerunner of the ARCs. I was, and remain, an ardent advocate of the CLAHRC/ARC model. This is the first in a series of News Blog articles based on reflections over thirteen constructive years.

So, what is the ARC model, and in what way does it differ from an applied research collaboration anywhere in the world? There is more than one answer to the question, but I give the answer that my peer director, Peter Jones, gave when Chris Whitty, Sally's successor, posed the question – the difference lies in the need to obtain service co-funding in order to qualify.

Service co-funding is central because it taps into the idea of an applied research programme deeply embedded in the service – a research centre *'in the service, of the service, for the service.'* This idea of a research service close to the beating heart of the health and social care services had a long provenance, and owes much to the thinking of a Canadian health service researcher, Jonathan Lomas.[1] A further influence on the thinking behind CLAHRCs/ARCs came from the notion of implementation research and the 'translational gap' between the generation of knowledge and its application in practice – the so-called T-2 gap – an idea to which I will return in the next article in this series.

The idea of a research centre co-funded by the service appealed to me strongly because this model opens up opportunities for *prospective* evaluations of service interventions. There are good reasons, that we shall explore more deeply in a later article, to prefer prospective over retrospective service evaluations. A corollary of this premise is that researchers need to be closely linked to service managers. In this way they can help shape service interventions, *and/or* they can discern when an intervention is imminent and then collect baseline data so that effects (intended and unintended) can be tracked over time. As stated above, prospective evaluations are methodologically stronger than purely retrospective evaluations, other things being equal.

This line of argument leads to a clear conceptualisation of what service co-funding should be spent on – service change.

This logic led to a fault line between myself and the civil servant responsible for the invitations to tender, because the invitation insisted that the matched funds "*should be under the control of the Director*." This requirement is problematic for the following reasons:

1. It is not natural for service managers to spend money allocated for patient care on research. It is therefore not a sustainable model outside the CLAHRC/ARC footprint and time horizon.
2. It is arguably *ultra-vires*, as acknowledged by Health Service Guidance 97/32; service and research expenditure should be separately accountable to parliament.
3. Decisions on expenditure on service change (and indeed research) are not 'controlled' by the Director. The Director is supposed to consult widely to establish mechanisms to determine priorities for service design and hence evaluation.
4. Above all, funds under the director's control does not mean service staff under the director's control. Service managers need to control funds to create services that the ARC can help shape and/or evaluate.

Our ARC WM is therefore built on a very simple funding model, represented in the figure.

Figure: ARC Funding Model

In the next article in this series, I shall explore the distinction between Intervention and Research in more detail; what the 'research' might entail; the distinction between an ARC and a management consultancy; and the role of the so-called Implementation Lead. Here I add a disclaimer. These are personal reflections, albeit based on my experience as an applied researcher (one of three still standing from the first tranche of CLAHRCs).

Reference:

1. Lomas J. Essay: Using 'Linkage and Exchange' to Move Research into Policy at a Canadian Foundation. *Health Aff.* 2000; **19**(3).

On the h-Index

Richard Lilford, ARC WM Director

While reviewing applications for a prestigious award I came across a statistician who cited his h-index as 124. Since I languish at 97, I was impressed. But how impressed should I have been?

The h-index is a metric that measures the productivity of scientists on the basis of their publications. It is named after a character called Jorge Hirsch. The index is calculated by counting the number of publications for which an author has been cited at least that number of times. So, I have published 97 papers which have been cited 97 times or more.

So, how good is an h-index of 124? The world's most highly cited author is thought to be Ronald Kessler at 300.[1] He is professor of psychiatric epidemiology at Harvard University. The first five on citation counts are all from the US, but number six is from Japan and number eight from France. Numbers 10 and 11 are famous epidemiologists from McMaster University in Canada – respectively Gordon Guyett at 267 and Salim Yusuf at 260. The top British entrant is Trevor Robbins from the University of Cambridge at 245.

Anthony Fauci, who we all know thanks to the COVID pandemic, is up there at number 35 and a h-index of 223. Cyrus Cooper, the famous epidemiologist from the University of Southampton, is number 41 in the world, at 217. He is closely followed by Gregory Lip (at 216), a cardiologist who used to work here in Birmingham and who is now at the University of Liverpool.

