Welcome to the 100th issue of your NIHR CLAHRC West Midlands News Blog.

In this 100th issue we have a bumper number of articles for you, starting with two main articles: one on the costs of generic service interventions; and one on health service utilisation in slums. Further, we look at recent work on payment by results; the results of cluster RCTs in general practice; revisiting the (in)famous Milgram experiment; whether divorce is an effect of the environment or genetics; the health implications of donating a kidney; the reasons for food deserts; and education to improve quality of care in rural India.

As usual, we also have details of the latest news and events; this issue’s quiz question; and highlight some of our latest publications.

We hope that you find these posts of interest, and we welcome any comments. You can find previous issues of our News Blog here.

You may have heard about the new General Data Protection Regulation ("GDPR") that comes into effect May 25, 2018.

Available at: https://mailchi.mp/d7a996c40827/clahrcwm-2018-04-3241485
Director's Blog I

Evaluation of High vs. Low Cost Service Interventions

Generic service interventions vary considerably in their costs. Human resource interventions, such as improving the nurse to patient ratio or making more specialists available over the weekend, tend to be expensive. Other service interventions, such as an educational intervention to improve team working in multi-disciplinary clinical teams, are less expensive. The cost-effective effect size is smaller for lower cost interventions than for those that are more expensive. The axiom, that the cost of an intervention determines the effectiveness threshold at which it becomes cost-effective, has profound implications for the design and analysis of evaluative studies. The nub of the argument is that the size of the health effect that would justify deployment of service interventions may be too small to be detected by affordable or logistically feasible studies when the cost of that intervention is low. Before developing this argument further, let me be clear that by cost I mean net cost (not just the cost of the intervention itself), and that costs must be compared with respect to a common denominator – e.g. cost per patient, cost per 1,000 patients, etc.

Let us imagine that we wish to improve consultant cover at weekends. This is a very expensive intervention (whether measured in terms of the cost of hiring new consultants or the opportunity costs of re-allocating consultant time).[1] Such an intervention would need to provide considerable health gain to justify its substantial cost. In such a case it is reasonable to expect – indeed require – that any evaluative study should be able to detect patient benefit, say in terms of lives saved and adverse events avoided. If no improvement in health gain is detected, then we must conclude that either the study was ‘underpowered’ OR that any effects are too small to justify the intervention costs. If the study was not underpowered – that is to say if the sample size was sufficient to detect health benefits sufficient to justify cost of the intervention – then we conclude that the intervention does not promise good value for money. We leave aside the issue of exactly how the threshold effect (which justifies an intervention cost) can be determined, save to point out that methods to do so exist and that we have advocated use of such methods (prospective health economic modelling) for some time.[1-3]
Take, as an opposite extreme, an intervention to promote hand-washing – perhaps using ‘nudge theory’. The intervention here is likely to be nugatory – say having a sticker with an illustration of a ‘watching eye’ placed over hospital sinks, for example. Harms are unlikely and intervention costs are low. It follows that there is not much downside to intervening. That is to say, even if the intervention was totally ineffective, no real harm would result. A massive trial with an endpoint such as hospital-acquired infection rates would be overkill in such a scenario. This is because the threshold effect to justify the intervention is much smaller than the minimal difference detectable in any affordable / logistically feasible study. Using ‘upstream’ endpoints, such as “was the intervention deployed?” and “did it increase use of hand-washing materials?” (necessary but not sufficient conditions for effectiveness) would suffice in an evaluation. Many interventions are rather more expensive than promotion of hand-washing, but much less expensive than large HR initiatives; the above mentioned educational intervention to promote team-work, for example. Here it might be too much to expect, or require, quality of life or mortality to change sufficiently for any change to be detectable (statistically) in an affordable trial. However, one might expect to pick up a broad range of other signals that an intervention effect was likely. For example, it may be observed that team working and patient satisfaction had improved, as well as that the intervention was adopted and supported by staff. That one might have to rely on such proxies for QoL and life years has been referred to as “an inconvenient truth in service delivery research.” It is important that grant awarding panels should not follow a one-size fits all approach to service delivery research, but rather they should tailor their requirements according to the cost of intervention concerned. Likewise, they should be prepared to integrate many sources of evidence in their assessment of health benefit parameters, as argued elsewhere, and in the report of a recent study later in this issue of your News Blog.

