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ARC West Midlands News Blog



18 December 2020

To Subgroup or Not to Subgroup?

Richard Lilford, ARC WM Director

Far from being ‘stamp collecting’, as Ernest Rutherford is [said to have claimed](#), classifying things is central to the scientific enterprise – imagine biology without the [Linnaean taxonomy](#) (multi-dimensional classification) of plants, animals and minerals (now plants, animals, fungi, protists, chromists, archaea and eubacteria kingdoms). Or medicine without its nosology. Classification has been the basis of all knowledge, and Rutherford was wrong – for example, astronomy is also built on a classification of stars and planets.

However, classification does not come free of problems. On the contrary, I call it the ‘*central dilemma of epidemiology*’. For a start, it is a human attempt to organise an underlying (latent) and often disorganised world. That is both its strength and its weakness. By organising the underlying complexity it allows abstractions to be made regarding the organising principles that underlie phenomena we observe about us. But the price we must pay is that we are often superimposing a classification over an underlying continuum. Thus, astronomical objects like Pluto can be ‘demoted’ and species change from one genus to another. Many health conditions do not fit neatly into one group or another, bearing features of both – think auto-immune disease and mental illness. Of course, any classification system is useful, insofar as it leads to new knowledge about underlying mechanisms and it is quite natural that the process is iterative, such that new classifications emerge – clades in biology rather than the original Linnaean family tree, for example.

But in the practice of epidemiology the issues of groups and subgroups can be a problem, not just because groups overlap, or misclassification may occur. A problem also arises in the interpretation of observed differences between groups. On the one hand, we do not want to miss important subgroup differences in the effect of an exposure on an outcome. On the other hand, we also want to avoid spurious associations. There are many examples, especially in the context of treatment trials, of subgroup associations that were subsequently over-turned.

The usual argument put forward to avoid spurious associations is that only subgroups specified in advance should be considered as a test of an hypothesis – all else is a fishing expedition, the results of which are to be down-weighted.

This is all very well but it just moves the problem from the analysis stage to the design stage. The corollaries are two-fold:

- 1 Any subgroup must be selected on the basis of sound principles – there should be a theoretical model for an interaction between exposure and outcome. The statistical subgroup analysis is then designed to strengthen or weaken the credibility of the model. Note, the issue is the interaction between subgroup and outcome through the treatment effect. A direct effect on outcome is neither here nor there.

2 Since precision is often low in a subgroup, and always lower than in the group as a whole, hypothesis tests are even less appropriate to subgroup effects than to the overall effect. Dichotomising the results into positive and null, and using this dichotomy to make a decision, is always stupid and is risible in a subgroup.

But this logic breaks down if there is a sound theoretical reason to expect a different result in the small sub-group. Grouping trans people with male or female would be unsuitable for many purposes. In such a situation it is better to have an imprecise answer to a specific question.

Some subgroups derive from an underlying, if latent, scale. Socio-economics groups, for example, or age. But others are irrevocably categorical. Gender, for example, or rural vs. urban residence. In the former situation – where the group is homologous (scalable) – a small subgroup is not a large problem, because the statistical model can look for a trend. The situation is more problematic when a small subgroup is not part of a homologous continuum. Any examination in the small subgroup will be imprecise in proportion to its size. Amalgamating it within a larger group makes sense on the basis that ‘it’s better to have a precise answer to a general problem, than an imprecise answer.’





ARC WM Hosts Our First Public Health Summit



Aileen Clarke (Public Health Theme Lead), Kate Jolly (Public Health Theme Lead), Fatai Ogunlayi (Imperial College Healthcare NHS Trust), Magdalena Skrybant (Patient and Public Involvement and Engagement Lead)

Introduction

Public Health has come into everyone's consciousness in new and unexpected ways in 2020. COVID-19 has made us all aware of how fragile our health as a population can be and how interdependent we are on each other's health and wellbeing. More than that, it has made us aware of the importance of thinking about everyone's health - old and young, key workers, health workers, care home workers, and others - and it has brought us face to face with issues of health inequalities.

ARC WM has a dedicated [Public Health theme](#) led by Profs Aileen Clarke and Kate Jolly. On Thursday 26th November 2020, the theme hosted its first *Public Health Summit* online. This event brought together more than 60 stakeholders from across the West Midlands who have a shared passion for improving the public health of people living in our communities.

The aims of the summit were to:

- i. Learn more about COVID-19 and Public Health: risks, inequalities, responses and renewals.
- ii. Link ARC WM members and those involved in Public Health in the West Midlands to exchange current issues and priorities and to identify opportunities and synergies for future working.

Format of the Day

The day started with four presentations followed by five breakout sessions. These were followed by a plenary and a Q&A session.

Initially Prof Richard Lilford and Prof Kate Jolly gave an outline of ARC WM - its structure and set-up, overarching aims, how the Public Health theme fits with the other themes, as well as detailing some of the work being carried out in the theme. Our website (arc-wm.nihr.ac.uk) gives more information.

Harry Rutter, who is a Professor of Public Health from the University of Bath and member of the government's SAGE committee, gave a keynote presentation on COVID-19 and Public Health.

His message reinforced the messages we have come to understand better as a result of the pandemic. He described how our approaches to the environment, health inequalities, and non-communicable disease have meant that our various populations did not come in to the pandemic on a level playing field. He explained how we need to think about 'rebooting' the workplace to make it healthier and safer for people, and discussed the flaws in the individual behaviour change model for improving health. He described the concept of the commercial determinants of health and explained how behaviour change needs to come from companies, politicians and those who can help to improve the context of our daily lives and choices.