Michael Marmot, with whom I recently shared a platform, comes in at number 49 in the world with an index of 212. He is closely followed at 211 by John Ioannidis of Stanford University who is arguably the world's foremost clinical epidemiologist and who is famous, perhaps infamous, for his article on why most scientific findings are wrong.[2] Position 63 is shared by Albert Bandura, the famous social psychologist and the Nobel prize winning economist, Amartya Sen. Then comes Tim Spector from Kings College, who is famous for his COVID app.

By the time we get to number 84 in the world, we have fallen below 200 with Simon Baron-Cohen of the University of Cambridge. The numbers become increasingly packed. Richard Peto comes in at 196 with a h-index of 177. Martin McKee of the London School of Hygiene and Tropical Medicine is down with a h-index of 155, but is still within the top 500 scientists of all types in the world. By the time we get down to an index of 132, we are at about 1200 in the world; a position occupied by none other than Graham Thornicroft, a psychiatrist and ARC Director from Kings College London. He fights it out with Peter Jones of the University of Cambridge, also both an ARC Director and psychiatrist, with an Index of 130. Once you get to 102, you fall out of the list of the top 4,000 people in the world.

Of course, the h-index is not the ultimate arbiter of scientific excellence. In one sense it is biased towards older people, but in another the opposite way. This is because papers are cited much more frequently nowadays, than they were when I was setting out on my professorial career. Also, if you take time out to look after children or if, like me, you move into another career for a period of time, then this will count against you. Some specialties such as psychiatry, score higher than others, although I note that Kevin Marsh, orthopaedic surgeon from Oxford has a h-index of 140. There may be regional variations, the top scoring scientist I can find from Africa is Dan Stein, a psychiatrist from Cape Town, at 142. And then, of course, it does not measure the distribution, so that a person with a very few spectacular citations, may have a very modest h-index.

However, I found it fascinating to scroll through the list of H indexes, and it beats settling down to complete my appraisal form!

Reference:

1. Ranking Web of Universities. Highly Cited Researchers (h>100) according to their Google Scholar Citations public profiles. 14th Edition. 2021.

ARC WM Quiz

Born on February 25 1869, Phoebus Levene was a biochemist who found that DNA contained four different nucleotide bases - can you name all four?

email your answer to: ARCWM@warwick.ac.uk

Answer to previous quiz: Dame Kathleen Lonsdale played a fundamental role in establishing the science of x-ray crystallography.
Congratulations to Richard Grant and Bert Evans who were first to answer correctly.

Induction of Labour: Involving Women in a Local Quality Improvement Project

Magdalena Skrybant (Public Involvement Lead);
Fiona Cross-Sudworth (Research Fellow)

They say that the best things come to those who wait. But waiting for your baby to arrive, a baby you've carried for nine months, can be an anxious and stressful time. This is especially true for women recommended to have induction of labour for whatever reason.

Issues in induction of labour are not new. We know that women who have a labour induced can have a less-positive experience overall compared to women who have a spontaneous delivery.[1] Our Maternity theme brought together staff from the local NHS Trust and public contributors to better understand where issues are locally and to make recommendations to improve the service in the future. ARC WM's public contributors were involved throughout the whole process and played an important role in capturing the views of women who had an induction of labour.

Induction of Labour: National Context

The number of inductions in the UK is rising, increasing from one-fifth of births in 2007/2008 to one-third of births in 2019/20,[2] and this is presenting an increasing challenge for maternity services. Induction of labour may be offered when women go beyond their due date; when waters break early and labour doesn't immediately start; or for a number of other reasons, such as problems with mother or baby. The process usually starts by inserting vaginal prostaglandins that 'ripen' or soften the cervix and increase the chance of going into labour. Inductions can also involve mechanical processes, such as inserting an intracervical catheter or rupturing membranes, followed by oxytocin to stimulate contractions to start the labour process. This medicalised process can be far-removed from what women may have originally envisaged with calming music, birthing balls, water births, etc.

Evidence tells us that women may experience anxiety from delays in the process,[3] feel a lack of involvement in decision-making about their labour,[4] and may also experience increased pain compared to women who give birth through spontaneous labour.[5] Anecdotally, we also hear stories of rising complaints, concerns over safety, and women feeling they are over-burdening an already stretched maternity service when they are induced.