-- Richard Lilford, CLAHRC WM Director

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**References**

[1] [6-8] and in the report of a recent study later in this issue of your News Blog.

**Director's Blog II**

**Private Providers are Consulted More Often than Public Providers in Slums**

This finding comes from a number of studies across many parts of the world, including:

1. India [1] – where private providers were both preferred over public providers and consulted more often. Private providers were more accessible in terms of distance from residence.

Available at: https://mailchi.mp/d7a996c40827/clahrcwm-2018-04-3241485
2. Kenyan maternity care [2] – women preferred private over public providers, even though the private providers were rated as ‘inappropriate’ by government.

3. Dhaka slums [3] – this is an important study because it divides health facilities according to Ahmed’s classification.[4] Most commonly consulted were pharmacies (43%), followed by government hospitals (14%), then private hospitals (4%), independent medical practitioners (3%), informal providers (3%), and traditional healers (1%). Dissatisfaction was highest with government hospitals (25%) and lowest with informal providers and pharmacists.

4. Accra’s Sodom and Gomorrah slum [5] – the facilities accessed were similar to those in Dhaka: 61% pharmacies and 33% hospitals. In this study lack of insurance was a major factor limiting access, while distance from facilities was not.

5. Mumbai slums [6] – this study did not look at pharmacies specifically, but overall local private providers were the most widely used facilities. The use of public providers rose in proportion to the seriousness of the disorder, from 15% at low categories, to 42% for serious illness, and 60% for maternal health.

One important conclusion from the above literature is that facilities should be classified to capture those inside a slum and external to it, and that pharmacies / drug stores should have their own stratum and not be elided with informal or private providers. Private allopathic providers should be classified as medical, other registered health professional (nurse / medical officer), community health worker (with formal links to the public service), and informal non-qualified provider. In studies that cross slum boundaries, multi-level modelling should be used to allow for correlations within clusters and avoid an ecological fallacy / Simpson’s paradox.[7]

The above studies are all based on population/household-based questionnaires. Another Dhaka based study takes a different approach [8] – instead of asking people who live in slums where they go for their health care, Adams and colleagues mapped health facilities across six urban slums. They found that 80% of the 1,041 facilities identified in their spatial survey were privately operated. Unlike NGO- and government-funded clinics, private health care delivery clinics operate in the evenings. Only a third of staff in these private clinics have a medical qualification. Overall, the ‘density’ of health delivery points across the six slums was 1.5 per 10,000 of population. The average distance to a major government hospital offering outpatient services was 3km.

In our NIHR Global Health Research Unit on Improving Health in Slums we will be combining supply-side surveys of facilities with demand-side household surveys of use and satisfaction. We plan to go further by examining the socio-political structures that have determined patterns of provision and that may facilitate or impede the future development of a more accessible and high-quality service. We will then model the costs and benefits of alternative logistically and politically viable options using an iterative approach. In developing these models we will work closely with residents of slums and with those who control the purse strings.
Richard Lilford, CLAHRC WM Director

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References

Return to top

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CLAHRC WM Quiz

Linus Pauling was awarded two Nobel prizes for chemistry and peace; John Bardeen received two for physics; and Frederick Sanger won two for chemistry. But who was the only person to have been awarded two Nobel prizes for two different sciences?

Email CLAHRC WM your answer.

Photo by: Tim Ereneta

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Answer to our previous quiz: Sir Roger Bannister was the famous neurologist who also achieved a significant sporting landmark - the first person to run a mile in under four minutes. Congratulations to Magdalena Skrybant who was first to answer correctly.