Justin Varney, Director of Public Health for Birmingham, gave a keynote presentation on the local context. He talked about the immediacy of the COVID-19 response and what the next steps might be for improving health, including understanding the role of food in our health and how we can improve the levels for healthy eating - time, access to better food and autonomy. Justin also talked about the importance of mental health. He spoke about the upcoming *2022 Commonwealth Games*, which will be held in Birmingham, and how flagship events can encourage a momentum for health change - for example, Birmingham will be making intense efforts to encourage active transport for the games. Justin finished by talking about how to build a city without inequality. He talked about identities and meaningful change in how our communities are understood and supported for health change in Birmingham, and of how COVID-19 has reinforced and strengthened Birmingham's approach to minority health and inequalities.

Our five breakout sessions covered current Public Health priorities and issues:

- Public Health priorities.
- Behavioural interventions and COVID-19.
- Workplace well-being.
- The TRACE project, which aims to understand how health system reform affects population health.
- Coventry City of Culture ([see also our previous blog](#)).

As well as the members of the summit, each breakout session had an expert facilitator, a Public Involvement Contributor, and a Public Health specialist in training.

Key messages from our breakout sessions included:

1 In the **priorities** session, the importance of engagement and partnership working, listening to the voices of communities of interest (working mums, LGBT+ communities, people with long-term conditions, and faith communities are just a few examples), and of different ethnicities and population groups were highlighted. Participants discussed the importance of partnership working to solve many of these challenges, co-producing solutions with the communities involved and ensuring that the way we describe the communities transcends just being based on geographical location.

2 In the **behavioural interventions** session, there was a philosophical discussion! Fairness and liberty were discussed in relation to the tailoring of messages to encourage vaccine uptake. It was agreed that messages were complex and that practical vaccine access was also going to be important. Some of the ideas discussed included: looking more carefully at people's actual concerns when developing

targeted messaging; using behavioural science to keep the message clear, simple and coordinated; and the importance of community engagement in addressing fears around speed of vaccine development and vaccine safety.

3 In the **workplace wellbeing** session the *‘Thrive at Work’* toolkit was discussed, alongside how to improve health and positive wellbeing at work, with ideas for an asset-based approach for employers to map what’s out there and what’s needed. The delegates also discussed the importance of broad outcome measures that capture what is important to both employers and employees, as well as cost-effectiveness of the interventions.

4 In the **TRACE** session, evaluation and measures for understating the impacts of health system reform were discussed. We talked about metrics for integrated health systems and how to evaluate major changes to the way we organise our population health services and systems. Delegates discussed the complexity of creating a specific *“integration index”*.

5 The **Coventry City of Culture** break-out session discussed the multifaceted economic, health and social impacts of the City of Culture and echoed Justin Varney’s concept of building on major events to highlight our population health needs and issues. Delegates also discussed the impact of COVID-19 on health inequality challenges, especially since the areas with high deprivation have also been those with the largest COVID-19 outbreaks and lower engagement with formal cultural activities.

In the feedback and plenary session, we discussed key overarching messages of the day. Three themes emerged for our response to COVID-19 and for our future synergies, thinking and collaborations. The three themes can be summarised as the three ‘Es’:

Engagement: the necessity for engaging properly and fully with our complex multifaceted populations

Achieving ‘buy in’ is hard to co-producing health: there are no quick fixes or magic bullets and it requires significant investment of time and resource. However, we cannot progress until we have those established links and connections. It is only through working with communities that we can understand what their public health needs and priorities are, and when, where and how public health interventions should be delivered. Most importantly, we need to move from short-term relationships with communities to longer-lasting relationships, built on foundations of mutual trust and reciprocity.

Equity: Across the day the concept of equity came up a lot. We discussed the necessity for understating how our health is patterned and how we can understand and reverse some of that negative patterning due to our work, where we live, and the commercial pressures on us.

Evaluation: the requirement to evaluate what we do is vital

Evaluation enables us to understand the public health interventions and activities that don’t work so well - and to share, celebrate and use the ones that do!!!

Conclusions

The event was a resounding success. There were over 60 attendees, including Directors of Public Health, researchers, academics, trainees, public contributors, and NHS staff from all across the West Midlands and beyond. Not only does the Public Health theme now have a wealth of ideas to take forward, it also has a community of stakeholders and friends who attended on the day and who expressed a willingness to be involved in the ARC WM Public Health community. In these times of lockdown, it was important for us to come together. We received some fantastic feedback, but we think one of our Public Contributors, Tony, encapsulated the value of the event:

“I think what I took away most, apart from some excellent individual points, was the feeling of partnership which the event engendered.

This co-mingling of the professional and the personal is obviously the way forward for us, alongside exchanging views and knowledge in a respectful and inclusive manner.”