Working with Women to Better Understand Induction of Labour

Local Trusts implementing induction of labour as a Quality Improvement project should benefit many women. By bringing together representatives from the local Trust, researchers and women from the ARC WM Maternity theme, a project was set-up to better understand induction of labour processes and improve the experience for future mothers-to-be.

Working with Public Contributors to Capture Women's Views

ARC WM's public contributors expressed strong support for a survey, independent of the Trusts, to capture the experiences of women who had an induction of labour. As embedded partners in the Maternity theme, our public contributors worked alongside researchers in a virtual workshop to '*co-design the public-facing materials*' – a phrase familiar to any researcher that involves patients and the public in their work. But what did 'co-design' look like, and what changes came about as a result of the partnership between researchers and public contributors?

Our public contributors were able to bring key insights to help understand how to encourage women who had just brought home their new-born baby to complete a survey about their experiences. Public contributors supported presenting the survey with a 'Congratulations' card to overcome that '*not another survey request*' feeling, and to provide a pen so it could be completed in the moment. They also thought that the prize draw to incentivise women to complete the survey was a good idea, and provided views on when to send reminders, with wording carefully crafted to '*serve as a gentle prompt*' unlikely to annoy a woman who was likely tired and faced with an already long list of things to do. A key consideration of any survey is the length – our public contributors stressed that the survey could not be too long as women would likely complete the survey in between feeds, sleep, nappy changes, and everything else that a new parent has to do!

In developing the content of the survey, the Maternity theme public contributors provided input into the included questions, the order of the questions, and the wording of the questions. Although some questions were taken from validated surveys, others were designed from scratch. Some proposed changes were fairly straightforward: one question was re-worded to clarify that Remifentanil is a drug administered '*in the hand*' for pain relief; another had wording changed from 'who was involved in the decision *for your labour to be induced*' to 'who was involved in the decision *about whether you should have an induction*' (the second version was felt to be more personal); and another changed response options of '25-36 hours' and 'over 37 hours', to options of '2 days' and '3 days'.

Some discussions over wording, however, were more prolonged and nuanced. It took over ten minutes discussion, for example, to agree the wording for the question '*From when you first rang the hospital on the day your induction was booked, how long did you have to wait for a bed there before the induction could be started?*'. Our contributors felt that the original wording, 'From when you rang on the day of your induction', was confusing - partly due to the delays involved in Inductions and numerous times you have to call the hospital during the process. These small, but important changes, hopefully meant women completing the survey understood what was being asked and were able to provide responses rather than leaving the question blank or, worse still, not completing the survey at all.

Whilst the team were able to make most of the suggested changes, not all changes proposed were feasible within the time-frames/resources

budgeted. The contributors, for example, were keen to capture experiences of women that didn't speak English as a first language, but it wasn't possible to provide translation support for survey completion because the women had been discharged from maternity services by the time the survey was posted (but this is definitely a project to consider in the future).

Throughout the process, updated versions of the survey were shared with public contributors. The versions showed where changes had been incorporated, as well as why certain suggestions could not be incorporated, until the final version, which everyone was happy with, was circulated.

Using the Survey Findings

The findings from the survey from women are being used to improve the experiences of women being induced in different ways. There have been some 'quick wins', such as making drinks and snacks available to women who are being induced outside of mealtimes; whilst others will be much harder and take longer to resolve, such as how to minimise delays from getting from the induction bay or antenatal ward to delivery suite to continue the induction process, or increasing the numbers of women able to have out-patient induction of labour.

Another positive output from the project, however, was the design of new leaflets and a poster to support Mums-to-be throughout the induction of labour process. Bringing together expertise from our Maternity theme, clinicians and our public contributors, the leaflets include clear information on what to expect in an induction and 'top tips' to support women through the process. You can see the final version here: https://bwc.nhs.uk/download.cfm?ver=5858. This is an example of ARC WM policy to integrate PPIE for research with PPIE for service improvement. We feel very strongly that it is illogical for the two types of PPIE to exist on parallel but separate tracks.

The Start of the Journey

This project very much demonstrates 'ARC WM in action'. With strong links with local maternity services and with PPIE embedded within the ARC WM, we were able to be involved in this project from the outset, which brought together the service, researchers and women to better understand issues at the heart of induction of labour. And whilst there are still some key issues to resolve, ARC WM will no doubt be part of that ongoing dialogue and at the heart of projects going forwards.