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Director's Choice - From the Journals

Payment by Results: More Evidence Against

I am something of a pro-market libertarian. From this ideological standpoint I am sympathetic towards the idea of payment by results to supplement for lack of market incentives in the supply of non-market services. Just one problem – they don’t work. Well, they often don’t work. A recent, elegant paper uses threshold analysis to examine the effect of the Medicaid / Medicare Services payment by results – their ‘Value Based Modifier’. [1] This is the largest health service in the world – much bigger than the NHS – so there are plenty of data points. The threshold used in studies was the size of the practice, at which various rewards and penalties cut in. So, in outline, the graphs look like this:

[1] Available at: https://mailchi.mp/d7a996c40827/clahrcwm-2018-04-3241485
If the incentive worked then we would expect to see this:

Instead we see this:
In other words, the incentives did not work. Assuming that the threshold does not coincide exactly with a counterfactual break, this disproves any benefit (or disbenefit) of performance-based payment in this or similar contexts. But CLAHRC WM did find that an incentive was effective in increasing uptake of home haemodialysis.[2] So here is an hypothesis: incentive systems only work when there is a clear objective that can be achieved by specific management / clinical action. We have said this before – Lilford’s rule if you insist – “incentives do not work when the people at whom the incentive is targeted do not have a clear and correct idea of how the objective may be achieved.” I also think this is a lovely example of threshold analysis, a topic mentioned in a recent News Blog.[3]

-- Richard Lilford, CLAHRC WM Director

References

A Poorly Argued Article on the Results of Cluster RCTs in General Practice

A recent paper in the Journal of Clinical Epidemiology analysed the results of cluster RCTs where general practices were the unit of randomisation.[1] Effect sizes were reported for 72 outcomes across 29 cluster RCTs. Fifteen of the 72 outcomes were significant statistically, and only one met or exceeded the alternative hypothesis (delta). Disappointingly, the authors do not classify the trials properly, as we have recommended [2] – with or without baseline measurements and, if baseline measurements were used, whether the study was cross-sectional or cohort.[3] The authors seem to favour Bonferroni correction when there is more than one end-point, but this is unscientific. In situations where many study endpoints are part of a postulated causal chain, then far from ‘correcting’ for multiple observations, correspondence between different observed endpoints should reinforce a positive conclusion. Likewise, lack of correspondence should cast doubt on cause and effect
conclusions. This process of triangulation between observations lies at the heart of causal thinking.[4] The logic is laid out in more detail elsewhere.[5] [6]

-- Richard Lilford, CLAHRC WM Director

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References

Revisiting the Milgram Experiment

During my career I have made three inaugural lectures. While preparing for the first of these I read an inaugural lecture made a few months before to glean information on procedure and form. I chanced upon an inaugural delivered by a newly appointed Professor of Psychology – one Tony Chapman. In his lecture, Chapman recounted Stanley Milgram’s famous (possibly infamous) experiments in which volunteers administered simulated electrical shocks to learners. The volunteers were urged to administer the electric shocks if the learner faltered. The learner, who was an actor, would then react to the simulated shock so that the volunteer would think the learner was recoiling from a real electric shock. The majority of volunteers complied with this harsh instruction. Conducted in the wake of World War Two atrocities, the experiments seemed to explain the behaviour of prison guards who perpetrated institutionalised cruelty on an unconscionable scale in the European and Eastern theatres.

Alas, it was all just a little too neat. Milgram’s archive has been made available to researchers and his findings are, at the very least, exaggerated.[1] A high proportion (above half) of volunteers suspected the ruse. Worse Milgram was selective in the results reported. It is, however, to Milgram’s credit that he maintained the archive and, moreover, recorded the many experiments he performed. In his archive Milgram makes an entry where he questions his own work – how much is science and how much theatre, he wonders. As to his conclusions – perhaps not so much wrong as not right. Certainly, much of human behaviour is contingent on the prevailing social environment, as discussed elsewhere in this News Blog.[2] [3] The education a person has had at mother’s knee, at school and at university, will all form the character that is eventually carried into clinical practice. The aim should be to generate a high rectitude individual who will resist, indeed oppose, the forces of evil.

-- Richard Lilford, CLAHRC WM Director

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References

Divorce is More Genetic than Environmental

Available at: https://mailchi.mp/d7a996c40827/clahrcwm-2018-04-3241485
That the children of divorced parents are more likely themselves to get divorced than the children of parents who stayed together, is not in doubt. The relative risk, however, varies widely, ranging from approximately 1.25 to over 3.