Beyond No Treatment or Standard Care Comparison Groups in Randomised Controlled Trials

Kelly Ann Schmidtke, Assistant Professor (Warwick Medical School)

All surgeries carry risk. As such, proponents of surgical interventions must provide practical evidence of their effectiveness and safety. Where possible, they should also provide evidence for the proposed surgical mechanism of action. Beard and colleagues conducted a multi-centred trial that could provide such evidence.[1]

The surgical intervention they examined was subacromial decompression surgery to reduce shoulder pain. The rationale for this surgery is that the pain is caused by the cushions (bursae) between the shoulder's rotator cuff and top bone becoming inflamed (bursitis). Surgeons can view the bursitis by inserting a tiny surgical camera (an arthroscope) into the patient's shoulder and

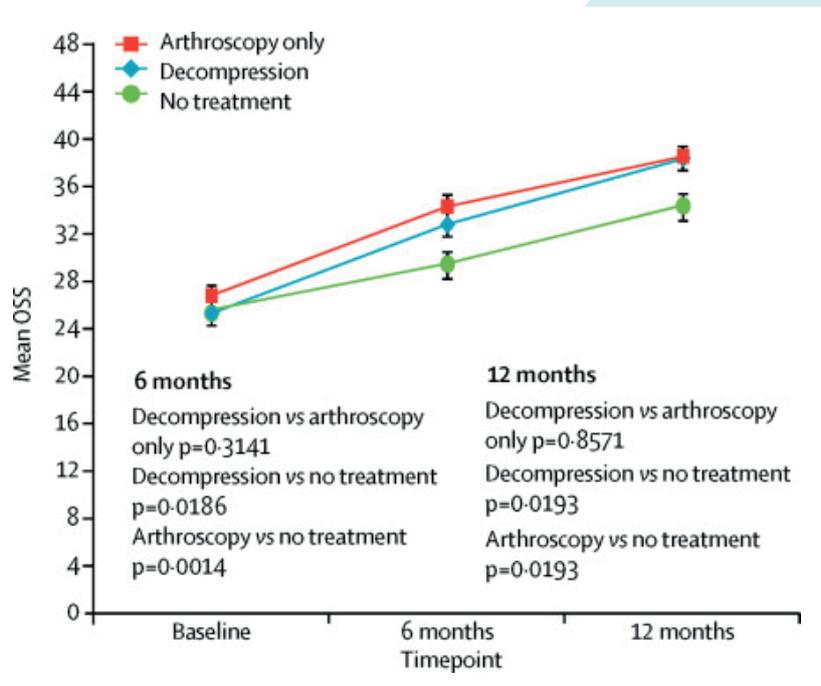
then they can remove the bursitis with a pen-sized mechanical shaver.[2] Even though there is no robust evidence supporting subacromial decompression surgery, its use has rapidly expanded. Between 2007/2008 and 2016/2017 the number of patients receiving this surgery in the United Kingdom almost doubled from 15,112 to 28,802.[3]

Beard, et al. randomised 313 patients into three groups - a treatment group or one of two comparison groups. Patients in the treatment group received subacromial decompression surgery. Patients in the practical comparison group received no treatment (one reassessment appointment, but no intervention). Patients in the mechanistic comparison group were

examined with an arthroscope only (they experienced surgery without removing any bursitis). All patients' shoulder pain was assessed using the Oxford Shoulder Score when they were first randomised, and then 6 and 12 months after randomisation.

The figure provided here is Figure 2 in Beard, et al.'s paper (under CC BY-NC-ND 4.0 license). At 6 and 12 months, the shoulder pain scores for patients in the arthroscope only and decompression surgery groups were statistically similar, and statistically above the no treatment group. Thus, while these findings provide apparent practical support that surgical intervention is better than nothing, they do not support the proposed mechanism of action.

Could it be that looking at bursitis with a fancy camera cures shoulder pain? The present authors suspect not. Likely a placebo effect is facilitating improvements in the arthroscope only and decompression surgery groups, and perhaps a nocebo effect is slowing improvements in the no treatment group. Another question, of greater interest to our ARC West Midlands team is "Why do surgeries increase in the absence of evidence to support their effectiveness and sometimes in the presence of evidence that refutes it?"[4] Answering this will require some detective work. We look forward to our future sleuthing.



References:

1. Beard D, Rees JL, Cook JA, et al. [Arthroscopic subacromial decompression for subacromial shoulder pain \(CSAW\): a multicentre, pragmatic, parallel group, placebo-controlled, three-group, randomised surgical trial.](#) *Lancet.* 2017; **391**(10118): 329-38.
2. Hammond TA. [Arthroscopic subacromial decompression - Dr Terry Hammond.dv.](#) YouTube. 26 Nov 2010.
3. Jones T, Carr AJ, Beard D, et al. [Longitudinal study of use and cost of subacromial decompression surgery: the need for effective evaluation of surgical procedures to prevent overtreatment and wasted resources.](#) *BMJ Open.* 2019;**9**:e030229.
4. Reeves K, Chan S, Marsh A, et al [Implementation of research evidence in orthopaedics: a tale of three trials.](#) *BMJ Quality & Safety* 2020; **29**: 374-81.