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1. Hildingsson I, Karlström A, Nystedt A. Women's experiences of induction of labour–findings from a Swedish regional study. *Aust N Z J Obstet Gynaecol*. 2011; **51** (2): 151-7.
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4. Coates D, Thirukumar P, Henry A. The experiences of shared decision-making of women who had an induction of labour. *Patient Educ Counsel*. 2021; **104**(3): 489-95
5. National Institute for Health and Care Excellence. Inducing labour. 2021.

Protecting Young Children from Malaria Does Not Make Them More Vulnerable to the Disease in Later Childhood

Richard Lilford, ARC WM Director

Tonight, approximately half of all children in malaria endemic parts of sub-Saharan Africa will go to sleep under a mosquito resistant bed net.[1] A series of important cluster trials in the 1990s confirmed the high level of protection offered by such bed nets. [2] However, it was theorised that this would stop children from developing innate immunity against the parasite, and consequently the protected children would have a higher case fatality later in childhood, thereby vitiating the protective effect of bed net usage in early life. A recent paper in the New England Journal of Medicine [3] tested this hypothesis by following up a cohort of children from early childhood to adulthood in Tanzania. The study was conducted in a rural health and demographic surveillance site, encompassing 25 villages. In total 6,706 participants were enrolled in the cohort, and the researchers obtained 89% follow up over 20 years.

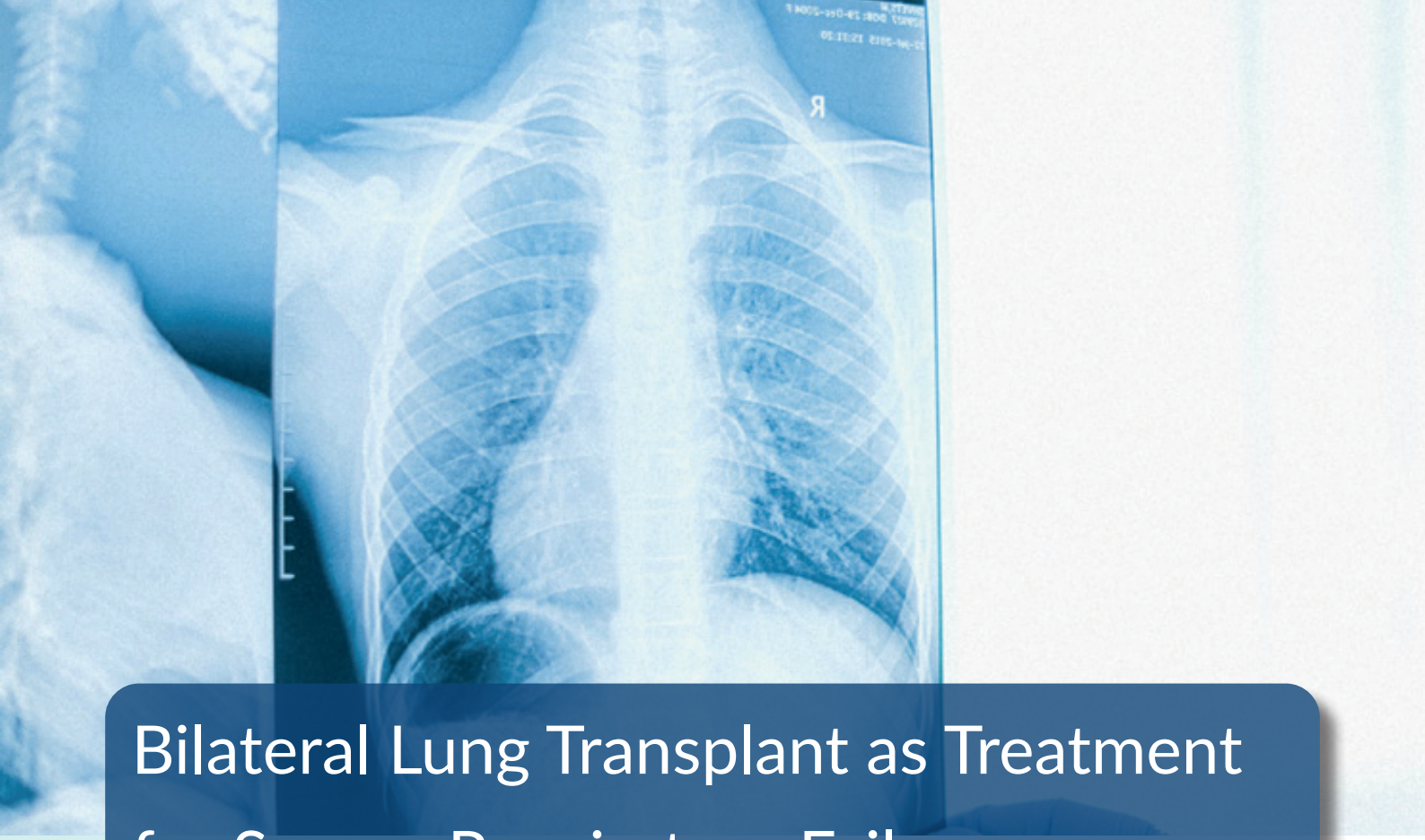
Mortality was estimated as the number of deaths per thousand person years, and multiple imputation was used to minimise bias from missing values. The cohort was divided into three groups: those where the child always slept under a net; where the child never did so; and finally where the child sometimes did so. Cox's adjusted proportional hazards modelling was used to compare mortality across the three groups, allowing for clustering within villages and testing the main modelling assumptions.