However, no study finds no association. The question is the cause – genes versus environment. This is always a tricky issue because genes act through the environment. Nevertheless, components of the variance in the overall effect can be teased apart, recognising that the relative contributions might themselves be ephemeral quantities. A Swedish linkage study of national registries shines light on this topic.[1] These Swedish registers are vast – big data personified. A recent study examined 8,500 adopted siblings and 53,000 biological siblings. The adoptees resembled the biological siblings, not those of their birth family, in their propensity to get divorced. The authors also found that the risk of divorce in an adopted person was more closely related to the divorce rate of their biological parents rather than to the divorce rate of their adoptive parents.

Of course, all sorts of biases can creep into a study like this. For example, homes are carefully screened before adoption is permitted. Nevertheless, taken in the round, these results do suggest a strong genetic component to divorce. I suspect that the genetic alleles responsible will be unmasked in due course.

-- Richard Lilford, CLAHRC WM Director

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**Reference**

**Donating a Kidney is Not (Very) Bad for You**

Kidney transplants are increasingly taken from living rather than deceased donors. In England more than half of all kidney transplants are now taken from living donors. A recent systematic review and meta-analysis from the US showed that donating a kidney is largely innocuous.[1] The authors found 52 studies comprising nearly 120,000 living kidney donors.

Largely innocuous, but not free of all harm. Donors do suffer some health effects; they have an eight-fold increased risk of kidney failure, while women who become pregnant have twice the risk of pre-eclampsia. However, the absolute event rate was low; for instance one case of renal failure for every thousand person years of follow-up. Although this study is very large, the confidence limits on many estimates were rather wide, reflecting the low incidence of disease during the follow-up period.

No adverse psychological effects were noted. A small absolute increase in risk of kidney failure seems a small price to pay for improving the health and extending the life of a loved one.
That poor people have a less healthy diet than rich people is not in doubt. That poor people have worse health because they have less healthy diets is also not in doubt. That poor people have less access to healthy food than rich people is, again, not in doubt. This series of observations has led to a predominant narrative: that the poor are denied the healthy foods that they would choose, where it only that they had equitable access to healthy options.

This does not follow, any more than the argument that low access to contraception is causative of high birth-rates. It is quite feasible that low demand is the cause of both low access and the corresponding outcomes, both in the case of the pill and low access to healthy food.

Allcott and colleagues addressed this issue with respect to diet and health.[1] They examined the possibility that observed differences in supply of healthy foods are a response to differences in the demand for those foods in different neighbourhoods. The authors examined this through a rich array of data sets, one of which covered nearly half of all US grocery purchases. They were able to examine how people of different socioeconomic group behave when supermarkets are established in new locations, or when people move into, or out of, food ‘deserts’. Effectively they treat these geographic changes as instrumental variables.

When they examined the effect of entry of a new supermarket in a given locality, they find that local supermarket entry does not materially increase healthy eating. Then they examined the converse – movement of a household to an environment where more healthy food is available. Again, behaviour does not converge towards the general eating pattern in the new location.

Could this be because the supermarkets charge more for healthy products in poor neighbourhoods than they do in rich neighbourhoods? The authors examined this possibility and were able to exclude it. What they found is that poorer households are willing to pay much less than wealthier households for healthy food. As a result they are provided with less healthy food.

The results are broadly consistent with studies on education and food preferences. Food deserts exist, but they are not the result of supply-side failure. Rather they reflect the role of culture and tastes in the United States, as they have been shown to do in so many other places. The effects observed in the study did not change over many years. Policy initiatives that simplistically target food deserts are thus unlikely
to succeed.

-- Richard Lilford, CLAHRC WM Director

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Reference

A Fascinating Trial of an Educational Intervention to Improve the Quality of Care in Rural India

The background to this interesting paper [1] (published in the journal Science) is the appalling standard of care provided for poor people in low-income countries. Even when a patient presents with straightforward features of a condition that is easy to diagnose, the correct treatment is given in less than half of all cases. Antibiotics are widely prescribed even for clearly non-infectious diseases, such as angina.