To Err is Human: A Blog Post About the Task Completion Er-

*Kelly Ann Schmidtke, Assistant Professor (Warwick Medical School),
Laura Kudrna, Research Fellow (University of Birmingham);
Ivo Vlaev, Professor (Warwick Business School)*

I started holiday shopping before the second lockdown in the United Kingdom started. My husband's parents and my parents both live back in the United States – in different states – so we are already familiar with ordering gifts online and sending them to each other's homes. To simulate holiday surprises, we wrap the gifts received and store them under festive trees. On the 25th of December, we unwrap our gifts together via the magic of video conferencing. The boxes started arriving at my home mid-November, and this past week, I wrapped them. I like wrapping. I picked out goofy wrapping paper and then embraced the origami challenge of fitting said paper around each box. I then craftily hid the tape holding my creations together with ribbons and obnoxiously large bows. Perfect. Five successfully wrapped

gifts for the hubby and me. I walked away to the millions of things on everyone's to-do list and returned the next day. Disaster – I forgot to put the “*To whom, From whom*” tags on the gifts. So now I'm looking forward to my family's video conference including phrases like: “*To Who? From Who?: Let's find out.*”

To err is human, and many errors are predictably irrational.[1] The above example demonstrates a predictable post-completion error,[2] which involves omitting a final task step after accomplishing a main goal. Above, I completed my main goal of wrapping gifts. However, my completion of the task was weak, as I forgot the tags. Your post-completion errors may be different, but the basis for them is similar. As

humans, we set out to accomplish a main goal, and once that main goal is done, we move on. Most of us have experienced thinking that we are done cooking only to realise an hour later that the oven is still on. Or, we may have left an original document in a photocopier after retrieving the copies, or forgotten to lower our hand during an online meeting after our question was answered. Some of these errors are so predictable we have designed automated reminders to say “*hold-on buddy, you’re not done yet.*” For example, ATMs require users to retrieve their card before taking their cash,[3] while my email account alerts me when I fail to include an attachment to an email with the word *attachment* in it. In hindsight, these errors seem silly. Like Homer Simpson, we may hang our head and exclaim “*D’OH!*”. Like Richard Thaler,[4] we should then get back up and redesign our environments to avoid future errors.

Like many people, my mind is a blur with extra COVID-19 stress. In stressful times, the probability of making predictable errors increases. The implications of this for NHS hospital staff, a profession in which burnout is already common, should not be ignored.[5] The hospital environment can be redesigned to reduce the probability of staff making predictable errors. Technology can play a part.[6] For instance, computerised reminder systems are already in place to reduce prescribing errors, and checklists are very common in surgical practice.[7] But, while technology may play a role in the redesign, it cannot be the *heart* of the redesign. The heart of the redesign must be human, appreciating what we want and reducing how much work we need to do to get there.

One surprisingly difficult task NHS staff members are asked to undertake is safely removing their personal protective equipment (PPE).[8] In 2019, one study reported that 39% of staff failed to properly remove their PPE, dangerously exposing themselves and others to infectious

agents.[9] This error can be understood as a post-completion error, as removing PPE feels like something staff do after their main goal of helping people is accomplished. To teach staff how to safely remove their PPE, Public Health England created a five-minute-and-12-second video.[10] Yes, over five minutes to describe how to take off outerwear. The recommended steps may differ slightly across institutions, but the overall idea will similarly involve a distinction between contaminated and uncontaminated surfaces. Generally, anything outside/in front of the PPE is more likely to be contaminated than anything inside/behind the PPE. Thus, the challenge is to remove the equipment without touching the outside/front of that equipment’s surfaces.

Step 1 is to peel away each glove from the inside out.

Step 2 is to remove the gown by undoing the neck and waist ties and then peeling away the gown from the inside out.

Step 3 is to remove the visor by reaching for the elastic strap at the back of the head and then pulling over the head.

Step 4 is to remove the respirator by reaching for the elastic strap at the back of the head and then pulling over the head.

Between each step the use of alcohol gel/rub is recommended, and the final step (**Step 5**) is to wash hands with soap and water upon stepping into the uncontaminated world. In addition, a buddy system is recommended wherein peers can supervise each other through the removal process.

The video is helpful, but providing information about “how to” is unlikely to be sufficient as many staff likely already have the know-how. Instead, staff also need “*reminders to*” built into the hospital environment. Posting signs on the wall is an obvious, but likely overused, option.

When too many safety signs are posted on the wall, staff experience sign blindness,[11] and if staff do not see the reminders, the reminders cannot do their job. Flashy and noisy signs make them harder to overlook, but will quickly become annoying and distracting. One solution might be to move the reminders from the walls to the edges of the gloves, gown ties, and elastic bands, e.g. “*start removing here*”. Thus, the reminder to remove PPE without touching contaminated surfaces would be more difficult to overlook. PPE could also be colour-coded according to outside/front surfaces and inside/back surfaces that make it clear where the contaminated areas are likely to be.

Public Health England’s recommended buddy system is a well-intended intervention leveraging the social environment, but is only likely to help if the buddy understands their professional role and identity. The video doesn’t make this role clear. Checklists may help buddies identify with their roles quickly – while one person is removing, the other person is checking – but the present authors suspect that checklists will quickly become unhelpful extra paperwork. Thus, we suggest that organisations create new social norms through buddy practice sessions with rituals after the removal is done, like a thumbs up, elbow touch, or just telling each other “*good work*” before moving on. Organisations might also consider asking buddies to set implementations plans together, using something like the four step **WOOP** method [12]: (1) specifying a **Wish**, (2) imaging what the best **Outcome** would look like, (3) specifying the **Obstacles** that need to be overcome, and (4) specifying a **Plan** for how each obstacle can be recognized and overcome.

A good job done is a safe job done, and the hospital environment can be redesigned to keep staff safer. As for my gift wrapping problem, I just used a WOOP app and now have a calendar reminder saved for the 15th of November that will trigger me to wrap smarter in 2021.