The hazard ratio for mortality, across the always and never users, between the age of five and adulthood, was slightly less than one, but with quite wide confidence limits. This contrasts with the hazard ratio for death of 0.57, within a narrow confidence interval, in early life. So, there is no evidence here that the gains made through use of impregnated mosquito nets in early life are lost later in life.

This is obviously an important and reassuring study, and I thank Professor Julian Bion for bringing it to my attention.

References:

1. Kim H, et al. Spatiotemporal analysis of insecticide-treated net use for children under 5 in relation to socioeconomic gradients in Central and East Africa. *Malaria J*. 2020; **163**.
2. Pryce J, Richardson M, Lengeler C. Insecticide-treated nets for preventing malaria. *Cochrane Database Syst Rev* 2018; **11**: CD000363.
3. Fink G, et al. Mosquito Net Use in Early Childhood and Survival to Adulthood in Tanzania. *N Engl J Med*. 2022; **386**: 428-36.



Bilateral Lung Transplant as Treatment for Severe Respiratory Failure

Richard Lilford, ARC WM Director

A recent paper in JAMA reports 100% survival for over 100 consecutive patients undergoing bilateral lung transplant as a treatment for severe respiratory failure caused COVID infection.[1]

This is quite a technological triumph. The patients had all been placed on extracorporeal membrane oxygenation, an artificial lung, prior to transplant. The operations lasted seven hours on average. Rejection was not an insurmountable problem and all 102 consecutive patients survived. We have no counterfactual, so we cannot say for certain how many would have survived but for transplantation. There is also a worry that the limiting factor on transplantation is the supply of donor organs, in which case other potential recipients may have failed to receive a needed treatment. Nevertheless, this is an extraordinary technological achievement.

Reference:

1. Kurihara C, Manerikar A, Querrey M, et al. Clinical Characteristics and Outcomes of Patients With COVID-19–Associated Acute Respiratory Distress Syndrome Who Underwent Lung Transplant. *JAMA*. 2022; **327**(7):652-61.

Non-Invasive Ventilation Improves Survival in COVID Cases Compared to Oxygen Therapy Alone

Richard Lilford, ARC WM Director

Congratulations to ARC WM members, Perkins and Stallard, for their important paper in the Journal of the American Medical Association.[1]

This important trial of nearly 1,300 patients showed benefit for non-invasive ventilation compared to oxygen therapy at conventional or high flow rates. The participants were people with COVID who could not maintain oxygen saturation levels at 94% despite breathing 40% oxygen. There was a large (eight percentage point) difference in death or the need for invasive ventilation, in favour of the non-invasive ventilation group. Adverse events were more common in the non-invasive ventilation group, and included things like pneumothorax.

The trial was stopped early for the happy reason that the incidence of severe COVID is declining rapidly in the UK, where the study was carried out. The findings appear not to be generalisable beyond COVID, where it has already been shown that either non-invasive ventilation or high flow oxygen are preferable to conventional oxygen. Yet again, we find that respiratory COVID behaves differently to other types of severe respiratory infection.