Doctors provide better care than informal providers, but the size of this difference is not large. Only in 51% of straightforward clinical cases did doctors give the right treatment in a study in rural India.[2] Their mean consultation lasted for less than two minutes. It is well established that doctors in the public sector often fail to turn up for their clinical assignments. Moreover, there are not enough doctors to go round and many people rely on informal providers.

So what should be done to remedy this unfortunate state of affairs? Should we train more doctors or upskill informal providers? Das and colleagues conducted a well-designed and executed RCT to find out.[1] Informal providers were randomised to receive an educational intervention or control. The educational intervention consisted of 72 sessions, delivered over nine months. The mean proportion of attendances at training sessions was 56%. Nevertheless, there was a clear improvement in performance among the informal providers who had been allocated to the intervention group.

Interestingly, the main method of endpoint assessment was by standardised patients (see our previous News Blog). These are 'mystery shoppers' who provide the health care provider with a straightforward and fairly unequivocal symptom combination for conditions such as asthma, angina and diarrhoea. Interestingly, the educators providing the training sessions were not party to the testing scenarios that were to be presented to the trainees (and their controls). Use of unnecessary treatments (e.g. antibiotics for angina) was not affected by the intervention. The results obtained by standardised patients were 'triangulated' by means of direct observation of a subset of consultations. The trends were corroborated – a statistically significant improvement was again observed across intervention and control groups.

The authors also compared the informal providers (both groups) with a group of medically trained providers (they had not received any additional training). Training
made good half of the performance gap between informal and medically qualified providers. Nevertheless, the latter provided correct case management in only about two-thirds of cases, and were more likely than the informal group to prescribe antibiotics where they were not indicated. Some methodological points:

1. I was impressed that the researchers avoided ‘training to the test’, as mentioned above.
2. They only used post-randomisation endpoints, whereas there is a case for pre- and post- measurements to allow measurement of differences in differences/controlling for baseline.
3. There is no use of (or mention of) clustering within the data – it would be interesting to examine for differences in performance by clinical scenarios within and across trainees.

Nevertheless, this is an extremely interesting study from both the scientific and practical points of view. It would be much less expensive to train more informal providers than to train more doctors. Perhaps doctors should be used as trainers and quality managers, and to see difficult cases, while a less highly trained / cognitively elite workforce is trained to manage the more quotidian cases – a proposal we have made for high-income countries.[3]

-- Richard Lilford, CLAHRC WM Director

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References

News & Events

NIHR I Am Research

The NIHR have launched their 2018 I Am Research campaign, aimed at encouraging patients, carers and the public to get involved in research and to raise awareness and involvement in research among health and care professionals.

This year it will encompass celebrating the 70th birthday of the NHS and as a joint campaign will highlight how people can give the gift of health research as a ‘present’ for the NHS. It will also celebrate how research has improved health and care over the past 70 years, and how we can shape the next 70 years.

For more information, please click here.

NIHR Funding

The NIHR have made details of their latest funding opportunities available.
HS&DR Programme:
- 18/73 - Standard researcher-led
- 18/74 - Evidence synthesis
- 18/75 - Mental health themed call

HTA Programme:
- 18/65 - Researcher-led evidence synthesis
- 18/66 - Researcher-led primary research
- 18/67 - Mental health themed call (evidence synthesis)
- 18/68 - Mental health themed call (primary research)

Invention for Innovation programme - Product development awards call 16.

Job Opportunity with CLAHRC West

CLAHRC West are advertising for a (Senior) Research Associate in Health Services or Applied Health Research, based at the University of Bristol. This is a full-time, open-ended position, and closing date for applications is 31 May 2018. For more information, please click here.

PhD Opportunities

Two 3-year PhD studentship opportunities are available at University College London, jointly funded by CLAHRC North Thames and the NIHR School of Public Health Research, and starting in September 2018. For more information, including research topics, please click here. Closing date for applications is 17:00 15 May 2018.

HSRUK Conference 2018

The 2018 Health Services Research UK conference will be held on 4-5 July 2018 in Nottingham. The conference presents the leading edge of health services research, and, this year, has a focus on Global Health Services Research in low-, middle- and high-income countries. For more information, and to register to attend, please click here. Early bird rates are valid until 13 May 2018.

Recent Publications


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