References:

1. Ariely D. *Predictably Irrational: The Hidden Forces That Shape Our Decisions*. London; Harper Collins Publisher: 2008.
2. Li SY, Blandford A, Cairns P, Young RM. The effect of interruptions on postcompletion and other procedural errors: an account based on the activation-based goal memory model. *J Exp Psychol Appl*. 2008;**14**(4):314-28.
3. Rikower C. Preventing User Errors in Automated Teller Machines. *UX Movement*. 11 October 2011.
4. Thaler RH. *Misbehaving: The Making of Behavioural Economics*. London: Allen Lane; 2015.
5. Quinn B. Survey of female NHS staff raises concerns over burnout in pandemic. *The Guardian*. 25 August 2020.
6. Thimbleby H. Technology and the future of healthcare. *J Public Health Res*. 2013;**2**(3):e28.
7. Haynes AB, Weiser TG, Berry WR, et al. A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population. *N Engl J Med*. 2009; **360**: 491-9.
8. Patel D. Supporting staff to use PPE safely during COVID-19. *Q, The Health Foundation*. 11 November 2020.
9. Okamoto K, Rhee Y, Schoeny M, et al. Impact of doffing errors on healthcare worker self-contamination when caring for patients on contact precautions. *Infect Control Hosp Epidemiol*. 2019; **40**(5), 559-65.
10. Public Health England. COVID-19: Removal and disposal of Personal Protective Equipment (PPE). *YouTube*. 2 March 2020.
11. Pierce F. Avoiding safety sign blindness in the warehouse. *Supply Chain Digital*. 5 May 2020.
12. Oettingen G. Stop Being So Positive. *Harvard Business Review*. 27 October 2014.



Does Intensity of Exercise Matter?

Peter Chilton, Research Fellow

Current recommendations (*both in the UK and USA*) for physical activity are 150 minutes of moderate intensity physical activity (MPA) (activities that cause light sweating or a slight-moderate increase in breathing/heart rate), 75 minutes of vigorous physical activity (VPA) (activities that cause heavy sweating or a large increase in breathing/heart rate), or an equivalent combination of both intensities. However, it is unclear whether undertaking VPA offers additional benefits compared to undertaking MPA (for the same amount of total physical activity). To investigate this, the authors of a recent paper in *JAMA Internal Medicine* [1] used data from a national health survey to analyse over 400,000 Americans who supplied self-reported physical activity over a median of 10.1 years of follow-up.

Analyses found an association between people who had a higher proportion of VPA to total physical activity (moderate to vigorous intensity) and a decrease in all-cause mortality (for the same amount of total physical activity). As an

example, people whose proportion of VPA to total physical activity was greater than 50-75% had a 17% lower all-cause mortality rate than people who only did moderate intensity physical activity (i.e. no vigorous activity) (hazard ratio 0.83, 95% CI 0.78-0.88). There were no significant differences in mortality linked with cardiovascular disease or cancer.

The authors conclude that clinicians should recommend a minimum of 150 minutes of MVPA per week, which is the threshold for the lowest all-cause mortality, with a focus on increasing the proportion of VPA to maximise health benefits.

Reference:

1. Wang Y, Nie J, Ferrari G, et al. [Association of Physical Activity Intensity with Mortality. A National Cohort Study of 403 681 US Adults.](#) *JAMA Intern Med.* 2020.

Blood Test for Early Diagnosis of Cancer

Peter Chilton, Research Fellow

Currently around 165,000 people die from cancer each year in the UK, and for a significant number of them their initial diagnosis came too late for treatments to be effective. The [NHS Long-Term Plan](#) aims to increase the proportion of people whose cancer is diagnosed at an early stage (stages one or two) from 50% to 75% by 2028. For a number of cancers, early detection can significantly increase the likelihood of 1-year and 5-year survival compared to cancers diagnosed at stage four.[1]

Recently the NHS [announced](#) a collaboration with the company GRAIL to pilot a new blood test to detect cancer at an early stage. The *Galleri blood test* works by detecting molecular changes in a blood sample. Evidence suggests that cancerous cells release small fragments of DNA and RNA, termed cell-free nucleic acids (cfNAs), into the bloodstream, which can be detected through sequencing, aided by machine learning algorithms and neural networking. These cfNAs also contain methylation marks from the originating tissue, meaning it may be possible to pinpoint where the cancerous cells are located.

An initial trial of biospecimens from 6,689 participants (just over one-third with cancer) found that the Galleri blood test was able to detect cancers across all stages, with an overall sensitivity of 54.9% across all cancer types, and a specificity of >99%. It was also able to identify the location of the tissue with >90% accuracy. [2]

A pilot study is now being set up in the UK, aiming to offer the test to 165,000 people, with the vast majority of these being symptomless. The study is expected to commence in 2021, with results anticipated in 2023, before a full trial begins in 2024-25.

References:

1. Office for National Statistics. [Cancer survival in England: adult, stage at diagnosis and childhood – patients followed up to 2018](#). 2019.
2. Liu MC, Oxnard GR, Klein EA, Swanton C, Seiden MV. [Sensitive and specific multi-cancer detection and localization using methylation signatures in cell-free DNA](#). *Ann Oncol*. 2020; **31**(6): 745-59.