Reference:

1. Perkins GD, Ji C, Connolly BA, et al. Effect of Noninvasive Respiratory Strategies on Intubation or Mortality Among Patients With Acute Hypoxemic Respiratory Failure and COVID-19: The RECOVERY-RS Randomized Clinical Trial. *JAMA*. 2022;**327**(6):546-58.

Mindfulness for Burnout in Interns

Peter Chilton, Research Fellow

We have long known that burnout is an important issue facing healthcare workers – affected staff tend to show less empathy, are more likely to make errors, and their patients are more likely to fail to stick to their prescribed care plan. Various studies have shown that mindfulness is able to reduce burnout but finding the time for staff, and the expertise to facilitate sessions can be difficult. The authors of a recent paper in JAMA Pediatrics conducted a multi-centre, cluster randomised clinical trial of a mindfulness curriculum that did not need prior facilitator training.[1] The study aimed to assess the effectiveness of the intervention among paediatric interns, as measured by emotional exhaustion, depersonalisation and feelings of inefficacy (the three facets of burnout).

Across 15 US paediatric training programmes, 340 paediatric interns were randomised to either the intervention or control arm. The intervention consisted of seven monthly sessions of one hour, focussed on mindfulness, along with monthly mindfulness refreshers during internship. Participants in the control arm took part in monthly social lunches (one hour each). At baseline most participants were classed as suffering from burnout (74.7% in the intervention arm, and 60.3% in the control arm). After the intervention was complete (at six months) participants in both arms saw an increase in their emotional exhaustion score compared to baseline, and this remained at 9 months later. There was no significant difference between the arms, nor were there any significant differences in any secondary outcomes, including depersonalisation or burnout.

The authors suggest that the lack of an experienced facilitator may have played a role in these results, or because the mindfulness sessions were integrated into pre-existing didactic time and thus were not robust enough to change behaviour, etc. Further, attendance of the mindfulness sessions was not mandated and was not recorded, so there may have been a dose response in the training that could not be analysed.

Reference:

1. Fraiman YS, et al. Effect of a Novel Mindfulness Curriculum on Burnout During Pediatric Internship. A Cluster Randomized Clinical Trial. *JAMA Pediatr*. 2022.

History Snippet: Origins of Medical Ultrasound

Richard Lilford, ARC WM Director

Here at ARC WM we are collaborating with ARC East Midlands on a project concerning the uptake and use of point-of-care ultrasound in primary care. This is part of a broader project, concerned with providing more care in the community for the benefit of patients and the system as a whole.

Point-of-care ultrasound, if properly used, can greatly increase diagnostic accuracy, compared to the traditional medical examination. It can sensitively and specifically identify conditions of the heart and lungs, many abdominal problems, such as gall stones, and conditions of early and late pregnancy.

Discussing our potential research programme took my mind back to the early days of my career, when ultrasound was very new. And I was reminded of the inventor of medical ultrasound, Professor Ian Donald. Donald was born in Scotland, but attended high school and university in Cape Town, South Africa. He studied classics at university, before returning to the UK to study medicine. He then specialised in obstetrics and gynaecology. Soon after qualifying he became a medical officer in the Royal Air Force where he took an interest in radar and sonar.

He returned to his native Scotland in the early 1950s where he contacted a company that used ultrasound for industrial purposes. This reminded him of his experience of sonar during his service days. If ultrasound can detect submarines in the sea, then why not cysts, tumours and babies in the human body – he must have thought. He used the equipment in the factory to determine the echogenic properties of tissue samples obtained in the hospital. Working with John Wild an engineer and John MacVicar, a fellow gynaecologist, he showed that ultrasound could identify cysts in the abdomen and breast. He was also first to show it could be used to 'visualise' the foetus. Over the years, and with certain adaptations, he showed that the technique could be used to make accurate measurements of the size of the foetal head and, later, identify abnormalities in the baby.

The equipment now used for ultrasound is a far cry from the crude equipment that I used to work with when I first qualified. And it has become highly portable. Hence our interests in promoting its use to increase diagnostic accuracy at the bedside. We plan to study the learning curve to reach competency in the use of the technique and we will study its effect on medical practice in the community. Traditional clinical examination is not accurate, no matter how skilled the clinician. The portable hand-held ultrasound has the potential to take diagnosis to a new level. But we need to know how much training is required and also be aware of possible harms, including from over-diagnosis.