Psychoanalysis: We Need You

Richard Lilford, ARC WM Director

In our recent News Blog we drew attention to factors contributing to anti-science and conspiracy theory.[1] The article we cited referred to neuroscientific changes associated with these precepts.[2] We discussed the role of education in combating these anti-enlightenment sentiments. A more recent article in the Lancet suggests another line of attack.[3] The authors make the perceptive point that anti-science is a form of denial. This causes the authors to reflect on denial as an, often misdirected, defence mechanism. Denial has a tendency to substitute

short-term gain for long-term pain. And the concept of denial as a defence mechanism originated in psychoanalysis. The authors argue that the trade-off between psychoanalysis on the one hand, and mainstream psychological and medical science on the other, should end. Such a rapprochement could lead to experimental approaches to tackle the existential threat that prevents action against pandemics, climate change and, most important of all, nuclear war. [4]

References:

1. Lilford RJ, Kudrna L. Science Denial and the Importance of Engaging the Public with Science. *NIHR ARC West Midlands News Blog*. 20 November 2020; **2**(11): 5-6.
2. Miller BL. Science Denial and COVID Conspiracy Theories: Potential Neurological Mechanisms and Possible Responses. *JAMA*. 2020; **324**(22): 2255-6.
3. Ratner A & Gandhi N. Psychoanalysis in combatting mass non-adherence to medical advice. *Lancet*. 2020; **396**: 1730.
4. Futter A, Watson SI, Chilton PJ, Lilford RJ. Nuclear war, public health, the COVID-19 epidemic: Lessons for prevention, preparation, mitigation and education. *Bull Atom Sci*. 2020; **76**(5): 271-6.

ARC WM Quiz

What is 'cliodynamics'?

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

Answer to previous quiz: The word quarantine is derived from the Italian '**quaranta giorni**' or 'forty days'. In the 15th century ships arriving in Venice were required to sit at anchor for 40 days before landing to ensure they weren't carrying the Black Death.

Congratulations to Alan Hargreaves and Patrick Wilson, who were first to answer correctly.

A Must-Read Study on the Fact of Food Supplementation on Cognitive Function of Under-Nourished Children

Richard Lilford, ARC WM Director

In previous News Blogs, we summarised evidence from three 2x2 factorial design RCTs of food supplementation and educational interventions in young children at risk of under-nutrition.[1][2] The results showed positive effects for the educational intervention but not the nutritional interventions, consistent across all three studies.

A recent trial from Guinea-Bissau, reported in BMJ, challenges these findings.[3] They hypothesised that the nutritional supplements used in previous studies were not optimal. In particular they cite animal studies that show that phenols, omega-3 fatty acids, and trace elements, such as molybdenum, have positive effects on brain development. They therefore conducted a randomised trial with three arms: control foods, standard nutritional supplements, and an improved multicomponent supplementary food, which I will call the experimental treatment.

The investigators did not wish to provide supplements for one child in a family and not another. They therefore treated the family as the unit of randomisation and included children between 15 months and four years in one stratum, and those between four and seven years

in another stratum. They measured working memory (by means of a simple test), brain blood flow, body composition and haemoglobin levels.

The experimental treatment produced improved working memory and cerebral blood flow compared to standard supplementation and the control. There was a slight imbalance in haemoglobin levels, with higher baseline levels in the experimental group. However, when analyses were conducted with control for baseline variables and excluded anaemic patients, they provided similar results. Adherence to the experimental treatment was measured and in a per protocol analysis, including only children who consumed 75% of the prescribed dose, the facts were even more impressive.

Clearly these results require urgent replication. I have heard it said that nutritional supplementation is not scalable. This is cobblers! Bed nets, vaccination and education have been scaled up over most of the world. If this improved nutritional supplement is confirmed to provide benefit in replication studies, then this will be a real game changer.

References:

1. Lilford RJ. [Really Important Papers on Child Development](#). *NIHR CLAHRC West Midlands News Blog*. 31 October 2014.
2. Lilford RJ. [Improve Long-Term Development of Children](#). *NIHR CLAHRC West Midlands News Blog*. 20 February 2015.
3. Roberts SB, Franceschini MA, Silver RE, et al. [Effects of Food Supplementation on Cognitive Function, Cerebral Blood Flow, and Nutritional Status in Young Children at Risk of Undernutrition: Randomized Controlled Trial](#). *BMJ*. 2020; **370**: m2397.

Farewell – Tribute to Katie Tempest

Magdalena Skrybant, PPIE Lead

It is with great sadness that I am writing to share the very sad news that one of our public contributors, Katie Tempest, died peacefully on Thursday 10th December. Katie's passing was very sudden and until very recently, Katie was actively involved in a range of projects.

Katie was a very passionate public contributor and joined ARC WM earlier this year. She first became involved in health and social care research in 2012 and she was a strong advocate for public involvement. Katie brought so many different perspectives to research: in addition to experiences from her career in social work, Katie offered her very personal experiences of being a patient and a carer to her husband.

Katie had a strong determination to improve health and care outcomes for patients and their families, as shown in the wide-range of activities she was involved in. In addition to working with ARC WM, Katie was a member of Keele's Research User Group, and was also a Research Champion for the WM Clinical Research Network and Join Dementia Research. She was actively involved in a range of projects, including as a co-applicant, and always championed and promoted the voice of patients and carers throughout the research cycle. Recently, Katie attended our Public Health Summit.

Over the last week, people from our research communities have shared fond memories of working alongside Katie. 'Dedicated', 'committed', 'hard-working', 'supportive' and 'kind' are qualities that are often used when people talk about Katie. Without exception, people have spoken about how generous Katie was with her time, and how incredibly supportive she was to everyone she worked alongside. In addition to bringing her skills and vast experience to her activities, people have also reflected on how Katie contributed her warmth and great sense of humour.

Here are just a few tributes from people that worked alongside Katie:

"Katie was an energetic, well-informed, hard-working, and dedicated member of our Research User Group. Her warmth, good humour, loyalty and advice will be greatly missed in all aspects of our work." -- Krysia Dziedzic

"It was my privilege to work with Katie as a Research Champion for the past three years. She was unstinting in her commitment to the patient and public voice in research and she inspired those around her with her passion, energy and insight. Katie was selfless and a real warrior for the unheard and the ignored. She will be missed and mourned." -- Anne Devrell

"Katie was a joy to work with and we will all miss her enthusiasm, vibrant energy and smile - she will be greatly missed." -- Carol Rhodes

"Katie was a wonderful strong vibrant lady, with a passion to ensure the patient and carer voice was heard. She was a dedicated hard-working member of the Research User Group and I will miss her dearly." -- Adele Higginbottom

"This is heart-breaking news, which will sadden a lot of people connected to our centre and beyond. I would like to give my gratitude for all of Katie's wonderful contributions to our work down the years." -- George Peat

"It has been an absolute pleasure to work with Katie over the last few years. Her enthusiasm, spirit, and vibrancy (hence the pink text) will be missed. What a gem of a human being." -- Tom Kingstone

We are all very saddened by this unexpected news and Katie's passing is a great loss to our community. Our thoughts are with Katie's family and friends at this time.

Latest News

West Midlands Healthcare Awards - Nominations Open

Nominations are now open for the prestigious West Midlands Academic Health Science Network (WMAHSN) Meridian Celebration of Innovation Awards. For five years this awards programme has been celebrating individuals and organisations that are revolutionising healthcare in the West Midlands with new ideas, technologies, and initiatives. Last year our *Birmingham Symptom-specific Obstetrics Triage System (BSOTS)* [won the Patient Safety and overall Meridian award for Innovation.](#)

Any organisation or individual from across the healthcare, enterprise, academia, or not-for-profit sectors can enter, but they must have worked on a project with WMAHSN, or one of its expert networks, to qualify.

Entries can be submitted via the Meridian Innovation Exchange website: meridian.wmahsn.org. The deadline for submissions is **Friday 5 February 2021.**



Social Care Summit

ARC West Midlands are holding an online Social Care Summit on **Thursday 25 February 2021.** The event will focus on adult social care in the West Midlands and will provide an opportunity for practice and research to meet, discuss and create together. For further details, and to register, please visit: eventbrite.co.uk/e/adult-social-care-research-in-the-west-midlands-tickets-129275513541.

Job Opportunity - Research Fellow in Health Economics

The Institute of Applied Health Research at the University of Birmingham are looking to recruit a Research Fellow in Health Economics, with an emphasis on *service delivery research*. This role will provide an opportunity to work on established evaluations of national service delivery interventions while developing cutting edge methods for such evaluations. It also offers an intellectually stimulating, yet supportive, disciplinary environment, including well-formed Health Economics and Statistics groups.

The post is particularly suitable for someone with a PhD in Health Economics, but those with

PhDs in a broadly related area (e.g. biostatistics, operational research, welfare economics) who are interested in moving into health economics are also welcome to apply. This post would also be suitable for a mathematician or a statistician with an interest economics, an economist with an interest in statistics or an epidemiologist with good numeracy skills.

This is a fixed-term contract until 31 December 2023.

For more information, and to apply, [please click here](#). Closing date for applications is **3 January 2021.**

Mali Health Project to Reduce Fatal Threat of Diarrhoea

Prof Richard Lilford, ARC WM Director, is co-chief investigator alongside Dr Semira Manaseki-Holland on a recently awarded £2m grant from the UKRI. The Mali-based health project will encourage families to change their food safety and hygiene behaviour in order to reduce the incidence of diarrhoea and pneumonia among children, with a particular focus on children transitioning from breastfeeding to eating food – these youngsters are at most risk as complementary food becomes contaminated.

Experts will use culturally relevant dramatic arts – including drama, songs and stories – as well as public meetings and home visits to engage with tens of thousands of people living in 60 rural villages and 60 urban communities in urban and rural Mali during the three-year project.

Further information is available in this press release: [birmingham.ac.uk/news/latest/2020/12/save-children-from-diarrhoea-death.aspx](https://www.birmingham.ac.uk/news/latest/2020/12/save-children-from-diarrhoea-death.aspx).

National NIHR ARC Newsletter

The December issue of the national NIHR ARC newsletter is now [available online](#). Including a number of reports on COVID-19 related findings and research, and various upcoming events.

To subscribe to future issues, please visit: <https://tinyurl.com/ARCSnewsletter>.



The BALLETS (Birmingham And Lambeth Liver Evaluation Test Strategies) study was a five-year study that aimed to evaluate mildly abnormal liver function test results in general practice among patients who did not have known liver disease. Results were [published](#) in 2013.

We are now following up these patients to gain an improved understanding of longer-term health outcomes. In this study we will be electronically linking patients' NHS numbers with two national databases to find out if they developed any liver-related health problems during the period 2007-2020.

More information on this follow-up study is available at: [birmingham.ac.uk/research/applied-health/research/ballets.aspx](https://www.birmingham.ac.uk/research/applied-health/research/ballets.aspx)

BALLETS Follow-up Study

Although all people who took part in the original BALLETS study agreed to be followed up in the future, we did not make it explicit that we would be linking data in this way.