Developing a Research Culture in Adult Social Care in the West Midlands

To help address the historical lack of investment and support for research with adult social care, ARC West Midlands have been working closely with adult social care practice partners in the region. This includes the local branch of the Association of Directors of Adult Social Services (WM ADASS), the regional Principal Social Work and Lead Occupational Therapist Networks, and Skills for Care. Regular meetings have been held with the Clinical Research Network and Research Design Service to understand challenges and explore opportunities in adult social care. Engagement events have also been held with practice stakeholders and with interested researchers.

One of the exciting developments from these discussions has been that WM ADASS, with support and guidance of ARC WM, have been able to secure an **Improvement and Innovation Strategic Fund Grant** from the Clinical Research Network. This will enable the region to recruit three Research Champions (seconded from local authorities 50% research and 50% social care practitioner). The post-holders will work with social care and academic stakeholders to build research capacity, contribute to strategic research priorities, and help to develop a positive culture of research in practice. Other activities will include the development of a pool of Experts with Lived Experience to co-produce the research strategy and implementation, and a training package to introduce practitioners and professionals within adult social care and Experts by Experience to undertaking research.

For more information please contact Professor Robin Miller, ARC WM Social Care lead (e-mail r.s.miller@bham.ac.uk or via Twitter: @RobinUoBham)

THIS 2022 PhD Fellowship Programme

The THIS Institute are currently seeking applications from universities for funding for full-time PhD Fellowships. The deadline for application is **Tuesday 15 March 2022**, with a funding decision to be made by 24 June 2022. For more information and to apply, please click here.

National NIHR ARC Newsletters - February 2022

The February issue of the national NIHR ARC newsletter is now available online, featuring news on tackling racism in UK health research; air quality near schools; using 'smart' GP review templates to improve fragmented care; guidelines to support young people accessing online mental health services; and how vitamin D supplements did not improve the health of people with psychosis

To subscribe to future issues, please visit: https://tinyurl.com/ARCsnewsletter.

Shaping the AHSN Network Website

The AHSN Network are looking for volunteers to share their views on a re-design of their website through a short online focus group to be held on **Wednesday 9 March, 10:00-11:30**.

The AHSN Network helps identify and spread health innovation that addresses health and care challenges. If you would like to volunteer, please email: Jayne.Holgate1@Nottingham.ac.uk by 4pm Monday 28 February, stating your region and role.

Better Public Involvement Adverts

Mike Bell and Zoe Trinder-Widdess of ARC West are running a free seminar looking at creating better public involvement adverts. The virtual event will take place on **Monday 14 March 2022**, 1pm-2pm. For more information, and to register, please visit: https://bit.ly/3nZGkOK

Changing Cultures in Health Care: What, Why How?

On **Tuesday 8 March** Prof Russell Mannion is giving the 36th Annual Health Services Research Lecture, as a virtual event running 5:30pm-7pm.

Modern health care policy frequently invokes notions of cultural change as a key means of achieving performance improvement and good quality care. In this lecture Prof Mannion will unpack what is meant by organisational culture and explore the empirical evidence and key sources of ideas linking culture to health care quality and performance. Further, he will suggest how a more realistic assessment of the task of cultural transformation is warranted.

This is a free event with no need to register. Further details and a link to the webinar can be found at: lshtm.ac.uk/newsevents/events/36th-annual-health-services-research-lecture-professor-russell-mannion.

International Conference on Integrated Care, ICIC22

ARC West Midlands have recently become a knowledge partner of the *22nd International Conference on Integrated Care*, which will take place in the Odeon in Odense, Denmark, from 23–25 May 2022.

The conference is a partnership with Healthcare Denmark in cooperation with the Region of Southern Denmark, Odense University Hospital, Municipality of Odense, Campus Odense and Destination FYN. Denmark is among international frontrunners when it comes to integrated healthcare services.

The conference will operate as a hybrid event meaning that people who do not wish to travel can join and present at the conference via video link and present their paper digitally. However, a delegate fee and registration will still be required. There are special subsidised rates for students, and bursary places for patients, carers and community representatives.

ARC WM associates are eligible for a 10% discount, please email ARCWM@warwick.ac.uk

For full details of the conference, please visit: integratedcarefoundation.org/events/icic22-22nd-international-conference-on-integrated-care

Recent Publications

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