If you participated in the original project, you have the right to withdraw at any time, which you can do by contacting the BALLETS team: m.t.skrybant@bham.ac.uk or r.j.lilford@bham.ac.uk. When contacting the team, please provide your full name and preferred contact details.

This data will be used to ensure your previously obtained data is not used in this follow-up study. We will use the details provided to confirm this has taken place. We will store the fact that you have requested to opt out of the BALLETS study, but we will not send you any further information, nor will we use the data for any other purpose.

Recent Publications

Atkin C, Knight T, Subbe C, Holland M, Cooksley T, Lasserson D. [Acute care service performance during winter: report from the winter SAMBA 2020 national audit of acute care](#). *Acute Med*. 2020; **19**(4): 220-9.

Beck C, Brown C. [Could the UK Foundation Programme training post allocation process result in regional variations in the knowledge and skills of Foundation doctors? A cross-sectional study](#). *Health Sci Rep*. 2020; **3**:E201.

Bion J, Aldridge C, Girling AJ, Rudge G, Sun J, Tarrant C, Sutton E, Willars J, Beet C, Boyal A, Rees P, Roseveare C, Temple M, Watson SI, Chen YF, Clancy M, Rowan L, Lord J, Mannion R, Hofer T, Lilford R. [Changes in weekend and weekday care quality of emergency medical admissions to 20 hospitals in England during implementation of the 7-day services national health policy](#). *BMJ Qual Saf*. 2020.

Ekeozor CU, Jeyaruban D, Lasserson D. [Where should patients with or at risk of delirium be treated in an acute care system? Comparing the rates of delirium in patients receiving usual care versus alternative care: a systematic review and meta-analysis](#). *Int J Clin Pract*. 2020; e13859.

Grove A, Clarke A, Currie G, Metcalfe A, Pope C, Seers K. [Advancing clinical leadership to improve the implementation of evidence-based practice in surgery: a longitudinal mixed-method study protocol](#). *Implement Sci* 2020; **15**: 104.

Healey EL, Allen KD, Bennell K, Bowden JL, Quicke JG, Smith R. [Self-Report Measures of Physical Activity](#). *Arthritis Care Res*. 2020; **72**(s10): 717-30.

Hill NR, Arden C, Beresford-Hulme L, Camm AJ, Clifton D, Davies DW, Farooqui U, Gordon J, Groves L, Hurst M, Lawton S, Lister S, Mallen C, Martin AC, McEwan P, Pollock KG, Rogers J, Sandler B, Sugrue DM, Cohen AT. [Identification of undiagnosed atrial fibrillation patients using a machine learning risk prediction algorithm and diagnostic testing \(PULsE-AI\): Study protocol for a randomised controlled trial](#). *Contemp Clin Trials*. 2020; **99**:106191.

Holland M, Subbe C, Atkin C, Knight T, Cooksley T, Lasserson D. [Society for Acute Medicine Benchmarking Audit 2019 \(SAMBA19\): Trends in Acute Medical Care](#). *Acute Med*. 2020; **19**(4):209-19.

Kwok CS, Mallen CD. [Missed acute myocardial infarction: an underrecognized problem that contributes to poor patient outcomes](#). *Coron Artery Dis*. 2020.

Lauridsen KG, Baldi E, Smyth M, Perkins GD, Greif R; on behalf of the Education Implementation and Team Task Force of the International Liaison Committee on Resuscitation (ILCOR). [Clinical Decision Rules for Termination of Resuscitation during In-hospital Cardiac Arrest: A Systematic Review of Diagnostic Test Accuracy Studies](#). *Resuscitation*; 2020: **158**: 23-9.

Oliver C, Adams D, Allen D, Crawford H, Heald M, Moss J, Richards C, Waite J, Welham A, Wilde L, Woodcock K. [The behaviour and wellbeing of children and adults with severe intellectual disability and complex needs: the Be-Well checklist for carers and professionals](#). *Paediatr Child Health*. 2020; **30**(12): 416-24.

Paskins Z, Crawford-Manning F, Cottrell E, Corp N, Wright J, Jinks C, Bishop S, Doyle A, Ong T, Gittoes N, Leonardi-Bee J, Langley T, Horne R, Sahota O. [Acceptability of bisphosphonates among patients, clinicians and managers: a systematic review and framework synthesis.](#) *BMJ Open.* 2020; **10**(11):e040634.

Qadi O, Lufumpa N, Adderley N, Bem D, Marshall T, Kokab F. [Patients' and health professionals' attitudes and perceptions towards the initiation of preventive drugs for primary prevention of cardiovascular disease: a systematic review of qualitative studies.](#) *BJGP Open.* 2020; **4**(5).

Swaithe L, Dziedzic K, Finney A, Cottrell E, Jinks C, Mallen C, Currie G, Paskins Z. [Understanding the uptake of a clinical innovation for osteoarthritis in real-world primary care: a qualitative study of knowledge mobilisation using the i-PARIHS framework.](#) *Implement Sci.* 2020; **15**(1): 95.

Yarnell CJ, Abrams D, Baldwin MR, Brodie D, Fan E, Ferguson ND, Hua M, Madahar P, McAuley DF, Munshi L, Perkins GD, Rubinfeld G, Slutsky AS, Wunsch H, Fowler RA, Tomlinson G, Beitler JR, Goligher EC. [Clinical trials in critical care: can a Bayesian approach enhance clinical and scientific decision making.](#) *Lancet Resp Med.* 2020.